



RĪGA STRADIŅŠ
UNIVERSITY

RĪGA STRADIŅŠ UNIVERSITY
INTERNATIONAL CONFERENCE
ON MEDICAL AND HEALTH CARE SCIENCES

Knowledge For Use in Practice

ABSTRACTS

April 1 – 3, 2019
Riga, Latvia



RSU CONFERENCE

2019 KNOWLEDGE FOR USE IN PRACTICE



RĪGA STRADIŅŠ
UNIVERSITY

RĪGA STRADIŅŠ UNIVERSITY
INTERNATIONAL CONFERENCE
ON MEDICAL AND HEALTH CARE SCIENCES

Knowledge for Use in Practice

ABSTRACTS

1-3 April 2019
Rīga, Latvia

Rīga Stradiņš University. (2019). International Conference on Medical and Health Care Sciences *Knowledge for Use in Practice* (Rīga, 1–3 April 2019): Abstracts. Rīga: RSU, XLVII p., 764 p., including Author Index.

Chair of the Organizing Committee

Dr. phil. Agrita Kiopa

Chair of the Scientific Committee

Prof. Aivars Lejnieks

Authors are responsible for the content of their abstracts.

RSU IPN Nr. 19-049

© Rīga Stradiņš University, 2019
16 Dzirciema Street, Rīga, LV 1007

ISBN 978-9934-563-29-4

Contents

OPENING PLENARY SESSION

Academia and Pharmaceutical Industry Collaboration: Advancing Drug Discovery <i>M. Dambrova</i>	1
Mosaic of Autoimmunity: Role of Genetics and Environmental Factors, Especially Microbiome <i>Y. Shoenfeld</i>	2
Opportunities of Using Artificial Intelligence in Medical Imaging <i>S. Saarakkala</i>	3

CONFERENCE SECTIONS

Cardiovascular Health

High Cardiac Risk Polymorbid Patient Undergoing Non-Cardiac Surgery <i>D. Smirnova, R. Leibuss, B. Vīlīte, I. Krustiņa, D. Bogdanovs, E. Striķe</i>	4
Association Between Circulating MicroRNAs and Metabolic Biomarkers in Patients with Prediabetes with and without Early Atherosclerosis <i>E. Knoka, K. Trusinskis, M. Mazule, I. Briede, S. Jegere, I. Kumsars, Z. Narbutis, D. Sondore, A. Erglis</i>	5
Role of Oxidative Stress in Calcific Aortic Valve Stenosis Patients <i>J. Hofmanis, D. Hofmane, G. Gersona, S. Svirskis, V. Mackevics, P. Tretjakovs, A. Lejnīeks</i>	6
Effects of SMS Text Messaging on Chemerin and Omentin Levels in Clinically Healthy Overweight and Obese Individuals: Results from RCT <i>V. Silina, M. K. Tessma, P. Tretjakovs, S. Senkane, G. Bahs</i>	7
Next-Generation Sequencing for Latvian Arrhythmogenic Right Ventricular Cardiomyopathy Patients <i>L. Bidiņa, D. Rots, L. Caunīte, K. Kupics, O. Kalējs, L. Gailīte</i>	8
Gender Differences in SCORE Screening Parameters in Latvia <i>L. Mača, S. Gintere, T. Žepiļenko, L. Esta, C. Heaster</i>	9
Quality of Life Changes in Patients after Cardiac Pacemaker Implantation <i>N. Nikrus, M. Vikmane, O. Kalējs</i>	10
Quality of Diagnostics and Treatment of Pulmonic Embolism: Two-Year Retrospective Analysis <i>I. Holste, J. Pavlova, O. Sjomina, P. Ivanova, J. G. Voichevskā</i>	11
Intrahospital and Long-Term Outcomes after True Bifurcation Stenting <i>A. Laduss, I. Kumsārs, E. Čamane, K. Pičkurs, A. Ērglis, K. Trušinskis, G. Latkovskis, I. Briede, A. Rudzītis, S. Jēgere, I. Narbutis</i>	12
Tissue Biomechanical Changes in Case of Dilated Human Ascending Aorta <i>I. Breca, P. Stradins, M. Kalejs, U. Strazdins, I. Ozolanta, V. Kasjanovs</i>	13
Involvement of Public Organisations and Healthcare Professionals in Identifying and Assessing Cardiovascular Risks for Residents in Liepāja, Latvia <i>L. Ēriksone, G. Bēta</i>	14

Effectiveness of Amiodarone, Propafenone and Synchronised Electrical Cardioversion for Conversion of Atrial Fibrillation Paroxysm to Sinus Rhythm in Emergency Department of Pauls Stradiņš Clinical University Hospital <i>M. Tracevskis, A. Kalēja, I. Pupkeviča, N. Nikrus, K. Jubele, O. Kalējs</i>	15
Athletes' Heart Hypertrophy Changes Due to the Impact of Aerobic Training <i>V. Lāriņš, J. Lācis, P. Krūmiņa</i>	16
Venous Thromboembolism Recurrence in Latvian Population <i>V. Ģibietis, D. Kigitoviča, S. Strautmane, V. R. Kalējs, K. Meilande, A. Skride</i>	17
Extracorporeal Membrane Oxygenation Outcome Review in Latvia <i>A. Berzins, R. Leibuss, B. Mozule, V. Harlamovs, E. Strike, P. Stradins</i>	18
Association between 4q25 Variant rs6838973 and Atrial Fibrillation in Latvian Population <i>I. Rudaka, D. Rots, A. Uzars, O. Kalējs, L. Gailīte</i>	19
Targeted Next-Generation Sequencing as Diagnostic Tool for Lone Atrial Fibrillation <i>I. Rudaka, D. Rots, A. Uzars, O. Kalējs, L. Gailīte</i>	20
Does Endovascular Embolisation Packing Density of Ruptured Cerebral Aneurysms Improve Angiographic Long Term Occlusion Rates? Single Centre Experience <i>A. Ozola, S. Ponomarjova</i>	21
Neurological Outcomes and Neuromonitoring in Cardiac Surgery <i>R. Leibuss, A. Klesmite, A. Reihmane, E. Oss, E. Strike, P. Stradins</i>	22
One-Year Analysis of Femoropopliteal Revascularisation vs. Endovascular Intervention in Patients with Infrainguinal Arterial Occlusive Diseases <i>A. Ligers, V. Liepa, J. Rozentals, K. Staudzs, I. Udrišs, P. Ivanova, A. Kratovska, S. Ponomarjova, V. Zvirgzdins</i>	23
Preliminary Results of Clinical Outcomes of Atrial Fibrillations Surgical Treatment at Time of Concomitant Cardiac Surgery in Pauls Stradiņš Clinical University Hospital <i>A. Ņikitina, D. Kalniņa, K. Kupics</i>	24
Association between Myocardial Strain and Severity of Coronary Artery Disease <i>L. Caunīte, G. Kamzola, K. Trušinskis</i>	25
GPx and MDA Oxidative Stress Markers and Severity of Depression as Predictives of Recurrent Stable Coronary Heart Disease <i>V. V. Voicehovskis, O. Kalejs, J. G. Voicehovska, A. Skesters, K. Apsīte, J. Grigorjeva, T. Ivascenko</i>	26
Results of Acute Decompensated Heart Failure Treatment with Early Addition of Angiotensin-Neprylisin Inhibitor <i>V. Grebneva, I. Kurcalte, Y. Safro, A. Kalnins, O. Kalejs, A. Lejnieks</i>	27
Change in Use of Antithrombotic Therapy 6 Months after Electrical Cardioversion over a Period of 4 Years <i>A. Bērziņš, I. Pupkeviča, R. Vilde, K. Apsīte, O. Kalējs</i>	28
Preoperative Left Ventricular Ejection Fraction Effect on Inotropic Support Initiation after Cardiopulmonary Bypass <i>K. Šetlers, R. Leibuss, V. Harlamovs, E. Striķe, O. Sabeļņikovs, I. Vanags, P. Stradiņš</i>	29

Study Protocol for Randomised Controlled Trial of Individualised Home-Based Exercise Programme in Pulmonary Arterial Hypertension <i>L. Butāne, D. Šmite, A. Skride</i>	30
Brugada Syndrome Patient: Case Report <i>K. Jubele, K. Kupics, N. Nesterovičs, O. Kalējs</i>	31
Rare Finding with Cardiac Multislice Computer Tomography in Patient with Ventricular Tachycardia Paroxysm <i>A. Strēlnieks, L. Zvaigzne</i>	32
Circadian Variation in Onset of Myocardial Infarction Based on Risk of Obstructive Sleep Apnea <i>A. Pekša, I. Stukēna</i>	33
Outcomes of Acute Cardiac Failure after Cardiac Surgery <i>K. Rutka, R. Leibuss, B. Arklina, V. Harlamovs, P. Stradins, E. Strike</i>	34
Comparative Effectiveness of Antiarrhythmic Drugs for Prevention of Early Relapses of Atrial Fibrillation after Electrical Cardioversion <i>I. Pupkeviča, B. Kokina, N. Nikrus, K. Spalva, O. Kalējs</i>	35
Clinical Characteristics and 6-Month Outcomes of Atrial Fibrillation Patients after Direct Current Cardioversion <i>A. Bērziņš, A. Strēlnieks, K. Spalva, O. Kalējs</i>	36
Oral Anticoagulant Influence on Health-Related Quality of Life for High-Risk Atrial Fibrillation Patients: 6-Month and 12-Month Follow-up <i>K. Apsīte, A. Tupahins, D. Stoldere, T. J. Eglītis, N. Nesterovičs, T. Ivaščenko, V. Voicehovskis, A. Lejnieks, O. Kalējs</i>	37
Case of Long QT Syndrome: Could be More Unrecognised than Rare <i>N. Nikrus, S. Sakne, O. Kalējs</i>	38
Emergency Department: Occurrence of Clinically Significant Bleeding in Patients Using Oral Anticoagulants <i>E. Sokolova, V. Spalis, D. Balode, O. Kalējs</i>	39
Relation of HAS-BLED Bleeding Risk Score to Major Bleeding in Anticoagulated Patients Presented to Emergency Department <i>E. Sokolova, V. Spalis, D. Balode, O. Kalējs</i>	40
Long-Term Results of Catheter Ablation in Supraventricular Paroxysmal Tachycardias: Single Center Experience in Latvia <i>R. Vilde, K. Jubele, K. Kupics, M. Baturevica, Z. Silina, A. Berzins, G. Kamzola, I. Cgojeva-Sproge, S. Sakne, O. Kalejs, A. Erglis</i>	41
Contrast-Enhanced Ultrasound (CEUS) Neovascularisation Diagnostic Limitation in Unstable Atherosclerotic Plaque with Extensive Calcified Component <i>M. Radziņa, A. Lioznovs, A. Jukna, S. Kovaļovs, A. Lācis, D. Krieviņš, K. Ķisis, M. Gediņš, K. Jurjāns, S. Pavlovičs</i>	42
Predictors of Effective Electrical Cardioversion of Atrial Fibrillation <i>I. Pupkeviča, K. Apsīte, K. Jubele, O. Kalējs, A. Lejnieks</i>	43
Lead-Related Infective Endocarditis in Patients after Cardiac Electrical Device Implantation in Pauls Stradiņš Clinical University Hospital <i>N. Nesterovics, G. Nesterovics, K. Jubele, P. Stradins, M. Blumbergs, J. Ansabergs, O. Kalejs, A. Erglis</i>	44
Masters Basketball Players Cardiovascular Parameters Changes during Training and Competition <i>M. Bumbure, A. Vavere, O. Kalejs</i>	45

Masters Basketball Players Heart Rate as Indicator of Training and Competition Intensity <i>M. Bumbure, A. Vavere, O. Kalejs</i>	46
General Framework to Manage Athletes with Arrhythmias <i>H. Heidbuchel</i>	47
Rare Causes of Cardiac Hypertrophy <i>A. Rudzītis</i>	48
Can the Type of Physical Load Lead Athlete's Heart Hypertrophy to Involution? <i>V. Lāriņš, J. Lācis</i>	49
Multimodality Approach in Diagnosis of Cardiac Storage Diseases <i>B. Barone</i>	50
Coronary Revascularisation – How do You Improve the “Gold Standard”? <i>M. Kalejs</i>	51
Oncology and Haematology	
Maximal Strength Training for Breast Cancer Patients Undergoing Adjuvant Treatment <i>R. Cešeiko, S. Tomsons, A. Vētra, A. Srebnis, M. Timofejevs, E. Purmalis, J. Eglītis</i>	52
STAT5 Transcription Factor is Retained in Cytoplasm in B-cells of Patients with Chronic Lymphocytic Leukemia <i>E. Kashuba, L. Kovalevska, A. Matvieieva</i>	53
Non-Invasive Multispectral Skin Cancer Screening Method <i>M. Lange, E. V. Plorina, A. Derjabo, J. Spigulis</i>	54
Expression of Dickkopf-Related Protein 1 and Evidence of Osteolysis in Multiple Myeloma Patients <i>D. Auziņa, I. Beinaroviča, B. Janicka-Kupra, S. Lejniece, V. Groma, A. Lejnicks</i>	55
Approaches for Patient-Derived Breast Cancer Cell Cultivation (2D and 3D Cultures) <i>I. Čakstiņa, V. Pirsko, D. Nitiša, Z. Daneberga, J. Gardovskis</i>	56
Effect of Chronic Mild Hypoxia on DNA Repair and Cell Cycle Regulation in HER2-Enriched Breast Cancer Cell Line <i>D. Nitiša, V. Pirsko, M. Priedīte, S. Vorstova, I. Čakstiņa, Z. Daneberga</i>	57
Telomere Length and TP53 Gene in Benign Prostatic Hyperplasia Patients <i>E. Zole, E. Baumanis, R. Dāle, A. Leiše, V. Lietuvietis, R. Ranka</i>	58
Implementation and Improvement of Molecular Diagnostics of Polycythemia Vera in Latvia <i>Z. Dobeļe, B. Janicka-Kupra, K. Bernate, L. Belajeva, K. Mikuda, L. Zarina, D. Rots, A. I. Tutane, S. Lejniece, L. Gailite</i>	59
HER2-Positive Breast Cancer Gene Expression Influenced Pathway Analysis <i>E. Kuzņecova, Z. Daneberga, M. Nakazawa-Miklaševiča, E. Bērģa-Švitiņa, V. Pirsko, E. Miklaševičs, A. Irmejs, J. Maksimenko</i>	60
Willebrand Factor Multimer Assay as a More Accurate Diagnostic Tool for Distinguishing between Von Willebrand Disease Types <i>D. Balode, M. Pikta, S. Lejniece</i>	61

Contents

Influence of MRPS18-2 Protein Levels on Migration and Invasion of Cancerous Endometrial Cells <i>L. Kovalevska, L. Buchynska, E. Kashuba</i>	62
Prognostic Indicators in Chronic Lymphocytic Leukemia <i>A. Rivkina, I. Holodnuka, I. Ventina, I. Spaka, M. Soloveicika, M. Murovska, S. Lejniece</i>	63
Detection of Chemokine Receptors CCR1 and CCR2 in Peripheral Blood Lymphocyte Sub-Populations of Patients with Chronic Lymphocytic Leukemia Using Multi-Parameter Flow Cytometry <i>L. Hippe, A. Rivkina, M. Soloveicika, I. Ventina, J. Pavlova, M. Murovska, S. Lejniece, I. Holodnuka</i>	64
Impact of Hypoxia on Chemoresistance in Breast Cancer Cell Lines <i>V. Pirsko, I. Čakstiņa, D. Nitiša, Z. Daneberga, E. Miklaševičs</i>	65
Autologous Hematopoietic Stem Cell Transplantation in Plasma Cell Disorders: 12 Years Experience in Hematology Centre of Latvia <i>I. Trociukas, B. Janicka-Kupra, S. Lejniece</i>	66
Fluorescent Probes in Membranes of Fibroblasts and Melanoma Cells <i>I. Kalnina, D. Pjanova, I. Leve, J. Kirilova</i>	67
Bladder Cancer Incidence Trends in Latvia in 1990–2017 <i>Ē. Bitiņa-Barlote, J. Plonis, V. Cauce, E. Vjaters, J. Gardovskis, E. Miklaševičs</i>	68
Association between Human Leukocyte Antigen Genes and Cervical Precancerous Lesions <i>O. Plisko, J. Zodzika, D. Rezeberga, I. Jermakova, J. Eglīte, D. Kasjko, I. Liepniece-Karele, D. Kunicina, D. Sivina</i>	69
CHEK2 Pathogenic Variants do not Change Penetrance of BRCA1 Variants c.4034delA and c.5266dupC <i>E. Berga-Švitiņa, E. Kuzņecova, M. Nakazawa-Miklaševiča, J. Maksimenko, A. Irmejs, Z. Daneberga, E. Miklaševičs</i>	70
FAP Cases in Latvia Confirmed by Molecular Genetic Testing <i>Z. Daneberga, D. Bērziņa, V. Borošenko, Z. Krūmiņa, A. Gardovskis, E. Miklaševičs</i>	71
Large Patient Cohort Study of Total Vitamin B12 Blood Level in Cases with Oncologic Diagnosis in Latvia <i>D. Gavars</i>	72
Epidemiological Data and Treatment Patterns among Patients with Pancreatic Neuroendocrine Tumours (pNETs) in Latvia: First Report from Multi-Institutional Study <i>M. Ptašņuka, H. Plaudis, A. Ozoliņš, M. Sperga, A. Truškovs, Z. Narbutis, I. Kudaba, A. Geriņa-Bērziņa</i>	73
Oncolytic Virus Immunotherapy in Melanoma <i>S. Donina</i>	74
Breast Cancer: Change of Paradigms <i>A. Irmejs</i>	75
Non-Small Cell Lung Cancer Stage III Patients Diagnostic and Treatment Data Comparison with Central Europe Patients Data <i>S. Hasnere</i>	76
Frequency and Diagnostic Value of Positive Manchester Score to Identify BRCA1/2 Gene Mutation Positive Breast Cancer Cases in Latvia <i>E. Tavuēna, A. Irmejs, G. Trofimovičs, J. Maksimenko, P. Loža, J. Gardovskis, Z. Daneberga</i>	77

Impact Factors on 2-Year and 5-Year Survival Rate in Patients Operated with Oral Cancer in Advanced Stage <i>K. Pastars, J. Zarins, A. Ivanova, A. Skagers</i>	78
Paediatric Embryonal Rhabdomyosarcoma: Case Report <i>E. Dručka, R. Dzalbs, J. Tārs, Z. Liepa, S. Isajevs, A. Ivanova, G. Rose, I. Franckeviča, E. Cebure, S. Valeiņa</i>	79
ADAM 10 Expression in Primary Uveal Melanoma as Prognostic Factor for Risk of Metastasis <i>R. Caltabiano, G. Broggi, V. Rapisarda, C. Ledda, V. Baylon, V. Filetti, C. Loreto</i>	80
Bladder Cancer Mortality Trends in Latvia in 1990–2017 <i>Ē. Bitiņa-Barlote, J. Plonīs, V. Cauce, E. Vjaters, J. Gardovskis, E. Miklaševičs</i>	81
Metastatic Thyroid Cancer <i>R. Ničiporuka, A. Ozoliņš, Z. Narbutis, I. Štrumfa, J. Gardovskis</i>	82
Thyroid Gland Morphology and Management Differences <i>A. Didrihsone, R. Ničiporuka, A. Ozolins, Z. Narbutis, J. Gardovskis</i>	83
Outcomes of Sporadic Resected Non-Functional Pancreatic Neuroendocrine Tumours (NF-pNETs) – 11-Year Experience in Tertiary Referral Hospitals in Latvia <i>M. Ptašņuka, H. Plaudis, A. Ozoliņš, M. Sperga, A. Truškovs, Z. Narbutis, I. Kudaba, A. Geriņa-Bērziņa</i>	84
Association between Neutrophil-to-Lymphocyte Ratio and Papillary Thyroid Cancer Aggressiveness <i>R. Ničiporuka, A. Ozoliņš, Z. Narbutis, I. Štrumfa, J. Gardovskis</i>	85
Epidemiology and Genetic Features of Prostate Cancer <i>J. Plonīs, Ē. Bitiņa-Barlote, V. Cauce, E. Vjaters, J. Gardovskis, E. Miklaševičs</i>	86
Clinicopathological Features of Follicular Variant of Papillary Thyroid Carcinoma <i>R. Ničiporuka, A. Ozoliņš, Z. Narbutis, I. Štrumfa, J. Gardovskis</i>	87
Quality Assurance Aspects of Colposcopy Service in Latvia <i>I. Jermakova, D. Rezeberga, J. Žodžika, M. Pilmane, O. Plisko, I. Liepniece-Karele, U. Kojalo</i>	88
Pathological Correlation between Needle Biopsy and Radical Prostatectomy Specimen in Patients with Localised Prostate Cancer <i>G. Sperga, M. Jakubovskis, L. Rēdmanis, V. Lietuvietis</i>	89
Role of Percutaneous Ultrasound Guided Needle Biopsy of Axilla to Restage Node Positive Breast Cancer after Neoadjuvant Chemotherapy <i>B. Līcīte, A. Irmejs, J. Maksimenko, P. Loža, G. Trofimovičs, E. Miklaševičs, J. Nazarovs, M. Romanovska, J. Deičmane, G. Purkalne, J. Gardovskis</i>	90
Combined Forms of Basal Cell Carcinoma in Head and Neck Region <i>J. Moisejenko-Golubovica, V. Groma, A. Ivanova, J. Muceniece, O. Volkovs</i>	91

Contents

Risk of Contralateral Breast Cancer in BRCA1 Gene Mutation Carriers with Primary Breast Cancer in Latvian Population <i>P. Loza, A. Irmejs, J. Maksimenko, A. Çilis, G. Trofimovičs, J. Gardovskis, E. Miklaševičs, Z. Daneberga</i>	93
Thyroid Surgery Influence on Calcium Metabolism: Hospital Experience <i>A. Didrihsone, R. Ničiporuka, Z. Narbutis, A. Ozoliņš, J. Gardovskis</i>	94
Multiparametric Magnetic Resonance Imaging and 68-Gallium-PSMA Positron Emission Tomography in patients with Biochemical Recurrent Prostate Cancer: Single Centre Study <i>M. Radzina, M. Tirane, L. Zemniece, M. Kalnina, L. Roznere, E. Vjaters, V. Lietuvietis, A. Freimanis, A. Strazdina</i>	95
Chromothripsis as a Prognostic Marker in Metastatic Colorectal Cancer <i>E. Skuja, D. Kalniete, M. Nakazawa-Miklaševiča, Z. Daneberga, G. Purkalne, E. Miklaševičs</i>	96
Microcell Formation in Various Cell Lines Due to Stress <i>Z. Simsons, T. Freivalds, R. Petrovska, L. Harju, I. Buiķis</i>	97
Downregulation of Mismatch Repair Proteins Correlated with Increased CD9a Expression in High Grade Prostate Cancer <i>K. Folkmanis, S. Isajevs, M. Jakubovskis, J. Eglītis, V. Folkmanis, V. Lietuvietis</i>	98
Targeted Therapy against Cancer <i>G. Purkalne</i>	99
Cell Responses to Ionizing Radiation: Current Research at Lithuania University of Health Sciences and Future Perspectives with “Inspire” Project <i>E. Juozaityte, A. Bartnykaite, D. Laukaitiene, R. Ugenskiene</i>	100
Accuracy of Imaging Methods in Differentiated Thyroid Cancer after Thyroidectomy for Evaluation of Residual Thyroid Tissue before and after Radioiodine Therapy <i>N. Šenterjakova, M. Radziņa, A. Bērziņa</i>	101
Glasgow Prognostic Score by TNM Burden and Overall Survival in Pancreatic Ductal Adenocarcinoma <i>A. Šilovs, R. Riekstiņš, D. Orlovs, I. Štrumfa, Z. Simtniece</i>	102
Results of Autologous Haematopoietic Stem Cell Transplantation in Kaunas – International Telemedicine Project <i>D. Vaitiekus, V. Svetickiene, M. Beitneriene, M. Rudžianskiene, R. Gerbutavičius, E. Juozaityte</i>	103
Histology of Cervical Precancerous Lesions and Ki-67 Biomarker Expression <i>I. Jermakova, D. Rezeberga, M. Pilmane, I. Liepniece-Karele, J. Žodžika, O. Plisko</i>	104
Genetic Markers of Thrombosis in Patients with Chronic Myeloproliferative Diseases <i>R. Dambrauskiene, R. Ugenskiene, R. Simoliuniene, E. Juozaityte, R. Gerbutavičius</i>	105
Effects of Chronic Mild Hypoxia on Proteome of HER2+ Breast Cancer Cell Line SK-BR-3 <i>S. Vorslova, V. Pirska, D. Nitiša, I. Čakstiņa, Z. Daneberga, E. Miklaševičs</i>	106
Quality of Transurethral Resection of Bladder Tumour in First Time Diagnosed Bladder Cancer <i>K. Leonenko, M. Jakubovskis, V. Lietuvietis</i>	107

Rare Solitary Fibrous Tumour of Pleura Growing More than 16 Years <i>K. Grigorovica, A. Spaks, D. Breiva, A. Bistrova, R. Mikijanskis, J. Ositis</i>	108
Personalised Multidisciplinary Management of Patient with Triple-Negative Breast Cancer: Clinical Case Report <i>J. Maksimenko</i>	109
Childhood Cancers – from Biobanking to Sequencing Projects <i>L. O. Baumbusch</i>	110
Children’s and Women’s Health	
Sexual Education Issues among Adolescents with Hearing and Visual Impairments <i>L. Esta, K. Čačka, E. Korsaka, L. Muceniece, D. Balodis</i>	111
Nurse as Interdisciplinary Team Member for Health Care of Children with Development Disorders <i>D. Voita, A. Bukulīte, A. Nastevica</i>	112
Effects of Urban Violence and Crime on Youth Access to HIV and Sexual and Reproductive Healthcare in Cape Town, South Africa <i>D. Cooper, G. Green, D. Tembo, S. Christie</i>	113
Timing of Conception and Neonatal Outcomes after Bariatric Surgery in National Cohort of Women <i>L. Malakauskiene, L. Maleckiene</i>	114
Impact of Bariatric Surgery-To-Conception Interval on Maternal Outcomes in National Cohort of Women <i>L. Malakauskiene, L. Maleckiene, D. Ramašauskaitė</i>	115
Next Generation Sequencing Identifies Pathogenic Variants in Genes Involved in Collagen Production in Patients with Preterm Birth Due to Precocious Cervical Ripening <i>L. Voložonoka, L. Gailīte, A. Miskova, I. Kempa</i>	116
Precocious Cervical Ripening – Management in Riga Maternity Hospital, Latvia <i>A. Miskova, L. Voložonoka, D. Rezeberga</i>	117
Family-Centered Care and Satisfaction of Parents of Children Receiving Inpatient Rehabilitation Services at Children’s Clinical University Hospital <i>D. Bērtule, A. Vētra, G. Kristapsons</i>	118
Serological Evidence of <i>Toxoplasma Gondii</i> in Latvian Population with Emphasis on Women’s and Children’s Health <i>G. Deksnē, V. Veisa, D. Rezeberga, L. Vīksna, A. Krūmiņa</i>	119
Identification of Cost Effective Model for Detection of Cystic Fibrosis Causative Alleles in Latvia <i>L. Gailīte, A. I. Tutane, I. Nartisa, I. Kempa, M. Kreile, G. Taurina, E. Aleksejeva, I. Pukīte, L. Korņejeva, I. Grinfelde, I. Kaze, S. Vilne, Z. Krūmina, V. Svabe</i>	120
Retrospective Cohort Study of Cesarean Scar Influence on Placental Implantation Site, Umbilical Cord Insertion and Length <i>D. Bokučava, N. Vedmedovska, V. Fodina, V. Margevičus, S. Ūdre</i>	121
Characteristics of Paediatric Trauma Patients in Latvia: Retrospective Single Center Study <i>S. Karkle, A. Zviedre, A. Eņģelis, A. Pētersons</i>	122

Contents

Risk Factors and Antenatal Suspicion for Placenta Previa and Abnormally Invasive Placenta <i>E. Savukyne, I. Vasilaviciute, E. Machtejeviene</i>	123
Influence of Genetic Variants Involved in Thrombophilia Pathogenesis and Folic Acid Metabolism on Embryo Implantation and Pregnancy Outcome <i>B. Alkšere, D. Bērziņa, D. Legzdiņa, L. Voložonoka, A. Dzalbs, I. Pupko, L. Korņejeva, L. Nikitina-Zaķe, V. Fodina, N. Vedmedovska</i>	124
Is MRE ADC-DWIBS an Appropriate Diagnostic Method for a Disease? <i>D. Berzina, I. Apine</i>	125
Prenatal Invasive Testing in Single Center: Indications and Results <i>N. Vedmedovska, D. Bokučava, P. Domaševs, I. Bičevska, L. Korņejeva, S. Tenberga, J. Rilika</i>	126
Gestational Weight Gain Effects on Delivery and Newborn Outcomes <i>Ž. Bojarune, N. Vedmedovska</i>	127
Differentiating Criteria for Acute Simple and Complicated Appendicitis in Patients Under the Age of Seven <i>P. Plūme, A. Zviedre, A. Laduss, K. Pētersons, A. Pētersons, A. Eņģelis</i>	128
Knowledge about Contraception among Latvian High School Students <i>L. Esta, L. Kozlovskā</i>	129
Inflammatory Cytokine Levels as Possible Diagnostic and Prognostic Aid in Hospitalised Children with Fever and Suspected Serious Bacterial Infection <i>L. Rautiainen, J. Pavāre, I. Grope, S. Ince, P. Tretjakovs, D. Gardovskā</i>	130
Iron Deficiency Anemia and Dietary Habits During Pregnancy in Latvia <i>K. Klaramunta-Antila, B. Lindemane, L. Ušpele, S. Krama, V. Cauce, L. Meija</i>	131
Association of Genetic Variants in TLR2 (Arg753Gln) and TLR4 (Thr399Ile) with Risk of Acute Rheumatic Fever in Latvia <i>M. Visnevska, V. Rovīte, V. Stanevica, Z. Dāvidsone, A. Scegolevs, R. Santere</i>	132
Extended Genetic Testing in Patients from Infertility Clinics Using New Genotyping Method: Preliminary Results <i>L. Gailīte, Z. Dobeļe, L. Laivina, Z. Vitina, V. Magomedova, J. Erenpreiss, I. Kempa</i>	133
Assessment of Children with Febrile Illness Visiting Emergency Department According to “Precautionary Level” System <i>U. N. Urbāne, Z. Likopa, I. Kravale, A. Silova, D. Gardovskā, J. Pavāre</i>	134
Diagnostic Values of Parental Concern and Clinician’s “Gut Feeling” in Identifying Serious Bacterial Infections in Children with Fever <i>U. N. Urbāne, M. Marčuks, M. Katvare, D. Gaidule-Logina, D. Zavadskā, D. Gardovskā, J. Pavāre</i>	135
DENND1A Gene Variations in Adolescent PCOS Patients – Clinical and Genetical Associations <i>L. Līdaka, G. Lazdāne, I. Dzīvīte-Krišāne, A. Grasmāne, L. Gailīte</i>	136
Prior Miscarriage and Preterm Delivery in Assisted Reproductive Technology Pregnancies <i>S. Ūdre, V. Margevičus, N. Vedmedovskā, V. Fodina</i>	137

Paediatric Acute Pericarditis in University Hospital within 2008–2017 (10-Year Review) <i>E. Ligere, I. Bergmane, B. Matsate-Matsone, I. Lubaua, I. Lāce, N. Sikora, L. Šmits, V. Ozoliņš</i>	138
Sleep Quality, Sleep Hygiene and Daytime Sleepiness in Adolescents in Latvia – Differences between Boys and Girls <i>M. Celmiņa, E. Mičule, A. Romanova, I. Daugule</i>	139
Evaluation of Possible Diagnostosing Tool Distinguishing Acute Appendicitis from Acute Mesenteric Lymphadenitis in Children <i>A. Zviedre, A. Eņģelis, P. Tretjakovs, V. Titans, A. Pētersons</i>	140
Risk Factors and Prognostic Indicators for Rescue Outcome of Children with Airway Foreign Body Obstructions <i>G. Di Mizio, A. Montana, F. Casella, D. G. Albano, F. Amico, V. Baylon, P. Malandrino, F. Patanè, I. Russo, M. Salerno</i>	141
Preliminary Results on Use of Oral Rehydration Solution in Form of Gelato for Rehydration of Children with Acute Gastroenteritis <i>G. Zvigule Neidere, A. Bārzdīņa, G. Laizane, I. Sviestina, K. Gross</i>	142
Patient and Their Family Needs in Paediatric Palliative Care:Results of Pilot Study <i>I. Kalnina, L. Deklava</i>	143
Microbiological Etiological Spectrum of Acute Complicated and Uncomplicated Appendicitis: Preliminary Results <i>M. Kakar, M. M. Butnere, A. Reinis, J. Kroiča, A. Eņģelis, A. Saxena, R. Broks, V. Jansins, A. Pētersons</i>	144
Staphylococcus Aureus Associated Acute Hematogenous Osteomyelitis Managment and Treatment Outcomes in Children’s Clinical University Hospital in 2017 <i>A. Meiere, I. Račko, J. Pavāre</i>	145
Frey Procedure in Treatment of Paediatric Chronic Pancreatitis: Case Report and Recent Update <i>M. M. Butnere, I. Pukite, I. Apine, G. Pupelis, A. Eņģelis, M. Kakar, A. Pētersons</i>	146
Change of HIV Positive Pregnant Women’s Care in Riga Maternity Hospital within Past 9 Years <i>J. Murzina, V. Veisa, Ē. Bitiņa-Barlote, M. Božko, E. Barlots, D. Rezeberga, S. Markova</i>	147
Paediatric Acute Scrotum Diagnostics and Treatment: Evaluation at Riga Children’s Clinical University Hospital within 2009–2018 <i>A. Mikitins, M. M. Butnere, A. Gilis, D. Pugacevska, M. Kakar, A. Eņģelis, A. Pētersons</i>	148
Serum and Urine Biomarkers Leucine-Rich Alpha Glycoprotein-1, Neutrophil Gelatinase-Associated Lipocal, and Interleukin-6 in Determining Acute Complicated and Uncomplicated Appendicitis: Preliminary Results <i>M. Kakar, M. M. Butnere, A. Reinis, J. Kroiča, A. Eņģelis, A. Saxena, R. Broks, V. Jansins, A. Pētersons</i>	149
Role of Yersinia Enterocolitica Antibody Serum Level in Paediatric Acute Complicated and Uncomplicated Appendicitis: Preliminary Results <i>M. Kakar, M. M. Butnere, A. Reinis, J. Kroiča, A. Eņģelis, A. Saxena, A. Pētersons</i>	150
Positive Group B Streptococcus and Outcome of Early Neonatal Period <i>G. Jansone, M. Koka, E. Pumpure, V. Veisa, D. Rezeberga, I. Morozova, Ļ. Lapidus, S. Markova</i>	151

Contents

External Anal Sphincter Muscle Recovery Detected with Surface EMG after Perineal Tear: Case Study <i>V. Zacesta, L. Rācene, H. Plaudis, D. Rezeberga</i>	152
Up-Regulation of FOXP3 T Regulatory Lymphocytes in Patients with High-Grade Squamous Intraepithelial Lesions <i>A. Mitildzans, S. Isajevs, D. Rezeberga</i>	153
Analysis of Submitted Complaints in Field of Obstetrics and Gynaecology to the Ministry of Health of the Republic of Latvia Health Inspectorate <i>M. Pukite</i>	154
Time Critical Paediatric Neurosurgery in Latvia <i>P. Kļaviņa, D. Pētersone, A. Buza, R. Balmaks</i>	155
Assessment of Competence Components in Infant Floating to Increase Parents' Competence Level <i>A. Kurmeleva</i>	156
Influence of RV Vaccination on Course of Disease in Patients Diagnosed with Rota Virus Gastroenteritis at Children's Clinical University Hospital <i>E. Grudule, D. Zavadska</i>	157
How to Distinguish Abusive Head Trauma <i>P. Kļaviņa, A. Bārzdīņa</i>	158
Efforts to Control CS Rate: Lithuanian Experience <i>R. Nadišauskiene</i>	159
Pre-Pregnancy BMI and Gestational Weight Gains Correlation with Pregnancy Outcome <i>I. Dupuža, N. Vedmedovska, K. Buķe</i>	160
Role of Confidential Enquiry into Maternal Deaths Analysis in Decrease of Maternal Mortality in Latvia <i>D. Rezeberga, M. Jansone, I. Blodniece, E. Lapiņš, V. Bathena-Krastina, S. Irša, G. Lazdāne</i>	161
Implementation of ICD-10 (ICD-PM) Perinatal Mortality Audit Tool: Analysis of Maternal Condition at Time of Perinatal Death <i>I. Blodniece, D. Rezeberga, G. Lazdāne, S. Markova</i>	162
Cesarean Section Rates in Latvia Using Robson Classification System <i>I. Zile, L. Rācene, D. Rezeberga</i>	163
Massive Rectal Bleeding in Child Due to Rectal Venous Malformation: Case Report <i>J. Karlsons, Z. Ābola, A. Eņģelis, P. Laizāns, A. Pētersons</i>	164
Ability to Turn a Breech Baby with Particular Exercises <i>I. Kanniece, M. Hoferte</i>	165
Association between Infant's Feeding Habits and Iron Metabolism in Latvia <i>I. Sirina, I. Strēle, I. Sikсна, D. Gardovska</i>	166
Incidence and Risk Factors of Late Onset Neonatal Sepsis in Newborns Treated at Children's Clinical University Hospital (BKUS) Neonatology Clinic in 2017 <i>O. Loginova</i>	167
Comparison of Tactics in Conservatively Treated Acute Uncomplicated Appendicitis in Children's Clinical University Hospital for Children Aged 7-16 Years in 2015 and 2018 <i>S. Ozoliņa, A. Rozentāberga, T. Zurmutāi, A. Pētersons</i>	168
Endometritis Aspects after Caesarean Section, Risk Factors <i>K. Rimaido</i>	169

Impact of Disability on Sexual Health of Women <i>I. Briedīte, Z. Rostoka, G. Saulīte, I. Pītkēviča</i>	170
Implementing Safety and Quality Improvement into Medical Practice <i>E. Minevich</i>	171
Growth Hormone-IGF-1 Axis in Diagnosis and Treatment of Growth Disorders <i>M. Savage</i>	172
Human Bocavirus 1 Infection in Hospitalised Children with Lower Respiratory Tract Infection <i>I. Ziemele, A. Vilmane, S. Rasa, M. Xu, K. Hedman, M. Söderlund-Venermo, D. Gardovska, Z. Nora-Krukle, M. Murovska</i>	173
Prognostic Importance of Complications after Primary or Interval Cytoreductive Surgery in Advanced Stage Ovarian Cancer <i>I. Silīnš</i>	174
Possibility of Nutrition Deficiency and Alteration of Anthropometric Data in Children with Food Allergy <i>Z. Melluma, L. Meija</i>	175
Self-Assessment of Changes of Sexual Life in Women after Vaginal Delivery <i>I. Briedīte, M. Ūdre, A. Pentjugova</i>	176
Microbiological Peritoneal Fluid Analysis in Paediatric Patients with Surgically Treated Appendicitis <i>J. Protasa, Z. Ābola, A. Zviedre, A. Eņģelis, P. Laizāns</i>	177
Postpartum Endometritis – Clinical Challenge from Microbiological Point of View <i>L. Rācene, K. Rācenis, Z. Rūsa, J. Kroiča, D. Rezeberga</i>	178
Spontaneous Rupture of Spleen During Pregnancy: Diagnostic Challenge <i>A. Kornete, A. Miskova, D. Rezeberga, M. Puksta</i>	179
Treatment Options in Children with Perianal Abscess <i>A. Rozentalberga, A. Zviedre, A. Engelis, A. Pētersons</i>	180
Influencing Factors on 24-Hour Blood Pressure Measurements in Childhood Coarctation of Aorta <i>P. Silis, I. Lubaua, I. Lāce, S. Sendzikaite</i>	181
Positive Group B Streptococcus and Perinatal Use of Antibiotics <i>M. Koka, G. Jansone, E. Pumpure, I. Morozova, Ļ. Lapidus, V. Veisa, D. Rezeberga, S. Markova</i>	182
Where is “Sexual and Reproductive Health and Rights” in Curriculum of Medical Faculty Students? <i>G. Lazdāne, H. Karro, R. Nadišauskiene, D. Rezeberga</i>	183
Caesarean Section for Nulliparous Women with Single Cephalic Full-Term Pregnancy in Spontaneous Labor <i>L. Rācene, L. Ušpele, D. Rezeberga</i>	184
Prediction of Poor Outcome in Critically Ill Children Using Clinical Evaluation, Scoring Systems and Biomarkers <i>R. Gobergs, D. Pētersone, C. Rey Galan, R. Balmaks</i>	185
Low Carbohydrate Nutritional Plan for Autistic Spectrum Children <i>S. Abele, L. Meija, L. Tzivian, V. Folkmanis</i>	186
Insulin Resistance and Leptin Levels in Children <i>I. Justamente, D. Reihmane, L. Ozoliņa-Molla</i>	187
Significant Diagnostic Tools for Blunt Abdominal Trauma in Children <i>O. Mežale, A. Zviedre, A. Eņģelis, A. Pētersons</i>	188

Contents

Postpartum Endometritis: Prevalence of Childbirth-Related Risk Factors in Riga Maternity Hospital <i>A. Ungure, S. Semenistaja, E. Pumpure, I. Briedīte</i>	189
Management of Labor for HIV Positive Patients in Latvia: Type of Labor Depending on Viral Load, Vertical Transmission Prevention <i>E. Gelderiņa, L. Timule, G. Jansone, D. Rezeberga</i>	190
High-Risk Pregnancy Outcome: Case Report on Maternal Mortality <i>K. Kalniņa, M. Jansone, A. Prutkova</i>	191
Improving Outcomes in Paediatric Neurocritical Care <i>M. Goldsmith</i>	192
Newborn Surgery – Way from Survival to Quality of Life-Long-Term Developmental Follow-up <i>U. Rolle, A. Allendorf</i>	193
Infectious Diseases	
Hepatitis A Virus Genotypes Detection by Sequencing for Outbreaks and Sporadic Case Investigations in Latvia between 2008 and 2018 <i>O. Savicka, R. Zeltmatis, A. Aniscenko, J. Storozenko, B. Rozentale, R. Korotinska, J. Perevoscikovs</i>	194
Human Leukocyte Antigens Class II Alleles Impacting Response to 5–7-Year Antiretroviral Therapy in Latvian Cohort <i>V. Jasinskis, J. Eglīte, O. Kolesova, D. Kasjko, I. Azina, B. Rozentale, L. Viksna</i>	195
Epidemiology of Invasive <i>S. pneumoniae</i> Disease in Latvian Children over the Period of Seven Years (2012–2018) <i>H. Čupeca, I. Grope, A. Krūmiņa, L. Savrasova, I. Zeltiņa, A. Villeruša, J. Galajeva</i>	196
Parvoviruses and Inflammatory Neurological Disorders <i>Z. Nora-Krūkle, A. Vilmane, A. Terentjeva, N. Sūna, S. Roga, S. Skuja, S. Rasa, M. Murovska</i>	197
Invasive Pneumococcal Disease in Latvia in PVC10 Vaccination Era, 2012–2017 <i>L. Savrasova, A. Villeruša, H. Čupeca, I. Grope, A. Krūmiņa, J. Galajeva, I. Zeltiņa</i>	198
Understanding How Targeting Annexin A1 May Control Inflammation in Systemic Lupus Erythematosus <i>K. Oleinika, H. Bradford, S. Crichton, F. Dempsey, D. A. Isenberg, C. Mauri</i>	199
Review of Current Nanoparticle-Based Approaches for Combating Multi-Drug Resistant Bacteria <i>I. Čakstiņa</i>	200
Use of Spectrophotometry in Differentiation of Bacteria <i>R. Lozins, D. Ozoliņš</i>	201
Continuous Veno-Venous Hemofiltration (CVVH) May Improve Long-Term Survival in Sepsis Patients <i>G. Moisejevs, J. Seilis, A. Počs, E. Bormane, A. Grigāne, D. Trumpika, R. Baufāle, I. Bušmane, O. Šuba, A. Silova, L. Gailīte, G. Briģis</i>	202
Frequency of Malaria Incidence and Laboratory Diagnostic Possibilities in Latvian Center of Infectology <i>Z. Zalgaucka, O. Konstantinova, T. Atrohova, T. Romanova, J. Storozenko, B. Rozentale</i>	203

Novel Marker Enabling Diagnosis of Autoimmune Thyroiditis <i>K. Todorova, A. Sultanova, M. Cistjakovs, R. Milcheva, R. Spasov, Z. Petrova, E. Pavlova, E. Shikova, M. Murovska</i>	204
Relationship between N-Acetyltransferase Phenotype and Hepatotoxicity of Antituberculosis Drugs in Latvian Tuberculosis Patients <i>A. Vīksna, V. Igumnova, I. Pole, G. Balode, I. Ozere, R. Ranka</i>	205
Measles Virus Genotypes Circulating in Latvia, 2011–2018 <i>O. Savicka, T. Kolupajeva, A. Aniscenko, D. Dusacka, R. Zeltmatis, M. Petrova, E. Bleidele, N. Repuscenko, S. Kuzmane, L. Firstova, N. Zamjatina, J. Storozenko, J. Perevoscikovs</i>	206
Biocompatibility of Biomaterials In Vivo and Antibacterial Efficiency In Vitro <i>I. Skadiņš, J. Kroiča, I. Šalma</i>	207
Whole-Genome Sequencing for Prediction of Mycobacterium Tuberculosis Drug Resistance in Comparison with Phenotypic Drug Susceptibility Testing <i>D. Aļeiņikova, I. Pole, J. Ķimsis, I. Ozere, I. Norvaiša, R. Ranka</i>	208
Distribution of HCV and HBV Genotypes in Latvia, 2017–2018 <i>J. Storozenko, L. Guseva, O. Vasins, T. Kolupajeva, G. Muzje, J. Ancerevica, B. Rozentale</i>	209
Fournier Gangrene: Single-Centre Experience <i>J. Bērziņš</i>	210
Expression of Chemokine Receptors CCR1 and CCR2 in EBV Latency III Burkitt Lymphoma and Lymphoblastoid Cell Lines <i>S. Kozireva, Z. Rudevica, A. Leončiks, M. Murovska, I. Holodnuka</i>	211
Experience of Pertussis Laboratory Diagnosis <i>J. Storozenko, G. Muzje, J. Ancerevica, T. Kolupajeva, I. Davidjuka, S. Kuzmane, B. Rozentale</i>	212
Diversity and Factors Associated with Occurrence of Legionella Pneumophila in Drinking Water Supply Systems <i>O. Valcina, D. Pule, A. Malisevs, S. Makarova, L. Grantina-Ievina, A. Berzins, A. Krumina</i>	213
HIV-1 Integrase Inhibitors Resistance among Antiretroviral Treatment- Experienced Patients in Latvia <i>O. Savicka, D. Dusacka, A. Aniscenko, T. Kolupajeva, J. Storozenko, A. Sangirejeva, B. Rozentale</i>	214
Assessment of Biofilm Production by Pathogenic Bacteria Isolated from Tonsillar Crypts of Patients with Chronic Tonsillitis <i>R. Klagisa, A. O. Balode, R. Broks, J. Kroica, L. Kise</i>	215
Human Papillomaviruses in Eastern Europe: Issues and Tendencies <i>M. Cistjakovs, A. Sultanova, O. Jermakova, L. Sokolovska, S. Capenko, B. Lesina-Korne, M. Murovska, I. Ziedina</i>	216
Early Diagnostic Biomarkers for Diagnosis of Acute Bacterial Infections <i>A. Reinis, M. Kakars, J. Kroiča, A. Eņģelis, A. Pētersons, I. Skadiņš, D. Rostoka, R. Rugājs</i>	217
First Application of Next Generation Sequencing in Human Donor Cornea Preservation Medium: New Method in Pathogen Detection <i>D. Borroni, M. Parekh, C. Rocha de Lossada, S. Ferrari</i>	218
Vaccination Against Influenza among Health Care Staff and Medical Students in 2017–2018 <i>A. Leidere-Reine, A. Medne, L. Vīksna, I. Zeltiņa</i>	219

Markers of Genetic Predisposition in Tuberculous Pneumonia Patients in Latgale, Latvia <i>K. Kramica, J. Eglīte, O. Kolesova, A. Kolesovs, T. Kramica, G. Titovica, D. Dzerina, G. Nikolajeva, L. Viksna</i>	220
Microbial Translocation Markers in HIV and HCV Patients <i>M. Madelāne, Ģ. Šķēnders, D. Rudzīte, A. Ivanovs, L. Viksna</i>	221
Purification of Recombinant Hepatitis E virus Capsid Protein VLPs and Assessment of Their Immunogenicity in Common Marmosets <i>E. Bayurova, I. Gordeychuk, A. Chumakov, K. Kyuregyan, O. Isaeva, A. Tukhvatulin, D. Logunov, M. Mikhaylov</i>	222
Evaluation of Laboratory Diagnostics of Scabies –Noteworthy Reminder <i>K. Liepiņa, L. Maule, G. Pakarna, V. Bondareva, S. Selderiņa, J. Storoženko</i>	223
Infectious Keratitis – Frequent Indication for Penetrating Keratoplasty <i>G. Laganovska, A. Kursite, K. Cacka, E. Sapale Salmane</i>	224
May Some Viruses be Beneficial? <i>S. Donina</i>	225
Patient-Reported Outcomes in Evaluation of Socio-Economic Impact of Myalgic Encephalomyelitis / Chronic Fatigue Syndrome to Society <i>D. Arāja, D. Pheby, R. Hunter, E. Brenna, L. Gitto, U. Berķis, A. Lunga, A. Ivanovs, M. Murovska</i>	226
Liver Echinococcosis – How Immunogenetic Tests Can Improve Diagnosis and Management Tactics <i>S. Laivacuma, L. Viksna, J. Eglīte</i>	227
Characterisation of High Risk HPV Variants Circulating in HIV-Infected Women with Squamous Cell Cervical Carcinomas in North-West Region of the Russian Federation <i>M. Issagouliantis, A. Runov, T. Savostjanov, E. Kurchakova, M. Demenkova, L. Albegova, A. Karlsen, M. Shabaeva, V. Ilinsky, A. Krasnenko, K. Tsukanov, M. Vonsky</i>	228
Modern State of Vaccine Development, DNA Vaccines <i>M. Issagouliantis</i>	230
Intercellular Adhesion Molecule-1, Macrophage Migration Inhibitory Factor and Plasminogen Activator Inhibitor-1 Relationship to Sepsis Clinical Severity <i>L. Bara, J. Eglīte, P. Oss, V. Cauce, S. Gintere, L. Viksna, A. Krumina</i>	231
Common Variable Immunodeficiency (CVID) in Latvia's Population <i>N. Kurjane, V. Zubkova, I. Jaunalksne, T. Prokofjeva, N. Gerula, P. Krike, I. Mihailova, V. Kenina</i>	232
Clinical Characteristics of Urosepsis Patients Treated in Intensive Care Unit <i>A. Freimanis, S. Siliņa, S. Laizāns, L. Rēdmanis, V. Lietuvietis</i>	233
Comparison of Knowledge, Action and Alert Level of Parents when Their Children Experience ARVI within Different GP Practices in Different Regions in Latvia <i>M. Latkovska, D. Raudīve, D. Semjonova</i>	234
Disease Register for Myalgic Encephalomyelitis / Chronic Fatigue Syndrome as an Opportunity to Encourage Integrated Care of Patients <i>D. Arāja, E. Brenna, D. Pheby, U. Berķis, A. Lunga, M. Murovska</i>	235
Viruses and Oncology: Epstein–Barr virus – Oncogenic Virus <i>I. Holodnuka, S. Kozireva, A. Leonciks, E. Kashuba</i>	236

Cognitive Impairment in Tick-Borne Encephalitis (TBE) Patients Regarding Montreal Cognitive Assessment (MoCA) Scale <i>E. Gūtmane, Z. A. Litauniece, L. Mekša, G. Karelis</i>	237
X-Linked Chronic Granulomatous Disease in Population of Latvia <i>T. Prokofjeva, T. Sarajeva, J. Krasts, I. Grantina</i>	238
Parvovirus B19, HHV-6 and HHV-7 Infection Markers in Synovial Fluid and Synovial Tissues of Patients with Rheumatoid Arthritis and Osteoarthritis <i>A. Kadiša, Z. Nora-Krūkle, P. Studers, V. Groma, A. Lejnieks, M. Murovska</i>	239
Bacteriophage Treatment in Biofilm Associated Infections <i>K. Rācenis, J. Kroiča, L. Mukāne, A. Pētersons</i>	240
Current Trends in Foodborne Listeriosis <i>A. Bērziņš</i>	241
Adhesion and Colonisation of Microorganisms on Porous Ti2O and Ti2O-silver Biomaterials <i>I. Skadins, L. Micko, L. Zvaigzne, J. Kroica</i>	242
Unexpected Gram-Negative Peritonitis Associated with Previous Exit-Site Infection in Peritoneal Dialysis Patients <i>L. Štelce, J. Baroņenko, I. Puide, G. Moisejevs, V. Kuzema, I. Mihailova, A. Pētersons</i>	243
Crusted Scabies: Case Report <i>E. Salputra, S. Žigure</i>	244
Molecular Detection of Rickettsia in Ticks from Different Regions of Latvia <i>M. Lazovska, A. Namiņa, V. Čapligina, R. Ranka</i>	245
Association of Different Vaginal Flora Types with High Risk Human Papillomavirus Infection <i>O. Plisko, J. Zodzika, I. Jermakova, D. Rezeberga, J. Kroica, L. Eglite, I. Liepniece-Karele, D. Sivina, D. Kunicina, I. Senfelde</i>	246
Adaptation Procedure as a Method to Overcome Bacteriophage Resistance and Enhance Phage Lytic Activity against Staphylococcus Aureus <i>D. Rezevska, K. Rācenis, J. Kroiča</i>	247
Aeromonas spp. as One of the Causes for Bacterial Gastroenteritis in Paediatric Patients <i>I. Grāve, A. Reinis, R. Rugājs</i>	248
Evaluation of Factors that Correlate with Disease Outcomes in Patients with Pneumonia in Pauls Stradiņš Clinical University Hospital <i>D. Ergle, D. Zentiņa, A. Salina</i>	249
Human Herpesviruses – Biology, Epidemiology and Disease Association <i>R. Rizzo</i>	250
Clinical Impact and Epidemiology of Emerging Human Parvoviruses <i>M. Söderlund-Venermo</i>	251
Earlier Initiation of Antiretroviral Treatment Coincides with Initial Control of HIV-1 Sub-Subtype F1 Outbreak among Men-Having-Sex-With-Men in Flanders, Belgium <i>K. Van Laethem</i>	252
Molecular Studies of Tuberculosis in Latvia <i>R. Ranka, I. Pole, I. Jansone, I. Ozere, A. Nodieva, G. Skenders, V. Riekstina, I. Norvaisa</i>	253

Contents

Systemic Treatment for Tinea Capitis <i>E. Salijuma, S. Zigure</i>	254
Microbiological and Treatment Considerations in Patients with Pyogenic Liver Abscesses <i>I. Drjagunovs, S. Laivacuma, I. Zeltiņa, A. Derovs, A. Krūmiņa</i>	255
Prevalence and Characteristics of Hepatitis C in Patients with Chronic Kidney Disease <i>A. Proskurina, V. Kuzema, A. Popova, P. Aldiņš, K. Gritāne, I. Ziediņa, I. Ādamsons, I. Puide, A. Pētersons</i>	256
Targeting Microbiota in 21 st Century: What Do We Know about It? <i>A. Derovs</i>	257
Role of Oxidative Stress in Patients with Community-Acquired Pneumonia and Sepsis, and Its Impact on Course of Disease <i>O. Suba</i>	258
Infectology – Objective Reality in the 21 st Century <i>L. Viksna</i>	259
Mental Health and Neuroscience	
Prefrontal Cortex Stroke Impairs Cerebral Blood Flow in Comorbidities of Obesity and Hyperuricemia <i>J. Singh</i>	260
Therapeutic Alliance and Its Relationship with Outcomes in Psychotherapeutic Treatment of Depression <i>G. Troscenkovs, G. Ancane</i>	261
“Open Dialog” Opportunities and Challenges at Riga Psychiatric and Narcology Centre Outpatient Mental Healthcare Centre (MHC) “Veldre” with a Hospital Facility <i>D. Ozerska, M. Taube, D. Ziedonis</i>	262
Surgical Treatment for Occipital Neuralgia <i>J. Zarins, K. Pastars, A. Dzirkale</i>	263
Children's Rights to Mental Health: Health Inspectorate of Latvia Control Results 14.02.2018–30.08.2018 <i>D. Roze, L. Balta</i>	264
Employees with Nonpileptic Seizures: Combined Treatment <i>L. Balta, I. Roja</i>	265
Changes in Depression Diagnostic Pattern among Family Physicians in Latvia Following Education Course “Depression School” within National Research Programme BIOMEDICINE 2014–2017 <i>E. Rancāns, A. Ķīvīte-Urtāne</i>	266
Development of a Working Model in Mindfulness-Based Dance Movement Therapy (DMT) and Its Application for Chronic Pain Patients <i>I. Majore-Dusele, I. Millere, V. Karkou, I. Logina</i>	267
Acute Stroke Long Term Clinical Outcome Study – Imaging Based Selection of Patients for Mechanical Thrombectomy <i>A. Balodis, M. Radzina, K. Kupcs, E. Miglane, A. Millers, K. Jurjans, H. Kidikas, R. Skumbins</i>	268
Cerebral Oximetry Guided Intraoperative Algorithm Relation to Postoperative Cognitive Function in Spinal Surgery Patients <i>S. Murniece, M. Soehle, I. Vanags, B. Mamaja</i>	269

Intervention in Early Psychosis: from Scientific Evidence to Clinical Practice in Latvia <i>L. Bērze, S. Čivčiša, I. Krone, J. Lazovika, S. Ķikuste, I. Šapele, E. Rancāns</i>	270
Prevalence of Depression and Associated Factors among Hospitalised Patients Diagnosed with Paranoid Schizophrenia after a Three-Week Course of Treatment <i>M. Ivanovs, J. Vrubļevska</i>	271
Outcome Difference in Patients with Spontaneous Intracerebral Hematoma <i>Z. Lāse</i>	272
Survey of Wellbeing and Depression in International Medical Students <i>C. Heaster, S. Gintere, L. Mača</i>	273
Generalised Anxiety and Autonomic Nervous System Function <i>E. Kupats, I. Noviks, J. Vrublevska, V. Kenina, I. Logina</i>	274
Trancranial Direct Current Stimulation : Effects on Autonomic Function and Neuropathic Pain <i>E. Kupats, I. Noviks, V. Kenina, D. Glazunovs, J. Krastina, K. Stasinska, M. Arons, I. Logina, U. Kojalo</i>	275
Clinical Manifestation of Pain Central Modulation Disturbances in Chronic Low Back Pain Patients <i>D. Šmite, G. Ancāne, A. Hohlova, G. Troščenkovs</i>	276
Depressive and Anxiety Disorders Screened and Correlated to the Level of Synovial Inflammation in Patients with Hip/Knee Osteoarthritis: Pilot Study <i>M. Tarasovs, A. Vikmanis, S. Skuja, V. Groma, A. Lejniņeks</i>	277
Progress and Challenges in Frontotemporal Dementia Research <i>Z. Priede, M. Kalniņa</i>	278
Use of Cognitive Reflection Test for Determining Predominance of Analytical or Intuitive Thinking for Rīga Stradiņš University Students, Latvia <i>A. Utināns</i>	279
Carpal Tunnel Syndrome Therapeutic Effectiveness Evaluation <i>J. Umure, I. Logina, M. Mihailova</i>	280
Latvian Family Physicians' Experience and Attitude in Diagnosing and Managing Depression <i>J. Vrubļevska, V. V. Vinogradova, E. Rancāns</i>	281
Novel Approaches to Evaluation of Neuropathic Pain Syndromes Including Quantitative Sensory Testing and Photoplethysmography <i>I. Noviks, E. Kupats, Z. Marcinkevics, A. Grabovskis, U. Rubins, D. Glazunovs, J. Krastiņa, K. Stašinska, I. Logina, V. Ķēniņa, M. Arons</i>	282
Diagnosing and Treatment Patterns of First-Time Patients with Alzheimer's Dementia in Riga Psychiatry and Narcology Centre Inpatient Setting <i>V. Kučerova, J. Vrubļevska</i>	283
Psychoneuroimmunological Effects of a New Evidence-based Intervention with Elements of Biodanza on Wellbeing and Health in Adults and Children <i>M. Stück, A. Villegas, V. Greaves, A. Raykova, D. Sturmane, K. Bauer, H. U. Balzer, U. Sack</i>	284
Neuropathic Pain in Hereditary Peripheral Neuropathy – Correlation with Clinical, Genetic and Neurophysiological Findings <i>E. Millere, E. Kupats, I. Mičule, I. Kazaine, D. Rots, L. Gailīte, O. Šterna, N. Kurjāne, V. Ķēniņa</i>	285

Contents

Spectrum of Polyneuropathies in Children – Data of the Population of Latvia <i>E. Millere, I. Kazaine, L. Gribuste, J. Strautmanis, V. Ķēniņa</i>	286
Theoretical Justification of Empirically Derived Dimensional Model of Personality Pathology Operationalised Latvian Clinical Personality Inventory (LCPI) <i>V. Perepjolkina, J. Koļesņikova, K. Mārtinsons, A. Stepens</i>	287
Physical Activity Predicts Brain Integrity in Frontal and Temporal White Matter in Seniors, but not Cognitive Functioning <i>K. Šneidere, N. Alruwais, N. Dowell, V. Arnis, J. Harlamova, K. Kupčs, Z. Ulmane, J. Young, J. Rusted, A. Stepens</i>	288
Rehacom “Alertness” Indicators for Primary School Age Children in Special Education <i>I. Rugina, S. Maciase</i>	289
Parkinsonism-Dystonia Syndrome in Methcathinone Abusers: Journey from Clinic to Functional Activation Networks in Brain <i>J. Juurmaa, P. Ilves, A. Stepens, P. Taba</i>	290
Screening for Symptoms of Psychological Distress in Adolescent Populations <i>Ņ. Bezborodovs, E. Rancāns, A. Villeruša</i>	291
Evaluation of Alcohol Withdrawal Syndrome by CIWA-Ar Scale and Analysis of Factors Determining Severity of Symptoms for Patients with Alcohol Dependence in Mental Hospital of Strenči, Latvia <i>J. Lice, S. Skaida</i>	292
Brief Systematic Review of Clinical Use and Reported Cases of Misuse of Phenibut <i>E. Kupats, J. Vrublevska, L. Zvejniece, G. Stelfa, E. Vavers, M. Dambrova</i>	293
10-Year Cardiovascular Disease Risk Assessment in Schizophrenia Patients <i>A. Gaibišele, E. Pūcite, N. Gaibišele</i>	294
Clinical Results and Life Quality Evaluation in Patients after Acute Cerebral Aneurysm Rupture and Endovascular Embolisation: Single Centre Experience <i>S. Ponomarjova, L. Šmaukstele, G. Krūmiņa</i>	295
Self-Assessment and Attitudes to Self-Care of Patients with Chronic Back Pain <i>I. Freimanis, A. Haduņkina, M. Māliņa, A. Teivāne, M. Mudule, A. Bjalkovskis, I. Logina</i>	296
Development of Postoperative Cognitive Dysfunction after Spinal Neurosurgery <i>R. Berezovskis, S. Mūrniece, B. Mamaja</i>	297
Neuroablative Procedures in Chronic Pain Management <i>M. Arons, M. Pilmane, E. Vasilevskis, I. Panihins, I. Evansa, L. Zvaune, J. Krasnika, A. Hadunkina</i>	298
Impact of Physical Activities on Cardiovascular Autonomic Neuropathy Development and Progression in Type 2 Diabetes <i>K. Stirāns, L. Stirāne, J. Mednieks, S. Borisāne, S. Kalva-Vaivode, J. Sokolovska</i>	299
Correlation of Cardiovascular Dysfunction and Parkinson’s Disease Duration and Severity <i>R. Valante, J. Mednieks, J. Umure, A. Millers</i>	300
Use of Ocrelizumab for Patients with Primary Progressive Multiple Sclerosis <i>E. Polunosika, D. Pastare, G. Karelis</i>	301
Prevalence and Sociodemographic Characteristics of Self-Reported Mild Types of Suicidal Behaviour in General Population in Latvia <i>K. Mieze, A. Ķivīte-Urtāne, D. Grinberga, B. Velika, I. Pudule, E. Rancāns</i>	302

Clinical and Sociodemographic Characteristics among First Time Psychosis Patients in Urban and Rural Regions in Latvia <i>K. Mīze, K. Brūna, L. Bērze, J. Zaharova, K. Bezina, E. Rancāns</i>	303
Contemporary Approach to Cognitive Assessment in Patients with Systemic Connective Tissue Disorders <i>J. Mednieks, V. Groma</i>	304
Cervical Epidural Steroid Injection with Triamcinolone for Unilateral Cervical Radicular Pain <i>M. Arons, L. Ksennikova, I. Panihins, E. Vasilevskis, A. Hadunkina, V. Sklarevics</i>	305
Depression Development in Women after Legal or Missed Abortion at RAKUS “Gaiļezers” Hospital <i>J. Bojarovska, M. Taube</i>	306
Emotion Regulation Skills and Depression <i>I. Paiča, M. Taube, K. Mārtinsons</i>	307
Relation between Number of Magnetic Resonance Contrast Examinations and Hyperintensity in Pulvinar, Globus Pallidus, Pons and Nucleus Dentatus in Paediatric Patients <i>R. Pitura, D. Sosārs, I. Apine, G. Krūmiņa</i>	308
Conservative Management of Vestibular Symptoms in Cerebellar Dystopia <i>D. Raumane</i>	309
Efficacy and Safety of Intravenous Alteplase in Patients with Mild Ischaemic Stroke <i>D. Ziemele</i>	310
Haemorrhagic Transformation in Acute Ischemic Stroke – Demographics, Risk Factors and Comparison with Literature Data <i>L. Dobelniece, N. Zdanovskis, L. Belasova</i>	311
Evaluation of Non-Motor Symptoms in Parkinson’s Disease Patients Presenting in Riga East Clinical University Hospital <i>G. Gulbe, O. Minibajeva, G. Karelis</i>	312
Correlation between Mortality and Computed Tomography (CT) Identified Diffuse Axonal Injury (DAI) Localisation in Polytrauma Patients: Single Center Experience <i>V. Zaiceva, G. Krumina, L. Jaunozolina, K. Rocane</i>	313
Off-Label Use of Rituximab in Neurology: Experience in Riga East University Hospital, Department of General Neurology <i>E. Šankova, D. Pastare, G. Karelis</i>	314
Non-Motor Symptoms of Parkinson’s Disease and Effect of Disease Symptoms on Patients’ Activities of Daily Living <i>O. Minibajeva, G. Gulbe, G. Karelis, N. Kurjāne, V. Kēniņa</i>	315
Efficacy and Safety of Intravenous Alteplase in Patients with Mild Ischaemic Stroke <i>A. Olesiks, R. Zikovs, R. Gailāne, D. Ziemele, L. Kande, Z. A. Litauniece, G. Karelis, A. Višņakovs</i>	316
Clinical Features and Characteristics of Triple-Seronegative Myasthenia Gravis Patients in Latvia <i>I. Glāzere, I. Kamša, N. Kurjāne, V. Kēniņa</i>	317
Outcome Assessment of Percutaneous Radiofrequency Thermocoagulation of Gasserian Ganglion in Treatment of Trigeminal Neuralgia <i>L. Zvaune, M. Arons, I. Logina, E. Vasilevskis, I. Panihins, L. Meksa</i>	318

Recognition and Management of Primary Headache Disorders: Cross-Sectional Study <i>L. Zvaune, A. Gaibisele, E. Pucite, L. Meksa, D. Pastare, I. Logina</i>	319
Most Common Comorbidities, Stroke Etiology, Hospitalisation Length and Clinical Outcome of Patients with Acute Ischemic Stroke Having Undergone Thrombolysis Therapy <i>L. Dobelniece, N. Zdanovskis, L. Belasova</i>	320
Smoking Habits in Schizophrenia Inpatients <i>A. Gaibišele, E. Pūcīte, N. Gaibišele</i>	321
Psychiatric Health Care Evaluation from Patients' Perspective – What Do We Know? <i>N. Berzina-Novikova, M. Taube</i>	322
Relationship between Quality of Life and Perceived Social Support for Dementia Patients in Social Care Institution <i>R. Terehova, J. Ļubenko</i>	323
Current Clinical Research in Neuroradiology at Rīga Stradiņš University, Latvia <i>G. Krūmiņa</i>	324
Postoperative Pain Management Strategies and Delirium after Transapical Aortic Valve Implantation <i>B. Arklina, V. Harlamovs, E. Strike, R. Lacis</i>	325
Prevalence of Depression Symptoms among Latvian General School Teachers and Related Factors <i>M. Gebele, M. Taube</i>	326
Comparison of Early Psychotherapy Dropout Prevalence between Residents and Certified Physicians in Rīga Stradiņš University Clinic of Psychosomatic Medicine and Psychotherapy, Latvia <i>A. Ancāns</i>	327
Stress, its Causes and Ways to Overcome It among Students of Medicine and Health Care Study Programmes <i>V. Sudraba, K. Vižla</i>	328
Mental Health and Quality of Doctor–Patient Relationship <i>G. Ancāne</i>	329
Cardioembolic Stroke Long-Term Function Outcome in Latvian Population from 2014–2017 <i>K. Jurjāns, E. Miglāne, O. Kalējs, Z. Priede, A. Müllers</i>	330
Impact of Participation in Quality Improvement Initiative and International Registry on Acute Stroke Care <i>J. Vētra, K. Jurjāns, E. Miglāne, A. Fjodorovs, S. Mironovs, A. Müllers</i>	331
Comparison of Frequency and Severity Levels of Feeling Depressed and Anxious among Rīga Stradiņš University 1 st and 6 th Year Latvian Medical Faculty Students, Latvia <i>L. Logina, A. Ancāns</i>	332
Slow or Fast Music Tempo and Its Impact on Psychosomatic Reactions <i>M. Kurpniece, L. Logina, G. Ancāne, L. Blumfelds, K. Plamše, Z. Bedikere, E. Keller</i>	333
Cognitive Reserve in Healthy Ageing <i>S. Mondini</i>	334

Modifiable Risk Factors for Alzheimer's Disease and Glia-Driven Neuroinflammation: What are the Links? <i>A. Klegeris</i>	335
Psychosomatics: Expressive Style Running in Families <i>R. J. Van der Gaag</i>	336
Self-Management Approach in Care and Compliance Hindering Factors <i>D. Brutane, K. Lielbikse</i>	337
Analysis of Hyperacute Ischemic Stroke Management and Outcomes at Riga East University Hospital <i>G. Ķauķe, L. Kande, D. Jeršova, R. Gailāne, E. Vanaga, I. Ķīkule, G. Karelis</i>	338
Efficacy of Reperfusion Therapy in Pauls Stradiņš Clinical University Hospital Neurological Clinic in 2018 and Compare Results with Year 2017 <i>N. Predkele, K. Svilāne, K. Jurjāns, E. Miglāne, A. Millers</i>	339
Effectiveness of Social Support on Quality of Life of People with Epilepsy <i>A. Specking</i>	340
Effects of Gender and Race on Perceived Trustworthiness in Modified Trust Game <i>V. Stonko</i>	341
Relation of Time to Treatment with Alteplase and Neurological Outcome and Mortality in Patients with Severe Stroke <i>R. Zikovs, A. Olesiks</i>	342
Dentistry, Orthodontics and Oral and Maxillofacial Surgery	
Implantation-Related Measurements in CBCT – How Trustworthy are They? <i>L. Zamure, L. Neimane, A. Skaģers, Z. Bokvalde</i>	343
Environmental Effects on Mechanical Properties of Dental Composite <i>K. Priladiša, J. Siliņš, T. Glaskova-Kuzmina, J. Proskurins, S. Bērziņa, E. Jaunuzola</i>	344
Expression of Gene Proteins, Interleukins and β -defensin in Cleft-Affected Tissue <i>I. Jankovska, M. Pilmane, I. Akota</i>	345
Condylar Bony Changes and Signs of Temporomandibular Joint Disorders in Class III Orthognathic Surgery Patients <i>J. Podčernina, I. Urtāne, P. Pirttiniemi</i>	346
Antibacterial Effect of Temporary Cements: In Vitro Study <i>K. Ozoliņš, U. Soboļeva, A. Reinis</i>	347
Patient Motivation and Education of Oral Hygiene, Treatment of their Partial and Complete Dentures <i>A. Maksimovs, A. Keiviša</i>	348
Interconnection between Facial Asymmetry and Occlusal Features <i>S. Silineviča, G. Jākobsone, A. Beļaka, N. Šilova</i>	349
Maxillary and Mandibular Reconstruction with Osteocutaneous Fibula Flap: 10-Year Experience of Single Surgeon Team <i>J. Zariņš, K. Pastars, J. Tārs, A. Ivanova, E. Rāte, R. Dzalbs, V. Neļjodovs</i>	350
Merkel Cell Carcinoma of Head and Neck Region: Review of Two Cases <i>E. Korņevs, I. Apse, K. Pastars, J. Tārs</i>	351
Comparison of Intraoral Scanner and Extraoral Scanner <i>A. Kalniņa, U. Soboļeva</i>	352

Contents

Clinical Manifestations of Burning Mouth Syndrome <i>V. Jankovskis, G. Selga</i>	353
Basal Cell Nevus Syndrome – Diagnosis and Treatment <i>J. Muceniece, A. Ivanova, J. Moisejenko-Golubovica</i>	354
3D Nasalolabial Appearance in Patients with Unilateral Complete Cleft Lip, Alveolus and Palate and Control Group <i>I. Bāgante, I. Akota</i>	355
Correlation of Manual Dexterity Test Results with Average Mark of Practical Part of Preclinical Course of the Faculty of Dentistry <i>N. Šilova, S. Bērziņa, S. Graudiņa</i>	356
Quality of Metalceramic Crown and Soft Tissue Health <i>E. Blūma, A. Vidžis</i>	357
Efficiency of Revitalisation Procedures in Permanent Teeth with Incomplete Root Formation and Pulp Necrosis: Preliminary Results <i>K. Andrejeva, A. Mindere Gūbele, A. Brinkmane</i>	358
Cone-Beam Computer Tomographic Study of Root and Canal Morphology of Maxillary First and Second Permanent Molars <i>K. Drava, A. Mindere Gūbele, A. Brinkmane</i>	359
Role of Clinical and Iatrogenic Factors in Success Rate of Orthograde Endodontic Retreatment: Preliminary Results of a Follow-up Study <i>L. Saulīte, A. Mindere-Gūbele, A. Brinkmane</i>	360
Intercenter Study of Different Surgical Techniques in Patients with Complete Unilateral Cleft Lip Alveolus and Palate (UCLAP) <i>I. Akota, I. Bagante, J. Lenz, L. Zaleckas, M. Soots, K. Gundlach</i>	361
Success and Longevity of Porcelain Laminate Veneers: Retrospective Study <i>M. Valdmane, P. Apse</i>	362
Oral Lichen Planus Prevalence and Severity Diagnostic Using Natural Tissue Fluorescence <i>J. Millers, G. Selga</i>	363
Late Facial Growth Results for Patients with Complete Unilateral Non-Syndromic Cleft Lip and Palate Treated by One-Stage and Two-Stage Palatal Repair <i>I. Zepa, I. Akota</i>	364
Dental Implants – Peri-Implantitis and 5-Year Follow-Up after Implantation of Biphasic Calcium Phosphate (HAp/βTCP) Granules <i>V. Kļimecs</i>	365
Osteoporotic Bone Reaction to Implantation of Biphasic Calcium Phosphate Bioceramics <i>A. Grišulonoks, A. Skaģers, I. Šalma, L. Neimane, J. Ločs, V. Kļimecs</i>	366
Impact of Education and Motivation on Oral Health <i>J. Kalnina, A. Brinkmane, E. Senakola</i>	367
Characteristics of a Th-POK Expression in Oral Squamous Cell Cancer <i>R. Kleina, M. Dzudzilo, I. Čēma, A. Dabužinskiene, D. Lutinska</i>	368
Use of Toothpastes with Optimal Fluoride Concentration in Latvia <i>I. Maldupa, I. Viduskalne, J. Kalniņa, L. Kroniņa, S. A. Uribe Espinoza, E. Senakola, A. Brinkmane</i>	369
Structure of Patients with Midface Fractures: Single Institution Experience <i>J. Muceniece, Ģ. Šalms</i>	370

Impact of Bone Mineral Density on Volume of Edentulous Jaw Bones <i>A. Slaidina, B. Springe, E. Nikitina, U. Soboleva, A. Lejnicks</i>	371
Assessment of Biocompatibility and Osteoinductive Potential of Amorphous Calcium Phosphate in Mice: Experimental Model <i>E. Makarova, J. Vecstaudza, R. Vilskersts, E. Kupats, J. Kuka, D. Loca, J. Locs, M. Dambrova</i>	372
Will Mineral Trioxide Aggregate Replace Calcium Hydroxide in Treating Carious Exposures in Adults? <i>R. Kundziņa</i>	373
Using Genetics to Identify Causal Risk Factors and Biological Mechanisms for Cleft Lip and Palate <i>S. Lewis</i>	374
Research of Bone Tissue Substitute Materials in Latvia <i>J. Ločs</i>	375
Research Integration in Teaching <i>I. Maldupa</i>	376
Translational Oral Health Research <i>J. Meurman</i>	377
Facial Genetics: Brief Overview <i>S. Richmond</i>	378
Experiences Regarding Orthodontic Treatment in Northern Norway <i>A. Sjögren</i>	379
Development of Biomaterial Research in Institute of Stomatology <i>A. Skaģers</i>	381
Modern Technologies for Orthognatic Surgery <i>Ç. Şalms</i>	382
Integrating Research and Clinical Practice in Dentistry <i>R. Skudutyte-Rysstad</i>	383
Osteoporosis and Edentulous Jaws <i>A. Slaidiņa</i>	384
Paradigm Shift for Dental Ceramics <i>P. V. Von Styern</i>	385
Benefits and Risks of Orthodontic Treatment in Subjects with Periodontal Disease <i>E. Zasciurinskiene</i>	386
Towards Understanding Oral Health <i>E. Zaura</i>	387
Impacted Maxillary Canines Three Dimentional Positions Impact on Patients Perception and Treatment Results <i>P. Sosārs, G. Jākobsons, M. Štekerhofs</i>	388
Pattern of CD44 Antigen Expression in Mucosal and Submucosal Structures in Case of Oral Leukoplakia <i>M. Dzudzilo, I. Čēma, R. Kleina, I. Franckeviča, A. Šmits</i>	389
Applications of Average Face in Orthodontic and Genetic Studies <i>A. Zhurov</i>	390

Pharmacy and Pharmacology

Preformulation Studies of Liquisolid Systems: Optimisation of Carrier / Coating Material Ratio <i>B. Vraníková</i>	391
Use of Innovative Spectroscopy Methods and Chemometrics for Rapid Authentication of Herbals <i>A. Brangule, P. Tretjakovs</i>	392
Research on Combinations of Substances, Found in Latvia, and their Possible Compatibility in Extemporaneous Dosage Forms for Dermatology <i>O. Kiselova, B. Maurina, V. Sidlovska</i>	393
Availability of Generic Medicines in Latvia <i>M. Ceha, E. Poplavska, I. Salmane-Kuļikovska</i>	394
Factors Affecting Hydrolysable Tannin Solvent Extraction <i>R. Šukele, D. Bandere, R. Koka, P. Sudmalis</i>	395
Levofloxacin Assay in Rabbit Plasma: UPLC Method Optimisation and Validation <i>A. Sitovs, D. Kustovs, M. Giorgi, L. Kovalcuka, L. Voiko, S. Purviņa, D. Bandere</i>	396
Use of Ethnomedicinal Plants in Latvian-Populated Territory <i>I. Sile, E. Romane, S. Reinsons, D. Tirzīte, M. Dambrova</i>	397
Anticoagulant Use Patterns in Patients with Pulmonary Embolism in Latvian Hospital <i>A. Prilina, A. Aitullina, L. Umnova</i>	398
Determination of Cortisol in Human Saliva by Ultra-High Performance Liquid Chromatography Method <i>D. Kustovs, A. Sitovs, A. Skesters</i>	399
Incidence of Colistin Induced Acute Kidney Injury in Patients with Different Renal Functional States <i>A. Aitullina, A. Krumina, S. Svirskis, S. Purvina</i>	400
Extraction of Active Ingredients for Pharmaceutical Use from Freshwater Sapropel in Latvia <i>A. Kļaviņa, I. Vanadzins, L. Dobkevica, A. Auce, L. Komarovska</i>	401
Therapy Related Adverse Drug Reactions in Patients with Inflammatory Bowel Diseases (IBD) <i>I. Mirzajanova, J. Pokrotņieks, S. Purviņa</i>	402
Analysis of Factors Associated with Occurrence of Bias in Studies Assessing Medication Adherence and Health Outcomes: Literature Review <i>I. Rutkovska, E. Poplavska, I. Urtāne, D. Šmits, D. Bandere</i>	403
Analysis of Efficacy of Food Supplements for Maintenance of Normal Blood Glucose Levels in Latvia <i>V. Joņina, E. Romāne, I. Salmane-Kuļikovska</i>	404
Excipients in Compounded Paediatric Drug Forms for Internal Use <i>G. Golubs, I. Barene, I. Sviestina</i>	405
Full Mitochondrial Genome Sequencing of MDR-TB Patients Using NGS to Clarify Polymorphisms and to Avoid Aminoglycosides Induced Ototoxicity <i>L. Veidemane, V. Igumnova, L. Barkāne, E. Zole, A. Viksna, R. Ranka</i>	406
Analysis of Factors Affecting Statin Therapy Undergoing Planned Percutaneous Coronary Intervention <i>K. Karklīna, I. Urtāne, A. Lejnieks</i>	407

Potassium Channels and Sodium Hydrogen Sulfide Relaxation of Rat Mesenteric Small Arteries <i>S. Abramavicius, A. Petersen, N. Renaltan, M. Whiteman, E. Stankevicius, E. Hedegaard, U. Simonsen</i>	408
Direct Oral Anticoagulants Concentration Testing in Clinical Practice for High-Risk Patients with Atrial Fibrillation <i>K. Pukite, I. Laizane, K. Apsite, I. Pupkevica, I. Cernevska, O. Boichuk, J. Meisters, D. Straupmane, I. Urtane, O. Kalejs</i>	409
Screening of Mitochondrial DNA Mutations Associated with Antibiotic-Induced and Non-Syndromic Deafness in Ethnic Latvian Population <i>V. Igumnova, L. Veidmane, A. Viksna, D. Bandere, R. Ranka</i>	410
Proportion Change of Approved and Off Label Used Oncological Medicinal Products during Clinical Studies <i>L. Kite, I. Urtane, P. Sudmalis</i>	411
Contribution of Molecular Structure to Self-Assembling and Biological Properties of Bifunctional Lipid-Like 4-(N-Alkylpyridinium)-1,4-Dihydropyridines <i>P. Dimitrijevs, M. Rucins, M. Plotniece, K. Pajuste, L. Jackevica, A. Gulbe, S. Kibilda, A. Sobolevs, J. Liepins, I. Domracheva, D. Bandere, A. Plotniece</i>	412
Search for Novel Treatment for Rare Cancers <i>R. Vilskersts, M. Videja, L. Jackevica, D. Zicane, A. Melderis, R. Belaunieks, M. Dambrova, M. Turks</i>	413
Analysis of Adherence to Statin Therapy in Ambulatory Practice <i>L. Vanaga, I. Urtāne, D. Šmits, A. Duhanova</i>	414
Conflict Management Skills among Lithuanian Pharmacists <i>A. Stankuniene, G. Macionyte, J. Bernatoniene</i>	415
Pharmacy Patients' Knowledge of Safe Use of Dietary Supplements and Medicinal Plants <i>R. Šukele, E. Ardava, I. Sīle, O. Onževs</i>	416
Improving Prescribing and Medicines Use: Approaches from Nova Scotia, Canada related to Antimicrobials <i>I. Sketris</i>	417
Fractal Aspects of Pharmaceutical Powder Flow <i>Z. Sklupalova</i>	418
Peculiarities and Advantages of an Interdisciplinary Approach to Science <i>N. Savickiene</i>	419
Proton Pump Inhibitor (PPI) and Non-Steroidal Anti-Inflammatory Drug (NSAID) Intrahospital Use Associated with Longer Hospital Stay in Inflammatory Bowel Disease Patients <i>I. Mirzajanova, J. Pokrotnieks, S. Purviņa</i>	420
Challenges for Commercialisation of Biotechnologies <i>D. Arāja</i>	421
Regulatory Issues and Relative Effectiveness of Borderline Herbal Products <i>D. Arāja</i>	422
Other Topics	
Extreme Hemodilution during Cardiopulmonary Bypass Effect on Neurocognitive Function in Patient after Cardiac Surgery <i>A. Reihmane, R. Leibuss</i>	423

Initial Experience of Therapeutical Use of Yellow Pattern Micropulse Laser in Latvia <i>L. Muceniece, D. Markevica, K. Leimane</i>	424
Prevalence and Manifestation of Diabetic Retinopathy in Type 2 Diabetes Patients <i>S. Pilāne</i>	425
Clinical, Dermatoscopic and Histopathological Correlation of Atypical Actinic Keratoses <i>A. Balcere, R. Karls, M. Sperga, M. Rone-Kupfere, I. Čēma, L. Vīksna, A. Krūmiņa</i>	426
Administration of Narrow-Band (311 nm) UVB Phototherapy as Choice Treatment Method for Plaque-Type Psoriasis <i>I. Hartmane, I. Mikažāns, I. Ivdrā, A. Dērvēniece</i>	427
Corneal Thickness and Infiltrate Change for Treated Keratitis <i>L. Muceniece, G. Laganovska</i>	428
Comparative Evaluation of Filtering Bleb Ultrastructure Using Anterior Segment Optical Coherence Tomography <i>O. Gertners, G. Laganovska</i>	429
Dermatoscopic Description of Non-Infectious Balanitis <i>A. Zavorins, J. Ķīsis, J. G. Voicēhovska</i>	430
Human-Animal Interaction as Research Subject <i>M. Lotko</i>	431
Testing Efficacy of Phototherapeutic Device FertereX for Improving the Semen Quality <i>B. Alksere, M. Belte, E. Pimane, V. Fodina, J. Erenpreiss</i>	432
Assessment of Rotational Thromboelastometry and Standard Coagulation Profile in Predicting Thrombosis in Microvascular Flap Surgery <i>K. Drizlionoka, J. Stepanovs, A. Ozolina, L. Nikitina-Zake, B. Mamaja</i>	433
Visual Acuity Association with Type of Diabetic Retinopathy in Patients with Type 1 Diabetes Mellitus <i>L. Ullase, K. Ducena, D. Markevica, G. Laganovska, K. Čačka</i>	434
Effects of Pre-Analytical Conditions on Mannan-Binding Lectin Pathway Activity in Healthy Donors <i>B. Šlīsere, J. Serova, D. Straupmane, A. Reinis</i>	435
Microvascular Reactivity in Psoriatic Plaque and Normal Skin <i>I. Miķelsone, I. Hartmane, A. Pāparde, A. Jurka, I. Barone, G. Gersons, M. Mežals, M. Cirse, P. Tretjakovs</i>	436
Results of Kidney Transplantation from Living Donors <i>I. Ziedina, K. Gritane, R. Lulle, E. Skrula, A. Malcevs, V. Suhorukovs, D. Amerika, J. Jusinskis</i>	437
Efficacy of Epidural Injections with or without Platelet Rich Plasma in Treatment of Patients with Lumbal Back Pain <i>A. Ozoliņa, U. Zeltiņa, J. Stīpiņš, K. Ruks, A. Gulbis, E. Skaba, I. Siliņa</i>	438
Patients' Profile with Open Globe Injuries: Retrospective Case Study <i>E. Dručka, O. Gertners, M. Jurjāne, Ē. Elksnis, A. Zemītis, I. Markeviča, J. Vanags, G. Laganovska</i>	439
Patch Test Results for Acne Vulgaris Patients in Aesthetic Dermatology Clinic of Prof. J. Kīsis from 01.01.2018–01.12.2018 <i>D. Buile, G. Pētersone, Z. Bogdanova, J. Ķīsis</i>	440

Frequency of Contact Allergy in Children with Atopic Dermatitis <i>G. Pētersone, A. Zavorins, E. Sālījuma, D. Buile, J. Ķīsis, I. Mikažāns, Z. Bogdanova</i>	441
European Standard Series Patch Test Results in Dermatology Clinic in 2018 <i>E. Sālījuma, A. Zavorins, G. Pētersone, J. Ķīsis, Z. Bogdanova</i>	442
Ultrasound – Easy and Reliable Tool for Assessment of Airways <i>Z. Glāzniece-Kagane, A. Kagans, J. Kraķe, S. Grigorjevs, B. Mamaja</i>	443
Quality of Life and Pain in Patients with Hidradenitis Suppurativa <i>A. Vigante, I. Upeniece, Z. Činokajeva</i>	444
Relationships between Retinal Nerve Fiber Layer Thickness and Axial Length in Young Adults: Pilot Study <i>M. Strelņikova, G. Laganovska</i>	445
Effect of Perioperative Ketamin Application on Postoperative Pain and Neurocognitive Function <i>L. Solovjovs, A. Ozoliņa, A. Gulbis, K. Ruks, I. Vanags, J. Dukate</i>	446
Evaluation of Nail Dermatoscopic Changes in Patients with Minimal Skin Psoriasis Manifestations <i>I. Ivdrā, I. Mikažāns, I. Hartmane</i>	447
Postoperative Pain Management after Abdominal Surgery <i>O. Gutņikovs, M. Rikmane, J. Stepanovs, J. Kraķe, B. Mamaja</i>	448
Influence of Permanent and Fixed Term Employment on Hypothalamic-Pituitary- Thyroid Axis in Nurses: Cross-Sectional Study <i>C. Ledda, R. Caltabiano, A. Montana, D. Cina, A. Marconi, V. Baylon, M. Salerno, C. Loreto, V. Rapisarda</i>	449
Families' Perception of Health and Support in Care of Children with Limited Survival <i>M. Mikelšone, S. Tomase</i>	450
Low Chronic and High Acute Exposure to Phorate – Death Paradigm: Case Report and Mini Review <i>A. Montana, A. Asmundo, V. Bylon, D. Condorelli, S. Rocuzzo, M. Esposito, M. Torrisi, G. Cocimano, G. Di Mizio, M. Salerno</i>	451
Love and Death: Passionate Homicides and Overkilling <i>D. Condorelli, M. Salerno, D. G. Albano, F. Amico, V. Baylon, G. Di Mizio, M. Esposito, I. Russo, M. Torrisi, A. Montana</i>	452
Which Came First, Ischemia or Car Accident? Key to Shed Light on “Road Murder” <i>M. Salerno, G. Di Mizio, M. Torrisi, V. Baylon, G. Cocimano, A. Musumeci, F. Patanè, P. Malandrino, A. Liberto, F. Indorato, A. Montana</i>	453
Differential Diagnoses of Chronic Pelvic Pain <i>A. Haduņkina, I. Evansa, V. Džabijeva, N. Zlobina, N. Ivanovs</i>	454
Optimisation of Corrections of Hemostasis Disturbances in Surgical Bleedings on Experience of Anaesthesiologist-Reanimatologist with Hemostasis Laboratory <i>I. Surgunte</i>	455
Effect of Donor Kidney Preceding Sclerosis on Early and Late Post-Transplant Results: 10-Year Observational Study <i>J. Bormotovs, A. Malcevs, J. Jusinskis, I. Ziedina, V. Suhorukovs</i>	456

Contents

Evaluation of Central Macular Thickness after Pars Plana Vitrectomy for Replacement of Dislocated IOL to Iris-Clips <i>D. Meiers, G. Laganovska</i>	457
Importance of Ionized Calcium Level in Serum in Ethylene Glycol Poisoning <i>R. Stašinskis</i>	458
Incidence Rate of Acute Appendicitis in Elderly Population in Latvia <i>S. Lapsa, A. Ozoliņš, I. Štrumfa, J. Gardovskis</i>	459
Innovative Knowledge Creation of Health Issues in Level of Holistic Community <i>B. Maženytė, M. Petraite</i>	460
Functional Capacity and Limitations Determination Assessment of Patients with Respiratory System Diseases <i>I. Dirveika</i>	461
Antioxidant Properties of Five Varieties of Bread-Wheat (<i>Triticum Aestivum</i> L.) Grains: Latvian Selection <i>A. Kulbacna, A. Skesters</i>	462
Does Birmingham Vasculitis Activity Score (BVAS) Influence Treatment Decisions of ANCA Associated Glomerulonephritis? <i>Z. Munkena, V. Kuzema, D. Sila, A. Pētersons</i>	463
Relationship between 4-Hydroxynonenal and Clinical Course in Community-Acquired Pneumonia Patients <i>J. G. Voicēhovska, N. Voskresenska, A. Voicēhovska, A. Silova, A. Skesters, A. Lejnieks</i>	464
Mode of Initial Dialysis Therapy for Chronic Kidney Disease Patients: Prospective Study <i>B. Vernere, V. Kuzema, M. Motivāne, A. Popova, V. Mešečko, I. Ādamsons, I. Puide, A. Pētersons</i>	465
Design Construction and Calibration of Self Recording Precipitation, Temperature and Relative Humidity Measurement Equipment <i>A. Titilayo Olayinka</i>	466
Basic Issues in Primary Education Delivery in Nigeria and West Africa <i>O.-R. Christabel Omon</i>	467
Power and Sample Size Calculation for Mixed Models <i>E. Šauriņa</i>	468
Expected Duration of Macular Surgery Depending on Best-Corrected Visual Acuity <i>A. Balode, D. Raščevskis, J. Vanags, G. Laganovska</i>	469
IOL Dislocation after Vitreoretinal Plus Phaco Surgery Depending on Capsulorhexis Size and Overlap <i>D. Raščevskis, A. Balode, J. Vanags, G. Laganovska</i>	470
New Horizons for Social Work Profession in Contemporary Socio-Environmental Dynamics: Challenges to Social Workers in Latvia <i>L. Vilka, M. Lotko</i>	471
Mitochondrial DNA Haplogroups and Telomere Length in Exudative Age-Related Macular Degeneration Patients in Latvian Population <i>B. Baumanė, L. Grava, L. Strucinska, E. Zole, R. Ranka</i>	472
Chronic Obstructive Pulmonary Disease (COPD) Patient Treatment Tactics and Its Results at Emergency Medical Center (NMC) Stage <i>M. Karpova, R. Uljanovs, D. Zentina</i>	473

Provision of Emergency Medical Assistance for Patients with Narcotics, Hallucinogenic and Psychotropic Substances Poisoning in Prehospitality: 3-Year Experience in Latvia <i>R. Ciekurs, D. Krievins, D. Jakubaneca</i>	474
Polytrauma Mechanism has Impact on Outcome and Reflects Environmental and Social Hazards in Latvia <i>L. Geibijeva, A. Caplinskis, M. Dolgusevs, A. Melderis, H. Plaudis, G. Pupelis</i>	475
Headache in Emergency Medicine Department Workers Compared to Medical Students <i>D. R. Vītola, I. Kalve</i>	476
Evaluation of Anterior Gastropexy as Treatment Option for Large Hiatal Hernias (Type III, IV) in Elderly Patients with Comorbidities <i>K. Žarkova, I. Ivanovs</i>	477

THEMATIC CONFERENCES

Complementarity Principle in Metabolic Disease Research

Association between Diabetes Mellitus and Overall Survival of Cancer Patients in Latvia: Register-Based Study <i>I. Strēle, S. Pildava, I. Repša, U. Kojalo, J. Vilmanis, G. Briģis</i>	478
Action of Different Types of Aspen Bark Extracts on Digestion Enzymes <i>J. Krasilnikova, G. Telysheva, E. Kistanova, K. Jursevics, S. Janceva, L. Lauberte, O. Bikovens</i>	479
Patient's Body Weight Changes and Food Intake in Hospital: Nutrition Day 2018 Audit <i>J. Arensburga, J. Rudzīte-Rjabceva, L. Meija</i>	480
Design of FRET-Based Assay for Detection of Intracellular pH <i>L. Hippe, M. Murovska, L. Gailīte, M. Kālis</i>	481
Trimethylamine-N-Oxide – Microbiota-Derived Cardiometabolic Risk Marker <i>M. Dambrova, J. Kuka, M. Videja, I. Konrade, E. Liepins</i>	482
Glucose Metabolism Disorders in Kidney Transplant Recipients <i>K. Gritane, I. Ziedina, J. Jusinskis, A. Malcevs, V. Suhorukovs, D. Amerika, A. Lejnieks</i>	483
Nutritional Risk Screening and Prevalence of Malnutrition in Hospitalized Patients <i>K. Klaramunta-Antila, J. Rudzīte-Rjabceva, N. Aleksīna, L. Meija</i>	484
Activated and Non-Activated Wheat Flakes Glycaemic and Insulin Response <i>G. Havensone, L. Meija, V. Cauce, A. Lejnieks</i>	485
Factors Associated with Glycemic Control in Hospitalised Diabetes Mellitus Patients: Preliminary Report <i>A. Pētersons, L. Umnova</i>	486
Increased Tissue Expression of Th17-Related Cytokines in Hashimoto's Thyroiditis: Shift in Traditional Th1/Th2 Paradigm <i>T. Zaķe, S. Skuja, I. Kalere, I. Konrāde, V. Groma</i>	487
Consistency of ADC-DWI and ADC-DWIBS in Bowel Walls Depending on Measurement Area in Active Chron's Disease <i>I. Apīne, R. Pitura, D. Bērziņa</i>	488

Pain Management in Intensive Care Unit Patients after Cardiac Surgery with Sternotomy Approach <i>B. Vilīte, E. Strīķe, R. Leibuss, K. Rutka</i>	489
Increased Load of Somatic Mutation in Association with More Aggressive Growth and Recurrence of Pituitary Adenoma <i>I. Balceris, R. Peculis, I. Radovica-Spalvina, I. Konrade, M. Romanovs, A. Kiecis, K. Megnis, V. Rovite, A. Lejnieks, J. Klovins</i>	490
Different Growth Factors and Proliferation Markers in Middle Ear Cholesteatoma: Literature Review <i>K. Dambergs, G. Sumeraga</i>	491
Using a Multi-Omics Approach to Understand Complexity of Metformin Action in Humans with Respect to Variability of Response to the Treatment <i>I. Konrade, J. Klovins, I. Elbere, M. Ustinova, V. Rovite, V. Pirags</i>	492
Milk as Most Important Source for Optimal Iodine Supply <i>L. V. Neimane, I. Strēle, I. Konrāde, A. Lejnieks</i>	493
Changes in Body Mass Index, Ratio of Waist and Hip Circumference Related to Use of Plate Principle for Overweight Women <i>L. V. Neimane, A. Baumane, S. Seņkāne</i>	494
Selenium-Rich Food Consumption in Latvia from 2000 to 2016 <i>I. Kalere, I. Konrāde, T. Zaķe, I. Strēle</i>	495
Have the Consumption Habits of Easily Identifiable Dietary Iodine Sources Changed? <i>V. Veisa, I. Konrāde, I. Kalere, I. Strēle, M. Makrecka-Kūka, D. Rezeberga, A. Lejnieks, M. Dambrova</i>	496
Changes in Iron Absorption in Patients with Proven Enteropathy: Single Centre Analysis <i>O. Basina, J. Derova, A. Derovs, S. Lejniece</i>	497
Changes in Haematological, Biochemical and Inflammatory Markers after Long Distance Running <i>D. Sūna, S. Rozenštoka, S. Upīte</i>	498
Traumatology and Orthopaedics	
High Frequency Ultrasound: Evaluation of B-Mode, Strain and Shear Wave Elastography, Doppler Microcirculation Mode in Rotator Cuff Tendinopathy <i>I. Supe, A. Platkājis</i>	499
Effectiveness of a Multidisciplinary Approach in Total Knee Replacement <i>M. Karimov, S. Madrakhimov</i>	500
Treatment Apparatus for External Fixation of Fractures of Femoral Neck <i>F. Salokhiddinov, R. Jakubjanov, M. Karimov, H. Aliyev</i>	501
Evaluation of Local and Systemic Analgesic Effects of Dexamethasone in Upper Arm Bone Fracture and Shoulder Joint Surgery <i>J. Kucina, I. Golubovska</i>	502
Chronic Pain Syndrome Manifestation before and after Total Hip Arthroplasty for Patients with Primary Hip Osteoarthritis <i>A. Studere, D. Šmite</i>	503
Medium-Term Outcome of Patients with Surgically Treated Tibiofibular Syndesmosis Injury <i>T. Arcimovičs, R. Jakušonoka, A. Jumiņš, G. Vinčela, Z. Pavāre, A. Lerner</i>	504

Medium-Term Outcomes of Polytrauma Patients with Pelvic Ring and Acetabular Fractures Treated by Modified Stoppa or Combined Approach <i>A. Vikmanis, A. Juntīņš, R. Jakušonoka, J. Movčāns</i>	505
Main Microvascular Thrombosis Risk Factors: Early Posttraumatic vs. Elective Reconstructive Surgery <i>J. Stepanovs, A. Ozoliņa, L. Nikitina-Zaķe, M. Mukans, I. Vanags, B. Mamaļa</i>	506
Patient Safe Education in Orthopaedics <i>A. Juntīņš, R. Jakušonoka, A. Vikmanis</i>	507
Analysis of Revision Operations after Total Hip Replacement in Dysplastic Hip Patients <i>S. Zebolds, A. Juntīņš, K. Knohenfelds</i>	508
Patient Experience after Receiving Lower Extremity Amputation Due to Diabetes and/or Peripheral Artery Disease <i>V. Drunks</i>	509
V-Shape Double Vascularised Fibula Growth Plate Transplantation – New Method for Long Segment Tibial Reconstruction <i>D. Ozols, U. Bergmanis, V. Neffodovs</i>	510
Long-Term Evaluation of Functional and Esthetical Outcomes for the New Method of Toe-To Hand Transfer for Full-Length Thumb Reconstruction in Congenital Thumb's Hypoplasia <i>D. Ozols, A. Pētersons</i>	511
Fascia Iliaca Block vs. Local Infiltration Analgesia for Postoperative Pain Control after Hip Replacement Surgery <i>A. Bogdanovs, A. Miščuks, I. Golubovska</i>	512
Femoral Geometry and Bone Quality Influence on Fracture Patterns of Proximal Femur <i>A. Džeriņš, P. Studers, V. Boginskis, M. Zolmanis</i>	513
Calcium Phosphate Bioceramic Materials General Influence on Osteoporotic Bone: Experimental Research <i>V. Ananjevs, A. Ananjeva, J. Vētra, A. Skaģers, V. Kasjanovs</i>	514
Challenges in Orthopaedics and Trauma in Regional Hospital <i>I. Kolosovs, R. Preiss</i>	515
Revision Total Hip Arthroplasty <i>P. Studers, A. Džeriņš, M. Zolmanis, U. Bladiko</i>	516
Syndesmotic Screw Fixation in Treatment of Trimalleolar Fractures <i>D. Grigorjevs, I. Terjajevs, M. Malzubris</i>	517
Postgraduate (Residency) Training of Orthopaedic Surgeons in Hospital of Traumatology and Orthopaedics in Cooperation with Universities <i>M. Ciems, R. Vēciņa, U. Zariņš, M. Ziediņa</i>	518
Using of Conservative Therapies to Prevent Formation of Hypertrophic Scars after Thermal Burns <i>G. Raipalis, K. Lācis, T. Krūmiņa</i>	519
Psoriatic Arthritis Symptoms in Patients with Psoriasis without Concomitant Diagnosis Psoriatic Arthritis <i>K. Tolocko, A. Mihailova, I. Mikažāns</i>	520
Deformation in Elastic Panels of Smart Garment when Imitating Self-Corrective Movements of Patients with Idiopathic Scoliosis <i>A. Leimane, G. Rusovs, A. Kataševs, A. Vētra, A. Okss</i>	521

Extended Flexor Carpi Radialis Approach: Treatment of Complex Distal Radius Fractures <i>I. Breide</i>	522
Can Holes in the New Implant for Osteosynthesis of Femoral Neck Contribute to Improvement of Its Mechanical Properties? <i>A. Jafarov, Ç. Alizadeh, Z. Ozer, F. K. Erbay, A. M. Mamedov, T. Demir</i>	523
Antibacterial Prophylaxis in Hand Trauma <i>V. Neffodovs, D. Ozols, J. Zarins, O. Rimdenoka</i>	524
Ankle-Joint Arthrodesis in Patients with Chronic Suppurative Osteoarthritis <i>C. Alizade, H. Aliev, S. Agaev</i>	525
Reconstruction of Osteomyelitis Defects <i>M. Malzubris, L. Raga, I. Terjajevs</i>	526
Comparison of Volar Locking Plates vs. External Fixation and K Wires in Arthroscopically Assisted Intraarticular Distal Radius Fracture Fixation <i>U. Krustins, J. Krustins, D. Bringina, K. Laurane, A. Juntins</i>	527
Arthroscopic Treatment and Bone Grafting of Scaphoid Nonunions <i>U. Krustins</i>	528
Challenges in Arthroscopic Knee Surgery – Medial Meniscus Posterior Root Tear <i>E. Ozols</i>	529
Quality of Life and Other Characteristics of Elderly Patients Six Months after Hip Fracture <i>G. Kristapsone, S. Tomsone</i>	530
Experience of Minimally Invasive Spine Surgery in Hospital of Traumatology and Orthopaedics <i>A. Repnikovs, K. Briuks, R. Gibners, E. Svolaks, O. Suhorukovs, A. Puce</i>	531
Orthopaedic Oncology – Challenge for Orthopaedic Surgeon <i>L. Repsa</i>	532
Choice of Implants in Shoulder Replacement Surgery Depending on Rotator Muscle Function <i>A. Vugulis</i>	533
Association of Interleukin-10 Gene Promoter Allelic Variants with Rheumatoid Arthritis in a Sample of Residents in Latvia <i>A. Dorondo, E. Nagle, L. Gailite</i>	534
Correction of Immunosuppressive Therapy in Rheumatologic Patients during Perioperative Period <i>A. Kadiša</i>	535
Perioperative Nutrient Role after Hip and Knee Arthroplasty <i>A. Zauers</i>	536
Options for Lower Limb Length Discrepancy Correction in Children <i>J. Upenieks, U. Bergmanis, A. Rekevica</i>	537
Can Myotonometry Aid Goniometry in Estimation of Treatment Efficiency of Paediatric Midshaft Forearm Fractures? <i>J. Upenieks, A. Rekevica, A. Petersons, A. Villerusa</i>	538
Long-Term Follow-up for Calcaneal Bone Reconstruction Using Vascularised Composite Fibula Growth Plate Transplantation for 5 Years Old Boy <i>M. Krumins, D. Ozols, K. Blums</i>	539

University Teaching and Learning Thematic Conference “Students as Researchers”

Mixed-Mode Instruction Using Flipped Classroom and Active Learning Techniques Leads to Improved Generic Problem-Solving Skills of Undergraduate Students <i>A. Klegeris</i>	540
Reflection on Research Integration in Study Process: Case of Psychology Branch at Rīga Stradiņš University, Latvia <i>K. Šneidere, K. Mārtinsonē, T. Koķe</i>	541
3D Printed Anatomical Models – New Visualisation Platform for Teaching and Education in Basic Study Course <i>D. Kažoka, M. Pilmane</i>	542
Lecturer’s Reflection on Feedback Provided in Study Course “Pharmaceutical Dosage Form Technologies” <i>O. Kiselova, V. Sidlovska</i>	543
Implementation of Research Experience in Study Courses at Rīga Stradiņš University, Latvia <i>I. Čakstiņa</i>	544
DeDiWe Case Study <i>S. Litiņa</i>	545
When a Teacher Is a Researcher Simultaneously – What Types of Benefits are There for Students? <i>I. Stars</i>	546
Most Common Ways of Learning for Students <i>I. Upeniece, V. Arnis, A. Aboliņa</i>	547
Exploring Satisfaction Attributes of E-learning among Students of Medical Terminology Study Courses <i>M. Karulis, I. Ābelīte, V. Vīksne, A. Zilvestre, Ņ. Zazerska, I. Fibiņa</i>	548
Worksheets as Example of Information Structuring in Chemistry Studies <i>I. Kazuša</i>	550
Analysis and Evaluation of Topics of Research Papers in the Context of Health Consciousness Presented in Latvian High School Learner Scientific Research Conferences on Health Science in Period of 2012–2018 <i>A. Pastare, A. A. Krūmiņa, M. Karulis</i>	551
Measuring of Gain for Evaluating Individual Student Growth at Science Courses of the University of Latvia, Faculty of Physics, Mathematics and Optometry <i>I. Cinite</i>	552
Need of Blended Learning / Teaching in Medical Chemistry Course <i>K. Kostrjukova, A. Brangule</i>	553
Teaching Approach and Methods for Development of Consultation Competency in Pharmacy Studies <i>E. Poplavskā, N. Jansone-Ratinika, L. Medjānova, R. Koka</i>	554
Changing Concepts of Teaching and Literacy in Age of New Media: Practice and Research: MIL&LAB project at Rīga Stradiņš University, Latvia <i>I. Skulte</i>	555
Multidisciplinary Learning Approach Delivering Study Courses English for Dentistry and Medical Terminology in English <i>T. Zakutajeva</i>	556

Using Moodle as Formative and Summative Assessment Tool in Medical Chemistry Course: Case Study <i>M. Halitovs, A. Brangule</i>	557
Making Sense of Things Together: Application of Phenomenology in University Teaching <i>U. Vēgners</i>	558
Virtual Reality as Innovation in Healthcare Education <i>M. Vervoorn</i>	559
Researchers' Careers and Inclusion in Scientific Communities <i>G. Laudel</i>	560
Morphology – Anatomy, Histology, Embryology, Anthropology	
Characterisation of Cytokines in Cleft Lip Palate Affected Lip Tissue <i>M. Pilmane, E. Sidhoma, I. Akota</i>	561
Evaluation of Tumour Necrosis Factor-Alpha, Matrix Metalloproteinase-2 and Human Beta-Defensin 2 in Hidradenitis Suppurativa <i>E. Sidhoma, M. Pilmane</i>	562
Significance of Growth Factors, Degenerating Enzymes, Inflammatory and Antimicrobial Factors in Morpho-Pathogenesis of Intraabdominal Adhesions in Infants <i>A. Junga, M. Pilmane, Z. Ābola, O. Vovrāts</i>	563
Strontium Enriched Calcium Phosphate Ceramics Improve Bone Regenerative Properties in Constant Osteoporotic Femoral Neck Bone <i>J. Zariņš, M. Pilmane, E. Sidhoma, I. Šalma, J. Ločs</i>	564
Y Chromosome: Tool in Estimation of Genetic Origin of the Balts <i>A. Puzuka, A. Krumina, S. Limborska, A. Khrunin, Z. Dobeļe, I. Nartisa, L. Gailīte</i>	565
Variability of Morphometric Parameters of Posterior Border of Hip Bone <i>D. Kažoka</i>	566
Insight into COPD Morphopathogenesis: Chronic Inflammation, Tissue Remodeling, and Antimicrobial Defense <i>Z. Vitenberga, M. Pilmane, A. Babjoniševa</i>	567
Embryonic Development of Haematopoietic Stem Cells in Human and Other Vertebrates: Lessons Learned from Animal Models and Xenotransplantations <i>A. Ivanovs, S. Rybtsov, A. Medvinsky</i>	568
Characterisation of OPG, TGF-β, Runx2 and Wnt3a in Cleft Lip Palate (CLP) Hard Tissue from First Surgical Intervention <i>D. Buīle, M. Pilmane, I. Akota</i>	569
Characteristics of Neuropeptide-Containing Innervation, Tissue Remodelling, Growth and Vascularity in Nasal Tissue of Cleft Lip Patients <i>E. Balode, M. Pilmane</i>	570
Association of Risk Factors with Posture Type and Symmetry for Children of Preschool Age in Riga Region, Latvia <i>L. Martinsons-Bērzkalne, S. Umbraško, I. Duļevska</i>	571
Evaluation of Waist, Hip and Upper Arm Measurements in Preschool Children with Bronchial Asthma <i>G. Skruze-Janava, D. Kažoka</i>	572

Children and Teenagers' Development in Longitudinal Research <i>S. Umbrasko, V. Čirule, I. Dulevska, L. Martinsone-Berzkalne, E. Čudars, A. Oginska, J. Stankevica</i>	573
Anatomically-Clinical Characteristics of Glandula Suprarenalis <i>Z. Cederstrema</i>	574
Characterisation of Morphology in Healthy, Traumatized and Aged Knee Meniscus of Different Species: Pilot Study <i>M. Podlesnaja, M. Pilmane, M. Ciems</i>	575
Assessment of Obesity Using Anthropometric Indexes <i>J. Stankeviča, L. Pļaviņa, G. Bahs, S. Umbraško</i>	576
Evaluation of Chest-Growth Indexes for Women of Age Greater than 40 <i>J. Stankeviča, L. Pļaviņa, G. Bahs, S. Umbraško</i>	577
Histopathology of Rabbits Jaws with Experimental Osteoporosis and Implantation of Biphasic Calcium Phosphates (BCP) in Trochanter Major <i>V. Ananjevs, A. Grisulonoks, A. Ananjeva, A. Abolins, I. Salma, G. Salms, J. Vetra, V. Kasjanovs, A. Skagers</i>	578
Spatium Retroperitoneale – Anatomical and Clinical Aspects <i>I. Dulevska, S. Umbrasko, L. Martinsone-Berzkalne, J. Stankevica, L. Gavricenkova</i>	579
Th17 Cells and Impairment of Thyroid Follicle Integrity in Pathogenesis of Thyroid Autoimmunity: Morphological Assessment <i>T. Zaķe, S. Skuja, I. Kalere, I. Konrāde, V. Groma</i>	580
Common and Different Homeostasis Regulating Factors, Innervation, Ischemia and Inflammatory Markers in Right Atrial Tissue from Patients with Degenerative Aortic Valve Stenosis and Coronary Heart Disease <i>E. Vārtiņa, M. Pilmane, R. Lācis</i>	581
Keeping Genome in Order: Role of Nuclear Lamina in Somatic Mutations and Progression of B Cell Malignancies <i>A. Braun</i>	582
Variation in Facial Morphology and Biopsychosocial Factors of Facial Attractiveness <i>J. Tutkuvienė</i>	583
Interleukins (IL) and Antimicrobial Proteins in Healthy Nasal Mucosa Biopsies <i>M. Vaivads, G. Sumeraga, M. Pilmane</i>	584
Clinical Aspects of Arteria Vertebralis and Anatomic Variations <i>A. Lacbergs</i>	585
Testicular Injection of Autologous Stem Cells: Case Report <i>J. Erenpreiss, E. Zandberga, J. Sorokina, N. Bozotova, V. Fodina</i>	586
Angiogenesis in Dilated Human Ascending Aorta Wall <i>I. Brecs, E. Beinars, P. Stradins, I. Ozolanta, M. Kalejs, S. Skuja, V. Groma</i>	587
Rare Clinical Cases, Rare Diseases	
Postoperative Torsades de Pointes Induced by General Anesthesia: Case Report <i>I. Evansa, V. Dzabijeva, N. Ivanovs, A. Hadunkina, N. Zlobina, E. Strike, I. Vanags</i>	588
Systemic Air Embolism with Cardiac Arrest after Percutaneous Lung Biopsy <i>A. Bogorodickis, P. Oss</i>	589

Susac Syndrome – Rare Neurologic Disorder, Disease Manifestations and Outcomes <i>V. Romanova, S. Mironovs, J. Mednieks, E. Miglane, A. Millers</i>	590
Macrophage Activation Syndrome in Children With Still's Disease – Clinical Manifestation, Laboratory Findings and Treatment: Single Centre Case Series <i>I. Šlēziņa, Z. Dāvidsone</i>	591
Life-Saving Pulmonary Endarterectomy in a Latvian Patient with Chronic Thromboembolic Pulmonary Hypertension <i>K. Sablinskis, M. Sablinskis, A. Lejnieks, A. Skride</i>	592
Possible Genetic Imitator of Wilson's Disease Phenotype <i>A. Zarina, D. Rots, M. Kreile, I. Tolmane, G. Cernevskā, I. Pukīte, Z. Krumīna, L. Gailīte</i>	593
Metabolic Control and Anthropometric Parameters of Phenylketonuria Patients in Latvia in 2018 <i>O. Lubina, R. Lugovska, N. Pronina, O. Sterna, A. Kvasova, J. Gailīte, P. Vevere, M. Kreile</i>	594
Prenatal Diagnostics of Rare Diseases in Latvia 2013–2017 <i>I. Malniece, M. Kreile</i>	595
Primary Immune Deficiency – Interleukin-12/Interleukin-23 Receptor Deficiency: Clinical Case from Latvia <i>N. Kurjane, E. Aleksejeva, L. Ozola</i>	596
Partial Duplication of the Genitourinary System with Total Colonic Duplication in a Boy after in Vitro Fertilization: Case Report <i>M. M. Butnere, A. Engelis, A. Gilis, D. Pugacevskā, A. Zviedre, M. Kakar, A. Petersons</i>	597
Pregnant Woman with Anti-NMDAR Receptor Encephalitis <i>S. Locane, B. Vikmane, T. Muravska, E. Miglane</i>	598
Multidisciplinary Approach Can Save Life in Deadly Subclavian Artery Injury <i>A. Lacis, M. Kalejs, K. Grigorovica</i>	599
Severe Laryngeal Manifestation of Rheumatoid Arthritis <i>K. Ivanova</i>	600
Gangliosidosis: Autopsy Case Report <i>S. Dubencovs, G. Pogule</i>	601
Simultaneously Diagnosed Primary AL Amyloidosis and Multiple Myeloma: Case Study <i>D. Auziņa, I. Trociukas, J. Nazarovs, O. Mahmajeva, D. Balode, S. Lejniece</i>	602
Low LDL-C – Is It Always a Good Sign? Case of a Rare Cause <i>I. Tonne, I. Balcere, S. Upmale, A. Lejnieks, I. Konrāde</i>	603
Multiple Endocrine Neoplasia Type 2b (MEN2B) Syndrome in Young Men <i>I. Tonne, I. Balcere, S. Upmale, I. Konrāde</i>	604
Adult-Onset Bartter Syndrome: Case Report <i>I. Tonne, S. Upmale, M. Romanovs, I. Konrāde</i>	605
Rheumatoid Arthritis Can Still Surprise <i>K. Ivanova, I. Stukēna</i>	606
Effects of Peritoneal Dialysis in Chronic Heart Failure Patient: Case Report <i>N. Šeršņova, M. Motivāne, B. Vernere, V. Kuzema, I. Puidē, A. Pētersons</i>	607

Case Report of a Partial AZFa Region Deletion <i>B. Alkšere, D. Bērziņa, J. Ērenpreiss, A. Dzalbs, U. Čonka, A. Dudorova, S. Andersone, L. Korņejeva, I. Grīnfelde, V. Fodina</i>	608
Löffler's Endocarditis: Challenging Case Report <i>L. Kundziņa, A. Strēlnieks</i>	609
Limb-Girdle Muscular Dystrophy <i>B. Vikmane, S. Locāne, N. Predkele, J. Mednieks</i>	610
Multimodality Management of Primary Cardiac Sarcoma: 3-Year Survival with Surgery, Chemotherapy and Radiotherapy: Clinical Case <i>R. Ereminienė, D. Karčiauskas, R. Ereminas, A. Siudikas, P. Jakuška, E. Ereminienė</i>	611
Splenic Torsion – Rare Surgical Emergency in Children <i>A. Rozentalberga, Z. Abola, P. Laizans, M. Kraule, A. Engelis, A. Petersons</i>	612
Perianal Crohn's Disease in Children <i>A. Rozentalberga, Z. Abola, A. Engelis, A. Petersons</i>	613
Traumatic Tracheal Injury in Children: Case Series <i>M. Klībus, R. Balmaks, I. Veģeris, I. Kārkliņa-Kravale</i>	614
Cryptococcus Neoformans-Induced Myocarditis in Immunocompetent 13-Year-Old Boy <i>L. Smane, G. Zvīgule-Neidere, I. Lubaua, I. Lace, G. Laizane</i>	615
CNS Manifestation as Haemophagocytic Lymphohistiocytosis <i>I. Buliņa</i>	616
History of Medicine	
“Maternal Impressions” in Latvian Folk Beliefs <i>I. Lībiete</i>	617
Blood Group Research and Its Importance in Latvian Anthropology <i>R. Grāvere</i>	618
Remarks Made by Professor Pauls Stradiņš about His Visits to Foreign Clinics <i>E. Bērziņa</i>	619
Look of Physical-Chemist onto Folk-Medicine Recipes in Oncology <i>T. Borisova, I. Vegnere</i>	620
Medicinal Plants, Collection of Stamps in Pauls Stradiņš Museum for History of Medicine <i>E. Kabucis, E. Bērziņa, I. Vegnere, I. Lementujeva</i>	621
Most Common Diseases and Traumas in Latvian Army in 1920–1940 <i>I. Gīle</i>	622
Modelling in Wax for Human Anatomy: Review of Methods in Past <i>D. Kažoka</i>	623
Saint Hildegard of Bingen and her VIRIDITAS as Basis for the Model for Slow Medicine <i>M. Zelča-Čerāne</i>	624
Latvian Medical Illustrator for a Nobel Prize Winner <i>J. Salaks, A. Pētersons</i>	625
Contribution of Professor Modris Melzobs to Development of Pharmacology in Latvia: Commemorating his 90 th Birthday <i>S. Purviņa, A. Skutelis, A. Ranks, J. Baltkājs</i>	626

Contents

Different Time: Photography of Janis Rieksts within the Collection of Pauls Stradiņš Museum for History of Medicine <i>I. Bondare</i>	627
Distinguished Palaeontologist and Owner of Zarnikau Estate, Christian Heinrich von Pander <i>M. Pozemkovska</i>	628
Leutners and Professor Gaston Backman <i>M. Pozemkovska, A. Zigmunde</i>	629
Prizes Awarded by Latvian Red Cross (1922–1940) in the Collection of Pauls Stradiņš Museum of the History of Medicine <i>I. Bule, L. Kostrica, M. Vesperis</i>	630
From Cestoda to Ursus: Use of Animal Image in Medical Posters <i>I. Vigdorčika</i>	631
Collection of Books Owned by Riga Physician Johann Bavarus (1575–1636) <i>D. Klešnika</i>	632
Training in Preventive Medicine in Latvia for Nearly a Century <i>J. I. Dundurs</i>	633
Sexual Dissent and Categorised Soviet Citizens: Sexually Transmitted Disease Policy in Soviet Latvia from Khrushchev to Gorbachev (1958–1985) <i>I. Lipša</i>	634
Development of Exhibition “Anatomical Hermitage” <i>V. Gavrilina, A. Akopov</i>	635
Upsala Notes by Nicolaus von Himzel <i>A. Ērglis</i>	636
Professor Pauls Stradiņš in Arts <i>I. Lementujeva</i>	637
Medical Education in Liepāja – from Patient Attendants to Medical Nurses <i>L. Gaitniece</i>	638
3rd Baltic Sea Symposium on Simulation and Virtual Reality for Health Care Education and Patient Safety	
Novel Technique for Radiation Dose Visualisation in Large Space <i>M. Piksis</i>	639
Perception of Usefulness of Clinical Skills in Medical Students and Young Doctors <i>M. Jurčenko, O. Sabeļņikovs</i>	640
Patient Death in High-Fidelity Simulation – Outcomes Measuring Medical Student Self-Confidence and Emotions <i>A. Bērziņš, J. Jagodzinska-Peškova, O. Sabeļņikovs</i>	641
Telementoring for Simulation Instructor Training and Faculty Development <i>R. Balmaks, L. Bidiņa, T. Whitfill, M. Auerbach, I. Gross</i>	642
Self-Learning for Medical Professionals – Is It Good or Bad? <i>A. Miskova, D. Rezeberga, M. Šarkele, O. Sabeļņikovs</i>	643
Video Visit in Home Care <i>I. Ozoliņa, I. Zariņa</i>	644
Edutainment, Gamification and Effective Training: SIMCUP Experience <i>P. L. Ingrassi</i>	645
Role of Simulation-Based Medicine in Quality and Safety of Medical Care <i>J. Lorenz</i>	646

Humanities and Medicine

Transforming the Challenge of Working with a Mixed Proficiency Class into an Educational Advantage <i>S. Muhejeva, Ņ. Zazerska</i>	647
Project on Intercultural Communication: Overcoming Barriers and Celebrating Diversity <i>S. Muhejeva, L. Jermakoviča</i>	648
Benefits of Latin in Learning Plant Taxonomy <i>I. Fībiga, L. Bodniece</i>	649
Communicative Approach in Latvian as a Foreign Language: Case of the Textbook “Latvian in Dentistry” <i>I. Znotiņa, I. Laizāne</i>	650
Age and Gender Sensitive Health-Related Habits: Case of Ozolnieki County, Latvia <i>D. Bite</i>	651
Anima and Animus: Towards an Integrated Self <i>V. Silis</i>	652
Challenging Aspects of Protecting Patient’s Will <i>V. Sīle, V. Silis, M. Satika</i>	653
Connection Between the Course “Medical Terminology in the Latvian Language” and Actual Communication with Patient in Clinics <i>S. Čeirane, D. Žibala, D. Tetere</i>	654
Pluralistic Policy of Determination of Death: Report on Public Views <i>I. Neiders, V. Dranseika</i>	655
Awareness of Students’ Learning Style Preferences for the Purpose of Adaption of Appropriate Instructional Methods <i>S. Grinberga</i>	656
International TATA Study Slice in Latvia <i>I. Skuja, A. Puce, M. Taube, I. Stukena, A. Lejnieks, J. Y. Le Reste</i>	657
Public Health and Management of Health Systems	
Body Mass Index and Nutrition Knowledge in Primary Care Practice <i>J. Rudzite-Rjabceva, L. Meija</i>	658
Diabetes Mellitus and Cancer Screening Uptake in Latvia: Self-Reported Data from National Health Interview Surveys 2003, 2008 and 2014 <i>I. Strēle, U. Kojalo, S. Pildava, I. Gobiņa</i>	659
Differences of Electronic Prescriptions in Cross-Border Healthcare in Three Selected Countries of the European Union <i>A. Puķīte</i>	660
Sleep Duration among Adolescents in Latvia by Age and Sex <i>S. Klavina-Makrečka, A. Villerusa, I. Gobina</i>	661
Patient Assessment of Nursing Care in Internal Medicine Wards <i>Z. Baļķena, G. Bēta</i>	662
Occupational Morbidity as Significant Occupational Health Problem in Latvia <i>M. Eglīte, I. Kalve, I. Vanadzins, T. Zvagule</i>	663
Work Motivation of Nurses in Hospitals in Latvia <i>D. Platāce, A. Kreile, I. Millere</i>	664

Evaluation of Functional Physical Health Status ahead of High Endurance Exercises <i>L. Pļaviņa, S. Smagare, A. Cakstins, A. Zahare</i>	665
Quality of Life in Patients with Cataracts <i>O. Fokina, T. Zorina</i>	666
Air Pollution and Respiratory Diseases in Riga, Latvia <i>M. Avota, J. Botella</i>	667
Is Smoking Prevalence Declining over the Decade in Latvia? Age and Cohort Analysis <i>Ģ. Briģis</i>	668
Newly Designed Furniture Prototype Testing and Ergonomic Evaluation by Digital Infrared Thermography <i>J. Reste, G. Zingis, I. Vanadzins</i>	669
Difference in Participation in Bowel Cancer Screening among Women and Men <i>S. Perkone, M. Kirse</i>	670
Impact of Environmental Problems on Health of the Population Living in the Region of Oil and Gas Industry <i>A. Utepkaliyeva, B. Shagatayeva</i>	671
Effect of Body Composition Parameters on Energy Expenditure in Walking and Running Exercises <i>R. Lagzdiņa, M. Rumaka, L. Blumfelds</i>	672
Experience and Needs for Cooperation between Public Health Authorities and Health IT Small-Medium Enterprises in Latvia <i>I. Gobina, E. Millere, D. Heiberģa, M. Apine, A. Balode, D. Glazitis, A. Mieģitis</i>	673
Cytokines Involvement in Workers Chronically Exposed to Asbestiform Fibers <i>V. Rapisarda, C. Loreto, E. Vitale, R. Caltabiano, V. Filetti, V. Baylon, C. Ledda</i>	674
Adolescent Self-Reported Lifetime Gender-Specific Suicidal Ideation in Latvia: Association with Peer-Related Factors <i>T. Pulmanis, L. Sprinģe, M. Taube, I. Millere</i>	675
Inter-Rater, Test-Retest and Internal Consistency Reliability for Latvian Version of WHODAS 2.0 <i>Z. Roģkalne, A. Vētra</i>	676
Level of Pesticide Residues in Lakes of Sapropel Deposit in Eastern Regions of Latvia <i>I. Vanadzinģš, A. Silova, A. Kļaviņa, L. Dobkevica, I. Mārtinģsone, L. Komarovska, L. Ribkinska</i>	677
Problematic Issues in Access to Education of Persons with Intellectual Disabilities <i>E. Kauliņa</i>	678
Time Trends in Cervical Cancer Survival in Latvia <i>U. Kojalo, I. Jermakova, J. Žodģika, S. Pildava, Ģ. Briģis, G. Lazdāne</i>	679
Innovative Soft Drinks with High Antioxidant Capacity for Oral Health <i>A. Skesters, A. Silova, R. Brinkis, A. Rozenblats</i>	680
Motivation of Nurses to Control Infection in Surgery Departments <i>D. Platace, Ž. Šedova, I. Millere</i>	681

Determination of Muscle Fatigue in Handling Operations of Metal Processing Enterprise <i>H. Kalkis, Z. Roja, I. Roja, K. Bokse, S. Babris</i>	682
Towards Conceptual Model of International Competitiveness of Latvian Health Sector <i>D. Behmane, D. Rūtītis</i>	683
Mortality among Drug Users in Latvia <i>D. Vanaga-Arāja, D. Mozgīs, I. Gavare</i>	684
Comparison of 30 Days Mortality Variance among Latvian Hospitals <i>A. Dudete, Ģ. Briģis</i>	685
Use of Short Version of Orebro Musculoskeletal Pain Screening Questionnaire for Patients with Low Back Pain in Primary Care: Pilot Study <i>M. Mežals, A. Mežals, I. Kokare, I. Logina</i>	686
Musculoskeletal Pain and Associated Ergonomic Factors among Latvian Workers <i>D. Kaļučnaja, Ž. Martinsone</i>	687
What Old Age Feels Like in Latvia: Preliminary Results from the First SHARE Data Collection Wave in 2017 <i>S. Tomšone, A. Ivanovs, D. Baltmane, L. Jansone, A. Alberte, G. Lazdane</i>	688
Unmet Health Care Needs of Elderly: Prevalence and Situation Comparison among 27 European Countries <i>M. Oniščuka, G. Lazdāne, A. Ivanovs, D. Baltmane</i>	689
Activity Calculator – Method to Determine Balance between Activity and Energy Level <i>Z. Liepiņa, K. Epalte</i>	690
Relationship between Use of Reflectors and Use of Preventive Health Care in Latvia: Year 2016 <i>A. Bukova-Žideļūna, A. Villeruša, D. Grīnberga, I. Pudule</i>	691
Restrictions of Human Fundamental Rights in Interests of Public Health in Latvia <i>A. Liepiņš</i>	692
Relation between Sense of Coherence and Work Quality Competence among Hospital Nurses <i>K. Circenis, S. Lakisa, A. Pāparde, K. Bite</i>	693
Correlation of Health Loss with Capacity Ability to Fulfill Existing Work Obligations for Adults With Occupational Diseases <i>J. Cīvako, A. Vetra, S. Ausekle</i>	694
From Mathematical Modeling of HIV Epidemic to Innovative Public Health Intervention for Key Populations in Latvia: Preliminary Results of HERMETIC Project <i>A. Ķīvīte-Urtāne, L. Marty, R. Kaupe, I. Liniņa, I. Ūpāce, V. Supervie</i>	695
Balance Parameters of BMX Riders in Correlation with Incidence of Fall Times <i>E. Dubiņina, R. Virse</i>	696
Sickness Absence Demographic Structure in Latvian Working Population <i>S. Lakisa, I. Gobina, I. Vanadzins</i>	697
Contributing Factors of Prolonged Hospitalisation in Malnourished Patients <i>O. Sjomina, L. Tzivian, A. Graubergere, A. Jeniceka, Z. Dzerve, I. Gubarevs, O. Basina, A. Derovs</i>	698

Nutrition Economics as Supportive Tool for Decision-Making in Health Economics <i>D. Arāja</i>	699
Psychological Impact of Changing Habits in Contemporary Society Communication on Socialisation Processes <i>I. Griškēviča</i>	700
30-day Mortality Rates of Acute Myocardial Infarction with ST-Elevation and Non ST-Elevation Patients <i>J. Skrule, S. Pildava, J. Bārzdiņš, A. Luguzis, R. Konstante</i>	701
Effect of Alcohol Trade from Latvia to Buying Habits and Consumption Pattern of Estonians <i>T. Muistna</i>	702
Effects of Swedish Massage Course Intensity on Blood Pressure and Heart Rates of Healthy Individuals <i>U. Veseta, O. Onževs, A. Gulbe</i>	703
Is Doctor Entitled to be Wrong? Conception of Iatrogeny <i>A. Lacis</i>	704
Armeo Spring Usability in Occupational Therapy Praxis: Patient Experience <i>K. Zalcmane, Z. Nesterova</i>	705
Analysis of Use of Projected Disability Status as Tool to Prevent Disability or Reduce Disability Degree <i>L. Rozenbergs, A. Vētra</i>	706
Subjective Self-Assessment of Foot Health Status among Military Population <i>D. Nesterovica</i>	707
Immune Reaction to Viral Hepatitis B Vaccination in Hemodialysis Patients <i>C. Morneau, A. Popova, V. Kuzema, I. Ādamsonē, B. Vernere, A. Pētersons</i>	708
Healthcare Tariffs – Government and Healthcare Service Providers Opinion and Evaluation <i>A. Kaļva, Ģ. Briģis</i>	709
Comparison of Fruit and Vegetable Intake of Vegetarians, Vegans and Omnivores as Potential Health Literacy Indicator <i>M. Grundmane, M. Valtenberga, G. Briģis</i>	710
Radiation-Ecological Assessment of Territories of West Kazakhstan <i>V. Rakisheva</i>	711
Treatment Regimen as Factor Related to Patient Adherence to Asthma Treatment in Latvian Asthma Patients in 2016 and 2017 <i>D. Šmits, I. Urtāne, D. Bandere, I. Rutkovska</i>	712
Food and Catering Organisation Aspects in Hospitals and Nursing Homes in Latvia <i>S. Aleksejeva, L. V. Neimane, S. Salaka, L. Savicka, A. Vētra, G. Bērziņa, A. Vētra</i>	713
Public Health Leaders in Lithuania: Do We Have Them? Do We Need Them? <i>M. Stankunas, K. Tamulionytė, R. Jakaite</i>	714
Problems Relating to Implementation of Quality Health Care Service <i>J. Vasilevska, S. Priedite</i>	715
Volatyle Organic Compounds Analysis Results Evaluation for Five Consecutive Years <i>P. Sudmalis</i>	716

Trace Element Determination in Sapropel <i>L. Komarovska, L. Ribkinska, A. Kļaviņa, A. Silova, I. Vanadžiņš, I. Mārtiņšone</i>	717
Occupational Health Risks Caused during 3D Printing Process <i>Ž. Martinsone, I. Pavlovska, I. Vanadžiņš</i>	718
Food Waste: Causes and Consumer Attitudes <i>L. V. Neimane, D. Jakuboviča, O. Rajevska</i>	719
Importance of Personal Assistance as Prerequisite for Self-Reported Wellbeing of Men and Women with Autism Spectrum Disorders <i>I. Reine</i>	720
Mobile Telephone Radiation and Male Fertility <i>J. I. Dundurs, B. London</i>	721
Discrimination of Elderly Patients in Health Care System of Lithuania <i>K. Sellī</i>	722
Health Budget Savings from Application of PET/ CT for Hodgkin Lymphoma Patients in Latvia <i>A. Kaļva, D. Behmane, Ģ. Briģis</i>	723
Representation of Epilepsy in News Portal Delfi.lv and National News Agency Leta.lv between 2003–2015. Content Analysis <i>A. Zeberga</i>	724
Digital Pathology	
Implementing Digital Slides into Undergraduate Pathology Course at University of Tartu, Estonia <i>A. Minajeva</i>	725
Eosinophilic Gastritis: Rare Benign Differential Diagnosis of Gastric Cancer <i>T. Tone, J. G. Pavlenko, D. Mezale, S. Jekabsons, J. Gardovskis, I. Štrumfa</i>	726
Diagnostic Value of Cytokeratin Expression Profile in Primary Small Cell Lung Carcinomas <i>A. Jukna, I. Štrumfa, A. Vanags, J. Gardovskis</i>	727
DNA Methylation-Based Classification of Childhood Brain Tumours: Local Case Series <i>I. Franckeviča, I. Štrumfa, M. Lubgane</i>	728
Prognostic and Predictive Significance of Immunohistochemically Defined Molecular Subclasses in Glioblastoma <i>A. Jakovlevs, I. Štrumfa, J. Gardovskis</i>	729
Prognostic Role of Ki-67 Labeling Index in Diffuse Gliomas <i>A. Jakovlevs, I. Štrumfa, J. Gardovskis</i>	730
IDH1 and ATRX Status in Childhood Gliomas by Immunohistochemistry <i>M. Lubgane, I. Štrumfa, I. Franckeviča</i>	731
Interaction Between Local and Systemic Inflammatory Response in Colorectal Carcinoma: Two Faces of Janus <i>I. Driķe, S. Cipkina, F. Čukure, I. Štrumfa, J. Gardovskis</i>	732
C-Reactive Protein and Other Sir Parameters in Relation to Lymph Node Yield in Colorectal Carcinoma <i>I. Driķe, F. Čukure, S. Cipkina, I. Štrumfa, J. Gardovskis</i>	733

Role of Epigenetics in Diagnostics of Brain Tumours <i>Z. Jaunmuktane</i>	734
Data-Driven White Matter Axonal Guidance (DWMAG) <i>A. Paeglis</i>	735
Expression of HIV Reverse Transcriptase in Implanted Murine Adenocarcinoma Cells Increases Burden of Liver Metastasis in BALB/C Mice: Pilot Study <i>D. Mezale, E. Bayurova, I. Strumfa, A. Vanags, I. Fridrihsone, S. Petkov, J. Jansons, I. Gordeychuk, M. Issagouliantis</i>	736
Juxtaglomerular Cell Tumour: Report of Unique Case <i>M. Sperga, I. Strumfa, O. Hes</i>	737
Childhood Pineoblastoma – Rare Brain Tumour <i>M. Lubgane, I. Štrumfa, I. Melderis</i>	738
Amyloid Goitre in Patient with Long-Standing Psoriasis <i>I. Fridrihsone, M. Riekstina, A. Abolins, I. Strumfa</i>	739
Primary Renal Lymphoma Mimicking Nephroblastoma: Rare Case of Childhood Tumour <i>I. Franckevica, S. Nikulshin, M. Grutupa, M. Lubgane</i>	740
Digital Pathology in Education: Experience of Rīga Stradiņš University, Latvia <i>I. Strumfa, D. Mezale, G. Bahs, A. Vanags, I. Fridrihsone, A. Jakovlevs</i>	741
Proliferation Activity and Epithelial-Mesenchymal Transition in Hepatocellular Carcinoma: Pilot Study <i>D. Mezale, I. Strumfa, A. Vanags, I. Fridrihsone</i>	742
Immunohistochemical Expression of Cd44 and Ki-67 in Follicular Thyroid Neoplasms <i>I. Fridrihsone, A. Abolins, I. Strumfa</i>	743
Severity of Acute Appendicitis in Elderly Patients: Morphological Evidence <i>S. Lapsa, I. Štrumfa, A. Ozoliņš, J. Gardovskis</i>	744
Chronic Vascular Stenosis: Background of Acute Appendicitis in Elderly Patients <i>S. Lapsa, I. Štrumfa, A. Ozoliņš, J. Gardovskis</i>	745
Digital Pathology: Overview <i>A. Laurinavicius</i>	746
Post Mortem Radiological Investigations <i>S. Remmer</i>	747
Author Index	748

Academia and Pharmaceutical Industry Collaboration: Advancing Drug Discovery

Prof. *Maija Dambrova*

Rīga Stradiņš University, Faculty of Pharmacy, Latvia

The expenses of drug discovery continue growth, and optimization of its expenses heavily depends on the focused and efficient innovation process. Drug discovery proceeds through the different development stages and requires effective collaboration among multiple players from the academia and pharmaceutical industry. The process involves specialized basic research knowledge, as well as highly developed skills in the project management. Low success rate in clinical trials is a key factor pointing at importance of mutual understanding of the state-of-the-art in the drug target discovery and experimental models from academia side, and drug candidate nomination, safety studies and clinical research driven by industry partners. Academia faces barriers in translating discoveries, while industry needs more information about disease mechanisms, valuable drug targets and promising active molecules. Collaboration helps academic investigators to overcome the obstacles in moving research discoveries from bench to bedside, educate researchers about translational research process and prepare for eventual industry careers. In partnership with academia, industry can avoid risky pre-discovery stages and focus on cost-effective and innovative approaches to drug discovery and development. For academia both scientific excellence, high level publications and previous reputation as a reliable external contract research partner is important to start collaboration with the industry. The most frequent barriers include lack in expertise, specialized funding and mutual understanding. The presentation will specifically focus on the experience in drug discovery and various examples of international academia-industry partnering models.

Mosaic of Autoimmunity: Role of Genetics and Environmental Factors, Especially Microbiome

Prof. *Yehuda Shoenfeld*

*Zabludowicz Center for Autoimmune Diseases, Sheba Medical Center
(Affiliated to Tel-Aviv University) Incumbent of the Laura Schwarz-Kipp Chair
for Research of Autoimmune Diseases, Tel-Aviv University*

Autoimmune diseases are conditions in which the immune system damages normal components of the individual. Thus autoantibodies productions were found to be multifactorial in their etiology. For practical reasons these factors are classified into four categories.

Genetic, which entail the MHC class I, II, and III. A case in point will be the haplotypes of HLA-DRB1 which are prevalent in many classical diseases.

Immune deficiencies: C1q C2, C4 and IgA deficiencies are among the most common defects associated with diverse autoimmune conditions.

Hormonal state, most autoimmune diseases are detected in females at the child bearing ages. The role of estrogens will be delineated. In addition other hormones play a role i.e. prolactin.

Emergence environmental causes: Those are the most important as a trigger factors (i.e. adjuvants) determining the time and type of disease. They entail infectious agents, chemicals, drugs and even vaccines.

The type of disease in an individual, in an autoimmune prone family, will be determined by the specific combination of the different factors mentioned above.

A special emphasis will be put on the microbiome interaction with component of parasites.

References

1. Shoenfeld Y. et al. The mosaic of autoimmunity. *IAMJ* 2008; 10; pp. 3-7; 8-12; 13-19.
2. Yaxiong Deng, Xin Huang, HaijingWu, Ming Zhao, Qianjin Lu, Eitan Israeli, Shani Dahan, Miri Blank, Yehuda Shoenfel. Some like it hot: The emerging role of spicy food (capsaicin) in 3 autoimmune diseases. *Autoimmunity Reviews* 2016; 15(5): 451-456.
3. Carlo Perricone, Mathilde Versini, Dana Ben-Ami, Smadar Gertel, AbdullaWatad, Michael J. Segel, Fulvia Ceccarelli, Fabrizio Conti, Luca Cantarini, Dimitrios P. Bogdanosi, Alessandro Antonelli, Howard Amital, Guido Valesini, Yehuda Shoenfeld. Smoke and autoimmunity: The fire behind the disease. *Autoimmunity Reviews* 2016; 15: 354-374.
4. Katchan V., David P., Shoenfeld Y. Cannabinoids and autoimmune diseases: A systematic review. *Autoimmunity Reviews* 2016; 15: 513-528.

Opportunities of Using Artificial Intelligence in Medical Imaging

Simo Saarakkala

University of Oulu, Finland

Artificial intelligence (AI) based methods are becoming more and more popular in the field of medical imaging. In research, the primary target of AI in medical imaging has been to automatically detect and classify abnormalities from the images. Recently, AI has been also applied in generation and enhancement of medical images. In this lecture, some of the most recent applications of AI in medical imaging will be reviewed. Specifically, we will focus on the following cases:

- automatic interpretation of chest X-rays;
- automatic detection of intracranial hemorrhage from computed tomography of the head;
- automatic detection of fractures from X-rays;
- automatic diagnosis of knee osteoarthritis from X-rays;
- prediction of knee osteoarthritis progression from X-rays;
- removal of noise from low-dose computed tomography;
- super-resolution for enhancing image resolution in chest computed tomography;
- generative adversarial networks (GANs) for generation of medical images and semi-supervised learning. Finally, the general discussion about the future role of AI in medical imaging will be discussed.

High Cardiac Risk Polymorbid Patient Undergoing Non-Cardiac Surgery

*Dr. Darja Smirnova*¹; *Dr. Roberts Leibuss*²; *Baiba Vilīte*²; *Ingūna Krustiņa*²; *Dmitrijs Bogdanovs*²; Prof. *Eva Striķe*²

¹ *Rīga Stradiņš University, Latvia;*

² *Pauls Stradiņš Clinical University Hospital, Cardiac Surgery, Anaesthesiology and Intensive Care Unit, Latvia*

Objectives

Aortic stenosis (AS) is the most common valvular lesion (2–9%) in individuals aged over 65 years and it poses a considerable challenge to the anaesthesiologist, due to the significant risk of perioperative mortality (1.9–7.1%). General anaesthesia (GA) is traditionally advocated in this group of patients for its haemodynamically stable properties. However the patient's individual characteristics may require a different anaesthetic management, especially according to GA association with an increased risk of post-operative cognitive dysfunction (POCD) for elderly individuals.

Results

Case report: an 81 year old female presented for an elective a.iliaca sinister reconstruction surgery. Her past history included asymptomatic AS (AVA 0.7 cm²/m²), severe dyslipidemia, diabetes mellitus type two, permanent tachysystolic form of atrial fibrillation and adiposity (BMI 39.1). CSA with isobaric 0.5% bupivacaine was selected for anaesthetic management. Surgery was performed successfully after initial dose of 5 mg bupivacaine and two consecutive 2.5 mg bupivacaine doses every hour. The patient remained clinically and haemodynamically stable (MAP 70 ± 5; HR 60–70) throughout the 115 minutes of surgery and unrequired any dose of vasoactive medication. MOCA (Montreal Cognitive assessment) one day before and seven days after surgery was 27 and 26 points respectively and MMS (Mini mental status exam) 28 and 26 points respectively.

Conclusions

Haemodynamic instability could be fatal for high cardiac risk patients undergoing surgery, so GA or epidural block is traditionally recommended. However CSA could be a valid alternative because of some preference: an adequate anaesthetic level and duration, post-operative pain control, using smaller doses of local anaesthetic, leading to maintenance of haemodynamic stability and probably lower risk of POCD. Summary: Our case report illustrates the use of continuous spinal anaesthesia as a valid alternative to other type of anaesthesia for high cardiac risk patient undergoing non-cardiac surgery.

Association Between Circulating MicroRNAs and Metabolic Biomarkers in Patients with Prediabetes with and without Early Atherosclerosis

*Dr. Evija Knoka; Ph.D. Karlis Trusinskis; Dr. Mairita Mazule;
Dr. med. Ieva Briede; Dr. Sanda Jegere; Dr. med. Indulis Kumsars;
Prof. Zenons Narbutis; Dr. Dace Sondore; Ph.D. Andrejs Erglis*

Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology

Objectives

Circulating microRNAs are extensively studied as biomarkers for a range of diseases including premature coronary artery disease. Impaired glucose regulation and dysregulation of microRNA-126, -145 and -155 are shown to promote atherosclerotic lesion formation. Our primary hypothesis was that the expression of atherosclerosis related microRNAs correlate with unfavorable clinical parameters in patients with impaired glucose regulation. Our secondary hypothesis was that patients with premature atherosclerosis have altered microRNA profile and unfavorable clinical parameter profile.

Methods

A total of forty patients with impaired glucose regulation defined as HbA1c \geq 5.7 and stable coronary artery disease (CAD) admitted for elective percutaneous coronary intervention were enrolled. Fasting blood samples were obtained before cardiac catheterization to evaluate clinical parameters and miR-126, miR-145 and miR-155 expression. The association between microRNA expression and clinical characteristics was evaluated. Premature CAD was defined as coronary atherosclerosis diagnosed before the age of 55 years in men and 65 years in women.

Results

Expression of miR-155 positively correlated with weight ($r = 0.40$; $p = 0.006$), triglycerides ($r = 0.32$; $p = 0.025$), fasting blood glucose ($r = 0.28$; $p = 0.04$), C-peptide ($r = 0.45$; $p = 0.005$), alanine aminotransferase ($r = 0.40$; $p = 0.006$) and negatively with age ($r = -0.35$; $p = 0.014$). No significant correlations between miR-126, miR-145 and clinical characteristics were observed. However, miR-126 had a tendency towards correlation with total blood cholesterol ($r = 0.21$; $p = 0.098$), age ($r = 0.25$; $p = 0.061$) and miR-145 with triglycerides ($r = 0.25$; $p = 0.059$), fasting blood glucose ($r = -0.21$; $p = 0.094$). In multivariate logistic regression analysis a significant correlation remained between miR-155 and C-peptide ($\beta = 0.45$; $p = 0.011$), weight ($\beta = 0.37$; $p = 0.04$) and alanine aminotransferase ($\beta = 0.30$; $p = 0.046$). Expression of microRNAs, lipid and glucose parameters did not have any differences in the group of patients with or without premature CAD.

Conclusions

Expression of microRNA-155 was an independent predictor of higher C-peptide level and increased weight in patients with impaired glucose regulation. MicroRNAs and clinical parameters did not differ in the groups of patients with or without premature coronary atherosclerosis.

Role of Oxidative Stress in Calcific Aortic Valve Stenosis Patients

*Dr. Juris Hofmanis*¹; *Dr. Dace Hofmane*²; *Ph.D. Gita Gersone*³;
*Dr. med. Simons Svirskis*⁴; *Prof. Vitolds Mackevics*¹;
*Prof. Peteris Trejakovs*³; *Prof. Aivars Lejnieks*¹

¹ *Rīga Stradiņš University, Faculty of Medicine, Department of Internal Diseases, Latvia;*

² *Zemgale Health Centre, Latvia;*

³ *Rīga Stradiņš University, Faculty of Medicine, Department of Human Physiology and Biochemistry, Latvia;*

⁴ *Rīga Stradiņš University, A. Kirchenstein Institute of Microbiology and Virology, Latvia*

Objectives

In AoS, unlike atherosclerosis, oxidative stress is associated with the weakening of antioxidant protection mechanisms and the release of uncoupled nitric oxide. Interactions between ROS, endothelium and antioxidants are important in the development of stenosis. The aim of the study is to analyze TrxR1 and MPO plasma levels in the control and stenosis groups. The main role of TrxR1 is to reduce inflammation, proliferation, apoptosis, thus reducing the osteogenic transformation of the valve's interstitial cells. As a pro-oxidant, MPO is associated with both inflammation and oxidative stress.

Methods

52 AoS patients were included in the study (18 mild, 19 moderate, 15 severe stenosis) and 50 healthy subjects selected as control. Stenosis patients were divided into severity subgroups according to EchoKG: severe (Vmax > 4 m/s; PG > 40 mmHg; AVA < 1.0 cm²; indexed AVA < 0.6); moderate (Vmax 3.0-4.0 m/s; PG 20-40 mmHg; AVA 1.0-1.5 cm²; indexed AVA 0.60-0.85); mild (Vmax 2.5-2.9 m/s; PG < 20 mmHg; AVA > 1.5 cm²; indexed AVA > 0.85). TrxR1, MPO, MMP-3, MMP-9 detected by ELISA; HDL-H with standard method.

Results

TrxR1 were significantly higher in patients than control ($p = 0.0016$). TrxR1 had the highest levels in patients with mild ($p = 0.0001$) and severe stenosis ($p = 0.039$). TrxR1 correlated with MMP-3 ($p = 0.013$; $rp = 0.37$). MPO has trended to increase along with stenosis severity vs. control. MPO correlated with HDL-H ($p = 0.047$; $rp = -0.3$), and MMP-9 ($p = 0.007$; $rp = 0.4$).

Conclusions

AoS is associated with increased TrxR1 and MPO. Oxidative stress is associated with stenosis in all severity degrees. The highest TrxR1 level was in mild stenosis (prevail active inflammation), but MPO in patients with severe stenosis (prevail calcification). The negative correlation of MPO with HDL-C shows the effect of oxidative stress on lipid metabolism, leading to HDL-C dysfunction and oxHDL-C formation. It is possible that oxidative stress and inflammation of the AoS patients exist independently of each other.

Effects of SMS Text Messaging on Chemerin and Omentin Levels in Clinically Healthy Overweight and Obese Individuals: Results from RCT

Dr. *Vija Silina*¹; Prof. *Mesfin K. Tessma*²;
Prof. *Peteris Tretjakovs*³; Ph.D. *Silva Senkane*⁴;
Prof. *Guntis Bahs*⁵

¹ Rīga Stradiņš University, Department of Family Medicine, Latvia;

² Karolinska Institutet, Department of Learning, Informatics, Management and Ethics, Sweden;

³ Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia;

⁴ Rīga Stradiņš University, Statistics Unit, Latvia;

⁵ Rīga Stradiņš University, Department of Internal Diseases, Latvia

Objectives

A link of serum chemerin and omentin with anthropometric indices of obesity and its related conditions, e.g., metabolic syndrome, diabetes and cardiovascular diseases, has been described. However, association between changes of chemerin or omentin and changes of anthropometric indices of obesity in clinically healthy overweight individuals is still ambiguous. Objective of this study is to examine association between chemerin and omentin levels with changes of anthropometric indices in clinically healthy overweight and obese individuals within a year.

Methods

We used data from our randomised controlled study with 123 overweight and obese clinically healthy individuals (63 in the intervention group and 60 in the control group) with a BMI above 25 m²/kg in the age group of 30 to 45. Intervention group received SMS messages once in two weeks. Anthropometric parameters (weight, waist circumference (WC), body mass index (BMI)), and cytokines (omentin and chemerin) were assessed at baseline and after one year. Between group differences were examined using the independent t test and multiple linear regression was employed to estimate the relationship between the outcome variables and the relevant predictor variables while controlling for demographic factors.

Results

Between-group results obtained over the course of a year showed statistically significant between-group differences in weight (-3.4 (95% CI -5.5, -1.3), BMI (-1.14 (95% CI -1.9, -0.41), WC (-4.6 (95% CI -6.8, -2.3), hip circumference (-4.0 (95% CI -5.9, -2.0), as well as chemerin (-6.8 (95% CI -11.4, -2.2) favouring the intervention group. Omentin changes were not significant. Multiple linear regression revealed significant relationship in chemerin changes when both SMS (B= -5.175; 95% CI -9.9, -0.4; p = 0.032) and weight (B = 0.457; 95% CI 0.1, 0.8; p = 0.022) are included in the model while controlling for age and gender.

Conclusions

Results imply that both SMS messaging and slight weight loss in clinically healthy overweight and obese subjects facilitates slight decrease in chemerin level, while has no effect on omentin levels.

Next-Generation Sequencing for Latvian Arrhythmogenic Right Ventricular Cardiomyopathy Patients

*Dr. Luīze Bidiņa¹; Dr. Dmitrijs Rots²;
Dr. Laima Caunīte³; Dr. Kaspars Kupics⁴;
Prof. Oskars Kalējs⁵; Dr. med. Linda Gailīte²*

¹*Rīga Stradiņš University, Department of Paediatrics, Latvia;*

²*Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia;*

³*Pauls Stradiņš Clinical University Hospital, Latvia;*

⁴*Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology;*

⁵*Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology;*

Rīga Stradiņš University, Latvia

Objectives

Genetic testing for arrhythmogenic right ventricular cardiomyopathy (ARVC) has significantly increased in the last years, but still genetic cause remains unknown in approximately 50% of the patients. Genotype and phenotype overlap is seen more frequently between different cardiomyopathies and channelopathies. Until now, 19 genes have been associated with ARVC. Next-generation sequencing (NGS) has been used for the first time in Latvia to analyse possible genetic variations for ARVC patients.

Methods

NGS using TruSight One kit (> 4800 disease associated genes included) was done for 24 ARVC patients. Bioinformatic analysis were performed for selected 74 genes in literature reported associated with cardiomyopathies (19 of these genes are associated with ARVC). Interpretation of pathogenicity of genetic variants was done based on ACMG (American College of Medical Genetics) guidelines.

Results

After 19 gene panel analysis, one pathogenic, two likely pathogenic and seven variants of uncertain significans (VUS) were found. Using 74 gene panel, 28 VUS were found for 18 patients in 20 different genes (TNNT2, TBX20, BAG3, MYH7, GLA, LAMA4, ABCC9, NEXN, DSC2, TNNI3K, RBM20, RYR2, FLNC, CTNNA3, ACTN2, MURC, DES, ILK, MYBPC3, DMD), from which, only three of them were previously associated with ARVC. Other genes are associated with dilated cardiomyopathy (DCM), hypertrophic cardiomyopathy (HCM) and Fabry disease. Three likely pathogenic variants have been found – c.819delC in TNNI3K gene, c.13696C>T in TTN gene and c.352delG in LDB3 gene. Two pathogenic variants have been found – c.2489+1G>A in PKP2 gene and c.2167C>T in MYH7 gene.

Conclusions

By performing TruSight One kit analysis, and successively comparing 19 ARVC associated genes with 74 different cardiomyopathy associated genes, it was seen that narrow gene panels are not sufficient for diagnostic purposes of ARVC. Genetic overlap is seen mostly between ARVC, DCM and HCM. wide cardiomyopathy panel should always be performed for any ARVC patient.

Gender Differences in SCORE Screening Parameters in Latvia

*Dr. Līva Mača*¹; *Dr. med. Sandra Gintere*¹; *Taisija Žeņiļenko*²;
*Dr. Līga Esta*²; *Dr. Cindy Heaster*²

¹ Health Centre of Rīga Stradiņš University, Latvia;

² Rīga Stradiņš University, Faculty of Medicine, Latvia

Objectives

According to the World Health Organization, cardiovascular diseases are the leading cause of death globally. Systematic Coronary Risk Evaluation (SCORE) system has been developed in order to assess the risk of cardiovascular death over the next 10 years. At any given age, this risk is lower for women than men, and so the authors wanted to compare the SCORE screening parameters between males and females.

Methods

Patients in target age groups (40, 45, 50, 55, 60, 65) were selected and SCORE protocol issued by the Latvian health ministry was used to determine the cardiovascular death. Collected data has been analyzed using IBM SPSS Statistics 23 (Kolmogorov-Smirnov test (K), Mann-Whitney U (M), Pearson Chi-square (C), Fisher's exact test (F), and $p < 0.05$ was considered as statistically significant).

Results

This is an ongoing study. 22 males and 31 females have been included in this study. There were no differences in age distribution (K, $p = 0.991$) and smoking status (C, $p = 0.086$) between the sexes. Statistically significant difference was found for systolic blood pressure (M, $p = 0.032$) with mean of 128.32 (SD = 18.82) mmHg for women and 141.29 (SD = 22.38) mmHg for men. In this study body mass index (M, $p = 0.313$), waist circumference (M, $p = 0.055$), total cholesterol (M, $p = 0.732$) and fasting glucose levels (M, $p = 0.493$) did not differ between genders. Although statistically significant difference was found in overall SCORE results (M, $p = 0.001$) with a lower risk for women (1.37% (SD = 1.75%)) than men (4.63% (SD = 5.28%)). However, difference in gender distribution was found only in the low risk group (8 women vs. 0 men; F, $p = 0.015$).

Conclusions

SCORE screening includes the assessment of parameters such as age, systolic blood pressure, total cholesterol and fasting glucose levels, as well as body mass index, waist circumference and smoking status. In this study differences between the sexes were found only for systolic blood pressure and total SCORE result with lower values for female subjects in both parameters.

Quality of Life Changes in Patients after Cardiac Pacemaker Implantation

Dr. Natālija Nikrus¹; Dr. Maija Vikmane²; Prof. Oskars Kalējs²

¹Rīga Stradiņš University, Department of Internal Diseases, Latvia;

²Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology

Objectives

The aim of the study was to evaluate patients' quality of life after cardiac pacemaker implantation.

Methods

A total of 142 patients of both genders were evaluated: 82 patients (58.54% women and 41.46% men) after cardiac pacemaker implantation and 60 patients (55.0% women and 45.0% men) before cardiac pacemaker implantation. Average age in patients after the operation 68.60 ± 10.11 years and 70.62 ± 10.69 years before operation. All patients completed the 36-Item Short Form Health Survey (SF-36) for quality of life measurement which provide an eight-scale profile of functional health, well-being scores and composite physical and mental health summary measures. Statistical analysis was conducted using IBM SPSS Statistics 21 t-test with a 5% significance level.

Results

The lowest SF-36 score referred to Role-Physical Functioning (11.67 ± 18.68) and the highest to Bodily Pain (51.57 ± 20.03) in patient group before pacemaker implantation. The lowest SF-36 score referred to Role-functioning Emotional (45.54 ± 35.43) and the highest to Social Functioning (63.78 ± 20.59) in patient group after pacemaker implantation. Both groups have shown low score results (47.05 ± 13.35 before the operation and 46.76 ± 18.24 after the operation) in General Health scale. There was a significant association between Role functioning-Physical ($p < 0.01$), Bodily Pain ($p = 0.05$), Vitality ($p < 0.01$), Social Functioning ($p < 0.01$), Mental Health ($p < 0.01$), Physical Health ($p < 0.01$) and operation.

Conclusions

Patients after pacemaker implantation presented higher quality of life scores in mental and physical health aspects. Both patient groups evaluate their general health as fair.

Quality of Diagnostics and Treatment of Pulmonic Embolism: Two-Year Retrospective Analysis

*Dr. Irina Holste¹; Dr. Jelizaveta Pavlova²; Dr. Olga Sjomina³;
Dr. Patricija Ivanova⁴; Dr. med. Julija G. Voichevovska³*

¹ Rīga Stradiņš University, Faculty of Medicine, Latvia;

² Pauls Stradiņš Clinical University Hospital, Latvia;

³ Rīga Stradiņš University, Department of Internal Diseases, Latvia;

⁴ Rīga East University Hospital, Latvia

Objectives

Thrombolytic reperfusion therapy is indicated for patients with proved high-risk acute pulmonic embolism (PE) with unstable hemodynamic 15 minutes or longer. Studies show that thrombolytic therapy results in lower PE mortality. However, there is almost no data about the length of prehospital instability and vital functions. The aim of this research was to analyse the quality of diagnostics of high-risk PE, and to evaluate the adequacy of treatment choice basing on the PE severity.

Methods

The retrospective study was performed in Riga East University Hospital. The materials of 2013 and 2016 years were analysed. We included all the patients with diagnosed PE by computed tomography angiography or by autopsy. Prehospital / intrahospital vital parameters, primary laboratory and imaging data, as well as general health status (age, comorbidities, used medications) were evaluated. We used PESI (Pulmonary Embolism Severity Index) for PE severity evaluation. IBM SPSS 25.0 was used for data processing. Ethical approval by Riga East University Hospital Ethical Committee.

Results

Overall, 256 PE patients were included – 102 in 2013 and 154 in 2016. Thrombolysis was performed in 4 cases of severe PE. In 2013, strong indications for thrombolysis were in 17 cases (performed in 3/17.7%), in 2016 – 40 cases (performed in 1/2.5%). In all cases of high-risk PE with thrombolysis mortality rate was 0%. However, it was 7.1% and 28.2% among high-risk patients with only anticoagulation therapy in 2013 and 2016 respectively ($p < 0.005$). Strong association between mortality and hemodynamic instability also was proved ($p < 0.001$), also the outcome was associated with presence of PE signs on primary ECG ($p < 0.05$).

Conclusions

The severity of PE is not evaluated adequately, and the appropriate attention to prehospital / intrahospital instability is not paid. Timely evaluation of disease severity and choice of acceptable therapy methods may significantly decrease the mortality and improve the outcome.

Intrahospital and Long-Term Outcomes after True Bifurcation Stenting

*Arnis Laduss*¹; *Dr. med. Indulis Kumsārs*²; *Dr. Evija Čamane*²;
*Dr. med. Konstantīns Pičkurs*¹; *Prof. Andrejs Ērglis*²;
*Dr. med. Kārlis Trušinskis*²; *Prof. Gustavs Latkovskis*²;
*Dr. med. Ieva Briede*²; *Dr. med. Ainārs Rudzītis*²;
*Dr. med. Sanda Jēgere*²; *Dr. med. Inga Narbutė*²

¹ Rīga Stradiņš University, Faculty of Medicine, Latvia;

² Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology

Objectives

The aim of this study was to evaluate procedural, intrahospital and long-term outcomes of patients who underwent percutaneous coronary intervention (PCI) for bifurcation lesions involving main vessel and side branch with diameter more or equal 2.5 mm.

Methods

A retrospective analysis of the ongoing Coronary Bifurcation Treatment registry in Latvian Centre of Cardiology (PCI performed from 01.01.2017. to 31.12.2017.) and 1-year follow-up. Study population was divided into two groups: provisional single-stenting and systematic double-stenting. Procedural, intrahospital and long-term complication rates were compared between groups.

Results

Totally were screened 4138 PCI procedures performed in Latvian Centre of Cardiology in year 2017. Patients with ST elevation myocardial infarction in last 24 hours were excluded. A total of 177 patients with true bifurcations were included in this study. 154 patients were treated using provisional single-stenting technique (1 stent) and 23 with systematic double-stenting technique (2 stent). Procedural complications were side branch occlusion (1 stent 2.6% (n = 4) vs. 2 stent 0% (n = 0), p = 0.434). Intrahospital complication was periprocedural myocardial infarction (1 stent 5.8% (n = 9) vs. 2 stent 4.3% (n = 1), p = 0.767). All cases were non-Q MI. 1-year follow-up till now was possible in 75 patients (1 stent - 67 patients, 2 stent - 8 patients). Long term complications were death (1 stent 1.5% (n = 1) vs. 2 stent 12.5% (n = 1), p = 0.07), target lesion restenosis (1 stent 1.5% (n = 1) vs. 2 stent 0% (n = 0), p = 0.728) and target vessel restenosis (1 stent 3% (n = 2) vs. 2 stent 0% (n = 0), p = 0.620). No cases of definite stent thrombosis were observed in both groups.

Conclusions

Procedural, intrahospital and long-term complication rate in the treatment of true coronary bifurcation lesions was low and there were no significant differences between groups. There were no proven cases of definite stent thrombosis.

Tissue Biomechanical Changes in Case of Dilated Human Ascending Aorta

*Dr. Ivars Brečs*¹; Prof. *Peteris Stradins*¹;
*Dr. med. Martins Kalejs*¹; *Dr. med. Uldis Strazdins*¹;
Prof. *Iveta Ozolanta*²; Prof. *Vladimirs Kasjanovs*²

¹ *Pauls Stradiņš Clinical University Hospital, Department of Cardiac Surgery, Latvia;*

² *Rīga Stradiņš University, Scientific Laboratory of Biomechanics, Latvia*

Objectives

Aneurysms of ascending aorta are dilatation of the first part of the human aorta. Commonly showing no clinical symptoms. This condition increases the risk of aorta dissection, which is a life-threatening condition. In this study we try to elucidate the changes in the biomechanical properties, which occur in the dilated human ascending aorta.

Methods

Fourteen specimens of ascending aorta wall were mechanically tested under a uniaxial tensile test. Two specimens from each ascending aorta anterior region were cut in the longitudinal and circumferential directions. The samples were stretched until rupture of the sample occurred. The obtained experimental data were processed to determine maximal stress, maximal strain and the tangential modulus of elasticity in the linear part of the stress-strain curve.

Results

We observed that there are statistically significant differences between the maximal stress for the samples of the aortic wall in the longitudinal and in the circumferential directions ($p = 0.006$). There were no statistically significant differences between the maximal strain of the samples in the longitudinal and in the circumferential directions ($p = 0.90$). We found that Tangential modulus of elasticity of the aortic samples in the longitudinal direction $Md = 1.76$ MPa (1.16–2.42) was significantly lower ($p = 0.002$) than the elastic modulus of the samples in the circumferential direction $Md = 2.33$ MPa (1.95–3.76).

Conclusions

The obtained results showed a remarkable anisotropy of the ascending aorta tissue. We found higher strength of the tissue in the circumferential direction than in the longitudinal direction. There were no statistically significant differences between the strains of the samples. Tangential modulus of elasticity showed that tissue in the circumferential direction is stronger and stiffer than in the longitudinal direction.

Involvement of Public Organisations and Healthcare Professionals in Identifying and Assessing Cardiovascular Risks for Residents in Liepaja, Latvia

Līga Ēriksone; Dr. Gunta Bēta

Rīga Stradiņš University, Liepāja branch, Latvia

Objectives

The aim of the study was to identify and evaluate cardiovascular risks for residents in the city of Liepaja in cooperation with public organizations and healthcare professionals.

Methods

Research design – quantitative, descriptive cross-sectional study.

The study analyzes data from Health Promotion Events in the city of Liepaja from April to November in 2018. The study included 230 residents of Liepaja data (n = 230) – total cholesterol and glucose levels, arterial blood pressure, pulse rate determined. Cardiovascular risk factors have been viewed in the context of age and gender, including cross-correlations.

Data collected and statistically processed using the IBM SPSS Statistics computer program.

Results

The results of 230 Liepaja residents were measured, including 185 women (80.4%) and 45 men (19.6%) with an average age of 55.8 ± 19.5 years.

The mean arterial blood pressure values for residents in Liepaja population correspond to the normative values of $136 (\pm 20)/82 (\pm 12)$ mmHg; average pulse rate per minute – $79 (\pm 14)$ x/min; total cholesterol in capillary blood – $5.3 (\pm 1.3)$ mmol/L; glucose level – $6.1 (\pm 1.3)$ mmol/L.

Conclusions

CVD prophylaxis is taken into consideration at a nationwide level, inviting citizens to be more active and engage in health preservation. Early awareness of cardiovascular disease requires campaigns to be carried out with the support of the state and local authorities as well as the involvement of active public organizations. Such mutual cooperation contributes to the creation of a larger population and allows everyone to assess the risks themselves.

1. Health promotion and prevention campaigns are more likely to be visited by women in their mature years, but are significantly less represented by both sexes in age group till 35–40 years.
2. Men have an average of 5 mmHg higher blood pressure measurements than women.
3. A statistically significant correlation occurs between systolic blood pressure and blood cholesterol.

Effectiveness of Amiodarone, Propafenone and Synchronised Electrical Cardioversion for Conversion of Atrial Fibrillation Paroxysm to Sinus Rhythm in Emergency Department of Pauls Stradiņš Clinical University Hospital

*Dr. Mihails Tracevskis*¹; *Dr. med. Anīta Kalēja*²; *Dr. med. Irina Pupkeviča*³;
*Dr. Natālija Nikrus*³; *Dr. med. Kristīne Jubele*³; *Prof. Oskars Kalējs*³

¹ *Pauls Stradiņš Clinical University Hospital, Emergency Department, Latvia;*

² *Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia;*

³ *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

Objectives

The aim of the study was to evaluate and compare the effectiveness of amiodarone, propafenone and synchronized electrical cardioversion in converting atrial fibrillation (AF) paroxysm to sinus rhythm (SR) in emergency department.

Methods

The retrospective analysis was performed on 97 patients (58 male and 39 female, median age 62.4 ± 12 , range 37–82) duration of AF 48 hours or less (averaged 22.1 ± 10.2 h). The patients were divided into three groups – I group of patients were treated by amiodarone i/v (59 patients – 60.8%), II group of patients were treated by propafenone i/v (23 patients – 23.7%) and for III group electrical cardioversion was applied (15 patients – 15.5%). Since the beginning of therapy was repeated ECG registration with measurement of the duration of the complexes and intervals. BP and pulse measurement was performed hourly till conversion of AF to SR or within 24 hours.

Results

Efficiency of amiodarone i/v converting AF to SR detected in 48 of 59 patients (81.4%). The average time from taking amiodarone till recovery of SR was 6.6 ± 1.4 hours, the average dose of amiodarone i/v 800 ± 200 mg. Efficiency of propafenone i/v converting AF to SR detected in 18 of 23 patients (78.3%). The average time from taking propafenone till recovery of SR was 3.1 ± 1.2 hours, the average dose of propafenone i/v 90 ± 22 mg. Efficacy of electrical cardioversion was pronounced in 14 of 15 patients (93.3%).

Conclusions

Efficacy of amiodarone and propafenone in converting AF paroxysm to SR was almost the same. The effect of amiodarone was slightly superior that of propafenone. In case if AF duration is less than 8 h propafenone is more effective and for AF with a duration over 24 h more effective is amiodarone. Electrical cardioversion in AF paroxysm is an effective with a high success rate. AF duration should be taken into account more often to choose an appropriate treatment.

Athletes' Heart Hypertrophy Changes Due to the Impact of Aerobic Training

Prof. *Viesturs Lāriņš*¹; *Jānis Lācis*²; *Pārsla Krūmiņa*³

¹ *Latvian Academy of Sport Education, Department of Sports Medicine, Latvia;*

² *Health Center "Veselības centrs 4", Latvia;*

³ *Latvian Academy of Sport Education, Department of Sports Medicine, Latvia*

Objectives

The aim of the study was to determine athletes heart hypertrophy changes due to the impact of the aerobic training.

Methods

Echocardiography method was used to assess the state of the heart, parameters and compliance with normal values (Lawless et al., 2014; Spencer et al., 2013). Three athletes from 18–26 years old with left ventricular posterior wall and interventricular septum hypertrophy participated in the study.

Results

The cardiac morphological and functional data acquired by echocardiography showed that all participants of the study had left ventricular posterior wall hypertrophy on average 11.67 ± 2.08 mm and interventricular septum hypertrophy 12.33 ± 1.53 mm. The athlete's left ventricular end diastolic diameter values were within the reference range 42 mm to 62 mm. Left ventricular mass index for two athletes was increased to 122.0 and 128.4 g/m², but for the third athlete's it was within normal reference range – 88.0 g/m². The results obtained confirmed that the heart adaptation process to the anaerobic and the strength training causes heart enlargement and mainly causing eccentrically ventricular hypertrophy (D'Andrea et al., 2002).

After 2 months of the aerobic exercise together with three sessions of swimming or cycling per week that lasted for 1 hour with average heart rate frequency of 130–140 beats per minute, left ventricular posterior wall hypertrophy values decreased on average to 9.67 ± 1.15 mm and interventricular septum hypertrophy values decreased on average to normal range (9.67 ± 1.53 mm).

Conclusions

Use of the aerobic training loads and the exclusion of an anaerobic and a strength training decreases the left ventricular posterior wall and the interventricular septum hypertrophy. The aerobic training was more effective (–27.0%) for the decreased left ventricular hypertrophy than the complete cessation of the exercise (–9.1%). Therefore the conclusion is that the aerobic physical activity causes a heart wall and an interventricular septum hypertrophy reduction, which was caused by the use of the intensive anaerobic exercises.

Venous Thromboembolism Recurrence in Latvian Population

*Dr. Valdis Ģībietis*¹; *Dr. Dana Kigitoviča*¹;
*Sintija Strautmane*²; *Verners Roberts Kalējs*²;
*Kitija Meilande*²; *Dr. med. Andris Skride*³

¹ Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

² Rīga Stradiņš University, Faculty of Medicine, Latvia;

³ Rīga Stradiņš University, Department of Internal Diseases, Latvia

Objectives

The aim was to assess risk factors for recurrent venous thromboembolism (VTE) in Latvian population.

Methods

The prospective cohort study included consecutive patients in a single centre from June 2014 till April 2018 presenting with VTE confirmed by imaging tests. All patients were followed up for at least one year or till death. Patients who died during the first 30 days after the index event were excluded (none of them had documented VTE recurrence). Statistical analyses were conducted using IBM SPSS 23.0.

Results

The study included 204 patients, mean age was 67 (\pm 16) years, 62.7% (n = 128) were female, 198 patients had confirmed pulmonary embolism (PE), 6 had isolated deep vein thrombosis (DVT). Median follow-up period was 434 days (range 31–1554). VTE recurrence rate was 6.4% (n = 13); median time to recurrence was 43 days (range 16–1554), 10 patients had PE, 3 had isolated DVT; 3 of 13 recurrences were fatal, 3 patients had discontinued anticoagulation. Recurrence rate in active cancer patients was 21.1% (n = 4) vs. 4.9% (n = 9) in patients without cancer (hazard ratio [HR] 6.79, 95% confidence interval 1.98–23.24, p = 0.002). Recurrence rate in the presence of transient risk factors before the primary VTE event was 2.9% (n = 2) vs. 8.2% (n = 11) (HR 0.401 [0.09–1.83], p = 0.239); death during follow-up occurred in 61.5% (n = 8) after recurrences vs. 20.9% (n = 40) in the remaining patients (HR 3.37 [1.56–7.28], p = 0.002). No association with recurrence rate was observed for body-mass index, age, gender, diabetes, chronic heart failure, hypertension, atrial fibrillation, chronic lung disease (p > 0.05).

Conclusions

Patients with recurrent venous thromboembolism had significantly increased mortality rate. Venous thromboembolism recurrence risk was almost 7-fold higher in cancer patients. The absence of transient venous thromboembolism risk factors before the primary event demonstrated a numerically higher recurrence rate without statistical significance. Duration of anticoagulant treatment did not appear to affect the risk of recurrence.

Extracorporeal Membrane Oxygenation Outcome Review in Latvia

*Dr. med. Arvids Berzins*¹; *Dr. Roberts Leibuss*²;
*Dr. med. Biruta Mozule*³; *Dr. med. Vladimirs Harlamovs*³;
*Ph.D. Eva Strike*²; *Prof. Peteris Stradins*²

¹ *Pauls Stradiņš Clinical University Hospital, Latvia;*
Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia;

² *Pauls Stradiņš Clinical University Hospital, Latvia;*
Rīga Stradiņš University, Latvia;

³ *Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Extracorporeal life support systems use is expanding, despite limited outcome data defining appropriate use, so worldwide and up to date outcome review's are needed. ECMO is a form of cardiopulmonary life-support, where blood is drained from the vascular system, circulated outside the body by a mechanical pump, and then reinfused into the circulation. Goal of this study is to review the outcomes of patients who underwent ECMO therapy for heart / lung and lung supporttherapy.

Methods

Retrospective, unicenter, study includes patients who underwent ECMO support for refractory cardiogenic shock after cardiac surgery or / and severe acute respiratory distress syndrome (ARDS) in Pauls Stradiņš Clinical University Hospital, Riga, Latvia, from 2008 until 2018. ECMO implantation indications for refractory cardiogenic shock was defined using echocardiography, hemodynamic and metabolic criteria, but ARDS due to Murray score. Analyzed outcomes were – 10 day hospital post operative mortality rate, length of ICU stay and quality of life (QOL) after hospital discharge at fixed intervals. We compared baseline demographics and outcomes over two time periods – 2008 to 2013 and 2014 to 2018.

Results

ECMO utilization increased from 6 in 2008 until 28 cases in 2018 (from 0.54% to 2.59%) in overall using ECMO in 97 cases over 11 years of practise. In 2018 post elective and emergency cardiac mortality incidence 3.88% (n – 42/1081), 21/42 were threated with ECMO (50%). 83 veno-arterial and 14 veno-venous ECMO supports therapies were conducted. Overall mortality rate reached 75% (average patients age of 59 ± 16). Overall length of ICU stay from 1 to 51 days (median – 8) and overall hospital stay from 1 to 53 days (median – 14). In the first period (2008 to 2013) intra hospital mortality reached 96% (average age 60 y.), 1 of 29 patients survived and was discharged from hospital. In the second period (2013 to 2018) mortality reached 52% (average age of 59 y.). Study show numerous of perioperative factors affecting outcome of patients undergoing ECMO support.

Conclusions

Between 2008 and 2018 the use of ECMO for circulatory and respiratory support has increased significantly with a concomitant modest improvement in patient survival. As this technology and use of it is growing, clinical triggers for ECMO implantation and ECMO explantation has improved since first ECMO case.

Association between 4q25 Variant rs6838973 and Atrial Fibrillation in Latvian Population

*Dr. Irina Rudaka¹; Dr. Dmitrijs Rots¹; Dr. Arturs Uzars¹;
Prof. Oskars Kalējs²; Dr. med. Linda Gailīte¹*

¹*Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia;*

²*Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology*

Objectives

Genetic background has an influence in development of atrial fibrillation (AF). One of the most significant AF-related genetic variations (rs2200733) is located at 4q25 region. Recently new susceptibility signals on 4q25 have been described (rs1448818, rs6817105, rs4400058, rs6838973). Present study was conducted in order to determine association of 4q25 rs6838973 and atrial fibrillation in Latvian population.

Methods

We enrolled 136 patients with non-valvular AF and 90 AF-free controls. Clinical data was obtained from interview and medical records. DNA was extracted from peripheral blood samples by commercially available kit innuPREP Blood DNA Mini Kit (Analytik Jena AG, Germany). Genotyping was performed by high-resolution melting technology. Statistical analysis was done in IBM SPSS Statistics 20 software.

Results

AF patients had a higher prevalence of AF-related risk factors such as older age (62.7 ± 9.8 vs. 56.6 ± 7.2 , $p < 0.001$), obesity (BMI, kg/m^2 31.3 ± 5.8 vs. 29.4 ± 5.5 , $p = 0.027$), coronary heart disease (22 (16.2%) vs. 6 (6.6%), $p = 0.032$) and chronic kidney disease (7 (5.1%) vs. 0, $p = 0.026$). Genotype of rs6838973 was significantly associated with risk of AF only in additive model of inheritance (CC vs. CT vs. TT: OR = 0.661, 95% CI 0.450–0.972, $p = 0.035$) and minor allele T showed protective effect. After adjustment for presence of AF-related risk factors association remained significant (OR = 0.534, 95% CI 0.325–0.877, $p = 0.013$). Within the case group 15 (11%) subjects had lone AF (LAF). No association was observed between rs6838973 genotype and risk of LAF.

Conclusions

Minor allele T of 4q25 rs6838973 is protective for development of atrial fibrillation.

Targeted Next-Generation Sequencing as Diagnostic Tool for Lone Atrial Fibrillation

*Dr. Irina Rudaka*¹; *Dr. Dmitrijs Rots*¹; *Dr. Arturs Uzars*¹;
*Prof. Oskars Kalējs*²; *Dr. med. Linda Gailīte*¹

¹ *Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia;*

² *Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology*

Objectives

Atrial fibrillation is the most common arrhythmia. In 10–20% of patients no apparent risk factors are identified even after extensive clinical investigation and this entity is described as “lone atrial fibrillation” (LAF).

Methods

We have performed Mendeliome (TruSight One kit) by NextSeq500 for five patients with lone atrial fibrillation. Read alignment, duplicate removal and variant calling was performed using Sentieon software. Variant annotation was performed by wAnnoVar and VEP softwares. Human genome reference GRCh38 and RefSeq transcripts were used for read alignment and variant annotation respectively.

Results

Mean coverage was 70× and 90% of target region was sequenced at coverage at least 20×. We have found possible etiology of LAF for two patients. A 55 years old male patient is heterozygous for likely pathogenic missense LMNA variation NM_170707.3:c.640T>A which was reported in multiple laminopathy cases. Although no structural abnormalities were found on echocardiography, typical ECG features of laminopathy were observed during sinus rhythm. Furthermore, atrial fibrillation is also diagnosed in the mother of the proband, but no detailed clinical information is available or DNA for segregation analysis. A second patient, 30 years old male, is a heterozygous carrier of likely pathogenic truncating nonsense TTN variant - NM_001256850.1:c.12745C>T which is transcribed in major TTN cardiac isoforms (N2BA and N2B), therefore is classified as type II variant (Deo, 2016). Four patients carried rare variants (two frameshift and two missense) in OBSCN gene, which encodes sarcomeric proteins. Unfortunately, no relatives were available for segregation analysis for either of families.

Conclusions

Pathogenic variants, causing monogenic cardiomyopathies, could be the common causes of the lone atrial fibrillation. OBSCN gene probably is a modifier in cardiac diseases, but further confirmation is necessary.

Does Endovascular Embolisation Packing Density of Ruptured Cerebral Aneurysms Improve Angiographic Long Term Occlusion Rates? Single Centre Experience

Ance Ozola¹; Dr. med. Sanita Ponomarjova²

¹ Rīga East University Hospital, radiology resident, Latvia;

² Rīga East University Hospital, Department of Interventional Radiology, Latvia

Objectives

The aim was to assess aneurysm occlusion level after endovascular embolization depending on coil density and aneurysm volume. Evaluate whether the coil packing density has affect on aneurysm occlusion level.

Methods

This was a retrospective study of cerebral aneurysm endovascular embolization, performed in Rīga East University Hospital, department of interventional radiology. Data from the procedure day and follow-up data three to six months after embolizations was gathered for patients with the following diagnoses – cerebral ruptured aneurysm with subarachnoid hemorrhage or sequelae of subarachnoid haemorrhage. Total coil volume for each aneurysm was calculated considering the amount of coil used and it's properties. Aneurysm volume was calculated using computed tomography angiography or rotational 3D angiography data. Knowing aneurysm volume and coil volume, coil packing density was determined. Packing density was divided into three groups – high (> 22%), moderate (12–22%) and low (< 12%) density. All the volumetric measurements and calculations for each patient were compared with the degree of aneurysm occlusion. Microsoft Excel was used to gather the data, and the statistical analysis was performed using IBM SPSS 22.

Results

Number of patients in the study was 99 (with a total of 99 aneurysms) – 59 women (59.6%) and 40 men (40.4%) with the mean age of 55.9 (\pm 14.1) years. The most common localization of embolized ruptured aneurysm in 33 (33%) cases was anterior communicating artery. The degree of occlusion immediately after treatment was evaluated according to the Montreal scale. Montreal A was in 77 (77.8%) cases, Montreal B in 18 (18.2%) cases, and Montreal C in 4 (4%) cases with the mean packing density of 33%. The result of the treatment was reevaluated three to six months after procedure. 23 patients missed the control angiography and 18 had died. Follow-up group consisted of 58 patients with following results – the degree of occlusion did not change in 42 (72.4%) cases, worsened in 9 (15.5%) cases, and improved in 7 (12.1%) cases. To assess correlation between coil packing density and degree of occlusion, Kruskal–Wallis test was used. It was concluded, that no statistically reliable correlation could be found. The relevant p values were $p = 0.523$ immediately after coiling and $p = 0.208$ in the follow-up.

Conclusions

Most common localization of ruptured aneurysms was anterior communicating artery. Stable occlusion of aneurysms with unchanged or improved degree of occlusion after three to six months after procedure was observed in 84.5% of cases. There was no statistically significant correlation found between coil packing density and degree of occlusion.

Neurological Outcomes and Neuromonitoring in Cardiac Surgery

Dr. Roberts Leibuss^{1,2}; *Dr. Anna Klesmite*²;
*Dr. Arnija Reihmane*³; *Elvijs Oss*¹;
Ph.D. Eva Strike^{1,2}; *Ph.D. Peteris Stradins*^{1,2}

¹ *Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology, Latvia;*

² *Rīga Stradiņš University, Latvia;*

³ *University of Latvia*

Objectives

Regardless of the degree of advances in neuroprotective strategies and technological progress in neuromonitoring, neurological complications still remains in cardiac surgery. In this study the authors sought to evaluate the relationship between several modes of central nervous system monitoring and perioperative outcomes.

Methods

Adult patients undergoing elective cardiac surgery with use of normothermic cardiopulmonary bypass (CPB) were included in prospective, randomized controlled clinical trial from October of 2018. Tertiary referral center, university hospital. Patients with a history of central nervous system illness were excluded. During the surgery transcranial doppler ultrasound (TCD) used to evaluate blood flow to both cerebral hemispheres, cerebral autoregulation, detect cerebral emboli. Noninvasive bispheric near-infrared spectroscopy (NIRS) and invasive jugular bulb venous blood gases analysis (SvjO₂) measured oxygen saturation. Measurements intervals after anesthesia induction (T₀), 15 minutes after aortic cross-clamping (T₁) and 15 minutes after CPB (T₂). Assessment of neurocognitive dysfunction was performed by trained research staff using Montreal Cognitive Assessment (MOCA) and Mini-mental State Examination (MMSE) tests before and after surgery at fixed intervals. Neurological complications approved by computed tomography angiography (CTA) and perfusion scan (CTP). In addition, follow-up period underwent a health-related quality of life (HRQoL) evaluation.

Results

55 patients included in data analysis. The study comprised 22 (40%) women and 33 (60%) men, ages ranged from 42 to 78 years (mean age – 63.6; SD – 11.7). 2/55 (3.6%) patients had suffered from transient ischaemic attack (TIA), manifesting as right side hemiparesis and sensorimotor aphasia. 5/55 (9%) patients had sustained neurocognitive impairment. 54/55 (98%) patients survived to be discharged. 1/55 (1.8%) died within 15 days of surgery of evidently non-cerebral cause. Follow-up according to the protocol could be carried out in 47/55 (85%) for a period of up to 1 months, none of whom showed abnormal signs at the last examination. NIRS (median – 62.1%; SD – 13.6%), SvjO₂ (median – 66.2 mmHg; SD – 12.1 mmHg), MCAV (median – 43.2 cm/s; SD – 15.6) values for the whole cohort associated with systemic hematocrit levels (median – 21.3%; SD – 5.1%) during CPB. Multimodal neuromonitoring combines several qualities, TCD have high interindividual variability, but NIRS low spatial resolution.

Conclusions

TCD, NIRS and SvjO₂ play an essential role in the multimodal neurological monitoring, According to this study, necessary to improve monitored combined together data interpretation.

One-Year Analysis of Femoropopliteal Revascularisation vs. Endovascular Intervention in Patients with Infrainguinal Arterial Occlusive Diseases

*Ph.D. Arturs Ligers¹; Dr. Veneta Liepa¹;
Janis Rozentals¹; Dr. Kaspars Staudzs¹; Dr. Ints Udris¹;
Ph.D. Patricija Ivanova^{1,2}; Dr. Aina Kratovska²;
Dr. Sanita Ponomarjova²; Ph.D. Vitalijs Zvirgzdins¹*

¹ Riga East University Hospital, Clinical Centre "Gaīlezers",
Department of Vascular Surgery, Latvia;

² Riga East University Hospital, Clinical Centre "Gaīlezers",
Department of Invasive Radiology, Latvia

Objectives

An endovascular-first approach has been widely adapted as an alternative to surgical bypass in patients who need lower extremity revascularization for femoropopliteal disease. This study evaluated patient selection, concomitant factors and outcome for these two revascularisation groups in one year period in our hospital.

Methods

We reviewed consecutive patients treated for claudication and critical limb ischemia with endovascular vs. femoropopliteal revascularization during year 2017 in our departments. Only patients for superficial femoral artery revascularisation were selected. The primary outcome was amputation free survival, freedom from arterial re-intervention. We analysed co-morbidity, severity of disease, repeated and crossover interventions, length of hospital stay and quality of revascularisation.

Results

A total of 78 patients were identified, mean age 68 ± 10.3 years, male 53 (67.1%), female 25 (32.9%). From them 46 patients were operated and 32 stented. 8 patients had previous vascular interventions. 4 patients have subsequent distal stenting after bypass. Ulcers were found in 53 (67%) patients, diabetes mellitus (DM) in 55 (69%) patients. After the intervention peripheral plus was detected in 50 (65%), popliteal puls in 28 (35%) patients. Hospital stay significantly differed between stenting and bypass – stenting mean 2.5 days, prosthesis bypass mean 8.7 days, vena bypass mean 8.9 days. Patients with DM underwent stenting more often ($p = 0.05$). For patients with ulcers we found a trend for more bypass operations. There were no cases of re-interventions or amputations in all analysed groups.

Conclusions

Endovascular and bypass approach is safe to treat claudication and critical limb ischemia. Patients with endovascular approach have shorter recovery but the method is not always applicable. Patients with DM might have more superficial arterial damage. Further study is required to determine long term outcome.

Preliminary Results of Clinical Outcomes of Atrial Fibrillations Surgical Treatment at Time of Concomitant Cardiac Surgery in Pauls Stradiņš Clinical University Hospital

Agnese Ņikitina¹; Diāna Kalniņa²; Dr. Kaspars Kupics²

¹ Rīga Stradiņš University, Faculty of Medicine, 6th year student, Latvia;

² Pauls Stradiņš Clinical University Hospital, Latvia

Keywords: arrhythmia, atrial fibrillation, cryoablation, radiofrequency catheter ablation.

Objectives

To find out the effectiveness of surgical treatment of atrial fibrillation – a review of clinical cases, and the safety of this method.

Methods

Prospective retrospective study of patients after surgical treatment of atrial fibrillation at the time of concomitant cardiac surgery during the period from July 19, 2018 to July 19, 2019 in Pauls Stradiņš Clinical University Hospital. About 50 patients are scheduled for observation.

Results

During the period from July 19, 2018 to December 30, 2018, 7 patients were followed up after 3 months. The mean age is 65.86 ± 14.17 years. All patients had congenital heart failure, 6 patients had atrial fibrillation directly before surgery. No previous cardiac surgery, percutaneous coronary intervention, history of myocardial infarction, stroke nor other cardio-vascular event were found. Full cryoablation (n = 1, 14.29%), biatrial cryoablation (n = 1, 14.29%), full left atrial cryoablation (n = 1, 14.29%) and radiofrequency catheter ablation (n = 4, 57.14%) were performed at the time of concomitant cardiac surgery – aortic valve replacement (n = 3, 42.86%), mitral valve replacement (n = 1, 14.28%) and repair (n = 1, 14.28%), tricuspidal valve repair (n = 2, 28.57%). The mean cardiopulmonary bypass time was 120.42 ± 30.59 minutes (median 121 minutes).

Six patients were discharged from a hospital with sinus rhythm and all patients – without any complications. The mean duration of hospital stay was $10.43 \text{ days} \pm 3.2$ (median 9 days).

After 3 months follow up, 6 patients (85.71%) had sinus rhythm, 6 patients (85.71%) were receiving rhythm control therapy, 4 patients (57.14%) were using peroral anticoagulants.

Conclusions

Surgical treatment of atrial fibrillation is the best choice with high efficiency for patients with the atrial fibrillation, who are presented for cardiac surgery.

Association between Myocardial Strain and Severity of Coronary Artery Disease

*Dr. Laima Caunīte; Dr. Ginta Kamzola;
Dr. med. Kārlis Trušinskis*

Pauls Stradiņš Clinical University Hospital, Latvian Cardiology Center, Latvia

Objectives

Myocardial strain is a precise tool for evaluation of systolic function in stable coronary artery disease (SCAD) patients with no previous myocardial infarction (MI).

Methods

93 patients undergoing percutaneous coronary intervention (PCI) due to SCAD were included in this study. Patients with PCI in previous 3 months or target vessel, or history of previous MI, atrial fibrillation at the time of study were excluded. No patients with medium or pronounced left ventricular hypertrophy, any valvular pathology, hypo- or akinetic segments visually, or decreased ejection fractions were included. Transthoracic echocardiography was performed on Philips iE33 the day before PCI. Myocardial strain was determined by 2D speckle tracking on TOMTEC ARENA using 16-segment model and results were analysed by SPSS 22.

Results

Fifty seven out of 93 patients had a single artery disease, 19 had two and 7 - three artery disease. Mean global longitudinal strain (GLS) was $-15.81 \pm 1.17\%$. In patients with single artery disease baseline GLS was $-16.09 \pm 1.08\%$, with two artery disease $-15.44 \pm 0.96\%$, with three artery disease $-14.13 \pm 0.97\%$. Difference between groups was statistically significant ($p < 0.001$). GLS was below normal range in all groups ($p < 0.001$).

Conclusions

In this study left ventricular systolic function assessed by myocardial strain was significantly below normal values in SCAD patients. Reduced GLS was associated with severity of coronary artery disease.

GPx and MDA Oxidative Stress Markers and Severity of Depression as Predictives of Recurrent Stable Coronary Heart Disease

*Dr. med. Vladimirs V. Voicehovskis*¹; Prof. *Oskars Kalejs*¹;
*Dr. med. Julija G. Voicehovska*¹; Ph.D. *Andrejs Skesters*²;
*Ketija Apsite*¹; *Dr. Julija Grigorjeva*³; *Dr. Tarass Ivascenko*¹

¹Rīga Stradiņš University, Department of Internal Diseases, Latvia;

²Rīga Stradiņš University, Biochemical Laboratory, Latvia;

³Rīga Stradiņš University, Faculty of Continuing Education, Latvia

Objectives

To study a patient with a stable coronary heart disease (SCHD): the severity of symptoms of depression (D), oxidative stress (OS) indicators, the effect of OS on the severity of D.

A major depressive disorder is 3–4 times more common in patients with coronary heart disease (CHD) than the prevalence in the population, which in turn increases the risk of cardiac mortality.

The relationship between D and CHD may be related to common pathophysiological mechanisms such as the activity of inflammatory reactions, circulating inflammatory mediators, the accumulation of free radicals, dysfunction of the endothelium. This makes it difficult to identify clinically useful diagnostic and prognostic markers, as well as treatment options.

OS is an emergency mechanism that relates to both cardiovascular and D pathophysiology. The accumulation of free radicals in the endothelium of blood vessels leads to its damage and after to its dysfunction, this leads to the activation of pathological biochemical processes and the development of inflammatory reactions that lead to OS.

Methods

A retrospective case-control study, stationary patients at the age 45+ years: 100 patients with recurrent SCHD and 100 patients with primary SCHD. In both target groups were assessed: manifestations of SCHD; OS parameters in the blood (MDA, GPx); D.

Results

The valid data obtained from 88 patients with primary SCHD and 86 relapses of SCHD: in patients with primary SCHD, D was established in 42 cases (mild – 36, severe – 6), in patients with recurrent SCHD – at 47 (mild – 41, severe – 6).

Conclusions

The primary data obtained indicate an increased level of OS – MDA in both groups. GPx does not have any significant changes in both groups. It is necessary to continue the study in randomized groups, taking in account level of D, cardiovascular risk and the therapy received.

Acknowledgements/Funding

Research project was supported by Rīga Stradiņš University PhD grant.

Results of Acute Decompensated Heart Failure Treatment with Early Addition of Angiotensin-Neprylisin Inhibitor

*Dr. Viktorija Grebneva*¹; *Dr. Irena Kurcalte*²; *Dr. Yelena Safro*³;
*Dr. Artis Kalnins*⁴; Prof. *Oskars Kalejs*²; Prof. *Aivars Lejnieks*²

¹ *University of Latvia, Department of Family Medicine;*

² *Rīga Stradiņš University, Department of Internal Diseases, Latvia;*

³ *Rīga East University Hospital, Clinical Centre "Gaiļezers", Latvia;*

⁴ *Rīga Stradiņš University, Latvia;*

Rīga East University Hospital, Latvia

Objectives

The aim of study was to evaluate effects and safety of early addition of sacubitril/valsartan to treatment of patients with acute decompensated heart failure.

Methods

We enrolled 18 patients (age – 55 (35–70) years, 14 males) who were hospitalized due to acutely decompensated congestive HF from June to September, year 2018 in observational cohort study. Heart failure was caused by coronary heart disease (5 patients), hypertensive heart disease (8 patients), dilated cardiomyopathy (5 patients). Patients who were hypotensive at admission weren't enrolled. All patients started with beta-blocker, ACEI, mineralocorticoid antagonist, intravenous (i/v) diuretics therapy at admission. Heart ultrasound was performed on third hospitalisation day, when LV ejection fraction (EF) under 35% was detected and i/v diuretics changed to perioral, ACEI was switched to angiotensin-nepriylisin inhibitor. Starting dose of sacubitril/valsartan was chosen to individual tolerance. ECHO parameters, distance of six minute walk test (6MWT) and laboratory analyses results at the time of discharge and after 3 months were compared.

Results

Statistically significant improvement of all measured parameters was found. The mean 6MWT distance increased from 303 m to 371 m ($p = .000$). Renal function improvement- from 57 ml/min to 62 ml/min. Heart ultrasound showed markable signs of reverse heart remodelling: ventricular systolic function improvement with mean EF rise from 28% to 36% ($p = 0.012$) and TAPSE rise from 16 mm to 19 mm, mean EDD decreased from 66 mm to 61 mm ($p = 0.008$), mean ESD – from 55 mm to 50 mm ($p = 0.003$), mean LAVI value decreased from 61 ml/m² to 48 ml/m² ($p = 0.032$). None of enrolled patients died, experienced hypotension, was rehospitalized or cancelled sacubitril/valsartan therapy due to adverse effects during the 3 month long follow-up period.

Conclusions

An advanced medication therapy of decompensated HFrEF including sacubitril/valsartan improved study patients functional status, ECHO parameters and renal function. Early inclusion of sacubitril/valsartan in decompensated HFrEF therapy scheme was safe in the study population.

Change in Use of Antithrombotic Therapy 6 Months after Electrical Cardioversion over a Period of 4 Years

*Dr. Alberts Bērziņš*¹; *Dr. Irina Pupkeviča*²; *Dr. Rūdolfs Vilde*³;
*Dr. Ketija Apsīte*¹; Prof. *Oskars Kalējs*²

¹Rīga Stradiņš University, Faculty of Continuing Education, Department of Internal Diseases, Latvia;

²Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology, Latvia;

Rīga Stradiņš University, Department of Internal Diseases, Latvia;

³Rīga Stradiņš University, Department of Internal Diseases, Latvia

Objectives

Our aim was to analyse the most commonly used oral anticoagulants after an electrical cardioversion and compare the acquired results with data from similar studies in Latvia from 2014 year.

Methods

The prospective study was conducted between January and December 2017 at the Latvian Centre of Cardiology, Pauls Stradiņš Clinical University Hospital. The study included 168 patients undergoing scheduled or emergency electrical cardioversion. Data from medical records were collected. 6-month follow-ups were conducted by telephone interview. Our conducted data were compared with data from similar study from 2014 year.

Results

After 6 months, warfarin was used in 47 (27%) patients, rivaroxaban in 34 (20.4%), dabigatran in 16 (9.5%). 36 (21.4%) patients were taking aspirin.

Comparing with study (Pupkeviča et. al., 2014) overall the use of anticoagulants increased by 11.6%. The use of DOACs versus warfarin increased from (11.2% vs 35.1%) to (29.9% vs 28%). Use of aspirin after DCCV decreased by 15.7%. However, still 77% of patients taking aspirin had a CHA₂DS₂-VASc > 2 after 6 months.

Conclusions

Over 4 years, the use of anticoagulants increased by 11.6% and the use of DOACs increased by 18.7%.

The rate of use of warfarin and DOAC is consistent with global data.

Comparing data over a period of time, the use of aspirin decreases, overall, it remains high.

Preoperative Left Ventricular Ejection Fraction Effect on Inotropic Support Initiation after Cardiopulmonary Bypass

*Kaspars Šetlers*¹; *Dr. Roberts Leibuss*¹;
*Dr. med. Vladimirs Harlamovs*²; *Prof. Eva Striķe*¹;
*Dr. med. Oļegs Sabeļņikovs*¹; *Prof. Indulis Vanags*¹;
*Prof. Pēteris Stradiņš*¹

¹ *Pauls Stradiņš Clinical University Hospital, Latvia;
Rīga Stradiņš University, Latvia;*

² *Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Transthoracic echocardiography is a standard procedure before open heart surgery. Decreased left ventricular ejection fraction (EF) can be bad prognostic criteria for restoring blood flow after cardiopulmonary bypass. Goal of this study was to evaluate EF influence on heart function restoration after cardiopulmonary bypass.

Methods

This is a randomised, single center, retrospective study for period of 2017 and 2018 year with patients undergoing elective open heart surgery. Intraoperative catecholamine initiation and reperfusion time after cardiopulmonary bypass was compared for patients with normal (50–70%), borderline (41–49%) or reduced (< 40%) left ventricular EF before surgery.

Results

100 elective open heart surgeries from a total amount of 2516 in year 2017 and 2018 were randomly selected. Normal EF was identified in 77, borderline in 11, and reduced EF in 12 cases. Intraoperative inotrope support was initiated on 25.9% vs 27.2% vs 75% of cases, $r = 0.28$, $p = 0.005$. Mean reperfusion time after cardiopulmonary bypass was 25.1 min (SD = 14.07). For patients with normal EF reperfusion time was 23.8 min (SD = 13.22) vs 24.27 min (SD = 11.40) vs 33.08 min (SD = 19.14), $r = 0.2$, $p = 0.048$.

Conclusions

Decrease in preoperative EF shows significant increase in inotrope initiation in intraoperative period. Increase in reperfusion time could be predicted for patients with reduced EF.

Study Protocol for Randomised Controlled Trial of Individualised Home-Based Exercise Programme in Pulmonary Arterial Hypertension

*Ph.D. Līna Butāne*¹; *Dr. med. Daina Šmite*²;
*Dr. med. Andris Skride*³

¹ Rīga Stradiņš University, Study program Medicine (Rehabilitation), Latvia;

² Rīga Stradiņš University, Department of Rehabilitation, Latvia;

³ Rīga Stradiņš University, Department of Internal Diseases, Latvia

Objectives

Exercise-based rehabilitation has been proved as a beneficial additional non-pharmacological treatment in patients with clinical stable pulmonary arterial hypertension (PAH). Majority of studies include hospital-based supervised programs. The findings from the recent studies reports effectiveness and safety of home-based rehabilitation and reflects the preference of the individual approach, supporting the need for RCT to continue research the efficient and safe intervention, that would be more convenient, promoting adherence and enhancing self-efficacy, most important – participation and patient autonomy. Our study purpose is to evaluate effectiveness and usefulness of individualized and integrated home-based exercise program, improving outcomes for patients with PAH.

Methods

This will be a randomized control trial. We will enroll 20 clinically stable PAH patients from the Pauls Stradiņš Clinical University Hospital. Participants will be randomly allocated to either the 12 week training group or no intervention group for the 24 weeks study period. The program will be adaptable for each patients functional state and home environment and will include aerobic exercise, muscle strength training, neuro-muscular relaxation techniques, self-control and telemonitoring, and handout materials. The following measurements will be performed 3 times (one week before the intervention, week after and after 12 week period without any intervention in both groups to follow up for adherence and long term changes in daily life): physical functional parameters (6MWT, spirometry), psycho-emotional parameters (questionnaires – Hospital Anxiety and Depression Scale, Pittsburgh Sleep Quality Index, General Self-Efficacy Scale), daily activities level (wearable activity monitor), participation level (questionnaire – Impact on Participation and Autonomy).

Results

This 24 week long study will demonstrate whether individualized, in daily life integrated home-based exercise program improves physical functional, psycho-emotional parameters and enhances daily activities level for clinically stable PAH patients.

Conclusions

This will be the first study that reflects the participation level and autonomy as intervention outcome measure for PAH patients.

Brugada Syndrome Patient: Case Report

*Dr. med. Kristīne Jubele*¹; *Dr. Kaspars Kupics*²;
*Ph.D. Nikolajs Nesterovičs*²; *Prof. Oskars Kalējs*²

¹ *Rīga Stradiņš University, Department of Internal Diseases, Latvia;*

² *Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Brugada syndrome is characterized by right bundle branch block, ST segment elevation in ECG and sudden death caused by ventricular fibrillation. There are three types of ECG findings in Brugada syndrome, divided according to the shape of ST segment in right chest leads.

There are geographical differences in prevalence: in Japan Brugada syndrome prevalence in the population is 12/10000, while in Europe and North America this prevalence is lower – 1:2000000 even. In cases of suspected Brugada syndrome an electrophysiological testing is recommended to assume the risk of life threatening arrhythmias in future.

Methods

Patient JA, 37yo, was hospitalized in planned order in P.Stradins Clinical University hospital for intracardiac electrophysiological testing because Brugada syndrome that was suspected in ECG. ECG was done in out patient clinic as a part of yearly follow up. There are no sudden unexpected deaths in family history. Patient had no previous heart disease, palpitations, dizziness or syncope. Echocardiographic testing was done with no abnormalities found. At admission ECG showed typical 1. type Brugada syndrome pattern.

Picture 1.

ECG at admission

Results

Intracardiac electrophysiological testing was performed. During pacing from right ventricular apex up to two extrastimulus reaching ventricular refractarity no ventricular rhythm disturbances were observed. By moving catheter in right ventricular outflow tract ventricular fibrillation was very easily provoked (see Picture 2).

Picture 2.

As patient has high risk of sudden cardiac death an ICD implantation was recommended. ECG testing of patient's parents and brother was done – no signs of Brugada syndrome. ECG testing of patient's son (15yo) is planned.

Conclusions

Brugada syndrome is very rare in Latvia and surrounding countries. Despite of that, physicians should carefully evaluate ECG's and electrophysiological testing should be considered in some cases. Even in asymptomatic patients ICD implantation can be necessary.

Rare Finding with Cardiac Multislice Computer Tomography in Patient with Ventricular Tachycardia Paroxysm

Dr. Aldis Strēlnieks¹; Dr. Ligita Zvaigzne²

¹*Rīga Stradiņš University, Department of Internal Diseases, Latvia;*

²*Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

There are cases when other investigative techniques are needed to identify the causes of arrhythmia. In particular, it is important to do so if arrhythmia is detected for the first time in patients' lives.

Methods

A 49 years old woman was admitted to the hospital due to a sudden onset of ventricular arrhythmias with the collapse and unconsciousness for the first time in her life. The patient's medical history did not present other complaints or abnormalities. The patient underwent clinical examination, electrocardiogram, transthoracic echocardiography, that showed no obvious abnormalities possibly associated with the occurrence of arrhythmia emergency. The decision was to perform the cardiac multislice computer tomography. After stabilization of hemodynamics and restoration of sinus rhythm by electrical cardioversion, video thoracoscopy was also performed, and the result of biopsy was oesophageal leiomyoma.

Results

After stabilization of hemodynamics and restoration of sinus rhythm by electrical cardioversion, video thoracoscopy was also performed, and the result of biopsy was oesophageal leiomyoma.

Conclusions

The objective of the report is to show the benefit of combination of different diagnostic methods in patients with unclear case of arrhythmia.

Circadian Variation in Onset of Myocardial Infarction Based on Risk of Obstructive Sleep Apnea

Andra Pekša; Prof. Inga Stukēna

Rīga Stradiņš University, Department of Internal Diseases, Latvia

Objectives

The aim was to recognize and evaluate the risk of obstructive sleep apnea (OSA) in patients admitted with acute myocardial infarction (MI) and analyze the potential circadian variation in the onset of ischemic chest pain based on the risk of OSA.

Methods

Cross sectional study involving patients admitted to the Riga East University Hospital with a diagnosis of an acute myocardial infarction during a time period between December 2016 and June 2017 was performed. The patients were stratified into groups based on the risk of OSA that was assessed by the STOP-Bang questionnaire.

Results

60 patients were included into the study who were admitted to the acute cardiology ward. 45 (75%) were men and 15 (25%) women. The mean patient age was 63, 9 ± 11 , 7 years. Using STOP-Bang questionnaire 33 (55%) of the patients were included in the high OSA risk group, 27 (45%) in the low risk group. From anthropometric and laboratory values patients with high OSA risk had larger neck circumference ($p < 0.0001$), increased weight ($p < 0.0001$), body mass index ($p = 0.001$), fasting blood glucose level ($p = 0.03$) and cholesterol ($p = 0.01$). By dividing the patient into four six-hour interval groups based on OSA risk and onset of ischemic chest pain, in patients with high OSA risk compared to low risk group, the frequency of ischemic chest pain onset was higher from midnight to 5:59 (28.3% vs 10%; $p = 0.020$), whereas in the morning hours (between 6 and 12 AM) there's tendency of more frequent onset of MI in patients with low risk (15% vs 23% $p = 0.051$).

Conclusions

Based on the risk of OSA day-and-night variation can be seen in the start of acute myocardial infarction.

Outcomes of Acute Cardiac Failure after Cardiac Surgery

*Dr. Katrina Rutka*¹; *Dr. Roberts Leibuss*¹;
*Dr. Baiba Arklina*¹; *Dr. med. Vladimirs Harlamovs*²;
*Prof. Peteris Stradins*¹; *Ph.D. Eva Strike*¹

¹ *Rīga Stradiņš University, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvia;
² *Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

To review outcomes of patients treated with a calcium sensitizer for acute cardiac failure after cardiac surgery.

Methods

Retrospective review of patient medical records and local registry of patient outcomes and additional treatments maintained at the Department of Cardiac Anaesthesia and Intensive Care of Pauls Stradiņš Clinical University Hospital. All patients treated with a calcium sensitizer (CS) for acute cardiac failure following cardiac surgery in 2018 were included in the study.

Results

In 2018, a total of 1263 patients underwent cardiac surgery on cardiopulmonary bypass (CPB), 59 of them received CS for acute cardiac failure after cardiac surgery. Median age of patients receiving CS was 68 ± 18 years, and median preoperative left ventricular ejection fraction (LVEF) was $45 \pm 26\%$. 42 (71.2%) patients received only CS, 12 (20.3%) patients received CS together with veno-arterial (VA) extracorporeal membrane oxygenation (ECMO), 1 patient (1.7%) received CS together with inhalational nitric oxide (iNO), and 4 patients (6.8%) received all three treatments. Overall mortality of patients after CPB surgery in 2018 was 2.8% (35 out of 1263), but among patients receiving CS – 44.1% (n = 26). Among patients with preoperative LVEF < 35% the mortality was 37.5%, but among patients with LVEF $\geq 35\%$ – 48.6%. The mortality of patients who received CS together with VA ECMO and iNO was 100%.

Conclusions

Patients with acute cardiac failure after cardiac surgery represent a high-risk patient group with a significantly higher mortality than the overall cardiac surgery patient population. Our study reflects the trend observed in other clinical trials, indicating that patients with low preoperative LVEF (< 35%) may gain more benefit from a calcium sensitizer than patients with higher preoperative LVEF. Patients in our study did not benefit from combined treatment with CS, VA ECMO and iNO, as reflected by the 100% mortality in this patient group.

Comparative Effectiveness of Antiarrhythmic Drugs for Prevention of Early Relapses of Atrial Fibrillation after Electrical Cardioversion

*Irina Pupkeviča*¹; *Baiba Kokina*²; *Dr. Natālija Nikrus*¹;
*Dr. Kristīne Spalva*¹; Prof. *Oskars Kalējs*³

¹ *Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology;*

Rīga Stradiņš University, Department of Internal Diseases, Latvia

² *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

³ *Rīga Stradiņš University, Latvia;*

Pauls Stradiņš Clinical University Hospital, Latvia

Keywords: Atrial fibrillation (AF), electrical cardioversion (ECV), antiarrhythmic drugs (AADs).

Objectives

AADs are used for post-cardioversion sinus rhythm (SR) maintenance. It is essential to estimate potential of various AADs for preventing AF recurrence after ECV.

The aim was to evaluate the effectiveness of different AADs for prevention of relapses of AF in early period after SR restoration by ECV.

Methods

In this prospective study, patients in Pauls Stradiņš Clinical University Hospital, undergoing ECV for AF and successful SR restoration from October 2018 till December 2018, were included. Participants signed informed consent and were interviewed according to questionnaire. Data concerning demographics, medication intake and medical history was acquired. After 30 days, follow-up interview was conducted. Data evaluation was carried out with Microsoft Excel and SPSS Statistics software.

Results

Among 52 patients (28 men and 24 women) included, 30 days after ECV 46 (88.5%) were taking an AAD (24 (52.2%) – amiodarone, 19 (41.3%) – aethacizine, 2 (4.3%) – propafenone and 1 (2.2%) – sotalol), while 6 (11.5%) were not adherent. Propafenone and sotalol users remained in SR until follow-up. In amiodarone and aethacizine groups, data of SR duration in days was non-parametric (Kolmogorov-Smirnov test $P < 0.05$). Among amiodarone users, 20 (83.3%) patients maintained SR, nevertheless 4 (16.7%) had AF relapsed (SR duration statistics in days: minimum: 1, mean: 25.8, 25th percentile: 30, median: 30, 75th percentile: 30, maximum: 30). In aethacizine group, SR maintained in 15 (78.9%) and relapse happened in 4 (21.1%) patients (SR duration statistics in days: minimum: 1, mean: 24.9, 25th percentile: 30, median: 30, 75th percentile: 30, maximum: 30). Comparing amiodarone and aethacizine groups, no statistically significant difference was established (Mann-Whitney test $P > 0.05$).

Conclusions

Amiodarone and aethacizine demonstrated equal effectiveness in preventing early relapses of AF after ECV (no statistically significant difference), indicating that amiodarone, causing adverse health effects, could be substituted with aethacizine. Propafenone and sotalol were effective in early AF recurrence prevention.

Clinical Characteristics and 6-Month Outcomes of Atrial Fibrillation Patients after Direct Current Cardioversion

*Dr. Alberts Bērziņš*¹; *Dr. Aldis Strēlnieks*²;
*Dr. Kristīne Spalva*³; Prof. *Oskars Kalējs*³

¹*Rīga Stradiņš University, Faculty of Continuing Education, Department of Internal Diseases, Latvia;*

²*Rīga East University Hospital, Latvia;*

Rīga Stradiņš University, Department of Internal Diseases, Latvia;

³*Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology;*

Rīga Stradiņš University, Department of Internal Diseases, Latvia

Objectives

Our goal was to analyze the outcomes 6 months after direct current cardioversion.

Methods

A prospective study includes patients with electrocardiographically confirmed atrial fibrillation who underwent direct current cardioversion, hospitalized in Pauls Stradiņš Clinical University Hospital. During the period from January 2017 until December 2017 168 patients were interviewed. All participants provided written informed consent. Data from medical records were collected. 6-month follow-ups were conducted by telephone interview. The obtained data were analysed by IBM SPSS.

Results

After 6 months, 3 patients had died from fatal stroke. 2 patients used oral anticoagulants and one patient didn't use any of anticoagulants.

62 (36.9%) patients had 1 repeated episode of AFib and 20 (11.9%) had a repeated episode 2 or more times. A total of 82 (49%) patients had at least one episode of Afib over a period of 6 months. 48 patients were hospitalised due arrhythmia and 16 due other reasons. With statistical significance the recurrence of arrhythmia presented more often in patients with previously known AFib ($P = 0.001$).

Conclusions

Our study showed low incidence of adverse clinical events in patients who underwent direct current cardioversion. Direct current cardioversion for atrial fibrillation has a high initial success rate, but only a half of patients remained in sinus rhythm after 6 months.

Oral Anticoagulant Influence on Health-Related Quality of Life for High-Risk Atrial Fibrillation Patients: 6-Month and 12-Month Follow-up

Dr. med. Ketija Apsīte^{1,2}; *Andris Tupahins*²; *Diāna Stoldere*²;
*Toms Jānis Eglītis*²; *Ph.D. Nikolajs Nesterovičs*^{1,2};
*Dr. Tarass Ivaščenko*²; *Prof. Vladimirs Voicehovskis*²;
*Prof. Aivars Lejnieks*²; *Prof. Oskars Kalējs*^{1,2}

¹ *Pauls Stradiņš Clinical University Hospital, Department of Cardiology, Latvia;*

² *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

Objectives

Conclude whether oral anticoagulant usage correlates with health-related quality of life (HRQOL) improvement for high-risk non-valvular atrial fibrillation (AFib) patients after 6 and 12 months.

Methods

A prospective study (October 2016–December 2018) including AFib patients during their hospitalisation. Three groups: warfarin users, DOAC users, no oral anticoagulant (OA) users. Each patient was asked demographic data, medical history, drug usage, HRQOL SF-36 survey. The interview was repeated over mobile phone after 6, 12 months. Data were collected and analysed using SPSS Statistics (p value CI-95%).

Results

Together 376 patients: 164 (43.6%) male and 212 (56.4%) female (mean age 71.1 years); warfarin used 130 patients (34.6%), DOACs – 138 (36.7%) and no OA – 108 (28.7%). 6-month follow-up was made with 142 patients and 12-month – with 59 patients. On 6-month follow-up a statistically significant improvement in HRQOL was detected for warfarin in physical health (base – 40%, 6m – 85%; $p = 0.0001$), social functioning (base – 76.2%, 6m – 93.1%; $p = 0.003$), role limitations due to emotional problems (base – 52.5%, 6m – 85%; $p = 0.003$), emotional well-being (base – 70.8%, 6m – 78.8%; $p = 0.004$), general health (base – 28.75%, 6m – 41.3%; $p = 0.028$). For DOACs: in social functioning (base – 81%, 6m – 93.5%; $p = 0.001$), role limitations due to physical health (base – 54%, 6m – 76%; $p = 0.016$), due to emotional problems (base – 70%, 6m – 86%; $p = 0.029$). Patients with no OA did not show any improvement in HRQOL over 6- and 12-month period. On 12-month follow-up no statistically significant change was detected.

Conclusions

OA usage correlates with HRQOL improvement for Afib patients. Warfarin usage correlates with improvement in physical health ($p = 0.0001$), social functioning ($p = 0.003$), role limitations due to emotional problems ($p = 0.003$), emotional well-being ($p = 0.004$), general health; DOAC usage with social functioning ($p = 0.001$), role limitations due to physical health ($p = 0.016$), due to emotional problems ($p = 0.029$).

Case of Long QT Syndrome: Could be More Unrecognised than Rare

*Dr. Natālija Nikrus*¹; *Dr. Sandis Sakne*²; Prof. *Oskars Kalējs*²

¹*Rīga Stradiņš University, Department of Internal Diseases, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology;
²*Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology*

The congenital long QT syndrome is a relatively rare disorder characterized by QT interval prolongation causing repetitive syncope and sudden cardiac death related to polymorphic ventricular tachycardia. In 2011 a 47-year-old female was brought to emergency room unconscious, intubated, after CPR related to ventricular fibrillation. Patient was having sudden syncope at home without breathing and circulation signs, relatives were started CPR. She had no history of such episodes before. In the hospital patient was examined. Her ECG in dynamics showed deep inverted T waves in apex, lateral and inferior wall, prolonged QT interval 487 ms. The pulmonary emboly was found. After 2 weeks of treatment patient was discharged from the hospital with recommendations for the use of anticoagulant medications, echocardiogram and Holter monitor control after 3 months.

In 2015 the same 51-year-old patient was referred to the hospital due to CPR related to ventricular fibrillation again. There were no causes found for such patient's condition. The ECG finding showed prolonged QT 482 ms. 28.10.2015 she underwent ICD implantation operation. Metoprolol was recommended for medical treatment.

In 2018 the same 54-year-old patient went to the hospital due to ICD discharge. ICD programming found ventricular fibrillation paroxysms with adequate treatment with shock discharge. There was also found prolonged QT interval on ECG, maximal 597 ms during all hospitalization time, but she had a history of Amiodarone use. Holter monitor – rare polymorphic VES, bigeminy cycles, 2 doublets and rare SVES. Echocardiogram control – without pathological findings. Medical treatment was changed to Bisoprolol. In 2019 genetical testing was done.

Emergency Department: Occurrence of Clinically Significant Bleeding in Patients Using Oral Anticoagulants

*Dr. Emma Sokolova*¹; *Dr. Viesturs Spalis*²;
*Dr. Dina Balode*²; Prof. *Oskars Kalējs*¹

¹ *Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology;*

² *Pauls Stradiņš Clinical University Hospital, Emergency Department, Latvia*

Objectives

To identify patients using oral anticoagulants with clinically significant bleeding who presented to the Emergency Department (ED) of Pauls Stradiņš Clinical University Hospital.

Methods

We conducted a structured, retrospective, observational study of 450 warfarin- or NOAC-treated patients presenting with any bleeding event to a large, academic ED between January 2014 and September 2014. We used descriptive statistics to summarize baseline characteristics, treatments, and outcomes and performed subgroup analyses based on the type of anticoagulant and site of bleeding. We evaluated also parameters that could affect and enhance bleeding using anticoagulants: age, gender, co-morbidities, coagulation test, used drugs that could increase risk of bleeding.

Results

Our archive search yielded 29 (8.7%) cases of 334 patients with proved major bleeding using oral anticoagulants, among them 26 patients (82%) taking a warfarin and 4 patients taking a NOAC (i.e., dabigatran n = 2, rivaroxaban n = 1 and dabigatran together with warfarin n = 1. Reversal agents were rarely used in all anticoagulant groups. Among patients on oral anticoagulant treatment – patients with gastrointestinal bleeding n = 17 (47%), intracranial bleeding n = 4 (11%), another major bleeding n = 8 (22%) respectively. Clinically severe bleeding was observed in 18 (62%) patients. We observed none cases of mortality.

Conclusions

In our study we had very small group of patients taking NOAC to compare them to warfarin-treated patients. Overall our findings support conduction of a larger scale, prospective study to confirm safety of using oral anticoagulants and compare patient groups taking different types of oral anticoagulants presenting with major bleeding.

Relation of HAS-BLED Bleeding Risk Score to Major Bleeding in Anticoagulated Patients Presented to Emergency Department

*Dr. Emma Sokolova*¹; *Dr. Viesturs Spalis*²;
*Dr. Dina Balode*²; Prof. *Oskars Kalējs*¹

¹ *Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology;*

² *Pauls Stradiņš Clinical University Hospital, Emergency Department, Latvia*

Objectives

To identify patients using oral anticoagulants with clinically significant bleeding who presented to Emergency Department (ED) of Pauls Stradiņš Clinical University Hospital and evaluate relation of major bleeding to HAS-BLED Bleeding Risk Score.

Methods

We conducted structured, retrospective study of 450 warfarin- or NOAC-treated patients presenting with any bleeding event to a large, academic ED between January 2014 and September 2014. Descriptive statistics were used to summarize baseline characteristics, treatments, outcomes and performed subgroup analyses based on the type of anticoagulant and site of bleeding. Medical history and HAS-BLED score assessed. We evaluated also parameters that could enhance bleeding using anti-coagulants: age, gender, co-morbidities, coagulation test, used drugs.

Results

From 450 patients enrolled in this study 334 patients (74%) were discharged with proved major bleeding. After enrollment we found out that only 29 patients (8.7%) were treated with oral anticoagulants and presented with major bleeding event; 17 (47%) of these events were gastrointestinal bleedings and $n = 4$ (11%) intracranial hemorrhages. Only 4 patients were treated with NOAC (11%). Clinically severe bleeding observed $n = 18$ (62%). Mean international normalized ratio (INR) was 3.5, in 6 patients $INR > 10$. In 12 patients HAS-BLED score was < 3 , in 4 patients with score ≥ 3 (in high risk). For patients with atrial fibrillation (AF) ($n = 16$, 44.4%) CHA2DS2-VASc ≥ 2 was observed in 15 cases. Based on our study HAS-BLED had a model performance superior and shows more accurately associated with major bleeding compared with to that of both CHADS2 un CHA2DS2-VASc.

Conclusions

The HAS-BLED score not only is useful in the assessment of bleeding risk, and should be used for assessing major bleeding. According to our study the practice of using CHADS2 and CHA2DS2-VASc as a measure of high bleeding risk should be discouraged, given its inferior predictive performance compared with HAS-BLED score. Future follow-up studies in larger groups are needed.

Long-Term Results of Catheter Ablation in Supraventricular Paroxysmal Tachycardias: Single Center Experience in Latvia

*Dr. Rudolfs Vilde*¹; *Dr. med. Kristine Jubele*²; *Dr. Kaspars Kupics*³;
*Marija Baturevica*³; *Zane Silina*³; *Dr. Alberts Berzins*⁴;
*Dr. Ginta Kamzola*³; *Dr. Irina Cgojeva-Sproge*³; *Dr. Sandis Sakne*³;
Prof. *Oskars Kalejs*²; Prof. *Andrejs Erglis*²

¹ Rīga Stradiņš University, State Emergency Medical Service, Latvia;

² Pauls Stradiņš Clinical University Hospital, Latvia;

Rīga Stradiņš University, Latvia;

³ Pauls Stradiņš Clinical University Hospital, Latvia;

⁴ Rīga Stradiņš University, Latvia

Objectives

Supraventricular arrhythmias are common heart rhythm disorders. Current treatment strategy consists of antiarrhythmic drug therapy and radio frequency catheter ablation as a first-line therapy. The aim was to evaluate the effectiveness of RFCA, prevalence of adverse effects, cardiovascular events and change in self-assessed quality of life after the RFCA. Analysis of a single center experience.

Methods

244 patients diagnosed with AVNRT or WPW syndrome and hospitalized for RFCA from 10/2014 to 12/2016 were included. The study includes a retrospective data base analysis and consecutive follow-up.

Results

186 patients with AVNRT were included, 160 (86%) reached for follow-up. The number reporting symptoms decreased from 158 (98.8%) to 44 (27.5%) after treatment ($p < 0.001$). 58 WPW syndrome patients were included, 44 (75.9%) reached for follow-up. Right side accessory pathway ablation was performed in 26, left in 31 case. The number of patients reporting symptoms decreased from 43 (97.7%) to 11 (25%) after RFCA ($p < 0.001$). 3 (6.8%) WPW and 4 (2.5%) AVNRT patients experienced relapses, which is compatible with major studies. The procedure was curative in 93.2% of the cases for WPW and 97.5% for AVNRT. Adverse effects were noticed in 8 (5%) AVNRT patients with 3 (1.9%) having AV conduction delay, 1 (0.63%) requiring pacemaker. After RFCA for WPW syndrome, only 1 patient had minor complications. Cardiovascular events were registered in 7 cases. Self - assessed quality of life improved from 5 (IQR 6-4) to 9 (IQR 9-8) out of 10 among AVNRT ($p < 0.001$) and to 8.5 (IQR 9-7) among WPW patients ($p < 0.001$).

Conclusions

The assessed efficiency, subsequent CVE and frequency of relapses coincides with the tendencies in major studies, shows better outcomes in safety and complication rate. The procedure is safe, effective and improves the quality of life. RFCA performance in the center is compatible with the other centers evaluated in published studies, surpasses them in periprocedural safety.

Contrast-Enhanced Ultrasound (CEUS) Neovascularisation Diagnostic Limitation in Unstable Atherosclerotic Plaque with Extensive Calcified Component

*Ph.D. Maija Radziņa¹; Dr. Andrejs Lioznovs¹; Dr. Agita Jukna¹;
Dr. med. Sergejs Kovaļovs²; Dr. med. Aigars Lācis²;
Prof. Dainis Krieviņš²; Dr. Kaspars Ķīsis²; Dr. Mārcis Gediņš²;
Dr. Kristaps Jurjāns²; Dr. Sergejs Pavlovičs³*

¹Rīga Stradiņš University, Radiology Research Laboratory, Latvia;

²Rīga Stradiņš University, Latvia;

Pauls Stradiņš Clinical University Hospital, Angio-surgery Department, Latvia;

³Rīga Stradiņš University, Latvia;

Pauls Stradiņš Clinical University Hospital, Diagnostic Radiology Institute, Latvia

Objectives

CEUS is one of the most perspective diagnostic method for unstable atherosclerotic plaque diagnostic, but it has limitations. The purpose of this prospective study – analyse CEUS limitations in confirming plaque's instability, evaluate specificity, sensitivity in comparison with histology results after endarterectomy.

Methods

During the study, conducted in the period from 2017 to 2018, 43 patients with duplex ultrasound detected unstable plaque were enrolled. Patients analysed with Duplex US, CEUS, CTA and in 23 cases the histology of the atherosclerotic plaque was acquired after endarterectomy. One group consisted of patients with extensive calcified plaque component, second group – soft plaques. For every group CEUS sensitivity, specificity was calculated in comparison with histology results. Neovascularization in CEUS examination was defined in 2 grades – poorly (Grade 1), well visible (Grade 2). For second group – contrast uptake onset time analysed in groups – below and above 30 seconds (early and late).

Results

Comparing 2 groups: excluding calcified plaques neovascularisation by CEUS was diagnosed in 10 cases (6 cases with grade 1 and 4 – grade 2). Comparing results with histology – sensitivity was 77.78%, specificity 60%, positive predictive value 77.78%, negative predictive value 60%, accuracy 76.3%; In a group with extensive calcified plaques – neovascularisation was detected in 13 patients (56.5%), methods sensitivity 53.33%, specificity 37.5%, positive predictive value 61.54%, negative predictive value 30%, accuracy 47.83%. Comparing results with CEUS grading and contrast arrival time, was found statistically significant difference between groups ($p = 0.035$) with earlier vasa vasorum enhancement in Grade2 subgroup.

Conclusions

Extensive calcinosis is important limitation factor in carotid atherosclerotic plaque neovascularisation diagnostics by CEUS, reducing methods sensitivity by 24.45%, specificity 22.5%, negative predictive value up to 2 times, positive predictive value by 16.24%. Plaque neovascularization Grade 2 have tendency to uptake contrast earlier than Grade 1. CEUS method sensitivity and specificity re-evaluation is advised in a larger cohort.

Predictors of Effective Electrical Cardioversion of Atrial Fibrillation

*Irina Pupkeviča¹; Ketija Apsīte¹; Dr. med. Kristīne Jubele¹;
Prof. Oskars Kalējs¹; Aivars Lejnieks²*

*¹ Rīga Stradiņš University, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia;*

*² Rīga Stradiņš University, Latvia;
Riga East University Hospital, Latvia*

Objectives

To evaluate the correlation between the amount of electrical shocks as well as the total energy applied with maintenance of sinus rhythm 30 days after electrical cardioversion.

Methods

In this retrospective study data from 150 patients were collected in Pauls Stradiņš Clinical University Hospital's Department of Arrhythmology which holds information about patients who had undergone electrical cardioversion to restore sinus rhythm. Questionnaires were administered and follow-up data were collected by phone patient survey from 30 days after ECV. Statistical analysis was conducted using SPSS 20.0 software. Crosstabulation with multiple variables, Fisher's Exact Test, Mann-Whitney U Test were applied.

Results

150 patients were questioned – 70% male (n = 105) and 30% female (n = 45) with a mean age of 65 (56–74) years. Electrical cardioversion was performed to all patients in this study. Sinus rhythm was restored in 145 of patients (96.7%). The success rate after a single discharge was 87.3%. 2 electrical shocks were required for 9.3% of patients and 3.3% of patients benefited from a third shock. A single discharge has a greater success rate for maintaining sinus rhythm for 30 days (p = 0.003). In 10% of all patients cardioversion began with 150 J. Initial discharge was 200 J for 76.7% of patients, the total energy applied was 300 J for 6% of patients and 360 J for 3.3%

Conclusions

Electrical cardioversion is a standard procedure and is very effective in the treatment of atrial fibrillation. It has a high rate of success in restoring sinus rhythm. A successful single discharge and higher total energy applied correlate with more stable sinus rhythm 1 month after electrical cardioversion was performed. The longer atrial fibrillation exists, or the more persistent it becomes over time, the harder it is to treat it.

Lead-Related Infective Endocarditis in Patients after Cardiac Electrical Device Implantation in Pauls Stradiņš Clinical University Hospital

*Ph.D. Nikolajs Nesterovics¹; Georgijs Nesterovics²;
Dr. med. Kristīne Jubele¹; Prof. Peteris Stradins¹;
Dr. Maris Blumbergs²; Dr. Janis Ansabergs²;
Prof. Oskars Kalejs¹; Prof. Andrejs Erglis²*

¹ Rīga Stradiņš University, Department of Internal Diseases, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia;
² Pauls Stradiņš Clinical University Hospital, Latvia

Objectives

To identify LRIE causal microorganisms and associated comorbidities.

Methods

The retrospective study has evaluated patients, who were referred to Pauls Stradiņš Clinical University Hospital due to lead-related endocarditis (LRIE), for lead extraction. Lead extraction was performed surgically or transvenously. Causal microorganisms were cultivated either from blood, leads or device pocket. IBM SPSS v22.0 software was used for data analysis.

Results

Forty-nine patients with LRIE were selected for this study. The mean age was 60.8 ± 17.2 years. Thirty-four were men (69.4%). In 26 (53.1%) patients LRIE developed after reimplantation of cardiac device. Six (12.2%) patients had one lead device, 36 (73.5%) two and 7 (14.3%) three leads. Forty-four (89.8%) patients had visible lead vegetations during Echocardiographic evaluation. Five (10.2%) patients had heart valve vegetations.

Thirty-two (65.3%) patients have received antibacterial treatment before sample collection. Thirty-one (63.3%) patient had positive culture. Most commonly isolated bacteria were *S. aureus* and Coagulase-negative staphylococci, each accounting for 23.5% of all bacteria. Most common comorbidities of patients with LRIE were Diabetes Mellitus ($n = 9$, 18.4%), Chronic kidney disease ($n = 11$, 22.4%) and Gout ($n = 5$, 10.2%). Eight (16.3%) patients had other implants. Eight (16.3%) patients had cardiac surgery in the past.

Conclusions

There were 10.2% of patients without visible vegetations and 36.7% patients with negative microbiologic samples. The diagnosis of LRIE is more challenging in these patients. The risk of LRIE is greater in patients with certain comorbidities, implanted prosthetics and after cardiac surgery. LRIE develops more frequently after reimplantation, rather than after primary implantation.

Masters Basketball Players Cardiovascular Parameters Changes during Training and Competition

*Dr. Mairita Bumbure*¹; *Dr. Andris Vavere*²; Prof. *Oskars Kalejs*³

¹ *Children's Clinical University Hospital, Department of Sport Medicine, Latvia;*

² *Murjanu Sport Secondary School, Sport medicine, Latvia;*

³ *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

Objectives

To evaluate masters basketball players heart rate, blood pressure and oxygen saturation changes during training and competition.

Methods

Sixteen male basketball players from four different teams participating in the MaxiBasket league were included in the study. Measurements were taken by the CONTECTM Pulse Oximeter CMS50D1 and Little Doctor® sphygmomanometer LD-71. The experiment was carried out in real training and competition conditions. Heart rate, blood pressure and oxygen saturation were measured before warming-up, three times during process (training/game) and after stretching. Collected statistical data were analyzed by MS Excel 2010 and SPSS V20.0 software.

Results

The mean age of participants was 49.4 ± 6.3 [95% confidence interval (CI) = 46.1–51.9] years. The average heart rate (HR) during training was 133 ± 10 [128–138], bpm but during game 148 ± 13 [142–154], bpm which showed statistically significant difference between both events ($p = 0.0002$).

There was no statistically significant difference between systolic (SBP) or diastolic blood pressure (DBP) during training (dT) and competition (dC): SBPdT 174 ± 22 [163–185] vs SBPdC 185 ± 16 [177–193], mmHg; $p = 0.084$. DBPdT 88 ± 11 [83–93] vs DBPdC 89 ± 8 [85–93], mmHg; $p = 0.610$.

There was statistically significant difference between mean diastolic blood pressure after training 84 ± 9 [79–89], mmHg and after competition 89 ± 7 [85–93], mmHg; $p = 0.046$. The same changes was shown comparing median (25; 75 percentile) oxygen saturation after training 97 (96; 97), % and after game 95 (94; 96), %; $p = 0.018$.

Conclusions

Heart rate increase during competition is more pronounced than during training. Game affects blood pressure similar to training process. Oxygen saturation after competition is statistically significant lower than after training. Study shows that competition is greater load to the body than training.

Masters Basketball Players Heart Rate as Indicator of Training and Competition Intensity

*Dr. Mairita Bumbure*¹; *Dr. Andris Vavere*²; Prof. *Oskars Kalejs*³

¹*Children's Clinical University Hospital, Sport Medicine, Latvia;*

²*Murjanu Sport Secondary School, Sport medicine, Latvia;*

³*Rīga Stradiņš University, Department of Internal Diseases, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Increasing count of older athletes and their desire to compete is new phenomenon around the world. One way to estimate exercise intensity is to see how hard heart is beating during physical activity. Aim. To evaluate masters basketball training and competition intensity by using players heart rate.

Methods

There were sixteen (n = 16) male basketball players included in the study. Measurements were taken by the CONTECTM Pulse Oximeter CMS50D1. The experiment was carried out in real training and competition conditions. Heart rate was measured before warming-up, three times during process (training/game) and after stretching. Maximum heart rate (HRMAX) for each participant was calculated by formula "220 - age". Collected statistical data were analyzed by SPSS V20.0 software. A significance level of $P < 0.05$ was applied.

Results

The mean age \pm standard deviation (SD) of participants was 49.4 ± 6.3 [95% confidence interval (CI) = 46.1–51.9] years. Maximum value of HR during training (dT) was 157 bpm, but during competition (dC) – 194 bpm. The average HRdT was 133 ± 10 [128–138], bpm but HRdC 148 ± 13 [142–154], bpm which showed statistically significant difference between both events ($p = 0.000$). HR of two participants (n = 2) during training was between 60–70% of HRMAX, n = 8 between 70–80% of HRMAX and n = 6 in zone 80–90% of HRMAX. During game: n = 2 between 70–80% of HRMAX, n = 11 in zone 80–90% of HRMAX and n = 3 between 90–100% of HRMAX.

Conclusions

Competition cause more pronounced increase in heart rate than training. Heart rate of most players is between 70–90% of HRMAX during training and competition which point out to moderate and high intensity.

General Framework to Manage Athletes with Arrhythmias

Prof. *Hein Heidbuchel*

*Antwerp University and University Hospital Antwerp,
Department of Cardiology, Belgium*

Management of arrhythmias in athletes often proves to be haphazard undertaking. Many aspects are confused, which ultimately also leads to confusion of the athlete and his/her entourage. This presentation wants to provide a simple conceptual framework to address such complex situations. In fact, management is guided by three principles:

1. What is the prognostic impact of the arrhythmia, i.e. is there any life-threatening danger?
2. What is the symptomatic impact of the arrhythmia, which may interfere with the subjective capacity of the athlete to continue sports?
3. What amount of sports can be allowed in the context of the arrhythmic condition, which usually also includes considerations on development of the underlying substrate by continuing sports participation?

The answers to these three basic questions will define the final management of the arrhythmic athlete. The framework will be illustrated with examples from athletes with atrial and ventricular arrhythmias.

Rare Causes of Cardiac Hypertrophy

Dr. med. Ainārs Rudzītis

*Pauls Stradiņš Clinical University Hospital,
Latvian Centre of Cardiology, Latvia*

Explained causes of cardiac hypertrophy are due to chronic afterload of the left ventricle (e.g., arterial hypertension, aortic stenosis, athlete's heart, aortic coarctation) or right ventricle (e.g., pulmonic valve stenosis, pulmonary hypertension).

In the absence of obvious conditions leading to cardiac hypertrophy, hypertrophic cardiomyopathy (HCM) is considered. The prevalence of HCM in population is 1 : 500 and in the majority of cases (up to 60%) in adolescents and adults it is caused by mutations in sarcomere protein genes.

In 5–10 percent of adult cases HCM is caused by other genetic disorders including inherited metabolic and neuromuscular diseases, chromosome abnormalities and genetic syndromes. Some patients have non-genetic disorders that mimic genetic forms of the disease, for example, wild-type (wt-TTR) and (AL) amyloidosis.

In general rare causes of cardiac hypertrophy can be classified as:

- storage diseases (Fabry–Anderson disease (alpha-galactosidase A deficiency), glycogen storage disease (Pompe), Danon disease (LAMP2 deficiency);
- infiltrative diseases (amyloidosis, sarcoidosis, Hurler's syndrome (mucopolysaccharidosis, MPS I), fatty infiltration;
- neuromuscular diseases (Friedreich's ataxia);
- mitochondrial diseases (MELAS, MERFF);
- malformation syndromes (LEOPARD, Noonan, Costello etc.).

It is important to perform comprehensive clinical evaluation of patients with hypertrophic cardiomyopathy (including family history, imaging, genetic testing and histology) as it carries different prognosis and disease specific treatment options are available.

Can the Type of Physical Load Lead Athlete's Heart Hypertrophy to Involution?

Prof. *Viesturs Lāriņš; Jānis Lācis*

Latvian Academy of Sport Education, Latvia

In competitive sports, regular intensive training load causes a benign increase in cardiac enlargement, with specific circulatory and cardiac morphological alterations, that represents a physiological adaptation to systematic training ("athlete's heart") (Maron et al., 2017; Maron and Pelliccia, 2006).

Endurance and aerobic training load promotes cardiac enlargement by causing relatively higher increase of left ventricular dilatation than hypertrophy due to increased volume load on left ventricle. Strength and anaerobic training load promotes cardiac enlargement by causing relatively higher increase of left ventricular hypertrophy than dilatation due to increased pressure load on left ventricle (Pelliccia et al., 2012).

Exercise-induced physiological cardiac remodelling can sometimes overlap with pathological heart changes and may become a challenge for the health care professionals when deciding about further participation in sports (Caselli et al., 2014; Kovacs et al., 2016).

In our research, use of an aerobic training load (swimming, cycling) for two months, caused the involution of left ventricular posterior wall hypertrophy and involution of interventricular septal hypertrophy.

Obtained results showed that aerobic training was more effective for the decrease of left ventricular posterior wall hypertrophy and for the decrease of interventricular septum hypertrophy, than the complete cessation of the exercise.

In general, results showed that use of the aerobic training load and the exclusion of an anaerobic and a strength training, decreases left ventricular posterior wall and the interventricular septum hypertrophy.

Multimodality Approach in Diagnosis of Cardiac Storage Diseases

Dr. Baiba Barone

Pauls Stradiņš Clinical University Hospital, Latvia

Storage diseases of heart are characterized by accumulation of specific substrate in different heart structures that causes various manifestations. This group of secondary cardiomyopathies includes iron overload cardiomyopathy and lysosomal storage disorders. The identification of the underlying cause and appropriate treatment is essential for the prognosis.

Different diagnostic approaches can be used to detect storage diseases. Biochemical investigations, histology, genetics and family screening are important to detect storage disorders. The initial phenotypic diagnosis of cardiac storage diseases often requires multiple imaging techniques to make a precise diagnosis.

Lysosomal storage disorders comprise a group of diseases caused by a deficiency of lysosomal enzymes, membrane transporters or other proteins involved in lysosomal biology. Cardiac disease is particularly important in lysosomal glycogen storage diseases (Pompe and Danon disease), mucopolysaccharidoses and in glycosphingolipidoses (Fabry disease). Various disease manifestations may be observed including hypertrophic and dilated cardiomyopathy, coronary artery disease and valvular disease.

Echocardiography can detect the first signs of myocardial damage in patients with Fabry cardiomyopathy. Cardiac magnetic resonance (CMR) with late gadolinium enhancement (LGE) may be useful in the non-invasive recognition of myocardial fibrosis, in the context of cardiac involvement of Fabry disease.

In glycogen storage disease echocardiography demonstrates increased LV mass and wall thickness although LV systolic function is preserved. It is the standard method to evaluate the cardiac response to enzyme replacement therapy. A diagnosis of Danon disease is confirmed by endomyocardial biopsy results.

Iron overload cardiomyopathy (IOC) is a secondary form of cardiomyopathy resulting from the accumulation of iron in the myocardium. IOC has been described as a dilated cardiomyopathy, characterized by left ventricular (LV) remodeling with chamber dilatation and reduced LV ejection fraction. The method of choice for assessing IOC is cardiac magnetic resonance, which allows tissue characterization including quantification of myocardial iron overload. Echocardiography is a useful modality in the follow-up of IOC patients.

Coronary Revascularisation – How do You Improve the “Gold Standard”?

Dr. med. Martins Kalejs

*Pauls Stradiņš Clinical University Hospital,
Department of Cardiac Surgery, Latvia*

Coronary artery bypass grafting (CABG) surgery has a long history dating back to 1960s when the first procedures using the greater saphenous vein and slightly later also internal mammary artery as graft material were performed. Since then it has been one of the best studied medical procedures in history with well known, very good long-term results in treating coronary heart disease.

After appearance of percutaneous transluminal coronary angioplasty (PTCA) these two techniques have been continuously compared. There have been numerous improvements to PTCA both technological and procedural, on the contrary in the last two or even three decades there hasn't been any significant progress in the CABG procedure. Nevertheless, up to now CABG demonstrates a significant long-term benefit compared to PCI in treating coronary heart disease especially in patients with more progressed and more complex disease. These results are also reflected in the current European and American guidelines. Still there is a growing knowledge that there are improvements to be implemented on a routine basis to even more improve the CABG procedural outcomes. Some of these improvements are more technological, like endoscopic graft material harvesting and some are more ideological, like total arterial revascularisation – usage of exclusively arterial graft material and use of bilateral internal thoracic arteries.

This talk presents the current knowledge from trials on the improvement of CABG surgery safety and short and long-term results when using bilateral internal mammary arteries, total arterial revascularisation, endoscopic graft harvesting, off-pump techniques and minimally invasive surgery.

Maximal Strength Training for Breast Cancer Patients Undergoing Adjuvant Treatment

*Rūdolfs Cešeiko*¹; *Dr. med. Signe Tomsone*²;
*Prof. Aivars Vētra*²; *Andrejs Srebnijs*³; *Mihails Timofejevs*³;
*Egils Purmalis*³; *Prof. Jānis Eglītis*³

¹ *Rīga Stradiņš University, Doctoral study program "Medicine" Ph.D. candidate, Latvia;*

² *Rīga Stradiņš University, Faculty of Rehabilitation, Latvia;*

³ *Rīga East University Hospital, Oncology Centre of Latvia, Department of Breast Surgery*

Objectives

Breast cancer (BC) patients lose muscle strength during adjuvant treatment, thus affecting physical functioning. Maximal strength training (MST), improves maximal strength and walking efficiency. However, the effect of MST for BC patients undergoing treatment remains elusive.

The aim of this study was to examine the feasibility and effects of such training in BC patients during clinical treatment on maximal muscle strength and functional performance.

Methods

Thirty patients (46 ± 9 yr) with stage I-III BC were randomized to training group (TG) or control group (CG). TG performed MST twice a week for 3 months and CG followed prescribed BC treatment without strength training. TG performed four sets of four repetitions (4 × 4) of dynamic leg press with an emphasis on the maximal mobilization of force in the concentric action and with a progressively adjusted intensity corresponding to 85–90% of one repetition maximum (1RM).

Results

After the MST period, TG displayed significant 25 ± 7 kg (23%) increase in leg press 1RM ($p = 0.001$). The strength improvements led to a significant increase in 6 Minute Walk distance (8%), 30-second chair test (23%), Stair Climb test (17%), and to a significant increase in walking performance of (8%) measured on an incremental treadmill test to exhaustion.

In 3 months' post-test CG displayed significant 10 ± 8 kg (9%) decrease in 1RM ($p = 0.006$). Reduced muscle strength led to a significant decrease in 6 Minute Walk distance (6%), 30-second chair test (14%), Stair Climb test by (8%), and walking performance reduced significantly by (17%). Significant changes from pre to 3 months' post-test were observed between TG and CG in all functional performance measured variables. Maximal strength training was feasible during treatment and increased maximal muscle strength in BC patients. Increased strength led to improved functional performance after 24 training.

STAT5 Transcription Factor is Retained in Cytoplasm in B-cells of Patients with Chronic Lymphocytic Leukemia

*Ph.D. Elena Kashuba; Ph.D. Larysa Kovalevska;
Alina Matvieieva*

*R. E. Kavetsky Institute of Experimental Pathology,
Oncology and Radiobiology of NASU, Ukraine*

Objectives

The aim was to find out the cause of inhibition of the IL2-STAT5 signaling pathway in chronic lymphocytic leukemia (CLL) cells.

Methods

CLL cells were isolated from peripheral blood, using gradient centrifugation on a ficoll-verografin mixture. Expression of STAT1-6 genes at the mRNA level was analyzed, using the OncoPrint database. Expression, phosphorylation status and cellular localization of the STAT5 protein were studied by fluorescence microscopy, using specific antibodies and by the western blot analysis.

Results

Unlike B-cells of healthy donors, expression of the STAT5A protein was low in patient CLL cells. As we have previously shown, the IL-2-STAT5 (JAK-STAT5) signaling pathway is inhibited in CLL cells. Now we demonstrated a low level of phosphorylation of the STAT5 protein, or a complete lack of phosphorylation in CLL cells. The STAT5A protein shows cytoplasmic localization, indicating the absence of complexes in the nucleus that activate / repress transcription of the STAT5-dependent genes.

Conclusions

Inhibition of the IL-2-STAT5 pathway in CLL cells is due to lack of STAT5 proteins phosphorylation and / or absence of the active STAT5A transcription complexes in the nucleus of CLL cells.

Non-Invasive Multispectral Skin Cancer Screening Method

*Marta Lange*¹; *Emilija Vija Plorina*¹;
*Aleksandrs Derjabo*²; Prof. *Janis Spigulis*¹

¹ *University of Latvia, Biophotonics Laboratory,
Institute of Atomic Physics and Spectroscopy;*
² *Riga East University Hospital, Oncology Centre of Latvia*

Objectives

Skin cancer is the most common type of cancer. Quick and reliable screening allows discovering the cancer at early stage. Here we show the non-invasive tool that can be useful for dermatologists and primary care physicians.

Methods

Typically, skin cancer patients are first examined by a family-doctor and then referred to a dermatologist for specific diagnosis and therapy. The device can be utilized as a screening tool for immediate diagnostics to establish a clinical decision, as well as to create a visual archive.

Skin lesions consist of different chromophores, for each malformation the absorption spectrum is different. To detect it, there is 5 MpixIDS camera and LEDs arranged in a ring in the device. Light sources include 3 narrow bandwidth light-emitting-diodes (LEDs) (wavelengths (λ): green (525 nm), red (660 nm) and infrared (940 nm)) for diffuse reflectance, as well as 405 nm LED to induce skin autofluorescence (AF), and a white broad spectrum LED (T = 6000 K) for visual archive.

Results

In total > 210 patients have been screened and 1130 images acquired so far in Oncology Centre of Latvia. Currently, it is possible to distinguish different skin cancers, including malignant melanoma (MM), from benign lesions, such as seborrheic keratosis and pigmented nevi with specificity close to 100%. Moreover, it is capable of the assessment of post-operative scars to evaluate possible cancer recurrence by comparing the AF signal of the scarred tissue.

Conclusions

We believe this tool will not only help the specialists evaluate the suspicious lesions, but also help to see the changes in moles over time, evaluate post-operative scars, as well as provide a visual image archive of patient's moles. With the increasing rate of MM and non-melanoma cancer worldwide, it is essential to diagnose it as early as possible, and with this screening method it is possible already at primary healthcare level.

Acknowledgements

This work was supported by grant "Portable Device for Non-contact Early Diagnostics of Skin Cancer" (No. 1.1.1.1/16/A/197).

Expression of Dickkopf-Related Protein 1 and Evidence of Osteolysis in Multiple Myeloma Patients

*Dr. Daiga Auziņa*¹; *Iveta Beinaroviča*²;
*Dr. Brigita Janicka-Kupra*³; *Dr. med. Sandra Lejniece*³;
*Prof., Dr. habil. med. Valērija Groma*⁴; *Prof. Aivars Lejnietis*⁵

¹ Rīga Stradiņš University, Department of Internal Diseases, Latvia;

² Rīga Stradiņš University, Latvia;

Rīga East University Hospital, Latvia;

³ Rīga Stradiņš University, Latvia;

Rīga East University Hospital, Oncology Centre of Latvia;

⁴ Rīga Stradiņš University, Department of Morphology, Latvia;

⁵ Rīga Stradiņš University, Department of Internal Diseases, Latvia;

Rīga East University Hospital, Latvia

Objectives

Multiple myeloma (MM) is a multifactorial disease, which shows increase in the incidence worldwide. Recently, an important link between dickkopf-related protein 1 (DKK1) and osteolytic process has been established. The secreted DKK1 regulates bone biology by inhibiting osteoblasts and by activating osteoclasts. This study aimed assessment of DKK1 expression using immunohistochemistry in newly diagnosed MM patients, correlating these data with the formation of osteolytic bone lesions.

Methods

49 patients from Riga East University Hospital, Oncology Centre of Latvia, with newly diagnosed MM, were enrolled in the study between June 2014 and June 2016. All MM subjects fulfilled World Health Organization criteria for the disease. Salmon-Durie staging system for MM was used. Bone marrow biopsy specimens (n = 49) were obtained from all patients with primary diagnosed MM. Immunohistochemistry was performed conventionally using polyclonal rabbit anti-human DKK1 antibody (1:20). The expression of DKK1 in plasma cells was estimated semiquantitatively. The valid statistical data were processed using SPSS 23.0. Correlation between antigen expression and clinical data was studied by X2 statistics. p values of < 0.05 were considered significant.

Results

The median age of MM subjects was 67.35 years (SD 11.9). Patients were subdivided into two groups – subjects with and without osteolytic bone lesions. In osteolysis patients, the most common group presented as IIA (90.3%), whereas in non-osteolysis – as IA (44.4%). Severe bone lesions were confirmed in 57.1% of patients. Weak (1–10%) DKK1 expression was found in 46.9%, whereas moderate (11–50%) and strong (51–100%) in 26.5 and 20.4% of patients, respectively. Distribution of DKK1 scores in the patients groups revealed statistically significant differences (X² = 38.65; p < 0.001). Strong correlation between DKK1 expression and osteolytic bone loss was found (r = 0.86; p < 0.001).

Conclusions

DKK1 is overexpressed in MM plasma cells, especially in patients with severe bone damage contributing to the regulation of osteoblast / osteoclast functioning and osteolysis of bone.

Approaches for Patient-Derived Breast Cancer Cell Cultivation (2D and 3D Cultures)

Prof. *Inese Čakstiņa*¹; Ph.D. *Valdis Pirsko*¹; *Dina Nitiša*¹;
Prof. *Zanda Daneberga*¹; Prof. *Jānis Gardovskis*²

¹ *Rīga Stradiņš University, Institute of Oncology, Latvia;*

² *Rīga Stradiņš University, Department of Surgery, Latvia*

Objectives

Development of new anti-cancer medicines, diagnostic approaches and biomarkers heavily relies on the experimental cancer models, including cancer cell culture in vitro. 3D culture methods (e.g., spheroid or mammosphere approach and organoid approach) gradually replace traditional 2D adherent breast cancer cell culture to improve efficiency of the primary tumour propagation and to enhance retention of the primary tumour features in the model system in vitro. The study is conducted to adapt the 3D breast cancer organoid cultivation method for future applications in chemo-resistance studies in patient-derived organoid material.

Methods

Organoid culture from breast cancer cell line MDA-MB-231 was developed according to the protocol by Sachs et al., 2018, briefly – cells were plated in adherent BME (growth factor reduced basal membrane extract type 2) drops and overlaid with BC organoid culture medium (advanced DMEM/F12 with the supplementation of R-spondin 3, neuregulin 1, FGF7, FGF10, EGF, Noggin, AB83-01, Y-27632, SB202190, B27 supplements, N-acetylcysteine, nicotinamide, HEPES, primocin). Organoid cultures were passaged every 1–4 weeks by mechanical and enzymatic dissociation. Nucleic acids from organoid and 2D cultures were isolated using TRI reagent. The expression of embryonic stem cell markers (POU5F1, SOX2, and NANOG) and cell adhesion markers (CDH1, ITGB3, ITGB1, ITGA6) were performed using real-time PCR.

Results

Preliminary analysis of embryonic stem cell marker transcriptomic expression levels showed slight alterations between 2D and 3D cultures. The expression levels of cell adhesion markers were higher in 3D organoid culture.

Conclusions

The 3D organoid cultures were successfully developed using breast cancer cell line MDA-MB-231 showing differential gene expression levels in comparison to 2D cultures. Next steps include the application of 3D organoid culture method to develop patient-derived breast cancer organoids for further application towards personalized medicine.

Effect of Chronic Mild Hypoxia on DNA Repair and Cell Cycle Regulation in HER2-Enriched Breast Cancer Cell Line

*Dina Nitisa; Ph.D. Valdis Pirsko;
Marta Priedite; Ph.D. Svetlana Vorslova;
Prof. Inese Cakstina; Prof. Zanda Daneberga*

Rīga Stradiņš University, Institute of Oncology, Latvia

Objectives

Tumour hypoxia has been associated with enhanced chemoresistance and metastatic potential. The present study was conducted to determine the effects of chronic mild hypoxia on the expression of DNA damage response (DDR) and cell cycle regulation related genes in HER2-enriched breast cancer cell line. Indications of dysregulation of cell cycle or decreased cell capacity to repair damaged DNA in hypoxic conditions would suggest an increased genetic instability underlying the development of more aggressive cancer phenotype.

Methods

HER2-enriched breast cancer cell line SK-BR-3 was cultured in chronic mild hypoxia (2% O₂) for four passages. Normoxic (20% O₂) cells were employed for control. Gene transcriptomic expression was determined by quantitative real time PCR. Proteins were subjected to filter aided sample preparation method with trypsin and subsequently analyzed by liquid chromatography–mass spectrometry.

Results

Out of 46 genes that were studied, genes involved in DDR and telomere maintenance were consistently downregulated in all hypoxic passages. The only gene consistently upregulated in all hypoxic passages was TP53, whose product is a mutant protein p53-R175H. Expression of mitotic G₂/M transition checkpoint and hypoxic response related genes remained unchanged in chronic mild hypoxia. Variation in gene expression was observed among different hypoxic passages and biological replicates. Protein analysis was of poor sensitivity and reproducibility, and only 15% of the analyzed proteins were highly variably detected among technical replicates.

Conclusions

In SK-BR-3, mild hypoxia in long-term does not induce genes associated with the response to moderate or severe hypoxia (ARNT, EPAS1). In response to hypoxic conditions, SK-BR-3 cell line is able to transcriptionally activate TP53. Upregulation of genes involved in metaphase, anaphase and cytokinesis (CENPA, PLK1, PRC1) and downregulation of genes involved in DDR and telomere organization (PARP1, RAD50, RNF168, TERT) under hypoxic conditions could contribute to an enhanced genetic instability, leading to a more aggressive breast cancer phenotype.

Telomere Length and TP53 Gene in Benign Prostatic Hyperplasia Patients

*Ph.D. Egija Zole*¹; *Dr. Edgars Baumanis*²; *Dr. Rolands Dāle*²;
*Dr. Andrejs Leiše*²; *Prof. Vilnis Lietuvietis*²; *Dr. Renāte Ranka*³

¹ *Latvian Biomedical Research and Study Centre, Latvia;*

² *Rīga East University Hospital, Latvia*

³ *Rīga Stradiņš University, Department of Pharmaceutical Chemistry*

Objectives

There are studies showing controversial results about telomere length (TL) in benign prostatic hyperplasia (BPH) patients. In some cases samples have shorter telomeres than normal tissue, in others – longer. Also, the role of TP53 gene is still largely unclear, as there are not so many studies about it, plus the results of these studies vary. There are proves that telomeres and p53 protein are connected in the regulation of the cell faith. The aim of this study was to investigate changes of TL and TP53 gene polymorphisms in BPH patients.

Methods

Blood and prostate tissue samples of thirty BPH patients, and forty-seven blood samples of the healthy control group were used; an average age was 72 years. Five DNA samples of prostate cancer tissue were used as a positive control for SYBR green qPCR telomere assay. Sanger sequencing was used for TP53 gene analysis. Ethics Committee permission No. 01-29.1/3.

Results

The results showed that BPH blood samples had longer telomeres than the healthy control group's blood samples ($p = 0.0129$), and TL was more scattered in BPH samples in comparison to controls. After comparing BPH prostate tissue and prostate cancer tissue samples, the last had longer telomeres ($p = 0.0049$). For BPH patients TL was longer in prostate tissue than blood ($p < 0.0001$). Eleven exons of the TP53 gene were sequenced for the BPH prostate tissue and control group samples. The only mutation was found in exon 4, rs7676154C > G. Among BPH patients only 1 (3.1%) had WT (wild type) sequence, 14 (43.8%) had heterozygotic variant and 17 (53.1%) had homozygotic variant. To test if this mutation is population specific SNP, all the healthy control group was sequenced, and only 4 (8.5%) had WT sequence, 19 (40.4%) had heterozygotic variant and 24 (51.1%) had homozygotic variant. Heterozygotic or homozygotic variant did not influence TL.

Conclusions

In conclusion, blood samples of the BPH patients had longer telomeres than healthy control group. No mutations associated with BPH in TP53 gene were found in our sample cohort.

Implementation and Improvement of Molecular Diagnostics of Polycythemia Vera in Latvia

*Dr. Zane Dobele*¹; *Dr. Brigita Janicka-Kupra*²;
*Dr. Kristine Bernate*³; *Dr. Ludmila Belajeva*²; *Dr. Karina Mikuda*²;
*Dr. Larisa Zarina*²; *Dr. Dmitrijs Rots*¹; *Anna Inese Tutane*¹;
*Dr. med. Sandra Lejniece*³; *Dr. med. Linda Gailite*¹

¹ *Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia;*
² *Rīga East University Hospital, Clinic of Chemotherapy and Haematology, Latvia;*
³ *Rīga East University Hospital, Clinic of Chemotherapy and Haematology, Latvia;*
Rīga Stradiņš University, Department of Internal Diseases, Latvia

Objectives

JAK2 gene allele V617F and exon 12 allelic variations have been presented as major diagnostic criteria for polycythemia vera (PV). In the last two years we have successfully introduced V617F and CALR gene testing for patients with BCR-ABL negative myeloproliferative neoplasms (MPN), but currently our aim was to improve molecular diagnostics of JAK2 gene analysis for PV patients.

Methods

A total of 291 patient samples were sent to Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics for the analysis of the most common MPN genetic causes. Only 175 of them were confirmed as MPN and classified in four groups: PV (n = 86), essential thrombocythemia (ET; n = 23), primary myelofibrosis (PMF; n = 15) and unclassifiable MPN (n = 51). JAK2 gene allele V617F and indels in 9th exon of CALR gene was analyzed for all MPN patients by using qPCR and fluorescent fragment length analysis, respectively. Sanger sequencing was used for JAK2 exon 12 screening that was performed only for patients who presented as JAK2 V617F-negative PV.

Results

Three patients initially diagnosed with PV were excluded from the PV group based on allelic variations that were found in CALR gene, which are typical only in ET and PMF groups. From all other PV patients allele V617F was found for 69 (83%) patients. In one patient among V617F-negative patients allele F537-F547dup11in exon 12 of JAK2 gene was found. In the group of PV 12% were negative for performed genetic testing.

Conclusions

Results show high number of unclassifiable MPN and V617F-negative PV patients. Three patients were misdiagnosed having PV before molecular testing, therefore proving the usefulness of genetic testing also for differential diagnostics.

As still there are many patients who lack any molecular findings in analyzed genes, there is a need for improvement of sensitivity of used methods as well as introduction of MPL gene analysis in routine molecular testing of MPN.

HER2-Positive Breast Cancer Gene Expression Influenced Pathway Analysis

*Elza Kuzņecova*¹; Prof. *Zanda Daneberga*²;
*Dr. Miki Nakazawa-Miklaševiča*²; *Egija Berga-Švītiņa*²;
*Ph.D. Valdis Pirsko*²; Prof. *Edvīns Miklaševičs*²;
Prof. *Arvīds Irmejs*²; *Dr. med. Jeļena Maksimenko*²

¹ Rīga Stradiņš University, Institute of Oncology, Latvia;

² Rīga Stradiņš University, Institute of Oncology, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia

Objectives

Overexpression of HER2-receptor in tumours, including breast cancer is associated with a poorer prognosis in terms of both relapse-free interval and overall survival. HER2-receptor regulates cell growth, survival, and differentiation via multiple signal transduction pathways therefore playing crucial role in tumorigenesis. Study aim was to identify differentially expressed genes in HER2-positive vs. HER2-negative and how these genes influence different pathways, which might be crucial for HER2-positive breast cancer pathogenesis.

Methods

12 patients with confirmed diagnosis of breast cancer and tumour tissue samples available in Institute of Oncology were included in the study. RNA was isolated from fresh frozen tissue samples using Direct-zol™ RNA MiniPrep (Zymo Research). For RNA NGS analysis cDNA libraries from RNA were constructed using TruSeq Stranded mRNA Library Preparation kit (Illumina) and then hybridised on flow cell using TruSeqPE Cluster Kit v3-cBot-HS (Illumina), followed by NGS sequencing with TruSeq SBS Kit v3-HS (Illumina). For processing of sequencing result CLC genomic workbench was used. Pathway analysis was performed with the help of IPA (Ingenuity pathway analysis) software.

Results

Analysed groups of HER2-positive and HER2-negative revealed 29 differentially expressed genes (Bonferroni $p < 0.01$). The main molecular pathways up- or downregulated for HER2-positive group involved cell signalling, cell death and apoptosis, cellular movement and inflammatory response.

Conclusions

Upregulated cellular movement may involve higher metastasis risk in patients with HER2 receptor overexpression. Silencing of some molecules from the influenced pathways, such as FN1 expression silencing has been linked to key mechanisms underlying metastatic behaviour, downregulated collagen 1 reflects invasive BC phenotype and tissue remodelling, also upregulated fibrin / fibrinogen is associated with inflammatory host response that disturbs the haemostatic balance.

Willebrand Factor Multimer Assay as a More Accurate Diagnostic Tool for Distinguishing between Von Willebrand Disease Types

Dr. Dārta Balode¹; Dr. Marika Pikta²; Dr. med. Sandra Lejniece¹

*¹Rīga Stradiņš University, Latvia;
Rīga East University Hospital, Latvia;*

²North Estonia Medical Centre Foundation, Tallinn University of Technology, Estonia

Objectives

The aim was to evaluate the distribution of patients between different diseases types, including low von Willebrand factor (VWF) group. And to assess the Latvian VWD patient distribution by disease types using semi-automated VWF multimer assay that is a new diagnostic tool and for now isn't available in Latvia.

Methods

Patients from Riga East University Hospital who were registered with VWD diagnosis between January 2012 and December 2017 were analyzed. To assess patient VWD type, first VWF activity to antigen ratio (VWF: Ac/Ag) was calculated, then in a part of patient samples VWF multimer levels were measured by gel electrophoresis.

Results

From 94 patients registered, 43 patients had VWD and 23 had low VWF. From 43 VWD patients, 7 (16.28%) had VWF: Ac/Ag > 0.6 and were classified as type 1; 22 (51.16%) had VWF: Ac/Ag < 0.6 and were classified as type 2, but 1 (2.33%) patient was classified as type 3, because his coagulation factor VIII levels, VWF activity and antigen were below 10%. For 15 patients their disease type was checked using VWF multimer assays (8 patients with type 1, 6 with type 2 and 1 with type 3). Of the 8 patients who were originally diagnosed as type 1 disease, only 2 were classified as type 1 with multimer assay, the remaining six had type 2 disease. For both type 2 and type 3, in all cases originally diagnosed types were confirmed.

Conclusions

If the VWF: Ac/Ag ratio is below 0.6 that most likely suggests type 2 VWD, but VWF: Ac/Ag ratio above 0.6 appears not to be diagnostic for type 1 VWD in all cases. It would be desirable for VWF multimer assays to be available to all VWD patients to classify their disease type.

Influence of MRPS18-2 Protein Levels on Migration and Invasion of Cancerous Endometrial Cells

*Ph.D. Larysa Kovalevska; Dr. Lubov Buchynska;
Dr. Elena Kashuba*

*R. E. Kavetsky Institute of Experimental Pathology,
Oncology and Radiobiology of NASU, Ukraine*

Objectives

The aim of the study was to monitor migratory and invasive ability of endometrial cancerous cells upon ectopic expression of mitochondrial ribosomal protein S18-2.

Methods

Cell transfections, cloning, a Wound healing assay, a trans-well assay, an immunofluorescent analysis, a bioinformatic analysis of the publicly open databases.

Results

Enhanced expression of the S18-2 protein led to decrease in E-cadherin and beta-catenin signals with simultaneous increase in vimentin and N-cadherin signals. Also, sublines of HEC-1, KLE and RL95-2 that expressed the S18-2 protein constitutively, showed higher invasive ability in the trans-well assay with the use of matrigel. Migratory ability of cells of such sub-lines was higher in the trans-well and the wound-healing assays as well. Earlier, we have shown, that in prostate cancer cells, S18-2 overexpression results in epithelial-to-mesenchymal cell transition (EMT), due to induction of CXC4 at the mRNA and protein levels and downregulation of E-cadherin.

Conclusions

The MRPS18-2 protein levels increase the migratory and invasive ability of cancerous endometrial cells, due to induction of epithelial-to-mesenchymal cell transition.

Prognostic Indicators in Chronic Lymphocytic Leukemia

*Ph.D. Alla Rivkina¹; Ph.D. Irina Holodnuka²;
Ildze Ventina²; Irina Spaka²; Dr. Marina Soloveicika¹;
Prof. Modra Murovska²; Dr. med. Sandra Lejniece¹*

¹ *Rīga East University Hospital, Clinic of Chemotherapy
and Haematology, Latvia;*

² *Rīga Stradiņš University, A. Kirchenstein Institute
of Microbiology and Virology, Latvia*

Objectives

Chronic lymphocytic leukemia (CLL) is characterized by an expansion of leukemic mature-like B cells with bone marrow infiltration and accumulation of leukemic cells in the blood and secondary lymphoid organs. This neoplasm has a heterogeneous clinical outcome with some cases having a stable disease and requiring no treatment, and others – expressing a rapid progression and short survival time. We have previously showed that CCR1 and CCR2 are up-regulated in activated B cells. The expression levels of ZAP-70 and CD38 (an activation marker) in leukemic cells predict time to the CLL progression. The reduced numbers of the CD3/CD4/ CD16+56 T cells correlated with the increased expression of ZAP-70 and CD38 on B cells. Also, in the same group of patients, the chemokine receptors CCR1 and CCR2 were determined on CD19+CD5+ cells.

The aim of this study was to analyze the cell-surface expression of ZAP-70 and CD38 in PB lymphocyte populations of untreated CLL patients, to define the progression variants and correlate them with the CCR1 and CCR2 expression.

Methods

The group of CLL patients was diagnosed at Riga East University Hospital (REUH). The patients' information and consent forms have been approved by the Central Ethics Committee at REUH. For diagnostic we used the FC500 (Beckman Coulter) and FACSriaIII (Becton Dickinson) analyzers.

Results

Evolutionary analysis of the subgroups revealed that is correlated with the expression of ZAP-70 and CD38. Statistical analysis of our data showed that 75% of patients with positive CD38 and ZAP-70 contained chemokine receptors CCR1 and CCR2 on CD19+CD5+ cells. Their frequency was linked to the progressive outcome.

Conclusions

Altogether, our data characterize different variants of CLL. The data could represent a therapeutic target and help to estimate the rate of progression of the disease.

Detection of Chemokine Receptors CCR1 and CCR2 in Peripheral Blood Lymphocyte Sub-Populations of Patients with Chronic Lymphocytic Leukemia Using Multi-Parameter Flow Cytometry

*Laura Hippe*¹; *Ph.D. Alla Rivkina*²; *Dr. Marina Soloveicika*³;
*Ildze Ventina*¹; *Jelena Pavlova*¹; *Prof. Modra Murovska*¹;
*Dr. med. Sandra Lejniece*²; *Ph.D. Irina Holodnuka*¹

¹ Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia;

² Rīga East University Hospital, Clinic of Chemotherapy and Haematology, Latvia;

Rīga Stradiņš University, Faculty of Medicine, Department of Internal Diseases, Latvia;

³ Rīga East University Hospital, Clinic of Chemotherapy and Haematology, Latvia

Objectives

The status of the immune system defines the course and outcome of the chronic lymphocytic leukemia (CLL) disease. The aim of the study was to develop the 12-color multi-parameter flow cytometry (mFC) method, using the BD FACS AriaIII system, for the assessment of the immune cells in the peripheral blood (PB) of patients with CLL.

Methods

The patients were diagnosed at Riga East University Hospital (REUH, Latvia) using the Rai staging system and clinical flow cytometry test. The consent forms and patients' information were approved by the Central Ethics Commission at REUH. The assessment of the following markers was included in the 12-color mFC analysis: CD19, CD5, CD14, CD27, CD3, CD4, CD8, CD56, CD127, CD25, CD38, CD191 (CCR1), and CD192 (CCR2).

Results

Earlier, we have demonstrated for the CLL patient cohort (64 untreated patients), using the 6-color mFC protocol, that the cell-surface expression of CCR1 and / or CCR2 on leukemic cells correlated with expression of the prognostic marker CD38. The elaborated 12-color mFC method allows the simultaneous identification of the PB lymphocyte sub-populations and their activation states.

Conclusions

Evaluation of the immune system status helps to identify the CLL patients with the high risk for the disease progression and thus select the appropriate chemotherapy regimen. The study was conducted in the frame of the Latvian Council of Science research project No Izp-2018/1-0156.

Impact of Hypoxia on Chemoresistance in Breast Cancer Cell Lines

*Ph.D. Valdis Pirsko*¹; Prof. *Inese Čakstiņa*¹; *Dina Nitiša*¹;
Prof. *Zanda Daneberga*¹; Prof. *Edvīns Miklaševičs*²

¹*Rīga Stradiņš University, Institute of Oncology,
Laboratory of Molecular Genetics, Latvia;*

²*Rīga Stradiņš University, Institute of Oncology, Latvia*

Objectives

Increased levels of hypoxia in tumours correlate with genetic instability, tumour progression, and radio and chemoresistance, all leading to poor clinical outcome, treatment failure and disease recurrence. Hypoxia induced increase in chemoresistance has been related to various pharmacokinetic, cellular and microenvironmental factors, including altered proliferation rates, drug transport changes, increased activity of HIF signalling, and the expansion of cancer stem cell (CSC) fraction. The aim of the study was to explore the impact of prolonged mild hypoxia on the development of chemoresistance in breast cancer cell lines.

Methods

Breast cancer cell lines MDA-MB-231 and SK-BR-3 were cultured in 2% O₂, 5% CO₂ atmosphere for at least 3 passages. Proliferation rate, growth rate adjusted sensitivity to chemotherapeutic agents (doxorubicin, paclitaxel, etoposide, 5-fluorouracil, gemcitabine), expression of ABC transporters (incl. multiresistance proteins) and cancer stem cell markers was measured after each passage. Chemosensitivity was determined by immunofluorescent viability / cytotoxicity assay. The transcriptomic expression of ABC transporter and CSC marker genes was measured by quantitative polymerase chain reaction, the proteomic expression of several CSC markers was measured also by immunofluorescence microscopy.

Results

Proliferation rate of both cell lines decreased during initial passages, and partially restored during further culturing. The alterations of sensitivity to the chemotherapeutic agents and changes in the expression levels of various ABC transporter genes were variable and displayed different patterns for different chemotherapeutic agents and in each cell line. Hypoxia increased resistance to some chemotherapeutic agents in both cell lines. Hypoxia resulted in increased both transcriptomic expression of CSC marker genes, and fraction of cells corresponding to CSC phenotype.

Conclusions

The adaptation of breast cancer cell lines to chronic mild hypoxia results in increased chemoresistance. The impact of chronic mild hypoxia on the expression of ABC transporter genes is variable (implying stochasticity). Chronic mild hypoxia results in increased proportion of CSCs.

Autologous Hematopoietic Stem Cell Transplantation in Plasma Cell Disorders: 12 Years Experience in Hematology Centre of Latvia

*Dr. Ilze Trociukas; Dr. Brigita Janicka-Kupra;
Dr. med. Sandra Lejniece*

*Riga East University Hospital, Latvia;
Rīga Stradiņš University, Latvia*

Objectives

Worldwide more than 1 million stem cell transplantations has been done. High-dose chemotherapy followed by autologous stem cell transplantation (ASCT) is the standard care in plasma cell disorder patients, who are fit and under 65 years of age. Although ASCT is not curative, event-free survival and overall survival (OS) are prolonged compared to treatment with standard dose treatments alone.

The aim of this study is to analyze the experience of the transplantation centre in Latvia.

Methods

It is retrospective, descriptive cross-referential research. 68 patients who underwent ASCT for plasma cell disorders at Riga East University Hospital, Transplantation department, following Melphalan conditioning between January, 2006 and December, 2018 were retrospectively analyzed. All patients had adequate stem cell collection and met all the eligibility criteria of the ASCT. For multiple myeloma (MM) staging Durie-Salmon system has been used. Complete remission and partial remission has been defined by International Myeloma Working group criteria.

Data were processed, using MS Excel and SPSS 23.0.

Results

Research comprises 68 patients, of them 2 patients with amyloidosis, 2 patients with nonsecretory MM, and 64 patients with MM. The median age at transplant was 49.65 years (SD 8.327), median waiting time until ASCT 10.8 months (SD 8.6). MM clinical stage at the ASCT were as follows: IIIA - 35.3%, IIA - 29.4%, IIB - 16.2%, IIIB - 8.8%. A total of 42 patients were transplanted in complete response and partial response. 26 patients underwent transplantation with nonresponding disease and with disease progression. The median stem cell harvesting episode count was 1.74 (range 1-5) and the median number of infused CD34+ cells $4.03 \times 10^6/\text{kg}$. The median time for engraftment - neutrophils 10.6 days (SD 1.7), platelets 11.8 days (SD 3.1) At the December 2018 32.4% of transplanted patients were died. After ASCT complete and partial remission has been achieved in 73.5%.

Conclusions

Autologous stem cell transplantation is safe, effective treatment option and available option for multiple myeloma patients in Latvia and these data are comparable to other studies.

Fluorescent Probes in Membranes of Fibroblasts and Melanoma Cells

*Inta Kalnina*¹; *Ph.D. Dace Pjanova*¹; *Ilze Leve*²; *Jelena Kirilova*³

¹ *Latvian Biomedical Research and Study Centre;*

² *Rīga Stradiņš University, Latvia;*

³ *Daugavpils University, Latvia*

Objectives

Cell surface membranes differ between normal and cancer cells. Fluorescent probes have shown to be excellent tools for the characterization of different membranes. The aim of this study was to analyze the localization of ABM (benzatrone derivate) probe in the cell as well as to characterize spectral parameters of the probe in different cells and different cellular compartments.

Methods

Two different cell lines were used, Hs-68 (normal fibroblasts) and SK-MEL 28 (melanoma cells). Cells were grown in DMEM medium supplemented with fetal bovine serum and antibiotics. When cells reached 90% confluency, they were stained with the ABM probe by adding 19.6 µmol/l of probe directly to the medium. Leica SP8 Laser scanning confocal microscopy was used to obtain the pictures of cells as well as to perform spectral measurements of the attached probe.

Results

In the cell, the ABM probe is mainly localized in the cytoplasmic membrane as well as in the cytoplasm of the cell (in the membranous cell compartments like Golgi and endoplasmic reticulum). In SK-MEL 28 cells higher concentration of ABM probe was observed in the cytoplasmic membrane compared to Hs-68 cells. Spectral measurements also showed the spectral shift of ABM probe to the shorter wavelengths in melanoma cells compared to fibroblasts (max 620 nm in fibroblasts and max 600 nm in melanoma cells). This spectral shift was mainly attributed to the spectral changes in the cytoplasmic membrane of cells and indicates a more rigid lipid environment in the SK-MEL 28 cell line that might be associated with the migration potential of these cells.

Conclusions

Obtained data confirm the applicability of the ABM probe to monitor the changes in physico-chemical properties of lipid membranes as well as show that ABM probe is able to detect differences between cytoplasmic membranes of normal fibroblast and melanoma cells.

Bladder Cancer Incidence Trends in Latvia in 1990–2017

*Dr. Ērika Bitiņa-Barlote*¹; *Dr. med. Juris Plonis*²;
*Dr. med. Vinita Cauce*³; *Prof. Egils Vjaters*²;
*Prof. Jānis Gardovskis*⁴; *Prof. Edvīns Miklaševičs*²

¹ *Pauls Stradiņš Clinical University Hospital, Center of Urology, Latvia;*

² *Rīga Stradiņš University, Institute of Oncology, Latvia;*

³ *Rīga Stradiņš University, Statistical Laboratory, Latvia*

⁴ *Rīga Stradiņš University, Department of Surgery, Latvia*

Objectives

The aim of the study was to evaluate bladder cancer (BC) incidence trends in Latvia over the past 28 years.

Methods

Retrospective study included 9589 patients, who were diagnosed with BC between January 1990 and December 2017. Data were taken from the Register of Latvian Centre for Disease Prevention and Control. The research data were analyzed for the incidence of BC, according to patients' gender and age. Data was analyzed using Microsoft Excel 2017, SPSS version 22 and Joinpoint version 4.6.0.0.

Results

The study included 9589 patients diagnosed with bladder cancer. Average age of 68.8 (SD 11.5) years, gender ratio 3:1 (men vs. women). Comparing the initial period (1990–1992) with the other (2015–2017), the mean age of patients at the time of diagnosis was statistically significantly changed from 67 to 71 ($p < 0.001$). Comparing these two periods, the mean age in men was significantly increased (66 to 70 years, $p < 0.001$), which was not observed in women (72 to 73 years). The standardized incidence rates (per 100 000) increased from 6.8 in 1990 to 10.8 in 2017, while the crude incidence rates increased from 9.8 in 1990 to 21.7 in 2017. Both genders experienced an increase (per 100 000) in crude incidence (men, 16.8 in 1990 to 35.5 in 2017 vs. women, 3.7 in 1990 vs. 10.0 in 2017) throughout the study period. Analyzing crude incidence trends, statistically significant increases are observed between 1990 and 2014 at an APC of 4.0 (95% CI 3.6–4.4), followed by a statistically insignificant reduction of BC incidence APC of –1.3 (95% CI 9.2–7.2) until year 2017.

Conclusions

1. The average age for men at the time of diagnosis has increased.
2. The incidence of bladder cancer has been gradually increasing over the past 28 years.

Association between Human Leukocyte Antigen Genes and Cervical Precancerous Lesions

*Olga Plisko*¹; *Dr. med. Jana Zodzika*¹; *Prof. Dace Rezeberga*¹;
*Dr. Irina Jermakova*²; *Dr. med. Jelena Eglite*³; *Diana Kasjko*³;
*Inta Liepniece-Karele*²; *Diana Kunicina*²; *Dace Sivina*²

¹Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;

²Rīga East University Hospital, Latvia;

³Rīga Stradiņš University, Joint Laboratory of Clinical Immunology and Immunogenetics, Latvia

Objectives

Persistent human papillomavirus (HPV) infection is a necessary cause for development of cervical precancerous lesions and cervical cancer, however, only a small percentage of women progress to cervical cancer. Factors that may be associated with progression risk are still incompletely understood. There are some studies that show association of Human Leukocyte Antigen (HLA) genes among the Major Histocompatibility Complex (MHC) and cervical neoplasia. Aim of the study was to assess an association of HLA-DQA1*; DQB1*; DRB1* allele's genetic variants between women with cervical precancerous lesions and healthy controls, and to identify both risk and protective HLA alleles patients.

Methods

This study included 50 patients with histologically proven cervical intraepithelial neoplasia (CIN) grades I-III and 100 healthy control persons from Latvian population. HLA genotyping was performed by real-time polymerase chain reaction. The significance of differences in individual subtypes between patients and controls was assessed by Mantel-Haenszel test and Fisher exact correction. Odds ratios (OR), and 95% confidence intervals (CI) were computed by standard methods.

Results

The frequency of HLA-DRB1*07:01 (OR 3.69; $p = 0.034$), DQB1*03:01 (OR 2.64; $p = 0.001$); DQB1*04:01-2 (OR 3.45; $p = 0.004$) and DQA1* 05:01 (OR 1.42; $p = 0.021$) were significantly increased in the CIN patients compared with the control group. The frequency of the alleles DRB1*13:01 (OR 0.12; $p = 0.001$) and DQB1*05:01 (OR 0.22; $p = 0.018$); DQA1* 03:01 (OR 0.27; $p = 0.011$) was smaller in study group patients and significantly higher in the control group.

Conclusions

We demonstrated strong association of cervical precancerous lesions with risk and protective HLA Class II alleles that are determined by the HLA-DRB1*; DQA1*; DQB1*. In the future we plan to increase the group of patients and define the genetic loci involved in cervical neoplasia and to assess its heritability using unbiased unrelated case / control statistical approaches. Our findings could lay the foundation for screening for people at increased risk of developing cervical cancer, and aid in the treatment and prognosis.

CHEK2 Pathogenic Variants do not Change Penetrance of BRCA1 Variants c.4034delA and c.5266dupC

*Egija Berga-Švītiņa*¹; *Elza Kuzņecova*²;
*Dr. Miki Nakazawa-Miklaševiča*²;
*Dr. med. Jeļena Maksimenko*²; *Prof. Arvids Irmejs*²;
*Prof. Zanda Daneberga*²; *Prof. Edvīns Miklaševičs*²

¹ *Rīga Stradiņš University, Institute of Oncology, Latvia;*

² *Rīga Stradiņš University, Institute of Oncology, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Carriers of BRCA1 pathogenic variants are at increased risk for developing breast or ovarian cancer. Genetic factors have a strong influence on penetrance of BRCA1 pathogenic variants. Checkpoint kinase 2 (CHEK2) has a significant role in DNA repair and it is an upstream regulator of the P53 and BRCA1 proteins. The aim of this study is to determine the association of three pathogenic variants of the CHEK2 gene with BRCA1 pathogenic allelic variant penetrance.

Methods

DNA derived from peripheral blood of 330 women from August 2002 to June 2018 with positive BRCA1 status for founder mutations c.4034delA and c.5266dupC were identified in DNA bank of Rīga Stradiņš University, Institute of Oncology. Overall, 132 (40.24%) women were carriers of pathogenic BRCA1 allelic variant with diagnosed breast cancer, 111 (33.84%) were carriers of pathogenic BRCA1 variant with diagnosed ovarian cancer, and 87 (25.92%) were carriers of pathogenic BRCA1 variant without diagnosed any type of cancer. The pathogenic variants of CHEK2 (IVS2+1 A>G, I157T) gene were detected by Sanger's sequencing and del5395 variant by multiplex PCR.

Results

CHEK2 variants were found in 13 cases (IVS2+1G>A, n = 1, I157T, n = 11, del5395, n = 1). We observed 4 CHEK2 variants in group of carriers of pathogenic BRCA1 variant with diagnosed breast cancer, 6 CHEK2 variants in group of carriers of pathogenic BRCA1 variant with diagnosed ovarian cancer, and 3 CHEK2 gene variants in women carrying pathogenic BRCA1 variant without diagnosed any type of cancer.

Conclusions

In summary, CHEK2 gene variants were most frequently observed in the group of carriers of BRCA1 pathogenic allelic variant with diagnosed ovarian cancer, but difference between groups does not reach statistical significance.

FAP Cases in Latvia Confirmed by Molecular Genetic Testing

Prof. **Zanda Daneberga**¹; **Dace Bērziņa**²;
Dr. Viktors Borošenko³; **Dr. med. Zita Krūmiņa**⁴;
Prof. **Andris Gardovskis**¹; Prof. **Edvīns Miklaševičs**¹

¹ Rīga Stradiņš University, Institute of Oncology, Latvia;

² Rīga Stradiņš University, Latvia;

³ Pauls Stradiņš Clinical University Hospital, Latvia;

⁴ Rīga Stradiņš University, Department of Biology and Microbiology, Latvia

Objectives

Familial adenomatous polyposis (FAP) is genetically determined colorectal polyposis syndrome with variety of symptoms. FAP is caused mostly by germline allelic variants (~ 1700 unique variants are reported) in the APC gene. Approximately 20–40% of allelic variants in the APC gene arise de novo, rest of them are inherited. Interpretation of novel variants is challenging task with high impact on clinical decision.

Methods

Selected patients based on defined criteria of adenomatous polyposis and positive family history were screened for germline allelic variants of APC gene. All persons involved in study signed informed consent. All DNA samples were subjected to direct sequencing of APC gene as described earlier. Clinical classification of pathogenicity for found allelic variants was evaluated based on family history and clinical data, publicly available databases, using in silico prediction tools and Joint Consensus Recommendation of the American College of Medical Genetics and Genomics and the Association for Molecular Pathology.

Results

Seven allelic variants of APC gene were detected. Two of them were described in Latvian population before. Allelic variant c.1433T>G is described in ClinVar database as likely pathogenic. Allelic variant c.4826delC is described in publicly available HGMD database and c.3942delG described in LOVD database, both without clinical classification. The best of our knowledge, four allelic variants were novel and underwent interpretation of pathogenicity. Pathogenicity was evaluated also for c.1433T>G, c.4826delC and c.3942delG variants. All detected variants were nonsense or frameshift with predicted deleterious impact to the protein. In combination with available clinical and family history data, all seven allelic variants were classified as pathogenic.

Conclusions

Allelic variants in the APC gene in Latvian high-risk families are highly heterogeneous and all predicted to be pathogenic. The standardised interpretation of novel allelic variants pathogenicity has high impact on choice for treatment, cancer prevention and family genetic counselling.

Large Patient Cohort Study of Total Vitamin B12 Blood Level in Cases with Oncologic Diagnosis in Latvia

Dr. med. Didzis Gavars

“E. Gulbis Laboratory”, Latvia

Objectives

Elevated B12 levels can be caused by B12 supplements or could be associated with particular diseases. Currently etiology of the high B12 phenomenon is understudied and it is not established whether the B12 level can serve as a diagnostic and / or prognostic marker in oncohematology.

Methods

B12 data from 80 000 regular E. Gulbis Laboratory, Latvia (EGL) patients (y2004–2018) were used to define the normal B12 value in blood plasma and the distribution function of the B12 value. All B12 results were used for this purpose. Standard EGL clinical laboratory technique and procedures were used for the B12 measurements.

Results

The logarithmic value of B12 follows Gaussian distribution with mean value at 400 pg/mL and half widths from 240 to 690 pg/mL for regular patients. The “normal level of B12” obtained can be discussed because patients checking B12 have some reason to suspect that their B12 values might fall outside the “normal range” while random sample of population in ideal case should represent the “true normal”. Nice Gaussian curve suggests that the majority of the patients taking the B12 test had their B12 values unaffected by any strong pathological processes.

The “normal” B12 level from this study is comparable to reference level of B12 from literature (119–663 pg/mL).

The B12 distribution in patients with myeloid leukemia shows double peaked structure with main peak representing 2/3 of the patients being only slightly above the normal value while the high value peak is at 1560 ± 200 pg/mL.

Conclusions

The B12 normal value and the distribution function were defined from more than 80 000 measurements. Strongly elevated level of B12 level in plasma in 1/3 of the patients with myeloid leukemia was observed possibly indicating that there are two different cancer metabolic models.

Epidemiological Data and Treatment Patterns among Patients with Pancreatic Neuroendocrine Tumours (pNETs) in Latvia: First Report from Multi-Institutional Study

*Dr. Margarita Ptašņuka*¹; Prof. *Haralds Plaudis*¹;
*Artūrs Ozoliņš*²; *Māris Sperga*³; *Artūrs Truškovs*⁴;
*Zenons Narbutis*²; *Iveta Kudaba*⁵; *Aija Geriņa-Bērziņa*⁶

¹ Riga East University Hospital, Department of General and Emergency Surgery, Latvia;

² Pauls Stradiņš Clinical University Hospital, Department of Surgery, Latvia;

³ Pathology Centre, Department of Infectious Pathology, Latvia;

⁴ Rīga Stradiņš University, Latvia;

⁵ Oncology Centre of Latvia, Clinic of Chemotherapy and Haematology;

⁶ Pauls Stradiņš Clinical University Hospital, Clinic of Oncology, Latvia

Objectives

Patients with pancreatic neuroendocrine tumours (pNETs) comprise a rare, heterogeneous group of neoplasms with favorable prognosis in comparison to other malignancies of the pancreas. The aim of this study was to present an overview of pNETs management in Latvia.

Methods

Patients with histologically confirmed diagnosis of pNETs treated at Riga East University Hospital and Pauls Stradiņš Clinical University Hospital between 2006 and 2016 were identified and included in EUROCRINE, an open-label international Endocrine Surgical registry with a special focus on rare tumours. Data were entered by trained study personnel into a browser-based online platform (www.eurocrine.eu) and reviewed retrospectively.

Results

In total, 50 patients were included. The median age of the patients was 62 (IQR 50–70) years, 80% (n = 40) were females. In 74% (n = 37) tumours were hormonally non-functional. Among those with functioning pNETs, 38.5% (n = 5) had an insulinoma, 7.7% (n = 1) ACTHoma. Distant metastases at diagnosis were found in 46% (n = 23). According to Ki-67 distribution, G1 tumours were 34% (n = 17), G2 – 42% (n = 21), G3 – 10% (n = 5), in 14% (n = 7) correct grading was difficult to obtain. The majority of patients 66% (n = 33) received an operation as a first-line treatment. Only 11 patients with advanced disease treated with systemic therapy: including seven with SSA, three with chemotherapy, one with PRRT. For the resected patients the overall morbidity rate was 18.2% (n = 6), predominantly consisted of POPF. Nevertheless, 21.2% (n = 7) had disease recurrence post-surgery. At the time of the analyses 88% (n = 44) of the patients were still alive.

Conclusions

In our experience, pNETs were predominantly non-functional and more likely presented with metastatic disease. Surgery considered as a mainly treatment option. Multinational cooperation and long term data collection in accordance to European level is crucial to optimize management strategies and develop treatment algorithm in the future.

Oncolytic Virus Immunotherapy in Melanoma

Dr. med. Simona Donina

Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia

Objectives

The aim was to review recent publications on oncolytic virotherapy (OV) in cutaneous melanoma and give a short overview of our own experience in melanoma treatment with OV.

Methods

Data were identified by searches of PubMed, and references from relevant articles using the search terms “oncolytic viruses”, “tumor microenvironment”, “in situ vaccination”, “melanoma treatment with oncolytic viruses”, “combination therapies with oncolytic virus therapy”, “oncolytic virus and immune checkpoint blockade”.

Results

The field of oncolytic virotherapy has grown tremendously. This has resulted in approximately 150 ongoing or completed oncolytic virotherapy clinical trials testing over 60 potential therapeutic oncolytic viruses (Alberts et al., 2018; Pol et al., 2016). There are three oncolytic viruses registered. Rigvir for cutaneous melanoma and two genetically engineered oncolytic viruses, the adenovirus H101 (Oncorine) for squamous cell carcinoma of the head, neck and oesophagus in China, and the genetically altered HSV-1 talimogene laherparepvec (T-VEC, Imlygic) for advanced melanoma treatment in the USA, Europe and Australia (Alberts et al., 2018; Orloff 2016).

In the OPTiM phase 3 trial of T-VEC, the objective response rate (ORR) was 26.4% (Ross, 2016). Oncolytic virus plus anti-PD-1 therapy favorably changed the tumor microenvironment and confirmed ORR was 62% in advanced melanoma patients in phase Ib clinical trial (Ribas et al., 2017). Oncolytic viruses can turn “immunologically cold” tumors into favorable environments for antitumor immune cell attack (Achard et al., 2018).

Melanoma stage IB and II patients who had undergone surgical excision (2008–2011) were analyzed in retrospective observation in Riga East University Hospital. 52 patients had been treated with Rigvir, and 27 had been observed. The Rigvir treated patients showed an improvement in overall survival and had 4.39–6.57-fold lower mortality calculated as the hazard ratio (Doniņa et al., 2015).

Conclusions

It was concluded that Rigvir significantly prolongs survival in early stage melanoma patients. The strategy of combination therapy to enhance selective viral replication, augment tumor cell oncolytic virus sensitivity, and modulate antitumor and antiviral response may be considered for OV in the future.

Breast Cancer: Change of Paradigms

Prof. *Arvīds Irmejs*

Rīga Stradiņš University, Department of Surgery, Latvia

Objectives

Leading paradigm of breast cancer treatment during the last half century has been from maximum tolerable to the minimum effective treatment as defined by U. Veronesi (Veronesi, Stafyla, Luini, & Veronesi, 2012); (Giuseppe Curigliano et al., 2017). This includes following de-escalating treatments of breast cancer like breast conserving surgery, conservative surgical approach to axilla, omission of adjuvant chemotherapy, if genomic risk is low and others.

Methods

Until recently vast majority of breast cancers worldwide are stratified and treated according to clinical-pathological risk assessment, including identification of breast cancer molecular subtypes as detected by immunohistochemical surrogate markers. However, increasing evidence exist, that optimal breast cancer management can be more appropriately determined by multigene tests. F. Cardoso and co-authors in 2016 published paper on 70-Gene Signature test use in prospective clinical setting concluding that approximately 46% of women with breast cancer who are at high clinical risk might not require chemotherapy, if the genomic risk is low (Cardoso et al., 2016; Kuijer et al., 2017; Sparano et al., 2018). For more definitive conclusions 10-year event free survival data on a larger cohort should be awaited, but with present evidence available it means that thousands of breast cancer patients could avoid unnecessary cytotoxic treatments and considerable financial savings in public health care system are possible. Also, St Gallen 2017 expert panel agreed that, when available, gene expression signatures were preferable to standard pathology, when adequate reproducibility is not granted (Curigliano et al., 2017).

Results

BRCA germline positive and BRCA like breast cancers is another subset of patients with potential for individualized treatments like platinum based chemotherapy and PARP inhibitors as well surgical risk reduction strategies (Ludwig, Neuner, Butler, Geurts, & Kong, 2016).

Conclusions

Persistent trend of last decades towards decreased breast cancer mortality encourages to follow those new paradigms.

Non-Small Cell Lung Cancer Stage III Patients Diagnostic and Treatment Data Comparison with Central Europe Patients Data

Dr. Sigita Hasnere

Pauls Stradiņš Clinical University Hospital, Clinic of Oncology, Latvia

Objectives

Worldwide, lung cancer is the most common malignancy and the most common cause of cancer deaths. Diagnostic and treatment approaches in non-small cell lung cancer (NSCLC) stage III are variable. Based on chosen treatment differs patient survival rates.

The aim of the thesis was to compare Pauls Stradiņš Clinical University Hospital lung cancer patients' diagnostic, treatment and survival data from year 2015 with Central Europe patients' data.

Methods

Retrospective study was performed in Clinic of Oncology, Pauls Stradiņš Clinical University Hospital. Data of 58 patients was obtained who met the inclusion criteria. Patient characteristics, smoking status, general condition, histological type, determination of genetic mutations, applied diagnostic methods, staging, therapy tactics and survival rates were compared with Central Europe study of 617 patients' data.

Results

NSCLC more often occurred for men and smokers. Patients in Latvia had worse performance status than patients in Central Europe. The most common histological type of cancer was squamous cell carcinoma. Genetic mutation testing in Latvia in 2015 wasn't done routinely but in Central Europe 26% (n = 159) was screened for mutations. The most often used diagnostic method to confirm a diagnosis was bronchoscopy but in 2015 some investigation methods were not available in Latvia, for example, positron emission tomography, endobronchial ultrasound. More than one third of patients in Latvia received only symptomatic treatment while in Central Europe it was less than 5%. The most common treatment tactics in Central Europe were combination of radiotherapy and chemotherapy or chemotherapy alone. The median overall survival in Latvia was 8.9 months but in Central Europe 33.7 months.

Conclusions

Taking into account lack of diagnostic methods, genetic mutation screening and so high proportion of symptomatic treatment, patients diagnosed in Pauls Stradiņš Clinical University Hospital with stage III NSCLC had worse survival rates than in Central European study.

Frequency and Diagnostic Value of Positive Manchester Score to Identify BRCA1/2 Gene Mutation Positive Breast Cancer Cases in Latvia

*Dr. Elīna Tauvēna*¹; Prof. *Arvīds Irmejs*²;
Prof. *Genādijs Trofimovičs*²; Dr. med. *Jeļena Maksimenko*²;
Dr. *Pēteris Loža*²; Prof. *Jānis Gardovskis*²; Prof. *Zanda Daneberga*²

¹ *Pauls Stradiņš Clinical University Hospital, Latvia;*

² *Rīga Stradiņš University, Latvia;*

Pauls Stradiņš Clinical University Hospital, Latvia

Objectives

The aim of the study was to evaluate frequency and diagnostic value of positive Manchester score (MS) to identify BRCA1/2 mutation positive breast cancer cases in Latvia.

Methods

The study is designed as retrospective investigation using Pauls Stradiņš Clinical University Hospital Breast Unit database information about breast cancer pathology (BCP) as well family cancer history (FCH) and BRCA1 founder (c.4035delA, c.5266dupC) status. In total 1006 breast cancers cases with available data were involved in the study. Numeric values from +13 to -6 were assigned to selected FCH and BCP parameters according to Manchester scoring system. MS was calculated for each breast cancer case. Cases with MS 15 or more were considered as positive.

Results

In total 57/1006 (5.7%) MS positive cases were identified. 24/57 (42%) cases were BRCA1 founder positive and 33/57 (58%) – negative. Frequency of MS positive and BRCA1 founder negative cases in total study group is 3.3% (33/1006). From the other hand there are 36/1006 (3.6%) BRCA1 founder mutation carriers in our cohort. 24/36 (67%) has positive MS and 12/36 (33%) negative MS. MS sensitivity, specificity and accuracy to detect BRCA1 founder mutations is 77.1%, 96.5% and 95.8% respectively.

Conclusions

Manchester score has higher diagnostic accuracy to identify BRCA1 founder mutation carriers in comparison to previously reported family cancer history performance alone. 3.3% of Manchester score positive and BRCA1 founder mutation negative unselected breast cancer cases have indications to undergo complete BRCA1/2 testing as probability of finding pathogenic nonfounder mutation is more than 10%.

Impact Factors on 2-Year and 5-Year Survival Rate in Patients Operated with Oral Cancer in Advanced Stage

*Dr. med. Kalvis Pastars*¹; *Dr. Janis Zarins*¹;
*Anna Ivanova*²; Prof. *Andrejs Skagers*²

¹ *Microsurgery Centre of Latvia;*

² *Rīga Stradiņš University, Department of Oral and Maxillofacial Surgery, Latvia*

Objectives

The purpose of this study is to analyse clinical impact factors on the survival rate, to identify key clinical factors, who have defenetive influence on patients prognosis.

Methods

142 patients with advanced stage oral cancer who had ablative surgery were included in this study. Impact of patients sex, tumor size, tumor grade, lymph node involvement on survival rate were analysed. 2-years and 5-years survival rate was calculated.

Results

Men 2-year survival rate was 60%, but women 65%, but 5-year survival rate for men was 42%, but for women was 45%. Patients with T3 and T4 tumor had of 2 years survival rate 60%. 5-years survival rate for patients with T3 was 41%, but T4 was 50%. 2-year survival rate for patients with no lymph node involvement (N0) was 75%, with node involvement N1 was 62%, but N2 was 40%. 5-year survival rate for patients with N0 was 65%, N1 was 38%, but N2 was 25%. Patients with Grade 1 tumor 2-year survival rate was 100%, Grade 2 was 55%, but Grade 3 was 61%. But 5-year survival rate for patients with Grade 1 was 100%, Grade 2 was 38%, but Grade 3 was 52%.

Conclusions

Lymph node involvement has been identified as key factor with the greatest impact on patients survival for patients with advanced stage oral cancer. Assessment of lymph node status is essential to establish proper treatment prognosis.

Paediatric Embryonal Rhabdomyosarcoma: Case Report

*Dr. Eva Dručka*¹; *Dr. Romāns Dzalbs*²; *Dr. Juris Tārs*³;
*Dr. Zanda Liepa*³; *Prof. Sergejs Isajevs*⁴; *Anna Ivanova*⁵;
*Prof. Geoffrey Rose*⁶; *Dr. med. Ivanda Franckeviča*⁷;
*Elizabete Cebure*⁷; *Dr. Sandra Valeiņa*⁸

¹ Rīga Stradiņš University, Department of Ophthalmology, Latvia;

² Rīga East University Hospital, Oncology Centre of Latvia;
Rīga Stradiņš University, Latvia;

³ Rīga East University Hospital, Oncology Centre of Latvia;

⁴ Rīga East University Hospital, Latvia;

⁵ Rīga Stradiņš University, Institute of Stomatology, Latvia;

⁶ Moorfields Eye Hospital, United Kingdom;

⁷ Children's Clinical University Hospital, Latvia;

⁸ Children's Clinical University Hospital, Latvia;
Rīga Stradiņš University, Latvia

Objectives

The aim of the study was to describe a clinical course of rare pediatric embryonal rhabdomyosarcoma case with unusual localization in an orbit.

Methods

A retrospective case study was conducted. Patient's anamnesis was analysed from the first appointment till the last follow-up in the tertiary referral medical center.

Results

A 17-years-old boy presented with proptosis, exotropia with hypotropia, conjunctival chemosis, decreased vision with diplopia and tenderness of the right eye.

MRI examination revealed a well-circumscribed, intra- and extraconal mass in the upper part of right orbit with size 3.6 × 3.5 × 3.1 cm. A proptosis and deformation of eye ball, as well as dislocation of m. rectus superior and m. obliques superior were seen without infiltration of the optic nerve.

An initial histological examination reflected reactive lymphoid hyperplasia. Afterwards the diagnosis of orbital pseudotumour was made and treatment with methylprednisolone was introduced. However, no improvement was obtained, and due to fast growing of the orbital mass visual acuity after 2 weeks decreased till hand movements in the right eye.

The lesion was covered with thick inflammatory tissue. Therefore, for diagnostic reasons partial resection of the lesion was done and histological examination was repeated, which suggested diagnosis of alveolar rhabdomyosarcoma. Chemotherapy with vincristine was initiated. Afterwards a repeated histological examination approved the diagnosis of high malignity embryonal rhabdomyosarcoma (IRS III, T3, N0, M0). Later for chemotherapy dactinomycin, ifosfamide were added and radiotherapy was started for the area of retrobulbar tumour. The last MRI reflected decrease of the size of tumour (2.9 × 2.1 × 1.3 cm) since chemotherapy and radiotherapy was initiated. The ophthalmic examination revealed improvement of visual acuity and subjective symptoms in the right eye, absence of exophthalmos. However, ptosis of the right upper eyelid, reduced amplitude of eye movements and diplopia were still present.

Conclusions

A multidisciplinary approach for the treatment of embryonal rhabdomyosarcoma is essential.

Orbital rhabdomyosarcoma is one of the few life-threatening diseases that presents first to the ophthalmologist, therefore early diagnosis and treatment is necessary. Knowledge of the clinical, histopathological, radiographic features and the management of this entity are important.

ADAM 10 Expression in Primary Uveal Melanoma as Prognostic Factor for Risk of Metastasis

Prof. *Rosario Caltabiano*¹; Dr. med. *Giuseppe Broggi*¹;
Prof. *Venerando Rapisarda*²; Prof. *Caterina Ledda*³;
Prof. *Vincenzo Baylon*⁴; Dr. *Vera Filetti*⁵; Prof. *Carla Loreto*⁵

¹ *University of Catania, Department G. F. Ingrassia, Section of Anatomic Pathology, Italy;*

² *University of Catania, Department of Clinical and Experimental Medicine, Occupational Medicine, Italy;*

³ *“Garibaldi Centro” Hospital of Catania, Clinical pathology and clinical molecular biology unit, Italy;*

⁴ *Newton Lewis Institute-ISR – Life Science Park, Malta;*

⁵ *University of Catania, Department of Biomedical and Biotechnological Sciences, Section of Anatomy and Histology, Italy*

Objectives

Uveal melanoma is the most frequent primary intraocular neoplasm in adults. Although malignant melanoma may be located at any point in the uveal tract, the choroid and ciliary body are more frequent locations than the iris.

Methods

In the present study, we examined ADAM10 expression levels in primary uveal melanoma both with and without metastasis, and we evaluated their association with other high risk characteristics for metastasis in order to assess if ADAM10 can be used to predict metastasis.

Results

This study included a total of 52 patients, 23 men and 29 women, with uveal melanoma. A significantly high expression of ADAM-10 was seen in patients with metastasis (11/13, 84.6%), but not in patients without metastasis (15/39, 38.5%).

Conclusions

In conclusion we found that ADAM10 expression was associated with a more rapid metastatic progression confirming its role in uveal melanoma metastasis.

Bladder Cancer Mortality Trends in Latvia in 1990–2017

*Dr. Ērika Bitiņa-Barlote*¹; *Dr. med. Juris Plonis*²;
*Dr. med. Vinita Cauce*³; *Prof. Egils Vjaters*²;
*Prof. Jānis Gardovskis*²; *Prof. Edvīns Miklaševičs*²

¹ *Pauls Stradiņš Clinical University Hospital, Center of Urology, Latvia;*

² *Rīga Stradiņš University, Institute of Oncology, Latvia;*

³ *Rīga Stradiņš University, Statistical Laboratory, Latvia*

Objectives

The aim of the study was to evaluate trends in mortality from bladder cancer (BC) in Latvia over the past 28 years.

Methods

Retrospective study included 7182 patients, who were diagnosed with BC between January 1990 and December 2017 with known date of death and cause of death. Data were taken from the Register of Latvian Centre for Disease Prevention and Control. In the study, data on mortality from BC were analyzed and stratified by patients' age and gender. Statistical analysis was performed using Microsoft Excel 2017, SPSS version 22 and Joinpoint version 4.6.0.0.

Results

The study included 7182 patients diagnosed with bladder cancer. The average age of death due to BC in the entire considered time period was 72.8 (SD 10.4) years. The average age of death due to BC from year 1990 until 1992 was 71.2 (SD 11.0) years, then it increased and reached 76.0 (SD 9.5) years in the time period from year 2015 until 2017 ($p < 0.001$). Gender ratio of total and specific mortality was 3.2: 1 (men vs. women). The total number of patients, who died due to BC during the study period was 67% ($n = 4790$). Crude mortality rates of BC (per 100 000) rose from 5.8 in 1990 to 10.7 in 2017, while age-standardized BC mortality rate rose from 3.9 in 1990 to 4.4 in 2017. The cancer specific crude mortality rates gradually increased at an APC of 1.3 (95% CI 0.2–2.4) from 1990 to 2003, and then rapidly increased at an APC of 3.7 (95% CI 2.5–4.9) since 2004. In the case of cancer-specific age-standardized mortality APC was 0.5 (95% CI 0.1–0.9).

Conclusions

1. Cancer specific crude mortality of bladder cancer has been gradually increasing over the past 28 years with faster growth since 2004.
2. There has been a slow increase in cancer specific age standardized mortality.

Metastatic Thyroid Cancer

*Dr. Rita Ničiporuka*¹; *Dr. med. Artūrs Ozoliņš*¹;
*Prof. Zenons Narbutis*¹; *Prof. Ilze Štrumfa*²;
*Prof. Jānis Gardovskis*¹

¹ *Rīga Stradiņš University, Department of Surgery, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvia;
² *Rīga Stradiņš University, Department of Pathology, Latvia*

Objectives

Approximately 15% of all thyroid cancer patients develop metastasis. Clinical course of patient with metastatic thyroid cancer is highly variable. Several tumor related clinicopathological factors are associated with metastatic disease and therefore worst outcome.

Methods

Retrospective 283 patient data, who underwent thyroid surgery from 2015–2018 and were diagnosed with cancer were analysed. In 50 (17.7%) cases metastatic central or lateral neck compartment lymph nodes were noticed. Data were analysed regarding patient gender, age, indications for surgery, surgical approach, morphology, tumor size, focality, extrathyroidal extension.

Results

Among patients with lymph node metastases male to female ratio was 1:4. Mean age was 52.1 ± 13.6 years. Main indication for surgery was suspicious on proved malignancy – 46 (92.0%) patients. In 4 (8%) cases metastatic neck lymph nodes were incidental finding in patients operated due to benign thyroid pathologies.

Bilateral thyroid operations were performed in 44 (88.0%) cases, hemithyroidectomy in 6 (12.0%), from those 4 patients later received completion thyroidectomy by cancer. Prophylactic or diagnostic lymphadenectomy was performed in 37 (74.0%) cases – 32 central and 5 lateral neck compartment lymph node dissection. In 13 cases metastatic lymph nodes were incidental finding. Regarding morphology, in majority of cases – 44 (88.0%) papillary thyroid cancer was found, in 2 (4.0%) cases coexisting papillary and follicular cancer, medullary cancer noticed in 4 (8%) cases, from those 1 case with coexisting medullary cancer and papillary microcarcinoma. Mean tumor size was 18.7 ± 14 mm. Majority of cancers were multifocal – 27 (54.0%). In 18 (36.0%) cases lympho-vascular or blood vessel invasion was noticed. Extrathyroidal extension found in 17 (34%) cases of metastatic thyroid cancer.

Conclusions

Although most metastatic thyroid cancers are predicted and noticed prior operation, small part could be found incidentally. Cancer multifocality and invasion ability has an important role in development of lymph node metastases.

Thyroid Gland Morphology and Management Differences

*Dr. Alise Didrihsone; Dr. Rita Ničiporuka;
Dr. med. Arturs Ozolins; Prof. Zenons Narbutis;
Prof. Jānis Gardovskis*

*Pauls Stradiņš Clinical University Hospital, Latvia;
Rīga Stradiņš University, Department of Surgery, Latvia*

Objectives

Morphological variations of the thyroid gland have been reported from different parts of the world. Regarding morphological variation different diagnostic and treatment algorithms could be used, depending on local guidelines and preferences.

Methods

Retrospective Eurocrine registry data analysis was performed. Data from 799 local hospital patients who underwent thyroid surgery from 2015–2018 – Group A and 1880 similar patient data operated from October – December 2018 in other European hospitals involved in Eurocrine registry – Group B – were analyzed and compared.

Results

Main indications for surgery in Group A (total 799) and B (total 1880) were benign thyroid disorders – 453 (56.7%) and 931 (49.5%) cases respectively. Regarding malignancy excluding it in Group A was significantly less common compared with Group B: 217 (27.2%) vs. 743 (39.5%) cases. Proved malignancy as indication for surgery was more common in Group A than B – 108 (13.5%) vs. 162 (8.6%) cases. Morphological distribution in both groups was similar. Main morphological diagnosis in Group A (Total 762) and B (Total 1310) was nodular goiter: 397 (52.1%) and 716 (54.7%). Grave's disease in Group A was noted in 23 (3.0%), in B – 90 (6.9%) cases. Papillary thyroid cancer was significantly more common in Group A than B – 208 (27.3%) vs. 201 (15.3%) cases respectively. Smaller benign and malignant morphological subtypes as Follicular adenoma and Follicular carcinoma oxyphilic cell type were less common noticed and described in Group A than B – 3 (0.4%) vs. 38 (2.9%) and 2 (0.3%) vs. 9 (0.7%) respectively.

Conclusions

Main morphological groups in both groups were similar. Local diagnostic preferences and quality increase specificity of indication for surgery, leading to higher rate of diagnosed malignancy. Despite better results in diagnosing malignancy, different morphological subtypes of benign and malignant pathologies were poorly described comparing with other European countries.

Outcomes of Sporadic Resected Non-Functional Pancreatic Neuroendocrine Tumours (NF-pNETs) – 11-Year Experience in Tertiary Referral Hospitals in Latvia

*Dr. Margarita Ptašņuka*¹; Prof. *Haralds Plaudis*¹;
*Dr. med. Artūrs Ozoliņš*²; *PhD Māris Sperga*³; *Artūrs Truškovs*⁴;
*Prof. Zenons Narbutis*²; *Iveta Kudaba*⁵; *Aija Geriņa-Bērziņa*⁶

¹ Riga East University Hospital, Department of General and Emergency Surgery, Latvia;

² Pauls Stradiņš Clinical University Hospital, Department of Surgery, Latvia;

³ Pathology Center, Department of Infectious Pathology, Latvia;

⁴ Rīga Stradiņš University, Latvia;

⁵ Oncology Centre of Latvia, Clinic of Chemotherapy and Haematology;

⁶ Pauls Stradiņš Clinical University Hospital, Clinic of Oncology, Latvia

Objectives

With risen incidence over the last decades, pNETs represent a small part of pancreatic tumours with extremely heterogeneous biological behaviour. Moreover, management of NF-pNETs are still controversial worldwide, especially the dilemma arise for tumours < 2 cm in diameter.

Methods

We retrospectively analysed patients who underwent surgical resection of NF-pNETs at Riga East University Hospital and Pauls Stradiņš Clinical University Hospital between 2006 and 2016. For further analyses postoperative outcomes and recurrence rate were evaluated between asymptomatic patients group with small (< 2 cm) and large (≥ 2 cm) tumours.

Results

Thirty-seven patients with NF-pNETs were identified in our NET database, of these 24 (64.9%) were treated surgically. Asymptomatic NF-pNETs were diagnosed in 13 (54.2%) patients with a mean age 52 (± 15.3 SD) years. Among the latter group, 4 (30.8%) patients presented with small and 9 (69.2%) patients with large NF-pNETs. The mean follow-up time was 46.6 (± 35.2 SD) months. Regarding the large NF-pNETs group, 4 (44.4%) patients showed disease recurrence after a mean of 28.8 (± 23.9 SD) months and 1 of these patient died 28 months after disease progression. In contrast, all patients with small NF-pNETs during follow-up were still alive and without disease progression. Among the small NF-pNETs group we observed 25% (n = 1) clinically relevant postoperative complications.

Conclusions

Due to the rarity of the disease and small group of patients our study is limited to draw valid conclusions. However, in line to reported data in the field of pNETs, our series of asymptomatic resected NF-pNETs proved better outcomes in small rather than large tumours. Also, we could suggest critically appraise indications for aggressive pancreas surgical resection among patients with small NF-pNET and high risk of operation.

Association between Neutrophil-to-Lymphocyte Ratio and Papillary Thyroid Cancer Aggressiveness

*Dr. Rīta Ničiporuka*¹; *Dr. med. Artūrs Ozoliņš*¹;
*Prof. Zenons Narbutis*¹; *Prof. Ilze Štrumfa*²;
*Prof. Jānis Gardovskis*¹

¹ *Rīga Stradiņš University, Department of Surgery, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvia;
² *Rīga Stradiņš University, Department of Pathology, Latvia*

Objectives

Papillary thyroid carcinoma (PTC) exhibits a close association with chronic inflammation. Neutrophil-to-lymphocyte ratio (NLR) is easy extract from routine blood tests and could be used as predictor for poor prognosis in a variety of malignant neoplasms including PTC.

Methods

Retrospective thyroid patients' data from 2015–2018 were analysed. All together in 242 cases morphology revealed PTC. Thyroidectomy and central lymph node dissection was performed in 68 cases. NLR as inclusion criteria in 61 patients was available and analysed regarding age and gender, morphology, tumor size, extrathyroidal extension and lymph node metastases.

Results

NLR did not show significant difference regarding age (less than 55 years vs. 55 years and older) – 1.91 ± 0.80 vs. 2.07 ± 0.81 5 ($p = 0.454$) nor gender (male vs. female) 1.95 ± 0.24 vs. 2.0 ± 0.76 ($p = 0.869$). No significant correlation between PTC subtypes: classical variant, follicular variant and mixed (classical + follicular) was found ($p = 0.156$). NLR in microcarcinomas was significantly smaller comparing with tumors > 10 mm: 1.64 ± 0.67 vs. 2.26 ± 0.88 ($p = 0.034$) but did not reach significant difference if compared between T stages. No correlation between focality, extrathyroidal extension (E (-) vs. E (+)), presence of lymph node metastases (N0 vs. N1) and NLR was found: unifocal – 1.80 ± 0.70 vs. multifocal – 2.12 ± 0.86 ($p = 0.129$); E (-) – 2.01 ± 0.92 vs. E (+) – 1.96 ± 0.69 ($p = 0.828$); N0 – 1.96 ± 0.85 vs. N1 – 2.03 ± 0.75 ($p = 0.762$) respectively.

Conclusions

NLR is inexpensive and available marker to asses. Whether increased NLR could be used for determination of more aggressive forms of PTC still stays unclear. It should be further researched in larger trials.

Epidemiology and Genetic Features of Prostate Cancer

*Dr. med. Juris Plonis*¹; *Dr. Ērika Bitiņa-Barlote*²;
*Dr. med. Vinita Cauce*³; *Prof. Egils Vjaters*¹;
*Prof. Jānis Gardovskis*¹; *Prof. Edvīns Miklaševičs*¹

¹ *Rīga Stradiņš University, Institute of Oncology, Latvia;*

² *Pauls Stradiņš Clinical University Hospital, Center of Urology, Residency of urology, Latvia;
University of Latvia;*

³ *Rīga Stradiņš University, Statistical Laboratory, Latvia*

Objectives

The aim of the study was to compare 5 and 10 years cancer specific survival (CSS), Gleason score (GS) and age between family prostate cancer (PC) and sporadic PC.

Methods

There were 1175 patients registered in the Oncology Institute (Rīga Stradiņš University) database from 2000 to 2012 with PC diagnosis. Patients with hereditary PC (n = 12) and family PC (n = 203) were grouped into single family PC group (FG; n = 215, 18.3% of all patients with PC). Sporadic PC group (SG) consisted of 960 patients (81.7% of all PC patients). Statistical analysis was performed with IBM SPSS program.

Results

The average age of FG at the time of diagnosis was 58.9 (95% CI 57.8–60.1) years and in SG was 67.2 (95% CI 66.7–67.6) years. The FG patients were on average 8.3 years younger than the SG patients ($p < 0.0001$). There were not found statistically significant difference of 5 year CSS rate between FG and SG. The 10-year CSS rate was 92% (95% CI 0.88–0.97) in FG and 69% in SG (95% CI 0.60–0.78). Thus, in the FG, the 10-year CSS rate was 23% higher than SG ($p = 0.024$). The GS was totally known for 622 patients with PC. 130 of these patients were included in FG (20.9% of all patients with known GS) and 492 patients in SG (79.1% of all patients with known GS). There were no statistically significant differences in the fraction of patients with known GS between both groups ($p = 0.712$).

Conclusions

1. The average age of patients in the FG at the time of diagnosis was lower by 8.3 years than in SG.
2. The cancer-specific 10-year survival rate in the FG was 23% higher than in the SG.
3. No statistically significant differences of GS could be found between FG and SG.

Clinicopathological Features of Follicular Variant of Papillary Thyroid Carcinoma

*Dr. Rīta Ničiporuka*¹; *Dr. med. Artūrs Ozoliņš*¹;
*Prof. Zenons Narbuts*¹; *Prof. Ilze Štrumfa*²;
*Prof. Jānis Gardovskis*¹

¹*Rīga Stradiņš University, Department of Surgery, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvia;

²*Rīga Stradiņš University, Department of Pathology, Latvia*

Objectives

Follicular variant of papillary thyroid cancer (FVPTC) is one of most common subtypes. It has been increasingly diagnosed in recent years. However, little is known about its clinical behaviour.

Methods

Retrospective thyroid patient data from 2015–2018 were analysed. Morphology revealed PTC in 208 of patients who underwent thyroid operation due to various reasons. FVPTC noted in 21.2% (n = 44) – Group A, classical variant of PTC (cPTC) in 72.5% (n = 151) – Group B. Concomitant FVPTC and cPTC was found in 6.3% (n = 13) cases. Only patient data with isolated FVPTC or cPTC (n = 195) were analysed regarding to indications for surgery, tumor size, extrathyroidal extension, blood and lymph vessel invasion and presence of lymph node metastases.

Results

Main indication for surgery was suspicious or proved malignancy: Group A – 72.7% (n = 32), B – 73.5% (n = 111) (p = 0.689). Mean tumor size in groups A and B was 14.7 mm and 13.6 mm respectively (p = 0.59). Extrathyroidal extension in Group A noted in 13.6% (n = 6), B – 33.8% (n = 51) (p = 0.035). No significant difference regarding lympho-vascular and blood vessel invasion was found: 9.1% (n = 4) vs 12.6% (n = 19) (p = 0.527) and 11.4 (n = 5) vs 6.0% (n = 9) (p = 0.156) respectively. Lymph node metastases noticed in Group A – 9.1% (n = 4) vs B – 21.2% (n = 32) (p = 0.069).

Conclusions

In literature aggressive FVPTC is assumed as the hybrid of clinical behaviour of C-PTC and follicular thyroid cancer leading to worse prognosis. In our study FVPTC and cPTC have a lot of similar features and did not show significant differences.

Quality Assurance Aspects of Colposcopy Service in Latvia

*Dr. Irina Jermakova*¹; Prof. *Dace Rezeberga*²;
*Dr. med. Jana Žodžika*²; Prof. *Māra Pilmane*²; *Dr. Olga Plisko*²;
*Dr. med. Inta Liepniece-Karele*³; *Una Kojalo*²

¹ Rīga East University Hospital, Latvia;

² Rīga Stradiņš University, Latvia

Objectives

Cervical cancer screening program was established in Latvia in 2009. Colposcopy service as a part of a program started in June 2012. The first Colposcopy reference center with the focus on maintenance of quality assurance (QA) was established in Rīga East University Hospital in 2012. Latvian precancerous lesions diagnostic and treatment national guidelines were accepted in 2013.

The aim of our study was to evaluate how to adapt and to realize QA colposcopic standards in Latvia based on experience of European Federation for colposcopy (EFC) guidelines.

Methods

Theoretical and practical knowledge were obtained during British Society for colposcopy and cervical pathology (BSCCP) training program and attending QA group visits in the hospitals of the United Kingdom which helped understand and recognize the importance of colposcopy service functioning according QA standards. We analyzed the clinical data obtained in 2012–2017 in colposcopy reference center in Rīga.

Results

Some of EFC recognized QA standards were implemented: uniform colposcopy data collection with 100% squamocolumnar junction visualization and documentation, protocols of the referral cytology are available at time of colposcopy as well as colposcopic examination prior to treatment of abnormal cytology is mandatory.

However, data collecting in colposcopy is not standardized yet and model of internal QA audit is not in progress, as well as multidisciplinary team meetings as an important aspect of colposcopic QA have never taken place.

Conclusions

Consensus on agreed quality standards should be obtained as soon as possible to enable and guide required data collection. The Latvian screening program should aim to have a single colposcopy data set to enable benchmarking and quality assurance. Internal QA should include the standardized audit and the use of regular multidisciplinary team meetings. Future development of QA standards in colposcopy in Latvia will be required and regular audit of it will be provided.

Pathological Correlation between Needle Biopsy and Radical Prostatectomy Specimen in Patients with Localised Prostate Cancer

*Guntars Sperga; Dr. Māris Jakubovskis;
Dr. Linards Rēdmanis; Prof. Vilnis Lietuvietis*

Rīga East University Hospital, Clinic of Urology and Oncological Urology, Latvia

Objectives

This study aims to evaluate the accuracy of transrectal ultrasound (TRUS) guided prostate biopsies in predicting pathological grading and tumor distribution in the final pathological specimen of patients who underwent radical prostatectomy for clinically localized prostate cancer (PC).

Methods

We reviewed retrospectively the records of 399 patients with localized PC in 2016–2017 year diagnosed by TRUS-guided prostate biopsy and treated with radical retropubic prostatectomy.

Results

Of the 235 patients with ISUP G1 (International Society of Urological Pathology prostate cancer grades) on needle biopsy, 78 (32%) had ISUP G1 on final pathology, 140 (61%) had ISUP G2; 9 (4%) had ISUP G3; 8 (3%) had ISUP G4-5. 109 patients with ISUP G2 on needle biopsy, 20 (18%) had ISUP G1 on final pathology, 78 (72%) had ISUP G2; 6 (5%) had ISUP G3; 6 (5%) had ISUP G4-5.

15 patients with ISUP G3 on needle biopsy, 1 (7%) had ISUP G1 on final pathology, 6 (40%) had ISUP G2; 6 (40%) had ISUP G3; 2 (13%) had ISUP G4-5.

22 patients with ISUP G4 on needle biopsy, 1 (0.5%) had ISUP G1 on final pathology, 6 (27%) had ISUP G2; 7 (32%) had ISUP G3; 7 (27.5%) had ISUP G4-5.

18 patients with ISUP G5 on needle biopsy, 2 (11%) had ISUP G1 on final pathology, 7 (39%) had ISUP G2; 5 (28%) had ISUP G3; 4 (22%) had ISUP G4-5.

Conclusions

Comparing the histological results for patients, who had a radical prostatectomy treatment, before and after operation we conclude that for 43.1% of patients post operational histological ISUP G is the same as with the pre-operational histological G, for 42.9% of patients post operational histological ISUP G increases and for 14% - decreases. From our analysis we conclude that there's a paramount need to improve the quality of the acquisition of a histological material, it's processing and evaluation. Due to these factors one must recognize that by choosing the strategy for the treatment based on low or mid-level prostate cancer risk groups there exists tangible risks that the treatment will not be adequate.

Role of Percutaneous Ultrasound Guided Needle Biopsy of Axilla to Restage Node Positive Breast Cancer after Neoadjuvant Chemotherapy

Dr. Baiba Līcīte^{1,2}; Prof. *Arvīds Irmejs*^{1,3};
Dr. med. Jeļena Maksimenko^{1,2}; *Dr. Pēteris Loža*^{1,2};
Prof. *Genādijs Trofimovičs*^{1,2}; Prof. *Edvīns Miklaševičs*^{1,3};
*Dr. Jurijs Nazarovs*⁴; *Dr. Māra Romanovska*⁴; *Dr. Justīne Deičmane*⁵;
Prof. *Gunta Purkalne*^{1,3}; Prof. *Jānis Gardovskis*²

¹ *Pauls Stradiņš Clinical University Hospital, Latvia;*

² *Rīga Stradiņš University, Department of Surgery, Latvia;*

³ *Rīga Stradiņš University, Institute of Oncology, Latvia;*

⁴ *Pauls Stradiņš Clinical University Hospital, Department of Pathology, Latvia;*

⁵ *Pauls Stradiņš Clinical University Hospital, Department of Radiology, Latvia*

Objectives

Aim of the study is to evaluate the role of percutaneous ultrasound guided needle biopsy (PUGNB) of axilla to restage node positive breast cancer after neoadjuvant chemotherapy (NAC).

Methods

From January 2016 – December 2018 96 node positive stage IIA-IIIC breast cancer cases undergoing NAC were included in the study. Largest, the most superficial and the most caudal axillary node metastasis confirmed by fine needle or CORE needle biopsy was marked with clip to facilitate the restaging of axilla and to decrease false negative rate (FNR) of axilla conserving surgery (ACS) after NAC. After NAC restaging of axilla was performed with PUGNB (fine needle or CORE needle biopsy) of the marked and/or the most suspicious axillary node. Afterwards axillary surgery was performed.

Results

60/96 cases with PUGNB data available were further evaluated. PUGNB after NAC revealed residual malignancy in 26/60 cases and was cancer free in 34/60 cases. In 38/60 cases ACS and in 22/60 cases axillary lymph node dissection (ALND) was performed. In 32% (19/60) of cases complete pathological response (ypCR) in axilla was observed. False Positive Rate (FPR) of PUGNB after NAC was 12% (3/26), FNR – 53% (18/34), sensitivity – 56%, specificity – 84%, accuracy – 65%.

Conclusions

PUGNB after NAC has low 12% FPR and is useful to predict residual axillary disease and to streamline surgical decision making regarding ALND as well to avoid frozen section and repeated surgeries. However, FNR is unacceptable high and PUGNB alone are not able to predict axillary ypCR and omission of further axillary surgery. In many cases ACS is still the most optimal method to restage the axilla after NAC.

Combined Forms of Basal Cell Carcinoma in Head and Neck Region

*Dr. Jelena Moisejenko-Golubovica*¹;
Prof., *Dr. habil. med. Valērija Groma*²; *Anna Ivanova*³;
*Dr. Julianna Muceniece*⁴; *Olegs Volkovs*⁵

¹ *Rīga Stradiņš University, Department of Doctoral Studies, Latvia;*

² *Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;*

³ *Rīga Stradiņš University, Institute of Stomatology, Department of Maxillofacial Surgery, Latvia;*

⁴ *Rīga Stradiņš University;*

⁵ *Rīga Stradiņš University, Latvia*

Objectives

The coexistence of different histopathological types of basal cell carcinomas (BCCs) in the same anatomical localization is rare and interesting for histopatologists and clinicians. Several clinical cases have been published in the literature about two separate tumors of different structures in one localization, but there are limited data exploring the features of combined type BCC in a single tumor, which histopathologically demonstrates more than one pathologic pattern of tumor. Minimally invasive therapy for a non-aggressive tumor subtype, diagnosed dermatologically or from a surface biopsy, may not be sufficient to treat a suspicious aggressive tumor subtype, leading to recurrent skin cancer. Dermatoscopically is difficult to identify all histopathological tumor types in one anatomical site. Histologically and immunohistochemically there is a big difference from other bcc types and clinically this types of BCC is more aggressive. They can reccure after surgical treatment. The aim of this study is to evaluate peculiarities of actin expression and SonicHedgehog (Shh) signaling implicated in development of mixed BCC in head and neck region assessed using immunohistochemistry and compare the findings with single tumor histological types of basal cell carcinoma.

Methods

We report about three cases of rare and aggressive BCC variants. The cases of combined basal cell carcinoma were observed both in the recurrent course of the disease and in the primary cases. We report a two cases of the coexistence of nodular and adenoid BCC and one case of coexistence of nodular, adenoid and infiltrative type of bcc in one anatomical site on the head and neck region after laser and imiquimod treatment. Histopathology with immunohistochemistry study using alfa - actin and sonic hedgehog revealed features of nodular, adenoid and infiltrative basal cell carcinoma, respectively. Semiquantitative estimation of samples in 20 randomly selected microscopic fields was applied. Expression of antibodies was evaluated by express expression as 0.1.2, where 0-0%, 1 - < 50%, and 2 - > 90%, respectively. Tumor and stromal expressions were estimated separately. Excision margins > 1 cm. Statistical analysis was preformed using SPSS 22.0 programme and tissue samples were analysed using Leica microscope (x 400). Investigative work up did not reveal evidence of metastasis.

Results

Dermatoscopically a homogeneous white-pink colouration, arborization of blood vessels, telangiectasias, and ulceration with white-red scally structures were detected dermatoscopically in two cases, were BCC was located on the nose. The BCC on the neck just with big ulceration, no any other criteria couldn't be identifying. A solid-adenoid and a solid-adenoid-infiltrative forms of BCC has been revealed by histopathology and immunohistochemically, where the alfa - actin was strongly positive in tumor mass and stroma. Recurrent BCC of solid/adenoid type reveals pronounced heterogeneity when stained for actin. The patients underwent surgery to remove the tumor and a multistage skin plastic. The actin expression of the two groups in the tumor tissues was more pronounced - 45.4% (single type) and 39.1% (mixed), respectively. Statistically higher stromal expression was evident in mixed BCC - 35.6% (mixed) and 24% (single type). The Shh immunopositivity in the mixed tumor tissues was up to 81.3% but in single BCC type was only 64.7%, but in the stroma mixed type showed 57.9% and single type 53.4%. The statistically significant difference in the expression of actin in stroma for

mixed types of BCC was revealed. But for Shh expression here was no statistically significant difference and differences were observed only in the intensity of staining, which was more pronounced in combined tumors.

Conclusions

In conclusion, the coexistence of two or more different histopathological types of BCC in the same anatomical position is very rare. Nevertheless, one should suspect and explore such coexistence when faced with BCC, especially when presenting with another morphology in the same anatomical location. Such coexistence can include a large area and requires extensive surgical removal and grafting of the skin. In addition, these timely therapeutic procedures are mitigated in preventing relapses and metastases. These data strongly suggest that the expression of alpha-smooth muscle actin is clear, reliable, and easy-to-use marker for aggressiveness in basal cell carcinoma. Aggressive basal cell carcinomas show a pronounced expression of alpha smooth muscle actin in the stroma, whereas nonaggressive basal cell carcinomas express alpha smooth muscle actin in tumor cells, which means that actin can be used as a marker of potentially prone to recurrence with basal and is applicable in clinical practice for taking surgical and therapeutic decisions. The presence of a high-level stromal expression suggests on possible paracrine communication and involvement of it in the development of relapse via the Shh pathway.

Risk of Contralateral Breast Cancer in BRCA1 Gene Mutation Carriers with Primary Breast Cancer in Latvian Population

*Dr. Peteris Loza*¹; Prof. *Arvīds Irmejs*¹;
*Jelena Maksimenko*²; Dr. *Ansis Ģīlis*³;
Prof. *Genādijs Trofimovičs*⁴; Prof. *Jānis Gardovskis*⁴;
Prof. *Edvīns Miklaševičs*¹; Prof. *Zanda Daneberga*⁵

¹ Rīga Stradiņš University, Oncology Institute, Latvia;

² Pauls Stradiņš Clinical University Hospital, Breast Surgery Department, Latvia;

³ Pauls Stradiņš Clinical University Hospital, Breast Unit, Latvia;

⁴ Rīga Stradiņš University, Department of Surgery, Latvia;

⁵ Rīga Stradiņš University, Faculty of Medicine, Latvia

Objectives

The objective of this study was to estimate the risk of metachronous contralateral breast cancer (CBC) in BRCA1 mutation carriers with unilateral primary breast cancer (UPBC) in Latvian population, dominated by three founder mutation types, and to evaluate the risk reduction associated with contralateral prophylactic mastectomy (CPM).

Methods

In this retrospective observational cohort study we selected women with BRCA1 gene mutation, who had surgery for UPBC in stage 1–3. Information regarding BRCA1 mutation was obtained from RSU Institute of Oncology database in Latvia. Primary endpoint was CBC. Secondary endpoints were event of ovarian cancer, distant metastasis and death. Data about CBC, ovarian cancer, distant metastasis and survival was obtained from national oncology register (eveselib.gov.lv). Information about CPM procedures was obtained from Pauls Stradiņš Clinical University Hospital electronic database (Arstu Birojs). Median follow-up time, risk of CBC and survival was calculated using Kaplan-Meier type analysis.

Results

Between February 1980 and November 2018, 171 patients were enrolled in the study. Mean age at primary breast cancer diagnosis was 47.0 (95% CI ± 1.7,) years. At median follow-up of 11.9 years (IQR 10.2–13.6 years), 26 (15.4%) patients developed CBC. Mean time from UPBC to CBC was 10.7 (95% CI ± 3.2) years. Cumulative risk of CBC within 10 years of primary cancer was 15.2% (95% CI ± 2.3) years. During follow-up period, 21 (12.4%) patients developed ovarian cancer, 25 (14.8%) women developed distant recurrence. A total of 42/171 (24.9%) deaths occurred of which 39 were confirmed due to breast cancer. Overall 10 year survival was 76.9% (95% CI ± 3.2%). CPM procedure was performed in 25 cases, all within one year of primary cancer diagnosis. Mean follow-up of this subgroup was 3.6 (95% CI ± 1.2) years. None of patients who had CPM procedure developed CBC.

Conclusions

BRCA1 mutation carriers in Latvia have high risk of developing CBC, however, this problem can be effectively solved by CPM procedure.

Thyroid Surgery Influence on Calcium Metabolism: Hospital Experience

*Dr. Alise Didrihsone; Dr. Rita Ničiporuka; Prof. Zenons Narbutis;
Dr. med. Artūrs Ozoliņš; Prof. Jānis Gardovskis*

*Pauls Stradiņš Clinical University Hospital, Latvia;
Rīga Stradiņš University, Department of Surgery, Latvia*

Objectives

Postoperative hypocalcemia is the most common complication after thyroidectomy. It requires replacement therapy and significantly decreases quality of life. The aim of this study was to identify prevalence and risk factors of early postoperative hypocalcemia after thyroid surgery.

Methods

From October 2015 till December 2018 total 801 patients underwent thyroid surgery in Pauls Stradiņš Clinical University Hospital. Calcium levels in blood was measured on 1st postoperative day (F0) and at first follow up 1 month after surgery (F1). In retrospective data analysis were included 410 patients who attended F1. Hypocalcemia was defined as less than 2.08 mmol/l.

Results

Altogether 180 patients had 1st postoperative day hypocalcemia (43.9%), 77 (42.8%) needed calcium substitution at discharge. At one month follow up hypocalcemia had 8 (1.9%) patients. Hypocalcemia at F0 was more often noticed after operations done due to compression symptoms: F0 – 67 (46.5%), and F1 – 3 (2.0%) patients respectively. If operated due to thyrotoxicosis – 45 (45.0%) cases, in 1 (1.0%) patient hypocalcemia was noted at F1. Due to malignancy F0 hypocalcemia had 66 (42.0%), at F1 – 4 patients (2.5%). Unilateral thyroid operation underwent 109 patients (26.6%) and 301 patient (73.4%) had bilateral surgery of thyroid gland. After unilateral operations F0 hypocalcemia was less common compared with those who had bilateral surgery – 28 (25.6%) vs 152 (50.5%) patients respectively. At F1 no case of hypocalcemia was noticed in unilateral surgery group compared with 8 (2.6%) cases in bilateral surgery group. Patients with F0 hypocalcemia had longer average hospital stay compared with those who had normal calcium levels: 1.4 vs 1.2 respectively.

Conclusions

Hypocalcemia is a common complication after bilateral thyroid surgery, which leads to prolonged hospital stay and necessity for calcium and vitamin D3 replacement. Further studies should be contributed concerning possible ways to avoid hypocalcemia after bilateral thyroid surgeries.

Multiparametric Magnetic Resonance Imaging and 68-Gallium-PSMA Positron Emission Tomography in Patients with Biochemical Recurrent Prostate Cancer: Single Centre Study

*Ph.D. Maija Radzina*¹; *Dr. Mara Tirane*¹; *Dr. Liene Zemniece*¹;
*Dr. Marika Kalnina*¹; *Dr. Lilita Roznere*¹; *Prof. Egils Vjaters*²;
*Prof. Vilnis Lietuvietis*³; *Dr. Arvis Freimanis*³; *Ph.D. Arta Strazdina*⁴

¹ Rīga Stradiņš University, Radiology Research Laboratory, Latvia;

² Pauls Stradiņš Clinical University Hospital, Department of Urology, Latvia;

³ Rīga Stradiņš University, Department of Urology, Latvia;

⁴ Rīga Stradiņš University, Department of Radiology, Latvia

Objectives

Evaluation of visibly detectable biochemical recurrence in prostate cancer (PCa) can be done both by multiparametric magnetic resonance imaging (mpMRI) and 68-Gallium-prostate-specific-membrane-antigen-ligand positron emission tomography (68Ga-PSMA PET/CT).

Our aim was to compare the diagnostic tools – mpMRI and 68Ga-PSMA PET/CT for evaluation of recurrence, regional lymph nodes and metastases in patients with biochemical recurrent PCa.

Methods

In this prospective study were included patients with biochemical recurrent PCa (with PSA \geq 0.2 ng/ml) who previously received:

- 1) radical prostatectomy – 20/31 (64%);
- 2) radiation therapy of prostate or prostate bed – 11/31 (36%).

For each patient mpMRI and 68Ga-PSMA PET/CT were made. The results between mpMRI and 68Ga-PSMA PET/CT were compared and evaluation of recurrence was made using reference standard that was based on clinical data of patient and/or results of histology material and/or follow-up information. Local recurrence was assessed in prostate gland or in prostate bed, regional lymph nodes are lymph nodes of true pelvis below the bifurcation of the common iliac arteries. Any other locations were considered as distant metastatic disease.

Results

Total 31 patients met inclusion criteria. Mean patient age 62.6 ± 7.4 years, age range 49–81.

Mean PSA value at the time of the studies were 1.93 ng/ml, median PSA 0.76 ng/ml. Median Gleason score 7, range 5–10. PSA median doubling time 4.1 months.

MpMRI revealed pathology in 48.6% (n = 18/31), while 68Ga-PSMA PET/CT showed pathological 68Ga-PSMA uptake in 62.2% (n = 23/31), whole body MRI DWI series were performed in 18/31. Local recurrence mpMRI vs PET (29.0%(9/31) vs 35.5% (11/31)), regional lymph nodes (32.3% 10/31 vs 41.9% 13/31) and distant metastases (6.5% 2/31 vs 41.9% 13/31). mpMR results correlated with PET for local recurrence $r = 0.55$, $p = 0.001$, regional lymph nodes $r = 0.53$, $p = 0.002$, no correlation in distant disease $r = -0.14$, $p = 0.44$. Showing highest sensitivity, specificity, PPV, NPV and accuracy for mpMRI and 68Ga-PSMA PET/CT in regional lymph nodes 63.64%, 94.12%, 87.50%, 80.00%, 82.14% and 100.00%, 94.12%, 91.67%, 100.00%, 96.43%, respectively. PET/CT interpretation was analyzed by 2 experienced radiologists and showed high agreement for local recurrence 25/30 (83.3%), by Cohen's Kappa $k = 0.619$, SE 0.150 ($p = 0.0001$), regional lymph nodes 28/30 (93.3%), $k = 0.857$, SE 0.097 ($p = 0.0001$) and distant metastases 24/30 (80.0%), $k = 0.510$, SE 0.190 ($p = 0.005$). The main limitations of mpMRI were small metastatic lymph nodes that showed nonspecific characteristics of mpMRI and limited scanning area in 42% (13/31) patients.

Conclusions

Our results revealed that 68Ga-PSMA PET/CT is more accurate diagnostic tool than mpMRI for both – local recurrence and regional lymph node evaluation in patients with biochemical recurrent PCa and superior in distant metastatic disease.

Chromothripsis as a Prognostic Marker in Metastatic Colorectal Cancer

*Dr. Elīna Skuja*¹; *Dr. Dagnija Kalniete*²;
*Dr. Miki Nakazawa-Miklaševiča*²; *Prof. Zanda Daneberga*²;
*Prof. Gunta Purkalne*²; *Prof. Edvīns Miklaševičs*²

¹ *Pauls Stradiņš Clinical University Hospital, Clinic of Oncology, Latvia;*

² *Rīga Stradiņš University, Oncology Institute, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvia

Objectives

Chromothripsis is a massive chromosome shattering occurred as a single catastrophic event leading to random repair of chromosomes. Multiple deletions and amplifications are very common in cancer cells affected by chromothripsis. In our previously reported study, we found a correlation between DNA massive fragmentation and increased progression free survival (PFS) in metastatic colorectal cancer (mCRC), but not overall survival (OS). The aim of this study is to find overlapping deleted genome regions in selected mCRC patients with chromothripsis and detect possible cause of increased PFS, and find new genes or combinations, involved in colorectal cancer oncogenesis.

Methods

10 mCRC patients with chromothripsis receiving FOLFOX first-line palliative chemotherapy between August, 2011 and October, 2012 were selected for this study. Genotyping. Microarray analysis was performed using the Infinium HumanOmniExpress-12 v1.0 FFPE BeadChip kit (Illumina). BeadChip was scanned on HiScan (Illumina). Analysis was performed by GenomeStudio software (Illumina) and R version 3.1.2. (<https://www.r-project.org/>). Copy number variation and breakpoints on the chromosomes were analyzed using the DNA copy package (<http://bioconductor.org/packages/release/bioc/html/DNAcopy.html>).

Results

Eight deleted tumor suppressor genes (ROBO2, CADM2, FAT4, PCDH10, PCDH18, CDH18, TSG1, CTNNA3) and four deleted oncogenes (CDH12, GPM6A, ADAM29, COL11A1) were identified in more than half of patients. In 70% patients' deletion in COL11A1 was detected. Deletion of MIR1269, MIR4465, MIR1261 and MIR4490 in patients with longer time to progression was observed. Four patients (40%) with PFS over 14 months, presented with NRG3 deletion (oncogene, EGFR ligand) what could possibly decrease proliferation of cancer cells via decreasing EGFR activation.

Conclusions

Multiple chromosomal deletions (MIR1269, NRG3, ADK) in mCRC patients with chromothripsis are associated with better response to first line palliative FOLFOX-type chemotherapy and increased PFS.

Microcell Formation in Various Cell Lines Due to Stress

*Zane Simsons*¹; *Ph.D. Tālivaldis Freivalds*¹;
*Ramona Petrovska*²; *Līga Harju*¹; *Ph.D. Indulis Buiķis*¹

¹ *University of Latvia, Institute of Cardiology and Regenerative medicine;*

² *Latvian Biomedical Research and Study Centre*

Objectives

Cancer cells are very polymorphic and found in various differentiation stages, hampering the choice and efficiency of suitable therapy. Data suggest that in spite of tumor diagnostics and improved treatment possibilities available therapies are not good enough (spkc.gov.lv).

Performing an experiment with cell cultures and acting on them with conventional chemotherapy revealed development of small-sized cells, called microcells – intensively stained small round or oval cells with small amount of cytoplasm (Buiķis et al., 1999). Buiķis et al. (2002) suggest to use the term sporosis – a process of microcell formation from damaged tumor macrocell (Buiķis et al., 2002).

The aim of this work was to induce microcell forming in human melanoma cancer cell line using anti-tumor drug and characterize the population of microcells.

Methods

SK-MEL-28, HS-68, HeLa cell lines were acquired from the American Type Culture Collection (ATCC) and maintained in a culture medium consisting of Dulbecco's modified Eagle's medium (DMEM; Invitrogen) supplemented with 10% FBS. The chemotherapy was used to induce microcell formation. In this study NADPH test and GFP transfection evaluation to characterize the population of microcells were used.

Results

The microcell induction was stimulated by anticancer treatment, and we observed them as small, round and intensively stained cells at the size of approximately 3 μm. These microcells after some time also expressed GFP that indicate that microcells are liveable and active.

Conclusions

According to this research we saw that of microcells are capable of forming under stress conditions, and they have high endocytosis ability when up-taking substances from an environment. The population of microcells start to increase after 24 h and the maximum was reached 48 h after applied therapy.

Acknowledgements

This project is supported by University of Latvia Donor – SIA “Mikrotikls”. Foundation of the University of Latvia is administrator of this donation.

Downregulation of Mismatch Repair Proteins Correlated with Increased CD9a Expression in High Grade Prostate Cancer

*Kristofs Folkmanis*¹; Prof. *Sergejs Isajevs*²;
*Dr. Maris Jakubovskis*²; Prof. *Janis Eglitis*²;
Prof. *Valdis Folkmanis*³; Prof. *Vilnis Lietuvietis*²

¹ *University of Latvia, Faculty of Medicine;*

² *Riga East University Hospital, Latvia;*

³ *University of Latvia*

Objectives

The objective of the current study was to compare the expression of exosomal biomarker CD9a and mismatch repair proteins (MMR: MSH2, MSH6, MLH1, and PMS2) by immunohistochemistry (IHC) in the tissue of patients with prostate cancer and benign hyperplasia.

Methods

The study was retrospective. Altogether, 30 patients with prostate acinar adenocarcinoma and 10 patients with prostate benign hyperplasia were enrolled in the study. The patients underwent surgical treatment at Riga East University Hospital at 2014. CD9a, MSH2, MSH6, MLH1, and PMS2 expression was analysed by immunohistochemistry.

Results

CD9 expression was significantly increased in prostate acinar adenocarcinoma compared to control group (3.1 ± 0.74 vs 0.78 ± 0.42 , score, $p < 0.0001$). In addition, a positive correlation between CD9a expression and Grade group was observed ($Rho = +0.54$; $p = 0.003$). MMR expression was absent in 10 patients (two patients with Grade group 3, five patients with Grade group 4 and three patients with Grade group 5). MMR was present in all cases of benign prostate hyperplasia.

Conclusions

High grade prostate cancer (Grade group 3–5) characterises by increased CD9a expression and downregulation of MMR.

Targeted Therapy against Cancer

Prof. *Gunta Purkalne*

*Rīga Stradiņš University, Department of Oncology, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Targeted therapy is the foundation of precision medicine. The aim of this presentation is to underline the last achievements of targeted therapies in some types of cancer.

Methods

Most targeted therapies are either small-molecule drugs or monoclonal antibodies. Signal transduction inhibitors are the largest type of targeted therapy in use today. EGFR inhibitors help stop the cancer from growing. Like EGFR, HER2 is a transmembrane receptor. EGFR and HER2 belong to one family of receptor tyrosine kinases. Most kinase inhibitors target tyrosine kinases. Targeted therapies help treat cancer by interfering with specific proteins that help tumors grow and spread throughout the body. Some monoclonal antibodies act on targets within immune system. The largest group is anti-CD20 antibodies, anti-CD52 antibodies work in the same fashion on lymphocytes. A third immune target is CTLA-4. CTLA-4 and PD-1 (CD279) belong to so-called immune checkpoint molecules.

Results

Much progress has occurred in the treatment of advanced non-small lung cancer because of the development of molecular targeted therapies for specific markers, such as EGFR mutations and ALK and ROS1 fusions, and immunotherapy.

Dual targeting of HER2 with antibodies has been a successful strategy in both early and metastatic breast cancer. Anti-VEGF and anti-EGFR antibodies can be effectively used in combination with cytotoxic chemotherapy for the first-line treatment of metastatic colorectal cancer.

There has been a therapeutic revolution in the treatment of metastatic melanoma over the past decade. Combination BRAF/MEK inhibition leads to rapid responses and has shown an improvement in overall survival. Treatments containing PD-1 antibodies are clearly superior to CTLA-4 antibodies in the frontline setting.

Conclusions

Targeted therapy will be added to or will completely replace chemotherapy in more defined subsets of patients with cancer. Precision medicine will expand in the future and improve survival and quality of life.

Cell Responses to Ionizing Radiation: Current Research at Lithuania University of Health Sciences and Future Perspectives with “Inspire” Project

Prof. *Elona Juozaityte*¹; Dr. *A. Bartnykaite*²;
Dr. *D. Laukaitiene*²; Dr. *R. Ugenskiene*²

¹ *Lithuanian University of Health Sciences, Oncology Institute;*

² *Lithuanian University of Health Sciences, Oncology Institute,
Oncology Research Laboratory*

Objectives

Lithuanian University of Health Sciences participates in Horizon 2020 project “INfraStructure in Proton International Research” (INSPIRE). We are involved in Radiobiology research. The aim is to analyze the molecular basis of breast cancer cell radio-resistance. The survival of breast cancer cells, following the exposure to linear accelerator, and the extent of apoptosis and cell cycle delay in irradiated cells were analyzed.

Methods

Two different breast cancer cell lines, MCF-7 and MDA-MB-231, were exposed to 2, 4, 6, 8, 10 Gy of ionizing radiation (IR) from linear accelerator. The survival of cells was assessed via clonogenic assay. The intensity of the radiation-induced apoptosis was measured using annexin V staining and Guava PCA flow cytometer. Furthermore, the cell-cycle delay was studied on Muse Cell Analyzer via propidium iodide DNA assay.

Results

In clonogenic assay the fraction of surviving MDA-MB-231 cells was higher than that of MCF-7 at all analyzed IR doses. The results suggests that MDA-MB-231 cells were more resistant to IR. The analysis of early radiation-induced apoptosis showed that MDA-MB-231 cells had a delayed apoptotic response, following the exposure to IR, compared to MCF-7 cells. In addition, cell cycle analysis revealed that IR induced G2/M phase arrest in MDA-MB-231 cells and G0/G1 phase arrest in MCF-7.

Conclusions

We concluded that radio-resistance in the MDA-MB-231 cell line may be associated with a delayed apoptotic response and G2/M phase arrest following the exposure to IR. The molecular mechanism of MDA-MB-231 and MCF-7 breast cancer cell lines radio-resistance is under investigation.

Accuracy of Imaging Methods in Differentiated Thyroid Cancer after Thyroidectomy for Evaluation of Residual Thyroid Tissue before and after Radioiodine Therapy

*Nataļja Šenterjakova*¹; *Ph.D. Maija Radziņa*²;
*Dr. Antra Bērziņa*³

¹ *University of Latvia, Faculty of Medicine;*

² *Rīga Stradiņš University, Radiology Research Laboratory, Latvia;*

³ *Rīga East University Hospital, Oncology Centre of Latvia,
Clinical Department of Nuclear Medicine*

Keywords. Radioiodine I-131 therapy (RIT), thyroidectomy, residual thyroid tissue.

Objectives

To compare the diagnostic accuracy of neck ultrasonography (US) performed just before RIT of differentiated thyroid cancer, thyroid scintigraphy (TS) performed during I-131 uptake measurement and post-therapy I-131 whole-body scintigraphy (rxWBS) in evaluation of residual thyroid tissue after thyroidectomy and to compare these methods with single-photon emission computed tomography/computed tomography (SPECT/CT).

Methods

214 patients had received RIT for period 2016–2017, 34 patients were retrospectively selected in whom all four imaging methods were performed: US before RIT, TS with a small dose (5 MBq) of I-131 performed during I-131 measurement, rxWBS performed 4–7 days after RIT and SPECT/CT performed in the situations when rxWBS had shown suspicious findings. SPECT/CT which is known as the most accurate imaging method in comparison with other three methods used as a standard of reference. Using the ROC curve the area under the curve (AUC) was calculated. The sensitivity (Sn), specificity (Sp) and accuracy of neck US, TS and rxWBS were calculated. The statistical significance of the difference between each of these three imaging methods and SPECT/CT was determined.

Results

ROC curve analysis showed AUC = 0.637, $p = 0.003$ for neck US; AUC = 0.703, $p < 0.001$ for TS; AUC = 0.923, $p < 0.001$ for rxWBS. Sn, Sp and accuracy were 50%, 97% and 76% for neck US; 55%, 96% and 79% for TS and 88%, 98% and 94% for rxWBS, respectively. There is statistically significant difference between neck US and SPECT/CT and between TS and SPECT/CT ($p = 0.001$) but difference is not significant between rxWBS and SPECT/CT ($p = 0.227$).

Conclusions

The diagnostic accuracy of rxWBS showed the highest similarity to SPECT/CT for evaluation of residual thyroid tissue after RIT in comparison with US and TS – showing markedly lower accuracy.

Glasgow Prognostic Score by TNM Burden and Overall Survival in Pancreatic Ductal Adenocarcinoma

*Artūrs Šilovs; Reinis Riekstiņš; Dāvids Orlovs;
Prof. Ilze Štrumfa; Dr. med. Zane Simtniece*

Rīga Stradiņš University, Department of Pathology, Latvia

Objectives

Glasgow prognostic score (GPS), based on serum levels of C-reactive protein and albumin, is a sensitive marker of systemic inflammatory response. The prognostic value of GPS in different cancers has been recently demonstrated (Nozoe et al., 2014; Jin et al., 2017). The aim of current study was to assess the prognostic role of GPS in pancreatic ductal adenocarcinoma (PDAC), known for dismal prognosis and unpredictable postoperative course.

Methods

Consecutive, morphologically confirmed PDACs, subjected to radical surgical treatment, were retrospectively identified by archive search in a single university hospital (2006–2017). Routine preoperative blood biochemistry tests were used to calculate GPS. Overall survival (OS) after the surgery was detected. Tumour pTNM, grade (G), resection line status (R), manifestations of invasive growth were assessed by protocol approach. Descriptive and analytical statistics (Mann-Whitney test, Spearman's rank correlation, Kaplan-Meier analysis) were performed by SPSS software. Significance was considered with $p < 0.05$.

Results

In the studied group, the following GPS distribution was found: 0, 61.5% [95% confidence interval 45.3–76.7]; 1, 25.6% [13.2–40.5] and 2, 12.9% [2.7–24.4]. The median OS was 11.0 months [7.5–12.5]. There was a statistically significant association between GPS and invasion in more than two histological structures ($p = 0.021$) as well as a trend to correlation with number of metastases in regional lymph nodes ($p = 0.061$). GPS lacked association with OS ($p = 0.566$). Yet, OS was affected by pT ($p < 0.0001$), perineural invasion ($p = 0.032$) and had trend to decrease if > 2 manifestations of invasive growth were identified ($p = 0.051$).

Conclusions

In our study of PDAC in Latvia, low GPS predominated. GPS lacked prognostic role, as overall survival was affected only by pT and perineural invasion. Yet, higher invasive capacity significantly correlated with increased GPS value. To the best of our knowledge, this is the first study devoted to GPS in PDAC regarding local patients in Latvia and Baltic countries.

Results of Autologous Haematopoietic Stem Cell Transplantation in Kaunas – International Telemedicine Project

*Dr. med. Domas Vaitiekus; Dr. Vilma Svetickiene;
Dr. Martyna Beitneriene; Dr. Milda Rudžianskiene;
Dr. Rolandas Gerbutavičius; Prof. Elona Juozaityte*

*The Hospital of Lithuanian University of Health Sciences Kauno Klinikos,
Department of Oncology and Hematology*

Objectives

To present The Hospital of Lithuanian University of Health Sciences Kauno Klinikos, Oncology and hematology department results of HSCT programs incorporating telemedicine project.

Methods

Retrospective analysis of 86 autologous HSCT performed for the period of 2015.07–2019.01. Patient's characteristics, transplantation period data and survival data analyzed.

Results

Telemedicine project was started under supervision of experienced director with protocols in place 2015 August. During project flow key elements for successful telemedicine project were identified:

1. Personnel Training in a JACIE accredited HSCT center and selection of local experienced hematologists staff.
2. Establishment of core facilities.
3. Site visit to the facilities.

HSCT results: Total number of transplants 86. Sex distribution: Male 48% Female 52%. Number of HSCT distribution according diseases: multiple myeloma 78, lymphoma 5, testicular cancer 3. Treatment related mortality (TRM) in one hundred days (100d) – 1.16%. Multiple myeloma OS 3.5y – 90.7%.

Conclusions

This innovative model of spreading of knowledge (know-how) and experience in the field of HSCT can serve as excellent example of future cellular therapies cooperation projects. Telemedicine project help to improve learning curve and avoid failures with many years experience and result are comparable with centers that are working for many decades.

Histology of Cervical Precancerous Lesions and Ki-67 Biomarker Expression

*Dr. Irina Jermakova*¹; Prof. *Dace Rezeberga*^{1,2};
Prof. *Māra Pilmane*²; *Dr. med. Inta Liepniece-Karele*¹;
Dr. med. Jana Žodžika^{1,2}; *Dr. Olga Plisko*²

¹ Rīga East University Hospital, Latvia;

² Rīga Stradiņš University, Latvia

Objectives

Histological assessment of cervical biopsies is a “gold standard” to confirm cervical intraepithelial neoplasia (CIN) and its grading, but misinterpretation may occur due to intra- and interobserver variability. These difficulties mean that patients as well may be over-treated for CIN lesions, which will naturally regress, as undertreated. Therefore, additional biomarkers should be required to improve diagnostic accuracy and quality in histopathology of cervical lesions.

The aim of this study was to determine the association between the different grades of cervical lesions and Ki-67 immunohistochemical expression (IHC).

Methods

A cross-sectional study that enrolled a total of 108 women aged 18–65 with abnormal cytology referred for colposcopy to Reference Colposcopy Centre in Rīga East University Hospital in July 2016–July 2017. Histological evaluation of cervical biopsy samples taken under colposcopy control was performed to each patient and all specimens were examined for Ki67 expression through IHC techniques.

Results

Low grade cervical intraepithelial neoplasia (CIN I) was found in 28 patients, high grade cervical intraepithelial neoplasia (CIN 2+) in 87 patients and reactive changes in 2 patients. A complete absence or just minimal IHC expression was observed in the normal cervical epithelium, but a significant increase in the expression of Ki-67 was detected in relation to the severity of lesions ($p < 0.001$). CIN2+ in histology reports was more likely correlate with Ki-67 presence: 85/87 cases.

Conclusions

We have found a significant increase in the expression of Ki-67 from low- to high-grade lesions. Additional use of Ki-67 expression with classical histology interpretation complete each other to reach an accurate diagnosis of CIN and help detect the prognosis.

Genetic Markers of Thrombosis in Patients with Chronic Myeloproliferative Diseases

*Dr. Ruta Dambrauskiene*¹; *Dr. med. R. Ugenskiene*²;
*Dr. med. R. Simoliuniene*³; Prof. *Elona Juozaityte*¹;
*Dr. med. R. Gerbutavičius*¹

¹*Lithuanian University of Health Sciences, Institute of Oncology, Oncology and Haematology Clinic;*

²*Lithuanian University of Health Sciences, Faculty of Medicine, Institute of Oncology;*

³*Lithuanian University of Health Sciences, Department of Physics, Mathematics and Biophysics*

Objectives

To evaluate the effects of platelet glycoprotein's, von Willebrand, FVII, β -fibrinogen single nucleotide polymorphisms, factor V Leiden, prothrombin G20210A mutation – and the risk of thrombosis in patients with BCR-ABL negative myeloproliferative neoplasia (MPN) at the Lithuanian University of Health Sciences.

Methods

This study included 108 patients with BCR-ABL negative MPN's. Genomic DNA was isolated from peripheral blood leukocytes. Genotyping was done using PCR and PCR-RFLP analysis.

Results

Of 108 subjects, 74 (68.5%) were found to have the platelet receptor GPIa/IIa c.807C>T polymorphism that was more frequently found in the group MPN patients with arterial thrombosis compared to the patients who were thrombosis-free (26.5% vs 11.5%, $p = 0.049$). Platelet receptor GPIIb/IIIa VNTR polymorphism's DD and CD genotypes were more frequent in the thrombosis group of MPN patients, compared to the patients without thrombosis, (15.5% and 8.2%, $p = 0.2$). Platelet receptor GPIIb/IIIa Kozak c.-5T>C, GPIIb/IIIa c.5792 C>T Ko, GPIIb/IIIa P1A1/2 and GPVI c.13254T>C genotypes frequencies were similar between the groups. Out of 108 subjects, vWF c.4751A>G SNP was determined in one (0.9%) patient. β -fibrinogen c.-148C>T CT genotype was observed more frequent in patients with thrombosis than those without thrombosis (59.3% and 36.7%, $p = 0.03$). FVII c.-323 P0/10 SNP's the P0/P10 genotype was observed significant more frequent in patients with thrombosis than those without thrombosis (22.0% and 8.2%, $p = 0.04$). Patients who were diagnosed with thrombosis more often had both FVII c.-323 P0/10 and β -fibrinogen c.-148C>T CT genotypes together than those without thrombotic complications (16.9% and 4.1%, $p = 0.03$). Of 108 subjects, four (3.7%) patients were found to have factor V Leiden (FVL) and prothrombin G20210A mutations that had a similar distribution between the groups.

Conclusions

TT genotype of GP Ia/IIa c.807C>T, CT genotype of β -fibrinogen c.-148C>T and c.323P10 variant of FVII SNP are associated with risk of thrombosis in patients with MPNs.

Effects of Chronic Mild Hypoxia on Proteome of HER2+ Breast Cancer Cell Line SK-BR-3

*Ph.D. Svetlana Vorslova; Ph.D. Valdis Pirsko;
Dina Nitiša; Prof. Inese Čakstiņa;
Prof. Zanda Daneberga; Prof. Edvīns Miklaševičs
Rīga Stradiņš University, Institute of Oncology, Latvia*

Objectives

Heterogeneous hypoxic areas are hallmark of breast tumors. The adaptation of tumor cells to hypoxia is a driving force in the clonal selection, resulting in a more aggressive and therapy-resistant tumor phenotype. As reported earlier, growth factor receptor expression alters the cellular response to hypoxia. The aim of the present study was to characterize the alterations in the proteome of breast cancer cell line SK-BR-3 during long-term adaptation to mild hypoxia.

Methods

HER2+ breast cancer cell line SK-BR-3 was exposed to mild hypoxia (2% O₂) for 4 subcultures (140 days, 20.1 population doublings); the respective cell line cultures grown in normoxia (19.6% O₂) were used as a control. Culture samples for analyte extraction were taken during each subculturing. Protein extracts were further processed by filter-aided sample preparation and tryptic digestion. NanoUPLC-MSE technique (Waters) was used to analyze the peptide mixture. Identification and relative quantification of peptides and proteins was performed by Protein Lynx Global Server and Progenesis Q1 (Waters). Statistical over-representation and enrichment analyses were performed with the use of Panther and Enrichr tools.

Results

More than 1370 unique proteins were identified in all of the samples, and 568 (41.5%) proteins were identified in both hypoxic and normoxic samples. Statistically significant changes of relative abundance during adaptation were observed for 226 proteins (fold change > 2.0). Hypoxia induced decrease and increase in the relative abundances of 148 and 78 proteins, respectively. The main pathways affected by hypoxia were glycolysis, tricarboxylic acid cycle, protein biosynthesis, synthesis of purines and exocytosis; hypoxia induced also major changes in cytoskeletal proteins and histones.

Conclusions

Even mild hypoxia induces major alterations in the metabolic pathways and protein synthesis in cancer cells. Based on the functionality analysis of differentially abundant proteins, the main changes were related to the cellular energy production, cell proliferation and cell migration.

Quality of Transurethral Resection of Bladder Tumour in First Time Diagnosed Bladder Cancer

*Dr. Klims Leonenko; Dr. Māris Jakubovskis;
Prof. Vilnis Lietuvietis*

*Riga East University Hospital, Clinical Centre "Gaiļezers",
Urology and Oncourology Clinic, Latvia*

Objectives

The quality of transurethral resection of bladder tumour (TURBT) is evaluated by presence of detrusor muscle (DM) layer in the pathological specimen. The good preformed procedure and presence of DM in pathologic sample correlated with better clinical and oncologic result in future and are associated as marker for evaluation of resection quality. The aim of our study was to analyse presence and absence of DM in final pathologic report of TURBT performed at a single high-volume referral academic centre.

Methods

We retrospectively collected data from 190 patients, who underwent treatment of newly diagnosed bladder cancer over 1 year. Exclusion criteria included past history of bladder tumour and cases where gynaecologic and surgical pathology with intermission in bladder. Pathologic data were categorised for tumour grade and stage, presence or absence of DM in final pathology specimen. Surgeons were classified for staff and resident. Descriptive statistic was used to analyse presence of DM. Uni- and multivariable analysis were applied to tested potential predictors of DM absence.

Results

The presence and absence of detrusor muscle was in 68.4% (130) and 31.6% (60), respectively. The correlation between surgeon experience and DM absence was not found ($p = 0.912$) as between number of lesions, tumor stage and grade. At Kaplan-Meier analysis, DM absence was not associated with worse outcomes in terms of postoperative recurrence-free survival.

Conclusions

Results of study showed that rate of DM presence is around 68%, and tumour pathologic characteristics was not associated with DM absence.

Rare Solitary Fibrous Tumour of Pleura Growing More than 16 Years

*Dr. Krista Grigorovica*¹; *Dr. med. Artjoms Spaks*²;
*Dr. Donats Breiva*²; *Dr. Anastasija Bistrova*²;
*Dr. Raimonds Mikijanskis*²; *Dr. Janis Ositis*²

¹ *Pauls Stradiņš Clinical University Hospital, Centre of Lung Diseases
and Thoracic Surgery, Latvia;*

² *Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Solitary fibrous tumour is a mesenchymal tumour that has been increasingly recognized over the past few decades. But to our knowledge there are no reports of large pleural solitary fibrous tumours causing destruction of vertebral bodies and compression of spinal cord.

Methods

A 67-year-old female presented with complaints of lower extremity weakness and walking difficulties. It was known that patient was diagnosed with asymptomatic right intrapleural mass 16 years ago. At the time she developed neurological symptoms mass has grown substantially. Radiological imaging revealed large pleural tumour 20 × 12 cm with compression and partial atelectasis of right lung, destruction of Th10–Th11 vertebral bodies, compression of dural sac and spinal cord due to tissue oedema. Patient was discussed at MDT meeting with oncologists, radiologists, thoracic and neurosurgeons. Considering patient's neurological complains, anatomical location and size of the tumour, decision was made to perform two stage surgery. Patient underwent right muscle sparing thoracotomy in 7th intercostal space, debulking and pleural tumour mass resection with following resection of spinal part of the tumour with laminectomy and stabilisation of vertebrae. Macroscopically resection was radical.

Results

Histopathology revealed tumour of mesenchymal origin – fibrous pleural tumour (CD34+, CD99+, Cytokeratin+, Ki67 5–8%). After surgery patient was transferred to ICU where she spent 4 days showing stable improvement, then patient was transferred to ward and discharged on postoperative day 13. On the follow up after 30 days patient showed neurological improvement, lower extremity weakness was significantly diminished. Patient is still receiving physiotherapy treatment.

Conclusions

This case illustrates rare pleural solitary fibrous tumour, that acts as a malignant neoplasm with destruction of surrounding tissues. Tumour progression could have caused dramatic consequences as permanent disability, paralysis or respiratory failure unless treated surgically. Multidisciplinary team approach and tailored treatment plan resulted in uncomplicated surgery and smooth recovery of the patient.

Personalised Multidisciplinary Management of Patient with Triple-Negative Breast Cancer: Clinical Case Report

Dr. med. Jeļena Maksimenko

*Rīga Stradiņš University, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia*

Triple-negative breast cancer is heterogeneous clinicopathological entity defined as an oestrogen, progesterone and HER2/neu negative breast cancer that is characterized by aggressive clinical behavior with poor prognosis. Due to lack of targeted agents the current standard of care remains chemotherapy.

Here we discuss the case of a 32-year-old female patient with a triple-negative breast cancer and no apparent family history of cancer. The combination of multidisciplinary team approach to the management of breast cancer and integration of research evidence into routine clinical practice resulted in the excellent treatment outcome.

Childhood Cancers – from Biobanking to Sequencing Projects

Lars O. Baumbusch

*Oslo University Hospital Rikshospitalet, Department of Pediatric Research, Norway;
Oslo Metropolitan University, Department of Mechanical, Electronics and Chemical Engineering, Norway*

Every year, approximately 150 children develop pediatric cancer in Norway. Many current treatment protocols incorporate specific molecular and genetic markers, which has improved overall childhood cancer survival rates. However, several pediatric cancer subgroups are still difficult to treat successfully, making pediatric cancers the dominant cause of death by disease among children over one year of age in developed countries.

Next generation sequencing will be the basis for personalized cancer medicine in the near future, in particular for heterogenic diseases with multi-modal therapy applications like neuroblastoma – one of the major challenges in pediatric oncology. In Norway, like in other countries, a number of national research projects are on-going exploring the clinical potential of genome sequencing in adult cancers. However, the results from adult cancer sequencing research efforts cannot simply be translated to pediatric cancers, as childhood cancers are substantially different from adult cancer in terms of clinical behaviour, frequency, histopathology, genetic subtypes, and tumor biology. A better understanding of the factors influencing the onset and progression of childhood cancers may lead to novel insights about tumor aggressiveness and treatment susceptibility.

A national Norwegian childhood cancer biobank has been established (<https://www.ous-research.no/childhoodcancerbiobank/>) to stimulate translational research. On-going childhood cancer research projects are investigating sequencing data aiming towards better characterization of the individual disease. It is planned that Norwegian childhood cancer patients with relapsed or refractory cancers will participate in extended genomic characterization and international targeted clinical trials. All these efforts will support the main goal of increasing survival rates for children with cancer in Norway in the near future.

Sexual Education Issues among Adolescents with Hearing and Visual Impairments

*Dr. Līga Esta¹; Kristiāna Čačka²; Evelīna Korsaka²;
Dr. Liene Muceniece³; Dr. Dainis Balodis⁴*

¹Rīga Stradiņš University, Department of Family Medicine, Latvia;

²Rīga Stradiņš University, Faculty of Medicine, 6th year student, Latvia;

³Rīga Stradiņš University, Department of Ophthalmology, Latvia;

⁴Rīga Stradiņš University, Department of Pathology, Latvia

Objectives

Adolescents with disabilities are often seen as asexual by their families, care providers, and society, therefore sexual education might not have considered necessary. This study seeks to understand and learn more about sexual education needs and sexual experiences of students with hearing and visual impairments.

Methods

This study observed visually (n = 18) and hearing impaired (n = 19) scholars (aged 16–21) from specialized schools in Latvia. Control group was conducted from 38 regular students (RS) who attend regular school in the same region by paired comparison technique – age and sex. An originally created questionnaire was used to collect data. Hearing impaired students were introduced to questionnaire by sign language interpreter. All interviews were individual and anonymous. Analyzing was done using IBM SPSS Statistics 23.0, Chi-squared test.

Results

Within the last year 54.1% (n = 20) of impaired students (IS) and 55.3% (n = 21) of RS had had sexual intercourse. Most common used contraception was male condom (IS – 48.6%, n = 18, RS – 50%, n = 19). Although, 24.3% (n = 9) of IS used emergency contraception (p = 0.006). 70.3% (n = 26) of IS and 34.2% (n = 13) of RS were unsure their chosen contraception method was effective at preventing sexually transmitted diseases (STD's) and pregnancy (p = 0.0019). Out sexually active respondents 80% (n = 16) of IS and 13.2% (n = 5) of RS admitted using contraception rarely or never (p < 0.0001). As most common sources of information about pregnancy, contraception and STD's in the IS group were named school (79.4%), friends (48.8%), internet (40%). RS admitted that main sources of information were school (68.4%), internet (47.4%) and friends (28.9%). Only 10.7% of IS and 10.5% of RS named medical employee as a source of information.

Conclusions

The study revealed that IS were as sexually active as nondisabled peers. Unfortunately, IS have a lack of understanding about STDs prevention and a rare usage of prevention. Furthermore, it is necessary to integrate mandatory, comprehensive and medically accurate sexual education for IS conducted by school program and medical professionals.

Nurse as Interdisciplinary Team Member for Health Care of Children with Development Disorders

Ph.D. Daina Voita¹; Dr. Astra Bukulite¹; Anta Nastevica^{1,2}

¹*Rīga Medical College of the University of Latvia;*

²*University of Latvia, Faculty of Medicine*

Objectives

The aim was to analyze the role of nurse as interdisciplinary team member in the health care and cognitive function improvement of children with development disorders.

Methods

The semi-structured interview (duration approximately 30 min) was used for analyses of the role of nurse as interdisciplinary team member. Vienna test system (VTS, Schuffried, Austria) subtests Cognitron S7 and S11 were applied for analyses of attention parameters in dynamics. 15 respondents with work experience in special schools participated in the interview. 52 respondents children with development disorders were tested by VTS twice – with one year interval. Ethics Committee permission was obtained before the study. Inform Consent Form was signed by parents.

Results

It was obtained that there are lack of common criteria for classification children to degree of intellectual disorders. The analyses of cognitive function, partly attention parameters, would be useful. Team members mainly focused on the safety, psycho-emotional stability and sustainability of children. The main problems are lack of funding and material resources. Diversification of teaching methods, application of creative thinking and systematic work are the bases for the intellectual development. The key aspect is the individual approach to each child, creating the flexible interdisciplinary team according to the individual needs of each child. Nurses should be the central member and acquire additional knowledge in psychology, pedagogy and communication with parents.

Conclusions

The flexible health care interdisciplinary team work model with nurse as the central person would promote the integration of children with development disorders in society. It is essential to maintain the special education institutions, to find a solution for increasing material resources and specially educated specialists (nurses) with aim to be able to work together on a common goal – promoting the development of children with intellectual disabilities. The cognitive function analyses in dynamics would be useful for analyses of team work success. The additional investigation will be done in future.

Effects of Urban Violence and Crime on Youth Access to HIV and Sexual and Reproductive Healthcare in Cape Town, South Africa

*Ph.D. Diane Cooper*¹; *Dr. Gillian Green*²;
*Dr. Doreen Tembo*³; *Sarah Christie*⁴

¹ *University of the Western Cape, School of Public Health, South Africa;*

² *University of Essex, United Kingdom;*

³ *University of Southampton, United Kingdom;*

⁴ *University of the Western Cape, School of Public Health, South Africa;*
Yale University, United States

Objectives

The aim was to understand the impact of urban violence and crime upon youth access to HIV and SRH services; to contribute knowledge to practical recommendations to ease access.

Methods

Qualitative face-to-face, semistructured, in-depth individual interviews were conducted from February 2017 – August 2018 with 20 young women and men (18–24 years) attending primary care facilities in two socio-economically vulnerable neighbourhoods with high levels of violence and crime in Cape Town, South Africa. Interviews were inductively, thematically analysed. Ethics Approval was obtained from the Universities' research ethics committees and the Western Cape Department of Health.

Results

Crime and violence was endemic affecting home youth's lives and accessing health services. These included muggings, rape and theft of medications. Theft of medication could leave them without treatment for days and going to and from the clinic was hazardous. Thugs and gangs preyed particularly on young boys enrolling them into gangs and on school children going and returning from school. Once in a health facility, they generally felt safe. Domestic violence was experienced in homes due to alcohol abuse. Nevertheless, resilience was apparent, with clients developing strategies: going in groups to health centres and taking taxis. Vigilantism occurred in response to violence and crime. The police were perceived as ineffective and corrupt. Respondent reported no or low paying jobs encouraging gangsterism as well as financial support to individuals and communities from gangs.

Conclusions

Recommendations included keeping children in school, providing after school sport activities or clubs; communities' uniting to deal with adequately rather than through vigilantism with crime – this would only be achieved if there was improved, uncorrupt and quick response policing; preventing families shielding gangsters in their midst; health services opening on weekends when clients could be accompanied to clinics; While there is likely to be a continuum of successes and failures transformation is a 'long haul' initiative.

Timing of Conception and Neonatal Outcomes after Bariatric Surgery in National Cohort of Women

Ph.D. Laura Malakauskiene; Prof. Laima Maleckiene

Lithuanian University of Health Sciences, Medical Academy

Objectives

The aim was to evaluate neonatal outcomes according to the time interval from bariatric surgery (BS) to conception.

Methods

A population-based retrospective cohort study covering all women with BS and postoperative singleton delivery during 2005–2015 in Lithuania was conducted. A total of 130 women aged 18–45 years were identified from the database of National Health Insurance Fund under the Ministry of Health. Women who conceived within the first 12 months after BS were included in the early conception (EC) group (n = 30) and who became pregnant after 12 months – the late conception (LC) group (n = 100). The neonatal outcomes of interest included gestational age at delivery, birthweight, large for gestational age (LGA) and small for gestational age (SGA) newborn, stillbirth, preterm birth rate, Apgar score at 1 and 5 minutes. Neonatal characteristics were compared between women who conceived during or after the first postoperative year.

Results

Neonatal outcomes did not differ significantly in women who conceived during or after the first year after BS. Mean gestational age at delivery was nearly equivalent in EC and LC groups (39.2 vs. 39.5 weeks). Mean birthweight in EC and LC groups was very similar (3469.6 ± 403.6 g vs. 3437.3 ± 512.1 g). In the overall cohort the preterm birth rate was 4.6%, and no congenital malformations at birth were detected. The rates of low Apgar scores at 1 and 5 minutes, stillbirth and preterm birth were not significantly different in women who conceived during or after the first postoperative year.

Conclusions

Neonatal outcomes in women who conceived during the first postoperative year are not significantly different comparing with later conceptions. Women who become pregnant within the first year after BS, should be reassured that neonatal complication rates generally are low.

Impact of Bariatric Surgery-To-Conception Interval on Maternal Outcomes in National Cohort of Women

Ph.D. *Laura Malakauskiene*¹; Prof. *Laima Maleckiene*¹;
Prof. *Diana Ramašauskaitė*²

¹ *Lithuanian University of Health Sciences, Medical Academy;*

² *Vilnius University, Faculty of Medicine, Lithuania*

Objectives

The aim of the study was to assess pregnancy and delivery outcomes according to the time interval from bariatric surgery (BS) to conception.

Methods

A population-based retrospective cohort study covering all women with BS and postoperative singleton delivery during 2005–2015 in Lithuania was performed. A total of 130 women aged 18–45 years were identified from the database of National Health Insurance Fund under the Ministry of Health. Women who conceived within the first 12 months after BS were included in the early conception (EC) group (n = 30) and who became pregnant after 12 months – the late conception (LC) group (n = 100). Pregnancy and delivery outcomes (pre-pregnancy body mass index (BMI), gestational weight gain (GWG), anemia during pregnancy, gestational hypertension, preeclampsia, gestational diabetes (GDM), mode of delivery, induction of labor and postpartum hemorrhage) were compared between EC and LC groups.

Results

No significant differences were found between the EC and LC group regarding gestational diabetes, gestational hypertension, preeclampsia, cesarean section rate and postpartum hemorrhage. Mean weight gain during pregnancy was significantly higher in the LC group (12.2 kg vs. 8.0, p = 0.009). Anemia during pregnancy was detected significantly more frequently in women who conceived after 12 months comparing with EC group (56.0% vs. 33.3%, p = 0.049). Maternal anemia was more common after Roux-en-Y gastric bypass than gastric banding (p = 0.05; OR 0.47 (0.23–0.95)).

Conclusions

Pregnancy and delivery outcomes are not significantly different in women who conceived during or after the first year following BS. The risk for maternal anemia increases significantly with the duration of the postoperative period.

Next Generation Sequencing Identifies Pathogenic Variants in Genes Involved in Collagen Production in Patients with Preterm Birth Due to Precocious Cervical Ripening

*Ludmila Voložonoka*¹; *Dr. med. Linda Gailīte*¹;
*Dr. med. Anna Miskova*²; *Dr. med. Inga Kempa*¹

¹Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia;

²Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia

Objectives

One of the causes of the premature parturition is a rare condition – precocious cervical ripening (PCR) characterized by softening and shortening (< 2.5 cm) of the internal os of the cervix. Familial aggregation has been observed in PCR indicating genetic component in its aetiology. The aim of our study was to identify pathogenic variants by application of the next generation sequencing (NGS) to a cohort of females with a clinical presentation of cervical ripening and history of recurrent preterm birth (PTB) and pregnancy loss (PL).

Methods

Study included seven females (age 33 ± 4.9 years) with anamnesis of painless cervix dilatation (length of the cervix 1.38 ± 0.58 cm) and history of PTB and PL (total number of pregnancies 4 ± 2.9 , PTB+PL 2.6 ± 1.8). Vaginal infection was ruled out by a pH assessment (< 4.4). NGS was carried out using Illumina TruSight One Kit. Reads were aligned to the reference genome (hg38) and annotated. Variant filtering left high quality rare nonsynonymous missense, protein truncating or splice site deleterious variants.

Results

Preliminary analysis highlighted few heterozygous variants in genes involved in collagen production, two patients had variants in COL8A2 gene (rs145553904 and rs201235688), one in COL7A1 gene (rs149267939), one in COL9A2 (rs150687987), one had splice site variant rs759812702 in COL6A5 and one sample contained two variants – rs542254849 in FKBP14 gene, known to function in collagen folding, and rs772400369 in COL11A1. Protein expression of these genes is shown in cervical and uterine tissues, in silico analysis predicts autosomal type of inheritance.

Conclusions

Collagen gene variants identified in our sample cohort seem potential candidates for a further investigation. Current guidelines of preterm labour advise only progesterone administration, expanding knowledge about molecular pathophysiology of the PCR would facilitate development of ad hoc screening tools allowing for timely application of means aimed to prolong at risk pregnancy till term and to improve patient consultation.

Precocious Cervical Ripening – Management in Riga Maternity Hospital, Latvia

*Dr. med. Anna Miskova¹; Ludmila Voložonoka²;
Prof. Dace Rezeberga¹*

¹*Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;*

²*Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia*

Objectives

Preterm birth (PTB) is a syndrome with different phenotypes. Globally PTB associated complications are a significant factor of perinatal mortality and the leading cause of neonatal mortality. Precocious cervical ripening (PCR) or short cervix is one of the PTB causes. So, the aim of our study is to identify possible genetical factors involved in PTB due to PCR.

Methods

Prospective cohort study involved 21 patients of Riga Maternity Hospital with PCR in current pregnancy. Screening for PCR was done during second trimester ultrasonography (USG). PCR or short cervix was defined if USG cervical measurement demonstrated cervical length (CL) < 25 mm. Patients with PCR received progesterone as first line treatment. If further USG cervical measurements demonstrates CL < 15 mm cervical pessary were placed for second line treatment as it is defined by Riga Maternity Hospital clinical protocol. Patients with pH > 4.4 were excluded from the study. Study still in progress.

Results

We analysed 21 singleton gestations with PCR in current pregnancy. Average maternal age was 34.4 (25–41) years old, average BMI – 26 (18–41) kg/m². Only to patient were primigravidae, for other 19 this pregnancy was current. Preliminary data demonstrates, the 16 patients delivered viable fetus at average gestational age 35 weeks 2 days (26+6–40 gest. weeks). All the patients received micronised progesterone and antenatal corticosteroids. For 11 patients cervical pessary was placed according to clinical protocol. For 3 patients cervical surgical cerclage was done. Two patients received progesterone only therapy because of suspected infection in combination with antibacterial therapy. In four gestations premature rupture of membranes happened. One patient was induced due to pregnancy induced hypertension. One case of postpartum endometritis was ruled out in patient with previous surgical cerclage.

Conclusions

Our protocol for PCR is a possibility to prolong the pregnancy and to have a viable fetus. Further research is necessary to establish individualised therapeutic strategy for maternal and fetal benefit.

Family-Centered Care and Satisfaction of Parents of Children Receiving Inpatient Rehabilitation Services at Children's Clinical University Hospital

*Dr. med. Dace Bērtule*¹; *Dr. med. Anita Vētra*²;
*Gunta Kristapsone*¹

¹ Children's Clinical University Hospital, Latvia;

² Rīga Stradiņš University, Department of Rehabilitation, Latvia

Objectives

Interventions in pediatric rehabilitation are focused on improving the development and functioning of children. Family-centered (FCC) rehabilitation programs might lead to care satisfaction. The aim of this study was to determine the relationship between parent satisfaction and family-centered care perception of parents of children hospitalized in 2018 in the inpatient rehabilitation ward at Children's Clinical University Hospital in Riga.

Methods

Parents of 148 children aged 6 months to 16 years completed the Client Satisfaction Questionnaire-8 and the The Measure of Processes of Care (MPCO-20). Data were analyzed using descriptive statistics and Spearman correlation analysis.

Results

Parents' satisfaction with rehabilitation services was generally high (mean value of 27.75, SD = 3.63). Overall, parents rated the family-centeredness of care positively. The highest ratings were in the domains "respectful and supportive care" (M = 5.89, IQR = 0.89), "enabling and partnership" (M = 5.55, IQR = 1.19), and "co-ordination and comprehensive care" (M = 5.68, IQR = 1.03). The lower scores were in the domains related to the provision of information - "providing specific information" (M = 5.28, IQR = 1.58) and "providing general information" (M = 4.02, IQR = 1.47). Significant ($p < 0.01$) correlation was found between parents' satisfaction with rehabilitation services and all FCC domains: respectful and supportive care ($r_s = 0.54$), enabling and partnership ($r_s = 0.45$), co-ordination and comprehensive care ($r_s = 0.45$), providing specific information ($r_s = 0.41$), providing general information ($r_s = 0.27$).

Conclusions

There is a positive correlation between parents' satisfaction with inpatient rehabilitation services and family-centered care perception. Service providers must be aware that inpatient rehabilitation programs that are family-centered might increase the overall client's satisfaction with the care received.

Serological Evidence of *Toxoplasma Gondii* in Latvian Population with Emphasis on Women's and Children's Health

*Dr. Gunita Dekšne*¹; *Dr. Vija Veisa*²; *Prof. Dace Rezeberga*²;
*Prof. Ludmila Viksna*³; *Prof. Angelika Krūmiņa*³

¹*Institute of Food Safety, Animal Health and Environment "BIOR", Latvia;*

²*Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;*

³*Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia*

Objectives

Toxoplasmosis is an infection caused by single celled zoonotic parasite *Toxoplasma gondii* which causes widespread human and animal diseases. Primary infection during pregnancy may lead to multiple abnormalities including neurologic and ocular diseases as well as fetal loss. In immunocompetent women initial infection confers immunity and prepregnancy infection nearly eliminates any risk of vertical transmission. Seroprevalence varies 10–30% in Northern Europe and influence the risk of vertical transmission and screening strategy. There is the gap of knowledge of *T. gondii* prevalence with the emphasize of women's and children health in Latvia.

Methods

For the retrospective study data from the largest clinical laboratory in Latvia were collected from unique patients who were tested for presence of anti-*T. gondii* IgG and/or IgM antibodies within 13 year period. To emphasize the women's health, additional blood samples and questionnaires were collected from 200 pregnant women and tested for the presence of specific anti-*Toxoplasma* IgG/IgM antibodies in from August to October 2018.

Results

In total, 25 069 unique patients were included in retrospective study where anti-*T. gondii* IgG prevalence was observed 36.3% and it was significantly ($p < 0.01$) higher than IgM prevalence (2.4%). Mean age for IgG antibodies positive patients was 33.7 ± 12.2 years. The seroprevalence of IgG antibody in age group under one year was 23.3%, there were no IgM antibodies found in this age group. Study in pregnant women showed high seroprevalence of specific anti-*Toxoplasma* IgG (47.5%) and IgM (1.4%) antibodies.

Conclusions

The results of present study show high and stable *T. gondii* seroprevalence in Latvian population which calls for higher awareness of zoonotic parasite infection. Further analysis of questionnaires will evaluate toxoplasmosis risk factors and their influence on *T. gondii* prevalence.

Identification of Cost Effective Model for Detection of Cystic Fibrosis Causative Alleles in Latvia

*Dr. med. Linda Gailite¹; Anna Inese Tutane¹;
Dr. Inga Nartisa¹; Dr. med. Inga Kempa¹; Dr. med. Madara Kreile¹;
Dr. Gīta Taurina²; Dr. Elina Aleksejeva²; Dr. Ieva Pukite²;
Dr. Liene Korņejeva¹; Dr. Ieva Grinfelde²; Dr. Inita Kaze²;
Santa Vilne¹; Dr. med. Zita Krūmina²; Dr. med. Vija Svabe²*

¹Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia;
²Childrens Clinical University Hospital, Latvia

Objectives

Cystic fibrosis (CF) is one of the most frequent life-shortening multisystemic autosomal recessive disorder. There are available different pathogenic variant testing methods but in majority of countries ethnicity based cost effective model should be identified.

Methods

In study there were included 64 CF patients from 59 families sent for CFTR gene pathogenic variant analysis from 1999–2018 with suspicion of CF diagnosis (not included CF-related disorders). DNA samples were tested for dF508. If two or one CF allele were not identified, different methods for genotyping of most frequent pathogenic variants were used – APEX (256 CF variants), InnoLipa (19 CF variants) and Elucigene (50 CF variants) panels – depending of technical and financial possibilities. If results were negative, in cases where DNA sample was available, MLPA and direct sequencing were used. One single case from family was included for statistics of pathogenic variant.

Results

In 59 single cases only seven CF chromosomes were not identified (all in heterozygous state either with dF508 or R553X variants) due to a lack of genetic material. Homozygous for dF508 variant were 26 of 59 cases, 22 cases were in compound heterozygous form with dF508, in 3 of 59 cases were compound heterozygotes with two rare variants. dF508 is identified in 67% of CF alleles in Latvian population. In five (2.3%) CF alleles identified dele2,3 (in one case in homozygous state). In three (2.5%) alleles identified W57R and R1066H; in two (1.7%) alleles – R553X, W1282X, W1282R, 394delTT; in one (0.8%) allele identified dup6-10, del6-10, L138ins, P67L, 2184insA, 621+1G>T, R334W, 3849+10kbC>T, A455E, L1335Pro. Seven of detected rare variants were not included in any of CF variant detection panels, but could be detected by direct sequencing or MLPA.

Conclusions

In Latvia cost effective algorithm for CF pathogenic variant detection in first step is dF508 and dele2,3 analysis following with direct sequencing of exons 3, 4, 12, 14, 20, 23 and 24 covering majority of identified variants in Latvian patients. If results are negative – MLPA and sequencing of other exons is used thereby allowing to discover rarer variants.

Retrospective Cohort Study of Cesarean Scar Influence on Placental Implantation Site, Umbilical Cord Insertion and Length

*Dr. Diāna Bokučava*¹; Prof. *Natālija Vedmedovska*²;
*Dr. Violeta Fodina*³; *Viktorija Margevičus*⁴; *Santa Ūdre*⁵

¹ *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;*

² *Rīga Stradiņš University, Department of Obstetrics and Gynaecology;*

Rīga Maternity Hospital, Latvia;

IVF Rīga Clinic, Latvia;

³ *iVF Rīga Clinic, Latvia;*

⁴ *University of Latvia, Faculty of Medicine;*

⁵ *University of Latvia, Department of Obstetrics and Gynaecology*

Objectives

The objective of this study is to describe possible difference in placental implantation site as well as umbilical cord insertion and length in women with and without Cesarean section scar.

Methods

This is a retrospective cohort study. Medical records of 58 women, who attended “IVF Clinic” in a time period from 2015 until 2018, were reviewed retrospectively. Patients were divided in two groups. 28 women with a history of Cesarean delivery in previous pregnancies were included in the study group and 31 women with no history of Cesarean or other uterine operations, including abortions, dilatation and curettage, were included in the control group. Notes about placental location, which was categorised as anterior, posterior and fundal, and umbilical cord insertion, which was categorised as central, lateral and marginal were retrieved from the second and third trimester ultrasound reports. The information about umbilical cord length was obtained from postpartum hospital notes. Due to small patient number data was examined using Fisher's exact test.

Results

From 28 women with a history of Cesarean delivery the placenta was localised anteriorly in 8 (29%) patients, posteriorly in 15 (55%) and in 1 case the localisation was fundal. In the control group anterior placental location was in 9 (29%) patients, posterior in 16 (51%) and fundal in 1 case. Significant differences in placental location between the two groups were not found ($p = 0.994$). There was no significant difference in the umbilical cord insertion ($p = 0.577$) and length ($p = 0.171$) between the groups.

Conclusions

We did not find an association between the presence of Cesarean section scar in the uterus and the difference in the placental implantation site, umbilical cord insertion and length. The limitation of our study was a relatively small number of patients and retrospective design, where all information about umbilical cord was retrieved from hospital charts. Therefore, it is advisable to conduct a further cohort study with a large number of patients involved.

Characteristics of Paediatric Trauma Patients in Latvia: Retrospective Single Center Study

*Santa Karkle*¹; *Dr. med. Astra Zviedre*²;
*Prof. Arnis Enģelis*²; *Prof. Aigars Pētersons*¹

¹ *Rīga Stradiņš University, Latvia;*

² *Children's Clinical University Hospital, Department of Paediatric Surgery, Latvia*

Objectives

Trauma is the second leading cause of death in Latvian pediatric population. The purpose was to understand the pediatric trauma characteristics and injury patterns in different age groups, and to determine the potential injury types.

Methods

A retrospective study was made including acute trauma patients with more than one injury from database of Department of Radiology in Children's Clinical University Hospital in Riga, Latvia up to 18-years-old who underwent a computed-tomography (CT) scan at the Emergency department (ED) from January 2013 to December 2016. Patients were divided into two groups: up to 9 years and 10 to 18 years old. Data was analyzed with SPSS using Mann-Whitney test with significance defined as $p < 0.05$.

Results

We identified 201 patient, 67% male and 33% female, with median age of 12 (95% CI 11.09–12.31) years. In 68% of cases patients were referred to the ED by paramedics, only 4% were transferred from another hospital, 28% arrived at ED themselves. The most common injury pattern for children aged up to 9-years-old was falls ($n = 32$, 63%), but for 10 to 18-year-old was motor vehicle associated injuries ($n = 68$, 47%) of which 35 were pedestrian accidents. A significant statistical difference in injury pattern between two groups was found ($p < 0.003$). From patients who received an emergency CT scan 47 (23%) were not hospitalized. Head injuries were prevalent in both age groups ($n = 79$, 39%), with brain concussions being the most common (44%). The statistical difference between two groups in diagnosis was not found ($p = 0.289$).

Conclusions

The most common injury pattern in children aged up to 9 years is fall from heights, but for children aged between 10–18 years it is motor vehicle associated injuries, in both groups head injuries are prevailing. The high rate of not hospitalized patients suggests more selective approach of CT scan as diagnostic tool.

Risk Factors and Antenatal Suspicion for Placenta Previa and Abnormally Invasive Placenta

Ph.D. Egle Savukyne; Ieva Vasilaviciute; Dr. Egle Machtejeviene²

*Lithuanian University of Health Sciences;
Hospital of Lithuanian University of Health Sciences Kauno Klinikos,
Department of Obstetrics Gynaecology*

Objectives

The aim of the study was to evaluate risk factors and antenatal suspicion of placenta previa and abnormally invasive placenta (AIP) for women, who delivered in the Hospital of Lithuanian University of Health Sciences between 2015 and 2017 y.

Methods

Retrospective analysis of 56 women's medical data with the diagnosis of placenta previa and AIP.

Data analysis was made using SPSS 18.0 program.

Results

Placenta previa and AIP was diagnosed to 56 (0.58%) women of 9650 births. Complete placenta previa occurred in 64.3%, partial placenta previa in 35.7% deliveries. 4 cases of placenta accreta were diagnosed with complete placenta previa, 2 – with partial placenta previa. Placenta increta occurred in 3 cases and placenta percreta in 2 cases – all of them were diagnosed with complete placenta previa cases. Prior surgical interventions were performed for half of placenta accreta and all cases of placenta increta and percreta cases. Mean age of patients with AIP was 34.5 ± 3.9 year and was statistically significant higher than in patients with placenta previa only – 31.1 ± 5.1 year ($p = 0.048$). Women diagnosed with AIP had more pregnancies than those with placenta previa only ($p = 0.018$). All cases of placenta previa and placenta percreta were diagnosed before delivery by ultrasound examination, although there were no signs of invasion described.

Blood loss during delivery was statistically significant higher in AIP than in placenta previa only (2066.7 ± 1327.0 ml vs. 958.9 ± 472.6 ml). Transfusion of blood was performed in AIP group more frequently.

Conclusions

The main risk factors of AIP were previous surgical interventions, higher maternal age and multiparity. All cases of placenta previa and AIP were diagnosed, but there is lack of standardization of ultrasound markers, which would make AIP diagnosis more precise. Despite the fact, that the most severe cases of AIP were diagnosed, blood loss during delivery was life-threatening.

Influence of Genetic Variants Involved in Thrombophilia Pathogenesis and Folic Acid Metabolism on Embryo Implantation and Pregnancy Outcome

*Baiba Alkšere*¹; *Dace Bērziņa*¹; *Diāna Legzdiņa*¹;
*Ludmila Voložonoka*²; *Dr. Aigars Dzalbs*¹; *Igors Pupko*¹;
*Dr. Liene Korņejeva*¹; *Dr. med. Liene Nikitina-Zaķe*³;
*Dr. Violeta Fodina*¹; *Prof. Natālija Vedmedovska*⁴

¹ *iVF Riga Clinic, Latvia;*

² *Rīga Stradiņš University, Latvia;*

³ *Latvian Biomedical Research and Study Centre;*

⁴ *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;*
Rīga Maternity Hospital, Latvia;
IVF Riga Clinic, Latvia

Objectives

Variants of different genes can lead to congenital thrombophilia. The most frequent single nucleotide polymorphisms (SNPs) altering coagulation are in genes F5, F2 and SERPINE1. Also, MTHFR variants are associated with hyperhomocysteinemia and blood hypercoagulation. All these SNPs increase the risk of thrombosis and adverse pregnancy outcomes.

Methods

The purpose was to investigate whether there are statistically significant differences between thrombophilia and infertility. 500 patients were included in the study, with diagnosed infertility and SNPs in genes F5, F2, MTHFR and SERPINE1. The patients were clustered into groups, each representing one or more SNPs. Association between SNPs and missed pregnancies or homocysteine levels was performed. Thrombophilia prevalence, allelic frequencies and ratios of investigated events were included in analysis. The data were processed with PLINK software, the threshold of statistical credibility.

Results

Hyperhomocysteinemia was found in 232 cases (46.4%). The miscarriage was observed in 146 cases (29.2%). The most frequent SNP in population is MTHFR c.1286A/C heterozygous genotype, followed by c.665C/T heterozygous genotype (23%), and also MTHFR c.1286A/C / c.665C/T compound heterozygous genotype (23%). Homozygous MTHFR c.1286A/C and c.665C/T genotypes were found in 11% and 9% of all cases. F5 and F2 variants compose a small proportion of the investigated population (4%). MTHFR c.665C/T relevance to hyperhomocysteinemia is high (OR = 3.37, $p < 0.001$). MTHFR c.665C/T and miscarriage association indicates increased risk (OR = 1.7, $p < 0.001$). F2 c.1601G/A SNP has the highest risk of spontaneous abortion - OR = 8.24 ($p < 0.001$). Risk increases, if there is raising a number of changes in coagulation pathway genes.

Conclusions

MTHFR is not related to miscarriage, but hyperhomocysteinemia might be an additional factor of risk of thrombophilia, that could be explained with the presence of F5 or F2 variants. Genetic changes of MTHFR are often and might increase the risk of thrombophilia if found together with F5 c.1601G>A or F2 c.*97G>A.

Is MRE ADC-DWIBS an Appropriate Diagnostic Method for a Disease?

Dr. Digna Berzina; Prof. Ilze Apine

*Rīga Stradiņš University, Faculty of Continuing Education, Latvia;
Children's Clinical University Hospital, Latvia*

Objectives

The aim of this study was to compare the apparent diffusion coefficients ADC of classically used diffusion-weighted imaging (DWI) and new generation diffusion-weighted imaging with background body signal suppression (DWIBS) sequences to assess whether both of these ADC coefficients are equally useful for Crohn's disease patients.

Methods

16 patients with proven Crohn's disease in the distal ileum loop (11 to 57 years of age) were included, including 22 segments from 9 children (11-17 years) and 20 segments from 7 adults (19-57 years). Five ADC measurements were performed in each DWI and DWIBS images. Statistical analysis was performed using SPSS. Groups were compared using t-test. Mean values were compared using unpaired t-test. p value of < 0.05 was chosen as a level of statistical significance.

Results

There is a statistically significant difference between adult and pediatric examinations where the mean value of DWI measurements in children (1.18 ± 0.32) was statistically significantly lower than the mean value of adult DWI measurements (1.29 ± 0.33), $p = 0.008$. In turn, the average value of DWIBS measurements in children (1.22 ± 0.52) is statistically significantly higher than the mean value of adult DWIBS measurements (1.09 ± 0.47), $p = 0.027$.

The mean ADC-DWI value of the whole population (1.24 ± 0.33) is statistically significantly higher than the mean value of DWIBS measurements (1.16 ± 0.50); $p = 0.036$. There is no statistically significant difference between DWI and DWIBS in children (1.18 ± 0.32 and 1.22 ± 0.52 , respectively; $p = 0.245$), whereas the mean ADC-DWI (1.29 ± 0.33) in the adult group was significantly higher than ADC-DWIBS (1.09 ± 0.22), $p < 0.001$.

There were no significant differences in ADC-DWI values between boys and girls being 1.17 ± 0.33 and 1.27 ± 0.24 , respectively; $p = 0.060$), as well as in ADC-DWIBS values being 1.25 ± 0.48 and 1.11 ± 0.67 ; $p = 0.193$).

Conclusions

Comparing to ADC-DWI, ADC-DWIBS is equally suitable for the evaluation of inflammation of the inflamed intestinal wall in children, whereas to use it in adults research needs to be continued to validate adult ADC-DWIBS values.

Prenatal Invasive Testing in Single Center: Indications and Results

Prof. *Natālija Vedmedovska*¹; Dr. *Diāna Bokučava*²;
Dr. *Pavels Domaševs*³; Dr. *Iveta Bičevska*³;
Dr. *Liene Korņejeva*⁴; *Santa Tenberga*³; *Jūlija Rīlika*³

¹ *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;
Rīga Maternity Hospital, Latvia;
IVF Rīga Clinic, Latvia;*

² *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;*

³ *Rīga Maternity Hospital, Latvia;*

⁴ *Rīga Maternity Hospital, Latvia;*

iVF Rīga Clinic, Latvia

Objectives

Aneuploidies causes up to 11% of all stillbirths and neonatal deaths. Chromosomal aberrations that are compatible with life but cause considerable morbidity occur in 0.65% of newborns. In Latvia in 2018 congenital anomalies among newborn were reported in 5.7%. Prenatal diagnosis of fetal chromosomal abnormalities is the most common indication for invasive prenatal testing. Compared to the amniocentesis or chorionic villus sampling, noninvasive techniques using maternal blood or ultrasound have a great advantage to the pregnancy concerning the risk of miscarriage and maternal stress.

The aim of the study was to clarify the most common indications for invasive procedures and utility of the existing local guidelines.

Methods

All genetic invasive procedures between January 1, 2017, and December 31, 2018, were collected from a single perinatal center in Rīga Maternity Hospital and were analyzed in respect to indications and testing results.

Results

A total of 304 patients had invasive genetic testing in the study period. Majority of cases with enlarged nuchal translucency revealed the normal standard karyotype (88%), as well as cases with the high background and biochemical risks for aneuploidies (normal karyotype in 92%). All confirmed cases of trisomies 18 and 13 have had typical ultrasound features. 55 cases with multiple anomalies have shown the normal standard karyotype results. Family history was an indication for invasive testing in three cases. Out of five cases of high-risk NIPT, four were confirmed by standard karyotyping.

Conclusions

The noninvasive method should be accessible in a case of biochemical and background risks for trisomies. Regarding a low chromosomal aberration rate found in a group of pregnancies with reported multiples fetal anomalies, we conclude that standard karyotyping for such prenatal cases should be replaced with chromosomal microarray testing to avoid possible diagnostic failures.

Gestational Weight Gain Effects on Delivery and Newborn Outcomes

Dr. Žanna Bojarune¹; Prof. Natālija Vedmedovska²

¹ Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;

² Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;
Rīga Maternity Hospital, Latvia;
IVF Rīga Clinic, Latvia

Objectives

Adequate gestational weight gain differs according to pre-pregnancy body mass index. High or low gestational weight gain is a potential risk factor for adverse delivery and newborn outcomes. The work was aimed at investigation of pregnancy weight gain, its norms, determinants and consequences, and how weight gain (increased or decreased) during pregnancy affects the delivery and newborn outcomes.

Methods

Were selected only 664 primipara woman, who had delivery at Rīga Maternity Hospital from 1 January 2017 to 31 May 2017. Inclusion criteria: primipara with antenatal care, data was available. Exclusion criteria: multi-fetal pregnancy, age less than 18 y., or over 47 y., the mother has extragenital pathology, some data is missed. Patients were divided according to BMI and weight gain. Approximately a quarter of patients entered the register without normal BMI. Both BMI and weight gain groups (increased / normal / decreased) were compared. The distribution of weight gain according to BMI group was evaluated. Were identified and analyzed delivery and newborn outcomes (newborn weight, delivery term, delivery type, duration of labor stages, delivery traumatism, uterus dysfunction, premature rupture of membrane, gestational anemia) in different BMI and GWG groups.

Results

Mean age of patients was 27.6 y., mean BMI 22.26, mean gestational weight gain 13.9 kg. About 36% gained above and 19% gained less the Institute of Medicine GWG guidelines. Newborns' weight gain is positively associated with GWG and pre-pregnancy BMI. Low weight gain is associated with less gestational age on delivery and a higher prevalence of gestational anemia. High GWG is associated with the risk of Cesarean section ($p = 0.015$), uterine dysfunction ($p = 0.009$). Fetal and maternal traumatic events were not associated with weight gain during pregnancy ($p = 0.49$).

Conclusions

Abnormal pre-pregnancy BMI and inadequate GWG have an important impact on delivery and newborn outcome.

Differentiating Criteria for Acute Simple and Complicated Appendicitis in Patients Under the Age of Seven

*Pāvils Plūme*¹; *Dr. med. Astra Zviedre*²; *Arnis Laduss*¹;
*Kārlis Pētersons*³; *Prof. Aigars Pētersons*⁴; *Prof. Arnis Enģelis*¹

¹ *Rīga Stradiņš University, Latvia;*

² *Rīga Stradiņš University, Department of Paediatric Surgery, Latvia;*
Children's Clinical University Hospital, Latvia;

³ *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

⁴ *Rīga Stradiņš University, Latvia;*
Children's Clinical University Hospital, Latvia

Objectives

The aim of this study was to determine the differences in clinical presentation, laboratory and ultrasonography (US) findings among acute appendicitis (AA) patients aged 0–6 years to differentiate simple from complicated AA.

Methods

A retrospective analysis of clinical symptoms, laboratory and US findings among patients aged 0–6 years old admitted to Children's Clinical University Hospital Emergency department with a diagnosis of AA during the time period of January 2012–November 2017. A total of 194 patients were included and divided into two groups – simple AA (73) and complicated AA (121) based on histopathological analysis of the appendix. Patients successfully treated with antibiotics were included in the simple AA group. Receiver operating characteristic (ROC) curves and the areas under curve (AUC) were defined.

Results

Mean age of the patients was 4.6 ± 0.21 years. Statistically significant differences between simple AA and complicated AA were found among the following parameters: duration of symptoms, frequency of vomiting, heart rate, local resistance, rebound tenderness, serum C-reactive protein (CRP) and interleukin-6 (IL-6) levels, US findings: dilated bowel loops, fecalith.

AUC of 0.76 (95% CI 0.690–0.823, $p = 0.001$) with $CRP \geq 22.6$ mg/L was 2.21 times more frequent (sensitivity 75% and specificity 66%) and AUC of 0.86 (95% CI 0.660–1.00, $p = 0.001$) with $IL-6 \geq 35.3$ pg/ml was 3.44 times more frequent (sensitivity 86% and specificity 75%) in patients with complicated AA than in those with simple AA.

Only rebound tenderness (OR 19.58, 95% CI 2.88–132.99, $p = 0.002$), dilated bowel loops (OR 27.00, 95% CI 3.59–202.92, $p = 0.001$) and fecalith (OR 28.03, 95% CI 3.80–206.91, $p = 0.001$) remained significant predictors of complicated AA using binary logistic regression. All the predictors account for 61.7% of the variability of complicated AA.

Conclusions

Levels of CRP and IL-6, rebound tenderness, dilated bowel loops and fecalith on ultrasonography can be used to differentiate simple from complicated acute appendicitis in patients under 7 years old.

Knowledge about Contraception among Latvian High School Students

Dr. Līga Esta; Dr. Līga Kozlovskā

Rīga Stradiņš University, Department of Family Medicine, Latvia

Objectives

Many sexually active adolescents engage in sexual risk behavior that can result in unintended health outcomes such as unplanned pregnancy and sexually transmitted diseases (STDs). The aim of this study was to research Latvian high school student's knowledge of contraception and sources of information about contraception.

Methods

This prospective study observed 163 scholars (aged 15–19) from Latvia. An originally created questionnaire was used to collect data. All interviews were voluntary and anonymous. Analyzing was done using IBM SPSS Statistics 23.0. A comparison was observed between gender groups.

Results

A total of 91 females and 72 males participated in the study. As the most common sources of information about contraception in both gender groups were named school (males – 87.5%, females – 83.5%), internet (males – 83.2%, females – 79.1%) and friends (males – 38.8%, females – 46.1%). When asked about the source with regards to contraception, 72.5% of females would search on the internet, only 7.15% would ask a doctor, 80.6% of males would search on the internet, only 4.3% would ask a doctor. Male condom was admitted as the most effective contraceptive method of pregnancy prevention in 42.9% cases among females, 63.9% among males. The most commonly preferred contraception method among females was male condom in 79.1%, hormonal pills in 14.3%, among males – condom in 79.2%, coitus interruptus in 9.7% ($p = 0.012$). 68.1% of females know that hormonal contraception does not prevent STDs and only 44.4% of males know it ($p = 0.005$). 73.6% of females know that emergency contraception does not prevent STDs and 51.4% of males know it ($p = 0.04$).

Conclusions

The study shows that high school student's knowledge about contraception is insufficient. As the internet was the most common source of information, more attention should be paid to make reliable internet sources for adolescents about contraception. Unfortunately, doctors were uncommon source about contraception.

Inflammatory Cytokine Levels as Possible Diagnostic and Prognostic Aid in Hospitalised Children with Fever and Suspected Serious Bacterial Infection

*Linda Rautiainen*¹; Prof. *Jana Pavāre*²;
*Dr. med. Ilze Grope*²; *Dr. Svetlana Ince*³;
Prof. *Pēteris Tretjakovs*⁴; Prof. *Dace Gardovska*³

¹ *Lapland Central Hospital, Finland;*

² *Rīga Stradiņš University, Latvia;*

³ *Rīga Stradiņš University, Department of Paediatrics, Latvia;*

⁴ *Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia*

Objectives

In children, acute infection is the most common cause of visit in the emergency department, although most of them are self-limiting, mortality due to severe bacterial infections (SBI) in developed countries is still high. When the risk of serious bacterial infection is too high to ignore, yet too low to justify admission and hospital observation, clinicians try to improve diagnostic accuracy by performing various laboratory tests. The aim of the study was to investigate whether early inflammatory cytokine and chemokine panel can add information in diagnostics of SBI and assessment of efficacy of early therapies in hospitalized children with fever and possible SBI.

Methods

This study included 51 children with febrile infections that were admitted to the emergency department (ED). Clinical examination, microbiological and radiological tests were used as reference standards for the definition of SBI. Informed consent was obtained from patients' parents and additionally from patients themselves, if applicable. The study protocol was approved by the Ethics Committee of Rīga Stradiņš University (No. 2./06.10.2011). All patients had received the standard of care according to hospital guidelines. Study population was categorized into two groups: 1) patients with SBI (n = 21); 2) patients without SBI (n = 30). Inflammatory cytokine and chemokine panels were analyzed from the first routine blood samples at hospital admission and after 24 hours.

Results

Out of 12 cytokines and chemokines only Eotaxin and granulocyte colony-stimulating factor (G-CSF) had statistically significant differences between groups at the time of inclusion. Receiver operator characteristic analysis to predict SBI showed an area under the curve (AUC) of 0.679 for G-CSF. In the SBI group statistically significant changes between time of inclusion and 24 hours the following markers showed sFAS (p = 0.041), IL-10 (p = 0.027), INF γ (p = 0.016), Eotaxin (p = 0.027), G-CSF (p < 0.001), IP-10 (p = 0.012).

Conclusions

Analysis of inflammatory cytokines in hospitalized children with fever may provide additional information in early diagnostics of SBI.

This study was conducted as a part of State Research Program VPP BIOMEDICINE Project No. 8.2 "Clinical, molecular-biological and morpho-functional research of diagnostics and treatment of inherited and acquired diseases of childhood".

Iron Deficiency Anemia and Dietary Habits During Pregnancy in Latvia

*Kristīne Klaramunta-Antila¹; Biruta Lindemane¹; Līva Ušpele²;
Santa Krama¹; Dr. med. Vinita Cauce³; Dr. med. Laila Meija⁴*

¹ Rīga Stradiņš University, Latvia;

² Rīga Maternity Hospital, Latvia;

Rīga Stradiņš University, Latvia;

³ Rīga Stradiņš University, Department of Physics, Latvia;

⁴ Pauls Stradiņš Clinical University Hospital, Latvia;

Rīga Stradiņš University, Latvia

Objectives

The iron deficiency anemia is common problem during pregnancy and associated with reduced birth weight and risk of premature birth. In severe cases the risk of maternal and child mortality increases. The aim of the study was to investigate the prevalence of iron deficiency anemia in pregnant women in Latvia and the related dietary habits.

Methods

The research was done by Rīga Stradiņš University, The Centre for Disease Prevention and Control of Latvia and Latvian branch of WHO during June 2017 till March 2018. The cross-sectional study was carried out involving 393 pregnant and one-week postpartum women. Interviews were held in outpatient departments of medical institutions and maternity departments of Latvia. The questionnaire was used to estimate frequency and amount of dietary intake. A 3-day food record was used to evaluate mineral and vitamin doses in a sample of 33 pregnant women.

Results

Iron deficiency anemia was diagnosed in 11% and iron deficiency – in 77.7% of the respondents. For 85.8% of pregnant women the meat intake was according to the recommendations. The advised amount of fish was consumed by 16% of respondents. As many as 33.8% of pregnant women consumed enough milk products, while the recommended daily intake was exceeded by 17.6% of respondents. The suggested amount of vegetables was consumed by 3.3% and fruits – 13.5% of pregnant women. The results of 3-day food records showed average intake of iron was 8.9 mg, which is below the dietary reference intake.

Conclusions

According to the results of the study, iron deficiency anemia was observed in tenth of the respondents. The intake of fish, vegetables and fruits were significantly under recommended amounts among most of the participants. Although majority of the pregnant women regularly consumed meat, there are indications that the recommended amount of iron was not achieved.

Association of Genetic Variants in TLR2 (Arg753Gln) and TLR4 (Thr399Ile) with Risk of Acute Rheumatic Fever in Latvia

*Dr. med. Marina Visnevska*¹; *Vita Rovite*²; *Valda Stanevica*³;
*Ph.D. Zane Dāvidsone*³; *Andrejs Scegolevs*⁴; *Ruta Santere*⁴

¹*Rīga Stradiņš University, Department of Paediatrics, Latvia;*

²*Latvian Biomedical Research and Study Centre;*

³*Rīga Stradiņš University, Department of Paediatrics, Latvia;*

⁴*Children's Clinical University Hospital, Latvia*

Objectives

Acute rheumatic fever (ARF) is an autoimmune disease following group A streptococcal infection. It is unknown why only some individuals are susceptible to ARF. Genetic association with streptococcal infections has been shown with the single-nucleotide polymorphisms (SNPs) in toll-like receptors (TLR), particularly TLR2 and TLR4. This study investigates the association of the TLR2 gene Arg753Gln (rs5743708) and the TLR4 gene Thr399Ile (rs4986790) SNPs and the risk of ARF.

Methods

The study included 91 patients diagnosed with ARF from 1995 until 2016 at Children's Clinical University Hospital and 293 healthy adult controls selected from the Genome Database of Latvian population. SNP genotyping was performed using TaqMan hybridization probe. Statistical analysis was performed with Plink 1.90. All genotyped frequencies confirmed to the Hardy-Weinberg equation.

Results

From 91 RF patients, 68.1% (n = 62) were boys, 31.9% (n = 29) were girls. The age of patients at time of diagnosis varied between 4 and 17 years, the median being 10 years (IQR 5–15). Gender proportion in control group was 63.5% (n = 186) men and 36.5% (n = 107) women. There was no statistically significant difference between TLR2 rs5743708 and TLR4 rs4986790 SNPs and control group corresponding p values; p = 0.278 and p = 0.639, odds ratios; OR = 0.698 and OR = 1.192 respectively.

Allele distribution of rs5743708 in patients was AA - 1, AG - 10, GG - 78, and 2/51/240 in controls, having rare allele frequency 0.067 in cases and 0.094 in controls. But polymorphism rs4986790 was more frequently observed in cases 0.062 compared to control group 0.053, however, this difference did not reach statistical significance. Allele distribution for rs4986790 was GG - 0, GA - 11, AA - 78 in RF cases and 0/31/262 in controls.

Conclusions

This study showed the lack of statistically significant genetic association of the TLR2 Arg753Gln and TLR4 Thr399Ile SNPs variants with the susceptibility to rheumatic fever, however, our data indicate that rs5743708 alleles show protective tendency, but rs4986790 show tendency for the increased risk of developing rheumatic fever.

Extended Genetic Testing in Patients from Infertility Clinics Using New Genotyping Method: Preliminary Results

*Dr. med. Linda Gailite*¹; *Dr. Zane Dobeļe*¹; *Msc Biol Liva Laivina*²;
*Dr. Zane Vitina*²; *Dr. med. Valerija Magomedova*³;
*Dr. med. Juris Erenpreiss*⁴; *Dr. med. Inga Kempa*¹

¹ Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia;

² Clinic EGV, Latvia;

³ Clinic "Your Doctors", Latvia;

⁴ Rīga Stradiņš University, Laboratory of Andrology, Latvia

Objectives

Multiple factors – infectious, environmental and genetic – can contribute to infertility or recurrent pregnancy loss (RPL). The aim of our study was to verify our recently created genetic testing method for the most common genetic causes of couple infertility (male and female factors) including the analysis of RPL cases and screening for most common autosomal recessive disorders in our population.

Methods

From three local infertility clinics and infertility specialists in the 2013–2018 period 400 peripheral venous blood samples were received: 200 female (mean age 34 ± 6.7 years) and 200 male (mean age 34 ± 6.5 years) samples were consigned to genetic testing in case of infertility or RPL. Majority of individuals were sent separate (not as a couple). Genetic testing was performed by Rīga Stradiņš University developed test combining allelic specific PCR with STR loci analysis (qualitative analysis for SNV and semi quantitative analysis for detecting number of sex chromosomes). Results were confirmed by at least one more alternative genetic testing method.

Results

Infertility due to genetic reasons were diagnosed in 15 males (11 had different range micro-deletions in Y chromosome and four had Klinefelter syndrome). In eight females possible cause for RPL were identified – seven have inherited thrombophilia and in one – Wilson disease was confirmed that could explain RPL. As carriers for frequent autosomal recessive disorders were identified four females and seven males (genetic testing was offered also for partner). For hormonal treatment important pharmacogenetic markers (variations in FSHB and FSHR genes) were identified in 56 females and 45 males.

Conclusions

Developed method is fast genotyping method that could be used in infertility patients (including RPL) for multiple purposes – to detect the cause of infertility and RPL, to test carrier status for autosomal recessive disorders and to choose personalised hormonal treatment if prescribed.

Assessment of Children with Febrile Illness Visiting Emergency Department According to “Precautionary Level” System

*Dr. Urzula Nora Urbāne*¹; *Dr. Zane Likopa*²; *Dr. Ieva Kravale*²;
*Dr. Alla Silova*³; Prof. *Dace Gardovska*¹; Prof. *Jana Pavāre*¹

¹ Rīga Stradiņš University, Department of Paediatrics, Latvia;

² Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

³ Children's Clinical University Hospital Riga, Latvia

Objectives

Safety measures must be taken to ensure the timely recognition of children with serious illness among the febrile children presenting to the emergency department. This study assesses the performance of the “precautionary level” system in clinical evaluation of children with fever used in the national algorithm for management of febrile illness in children.

Methods

A cohort of febrile patients observed the Emergency Department (ED) of Children's Clinical University Hospital was retrospectively categorized in three precautionary levels: high, moderate, and low. The “precautionary level” system divides patients in these categories according to vital signs, activity, skin features, hydration, and other important parameters, which is to determine the further management of the patient in the ED.

Results

The clinical features of 285 children with median age of 58 months were assessed. Thirty-two patients (11.2%) were categorized into the lowest precautionary level, 119 (41.8%) patients in the medium level and 134 (47.0%) in the high precautionary level. In the low precautionary level, three patients had serious bacterial infections (SBI), twelve patients (37%) were hospitalized, and nine children (28%) received antibacterial treatment. Among patients of medium precautionary level, the prevalence of SBI was 22.6% (n = 27), 60% were hospitalized (n = 71), 56.3% received antibacterial treatment, two patients were hospitalized in the paediatric intensive care unit (PICU). 48% (n = 64) of patients of the high precautionary level had SBI, 80% (n = 107) were hospitalized, 76% (n = 102) received antibiotics, and 19 were admitted to PICU.

Conclusions

The “precautionary level” system results in effective categorization of patients, selecting those with the highest risk for serious illness to undergo thorough investigation. A small number of patients with SBI visiting ED at the early stages of illness may present with features of the lowest precautionary level, therefore safety netting must be provided for patients discharged from the ED.

Diagnostic Values of Parental Concern and Clinician's "Gut Feeling" in Identifying Serious Bacterial Infections in Children with Fever

*Dr. Urzula Nora Urbāne*¹; *Mareks Marčuks*²; *Madara Katvare*²;
*Dr. Dita Gaidule-Logina*³; *Prof. Dace Zavadska*¹;
*Prof. Dace Gardovska*¹; *Prof. Jana Pavāre*¹

¹*Rīga Stradiņš University, Department of Paediatrics, Latvia;*

²*Rīga Stradiņš University, Faculty of Medicine, Latvia;*

³*Children's Clinical University Hospital Riga, Latvia*

Objectives

This study assesses the diagnostic value of parental concern and clinician's "gut feeling" in recognition of serious bacterial infections (SBI) in febrile children presenting to emergency department (ED).

Methods

Children aged 1 month to 18 years presenting to Emergency Department of Children's Clinical University Hospital between April 2017 and May 2018 were enrolled in a prospective observational study. Clinicians were approached immediately after first assessment of the patient with a questionnaire on their "gut feeling" on the seriousness of the disease. Parental concern was assessed via questionnaire and was defined as an impression that this episode of illness is different / more severe than the child's previous illnesses. Positive likelihood ratio was calculated for "gut feeling" and "parental concern", Pearson's Chi-square test was used to assess the statistical significance, p value of less than 0.05 was considered as significant.

Results

261 children were enrolled; the median age was 58 months. 87 children (33.3%) were diagnosed with SBI. The data on "gut feeling" was provided by clinicians for 247 patients, in 48.2% of cases (n = 119) the questionnaire was filled by licenced paediatricians. Data on parental concern was provided by 206 parents, most of them (89.8%, n = 185) were mothers. "Gut feeling" was predictive of SBI with a positive likelihood ratio (LR+) (95% confidence interval (CI)) of 3.8 (2.5-5.7), p = 0.000. "Gut feeling" of licenced paediatricians (LR+ (95% CI) = 6.02 (2.8-12.9)) was more predictive of SBI than when expressed by paediatric residents (LR+ (95% CI) = 2.7 (1.6-4.4)). Parental concern was not significantly predictive of SBI (LR+ (95% CI) = 1.2 (1.01-1.5)). The questionnaire provided evidence of fever phobia among parents, which may have affected their evaluation of the severity of the disease.

Conclusions

Clinician's gut feeling is useful in recognizing SBI in children. Parental concern was not significantly predictive of SBI in a tertiary care emergency department. Educational measures are necessary to erase fever phobia in parents.

DENND1A Gene Variations in Adolescent PCOS Patients – Clinical and Genetical Associations

*Lāsma Līdaka*¹; Prof. *Gunta Lazdāne*²; Prof. *Iveta Dzīvīte-Krišāne*³;
*Dr. med. Adele Grasmāne*⁴; *Dr. med. Linda Gailīte*⁵

¹ Rīga Stradiņš University, Latvia;

² Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;

³ Rīga Stradiņš University, Latvia;

Children's Clinical University Hospital, Latvia;

⁴ Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

⁵ Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia

Objectives

Polycystic ovary syndrome (PCOS) is characterised by oligo / anovulation, hyperandrogenism and characteristic specific ovarian appearance on the ultrasound; later it can lead to subfertility, cardiovascular diseases, hyperlipidemia and type 2 diabetes, all partially caused by insulin resistance. Condition starts in adolescent periodyears. DENDD1A gene variations and particularly rs10818854 and rs2479106 are associated with development of the syndrome and it's clinical and biochemical symptoms, including insulin resistance. Aim of the study was to assess association of clinical symptoms and rs10818854 and rs2479106 in DENDD1A gene between adolescent girls with PCOS and healthy control group.

Methods

Fifty four adolescents (14–18 y.o.) with PCOS according to ESHRE 2018 criteria and control group – 39 healthy adolescent girls were included in the study in the Children's Clinical University Hospital, Riga, Latvia. Genotypes were detected by HRM method. Study was approved by the Central Medical Ethics Committee.

Results

Average age of patients in PCOS group was 15.86 (SD 1.26) years and 16.1 (SD 1.19) years in control group. Average BMI percentile was 73.5 (SD 29.6) and 54.5 (SD 24.1) in case and control group, respectively; difference was statistically significant ($p = 0.001$). Waist – hip ratio was also significantly higher in the case group (0.84 (SD 0.11)) than in the control group (0.79 (SD 0.1)), $p = 0.005$. None of the control group patients had acanthosis nigricans, that was present in 25 (46%) of cases. Case and control group did not show statistically significant differences in genotype distribution in rs10818854 ($p = 0.82$) and rs2479106 ($p = 0.62$). We analyzed association of heterozygous and minor alleles within the case group with clinical markers of insulin resistance – BMI percentile, waist – hip ratio, acanthosis nigricans. None of those showed statistically significant results.

Conclusions

PCOS patients had significantly higher clinical markers of insulin resistance – BMI, waist-hip ratio and acanthosis nigricans. However, the prevalence of rs10818854 and rs2479106 in DENDD1A gene did not significantly differ between case and healthy adolescent girls, nor they showed any clinical correlation. Further studies in this area are required.

Prior Miscarriage and Preterm Delivery in Assisted Reproductive Technology Pregnancies

*Santa Ūdre*¹; *Viktorija Margevičus*¹;
Prof. *Natālija Vedmedovska*^{2,3}; Dr. *Violeta Fodina*³

¹ *University of Latvia;*

² *Rīga Stradiņš University, Latvia;*

³ *Clinic IVF Riga, Latvia*

Objectives

The aim was to evaluate associations between a history of miscarriage and preterm delivery in ART pregnancies.

Methods

Retrospective study in Infertility treatment clinic IVF Riga. Inclusion criteria: 25–35 years old nulliparous women with singleton pregnancies, without pre-existing maternal diseases. I group – ART pregnancy (study group), II group – spontaneous pregnancy (control group). The data were analyzed by statistical program SPSS ver. 23 and $p < 0.005$ was taken as the level of significance.

Results

In total, 153 women were included in the study, 87 (56.9%) conceived after ART and 66 (43.1%) conceived spontaneously. In the 22 (25.3%) ART and 12 (18.2%) spontaneous group cases were miscarriage in patient history. Mean delivery time in the ART group 39.05 (SD = 2.8), but in the spontaneous group 39.47 (SD = 3.52), preterm birth, respectively were 10 (11.5%) and 3 (4.5%) of cases ($p < 0.005$). There is no correlation with number of miscarriage and preterm delivery ($p = 0.668$).

Conclusions

The risk of preterm birth in singleton pregnancies resulting from ART is greater than in spontaneously conceived singletons. History of miscarriage not associated with increased risk of preterm delivery.

Paediatric Acute Pericarditis in University Hospital within 2008–2017 (10-Year Review)

*Ph.D. Elina Ligere*¹; *Dr. Inta Bergmane*¹; *Dr. Baiba Matsate-Matsone*¹;
*Prof. Ingūna Lubaua*²; *Dr. med. Inga Lāce*²; *Prof. Normunds Sikora*¹;
*Dr. Lauris Šmits*¹; *Dr. Valts Ozoliņš*¹

¹Children's Clinical University Hospital, Clinic for Paediatric Cardiology and Cardiac Surgery, Latvia;

²Children's Clinical University Hospital, Department of Paediatrics, Latvia

Objectives

Acute pericarditis (AP) in children is a rare disease and most often has infectious aetiology but can also arise from autoimmune and malignant causes. The diagnosis is often delayed because of nonspecific clinical signs. The objectives of the study were to analyse all cases of AP treated in our hospital during years 2008–2017.

Methods

All the cases with AP were selected from hospitals database. We analyzed case histories to explore the course of disease, causative agents, echocardiographic findings, surgical interventions and the outcome.

Results

There were 15 cases of AP diagnosed during hospitalization. One case was excluded from the further study due to myopericarditis with the prevalence of myocardial inflammation. There were 3 cases with non-infectious causes: mediastinal Hodgkin's lymphoma, thrombotic thrombocytopenic purpura and Stills disease with mastocyte activation syndrome. Patients with infectious acute pericarditis were 5 girls and 6 boys (55%), age 8 ± 5 years, 7 patients (64%) were transferred from other hospitals and 82% (9) had received antibiotics before admission to our hospital. The amount of pericardial fluid diagnosed by echocardiography at the moment of diagnosis was 25 ± 13 mm, CRP 84 ± 77 mg/L, leucocytes' count 10.7 ± 5 thousand. Causative agents were found in 7 cases (64%): (1 – tbc, 1 – parvo B19, 1 – EBV, 1 – RSV, 1 – CMV, 1 – S. aureus, 1 – Varicella). Pericardial drainage was performed in 82% (9). There were no cases of death. The length of hospital stay was 33 ± 18 days. Recurrent pericarditis was observed in 3 patients (27%) (2–3 episodes).

Conclusions

AP remains serious disease with complicated diagnosis due to inapparent clinical signs up to the collection of large pericardial effusion which develop within days to weeks. It is necessary to take blood cultures prior administration of antibiotics in unclear cases.

Sleep Quality, Sleep Hygiene and Daytime Sleepiness in Adolescents in Latvia – Differences between Boys and Girls

*Dr. Marta Celmiņa¹; Egija Mičule²;
Anna Romanova³; Prof. Ilva Daugule³*

¹ Children's Clinical University Hospital, Latvia;

² Children's Clinical University Hospital Riga, Latvia;

³ University of Latvia

Objectives

Adequate amount of sleep (SA) and good sleep quality (SQ) are important for physical and mental health. However, in adolescence both SQ and SA worsen due to various reasons. Sleep Hygiene Index (SHI) was created to evaluate behaviours affecting sleep. Epworth Sleepiness Scale (ESS) was developed to measure daytime sleepiness. The aim of the study was to analyse and compare the SQ, SA, daytime sleepiness and the influencing factors between sexes and ages.

Methods

Prospective study was carried out in 11 schools (seventh to twelfth grade) in Latvia in 2017. Data was collected using ESS and SHI; the adolescents also assessed their SQ and SA. Statistical analysis: ANOVA, Chi-squared test, Pearson correlation coefficient, Mann-Whitney test.

Results

The final sample consisted of 973 respondents (43% male) – 12 to 19 years of age (mean – 15.4 ± 1.7 ; median – 15). Mean ESS score was 9 (0–24), mean SHI was 32.9 (14–53). Both ESS and SHI scores increased with age (from 7 to 13 ($p = 0.0025$) and from 30.05 to 39.00 ($p < 0.001$), respectively) and were significantly higher in girls (7.5 vs 9.0 and 32.0 vs 34.0). In total, 20% ($n = 197$) of the respondents evaluated their sleep quality as bad (65.0% ($n = 197$) of them girls) and 54% ($n = 526$) thought they didn't sleep enough (59.1% ($n = 311$) of them girls).

Conclusions

Not surprisingly, all sleep related measures worsen with age but only older adolescents have excessive daytime sleepiness. More than a half of adolescents assess their sleep amount as inadequate and one fifth think that their sleep quality is bad due to excessive amount of homework / extracurricular activities, retiring too late, disrupted sleep, stress, and having to wake up too early. Girls are sleepier than boys and indicate more problems affecting their nighttime behaviours mainly due to emotional factors, nightmares, and waking up during the night.

Evaluation of Possible Diagnosing Tool Distinguishing Acute Appendicitis from Acute Mesenteric Lymphadenitis in Children

*Dr. med. Astra Zviedre*¹; Prof. *Arnīs Eņģelis*¹;
Prof. *Pēteris Tretjakovs*²; Dr. *Vilnis Titans*³;
Prof. *Aigars Pētersons*⁴

¹ Rīga Stradiņš University, Department of Paediatric Surgery, Latvia;
Children's Clinical University Hospital, Latvia;

² Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia;

³ Rīga Stradiņš University, Department of Paediatric Surgery, Latvia;
Outpatient Clinic "LaTi & Co" Ltd, Latvia;

⁴ Rīga Stradiņš University, Department of Paediatric Surgery, Latvia

Objectives

To find out whether a scoring system with additional clinical variables could distinguish patients with acute appendicitis (AA) from mesenteric lymphadenitis (AML) and require a consultation of a pediatric surgeon.

Methods

A prospective study was made including 57 patients (7-18 years) with suspected AA (October 2013 – October 2015). 31 patient underwent surgery for AA, 26 were not treated surgically and were diagnosed AML on ultrasonography. Alvarado score (AS), white blood cell count (WBC) and serum interleukin-6 (IL-6) were obtained on admission and were compared between groups. Parameter accuracy was assessed using receiver operating characteristic curves. The study was approved by the Institutional Ethics Review Board.

Results

57 patients with the mean age of 12.9 (SD – 3.2), 35 (61.4%) were boys and 22 (38.46%) were girls. The most often AS ≥ 7 was observed for AA with 71.0% of sensitivity, 76.9% of specificity, 78.6% of PPV, 67.0% of NPV and 73.7% of AR ($p = 0.001$). AUC of 0.77 (95% CI 0.64–0.89; $p = 0.001$) for IL-6 with the cut-off value 4.3 pg/mL before the operation (sensitivity – 67.7%, specificity – 76.9%) and AUC of 0.72 (95% CI 58.4–85.0; $p = 0.005$) for WBC with cut-off value $10.7 \times 10^3/\mu\text{L}$ (sensitivity – 74.2%, specificity – 53.8%) showed to be a valuable diagnostic tool in AA. AR of AA (89.5%) was provided combining AS ≥ 7 with WBC and IL-6 (sensitivity – 94.1%, specificity – 50.0%, PPV – 94.1%, NPV – 50.0%).

Conclusions

AS ≥ 7 , IL-6 with the cut-off value 4.3 pg/mL and WBC with cut-off value $10.7 \times 10^3/\mu\text{L}$ assessed altogether will require consultation of a pediatric surgeon and hospitalization for further treatment of AA.

Risk Factors and Prognostic Indicators for Rescue Outcome of Children with Airway Foreign Body Obstructions

Prof. *Giulio Di Mizio*¹; Dr. med. *Angelo Montana*²;
Dr. *Filomena Casella*¹; Dr. *Davide Giuseppe Albano*²;
Dr. *Francesco Amico*²; Prof. *Vincenzo Baylon*³;
Dr. med. *Pasquale Malandrino*²; Dr. med. *Federico Patanè*²;
Dr. med. *Ilenia Russo*²; Prof. *Monica Salerno*²

¹ *University of Catanzaro, Department of Legal, Historical, Economic
and Social Sciences, Italy;*

² *University of Catania, Department of Medical, Surgical Sciences and Advanced Technologies
"G. F. Ingrassia", Italy; University Hospital "Policlinico V. Emanuele", Italy;*

³ *Newton Lewis Institute-ISR, Malta*

Objectives

Foreign body inhalation is a relatively frequent event in children and is responsible for significant morbidity and mortality, especially in the pre-school age group. Sudden airway obstruction is one of the most dramatic pediatric emergency related with a very rapid death. The failing to assist for a fast and effective attempt to remove the airway obstruction before arrival in a hospital setting is often responsible for severe damage and death of little patients justified by the sudden onset and rapid aggravation of the asphyxiation mechanism. Evidence shows that to increase pediatric survival, relevant target groups, including day caregivers and other non-medical workers working with children, must possess resuscitation skills.

Methods

We report three accidental fatal cases of airway obstruction. Death occurred immediately and before medical rescues attempts. Post mortem examination is vitally important in these cases and a detailed description of foreign body and site of obstruction is mandatory.

Results

In the cases presented lacking of effective aid procedures from bystanders and delay in medical rescues contributed to unfavorable outcome and confirmed the importance of standardized emergency school policies and training with emergency manouvres. Survival from out-of-hospital paediatric cardiac arrest depends on fast recognition and initiation of resuscitation by bystanders. To increase paediatric survival, relevant target groups, including daycare employees and other non-medical personnel working with children, need to possess resuscitation skills.

Conclusions

Resuscitation manouvres from laypeople were performed, uncorrectly and unsuccessfully. It has been argued that most inexperienced lay people can achieve sufficient levels of skill with a short standardised training for both Paediatric Basic Life Support (PBLS) and foreign body airway obstruction management (FBAOM).

Preliminary Results on Use of Oral Rehydration Solution in Form of Gelato for Rehydration of Children with Acute Gastroenteritis

*Dr. Gunda Zvigule Neidere*¹; *Dr. med. Arta Bārzdiņa*²;
*Dr. Gunta Laizane*¹; *Ph.D. Inese Sviestina*³; *Karlis Gross*⁴

¹*Rīga Stradiņš University, Department of Paediatrics, Latvia;*

²*Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia;*

³*Rīga Stradiņš University, Latvia;*

⁴*Riga Technical University, Faculty of Materials Science and Applied Chemistry, Latvia*

Objectives

Oral rehydration solution (ORS) is used to reverse dehydration. Successful dehydration treatment is to replenish the lost water and electrolytes by consuming ORS, containing both electrolytes and glucose, because sodium and glucose transport in the small intestine are coupled. However, clinical practice show that children refuse ORS due to its salty-sweet taste and unpalatability. We hypothesized that freezing ORS containing a fruit/berry juice to a likeable texture in “gelato” form could promote oral rehydration. This form has not previously been trialed for rehydration fluid administration.

Methods

Apple and strawberry juice was the base and crystalline NaCl, water and glucose was added to the concentrations recommended by the WHO ORS standard and revised formulas. WHO standard recipe contains 90 mmol/L Na⁺, 20 mmol/L K⁺, 80 mmol/L Cl⁻ and glucose 111 mmol/L, but WHO revised formula – 70 mmol/L Na⁺, 20 mmol/L K⁺, 60 mmol/L Cl⁻ and glucose 75 mmol/L. All ingredients were pasteurized at 80 °C and cooled to 4 °C in a shock freezer. The gelato made in a Maestro HE. It was kept at -20 °C in a Gelato Coolbox and served at -12 °C. Portions of 200 g were given to children at the Infectiology and Emergency units. Rīga Stradiņš University Ethical committee's approval was obtained (No. 15 / 28.06.2018). All parents gave informed consent for participation.

Results

36 children (1–15 years old) were enrolled in the study. Fourteen (39%) children did not tolerate any amount, 22 (61%) ate ORS gelato. Seven patients (19.4%) ate ≥ 10 g/kg/h (ORS consumption rate needed for acute dehydration phase). Mean amount eaten was 4.6 grams per weight kg (SD 5.78 g/kg) – the rate needed for maintenance rehydration. There is a statistically significant correlation with the willingness to eat the gelato and a reported likeness of taste (Spearman rho value 0.639, $p < 0.001$).

Conclusions

Our results show that ORS can be successfully administered frozen as gelato. The small sample size is the major limitation of this study. Additional research is needed before we can test ORS gelato in clinical set up.

Patient and Their Family Needs in Paediatric Palliative Care: Results of Pilot Study

Inta Kalnina; Prof. Liāna Deklava

Rīga Stradiņš University, Department of Nursing and Midwifery, Latvia

Objectives

The integrated care approach is particularly important in palliative care, where the patient is a child with chronic, complex and life-limiting diseases. These patients have a multiple medical problems affecting the quality of life of children. The diversity and multifaceted nature of disease conditions make up patient's needs. Aim of this study is to find out the needs of children's palliative care patients and their families.

Methods

In cross sectional study was applied the quantitative research method, where as an instrument The Family Needs Survey (Bailey & Simeonsson, 1988) was used. The survey consist of 41 statement that are divided in 6 categories – information, family and social support, financial, exploring to others, Professional support and community services. The pilot study involved ten parents of pediatric palliative patients. Most of respondents was mothers (8 cases of 10) older than 40 years (8 cases of 10), who took care of children up to one year old (6 cases of 10).

Results

Family needs are related with need of information about necessary (10 cases of 10) and available (8 cases of 10) services. Eight of ten respondents notes of inaccessible information in areas of financial support. Parents need information of communication with children ($p = 0.01$), how to teach and educate a child ($p = 0.00$). Financial needs are related with financial support. Parents needs for financial support for household expenses ($p = 0.04$).

Conclusions

Most important factors affecting palliative care patient family needs are related with support of professionals in area of information and finances. That could mean that other aspects of family needs aren't relevant or are satisfied.

Microbiological Etiological Spectrum of Acute Complicated and Uncomplicated Appendicitis: Preliminary Results

*Dr. Mohit Kakar*¹; *Dr. Marisa Maija Butnere*²;
*Dr. med. Aigars Reinis*³; *Prof. Juta Kroiča*³;
*Prof. Arnis Eņģelis*⁴; *Prof. Amulya Saxena*⁵; *Renars Broks*³;
*Vladislavs Jansins*⁶; *Prof. Aigars Pētersons*⁴

¹ *Children's Clinical University Hospital, Latvia;*
Rīga Stradiņš University, Department of Paediatric Surgery, Latvia;

² *Children's Clinical University Hospital, Latvia;*

Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

³ *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;*

⁴ *Rīga Stradiņš University, Department of Paediatric Surgery, Latvia;*
Children's Clinical University Hospital, Latvia;

⁵ *Chelsea Children's Hospital, United Kingdom;*

Chelsea and Westminster NHS Fdn Trust, United Kingdom;

Imperial College London, United Kingdom;

⁶ *Rīga Stradiņš University, Department of Paediatric Surgery, Latvia*

Objectives

The appendix is hypothesized as a beneficial bacterial reservoir; however, its microbial role only recently is being discussed as the etiology of appendicitis. Current evidence directs to bacterial infections being the primary cause of appendicitis, not luminal obstructions. The aim is to determine the most common microorganism that causes pediatric acute complicated (AcA) and uncomplicated appendicitis (AnA).

Methods

Microbiological cultures were taken from the appendiceal proximal and distal ends from all operated appendicitis cases; in addition, cultures from the peritoneal cavity were also examined. 38 specimens were divided into group 1 (n = 21) for AcA and group 2 (n = 17) for AnA, and were examined using blood agar (aerobic and anaerobic), MacConkey agar, and mannitol salt agar for staphylococcal isolation. The isolated pure cultures were identified by biochemical properties using a VITEK2 analyzer.

Results

The microbiological growths of group one include: 15 incidences with *E. coli*, seven with *P. aeruginosa*, two with *S. paucimobilis*, an incidence each for *K. kristinae*, *P. oralis*, *A. viridans*, *Enterococcus* spp., *S. liquefaciens*, *S. capitis*, *A. hydrophila*, *A. caviae*, *A. lwoffii*, *A. viridans*, *E. faecalis*, *E. doacae* complex, *K. oxytoca*, *S. aureus*, and six unidentified. 17 culture results of group two revealed 10 with *E. coli*, two with *C. braakii*, an incidence each for *P. stutzeri*, *P. disiens*, *K. kristinae*, *S. capitis*, *K. pneumoniae*, *P. melaninogenica*, *L. mesenteroides*, *S. hominis*, and six unidentified.

26 peritoneal cavity cultures revealed 11 with *E. coli*, two with *A. baumannii*, an incidence each for *G. elegans*, *K. pneumoniae*, *Fusobacterium* spp, *S. paucimobilis*, *Veilonella* spp, *S. epidermidis*, *S. aureus*, *Micrococcus* spp, *Pantoea* spp, and six unidentified. This is an ongoing study, in which more participants will be admitted and statistical analysis will be presented.

Conclusions

1. Currently, the most common etiological result from the bacterial cultures is *E. coli*.
2. Until now there is no conclusive evidence to differentiate the microbiota from each appendiceal anatomical location as well as its relation to the peritoneal microbiota.

Staphylococcus Aureus Associated Acute Hematogenous Osteomyelitis Management and Treatment Outcomes in Children's Clinical University Hospital in 2017

Dr. Anija Meiere¹; Dr. Iveta Račko²; Prof. Jana Pavāre¹

¹*Rīga Stradiņš University, Department of Paediatrics, Latvia;*

²*Rīga Stradiņš University, Faculty of Continuing Education, Latvia*

Objectives

Acute hematogenous osteomyelitis (AHO) can result in severe complications, for example, bone and joint destruction, sepsis, septic shock and even death. The aim of this study was to analyze Staphylococcus aureus associated AHO management and treatment outcomes in CCUH in 2017, and most often used antibacterial therapy and microorganism susceptibility to the most often prescribed antibiotics.

Methods

All patients diagnosed with S.aureus associated AHO in age group above 1 month and below 18 years and treated at CCUH were included in retrospective, descriptive study conducted in 2017.

Results

In total, 23 patient cases were eligible according to the selected diagnoses within the study period. Blood cultures were performed only in 70% of cases (n = 16), and 62.5% of them (n = 10) were negative. The average duration of antibacterial treatment for S. aureus AHO was 24.6 days, but for patients who developed complications – 27.1 days. 43% of patients (n = 10) received a combination of two or more antibiotics. The most frequently used combination was Oxacillin with Amikacin, which was applied in 40% cases. 9 of 23 (39%) patients developed complications, only 2 out of those 9 received Clindamycin and had complications already at the time of the hospitalization. During hospitalization, all the patients received intravenous antibacterial treatment, and for nobody oral antibiotics were initiated during the stay at the hospital.

Conclusions

1. Earlier reports have shown a high prevalence of PVL positivity in S. aureus infections at CCUH, and PVL positivity could be responsible for so high AHO complication rate. Routine PVL status detection must be considered in CCUH in case of S. aureus AHO.
2. Only intravenous antibiotics were used during the treatment in CCUH and more frequent evaluation for possible conversion to oral treatment should be performed to decrease the rate of complications associated with intravenous access, and to increase comfort for the patients.

Frey Procedure in Treatment of Paediatric Chronic Pancreatitis: Case Report and Recent Update

*Dr. Marisa Maija Butnere*¹; Prof. *Ieva Pukite*²;
Prof. *Ilze Apine*³; Prof. *Guntars Pupelis*⁴; Prof. *Arnis Eņģelis*⁵;
*Dr. Mohit Kakar*⁵; Prof. *Aigars Pētersons*⁵

¹ Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

² Rīga Stradiņš University, Department of Paediatrics, Latvia;

³ Children's Clinical University Hospital, Department of Radiology, Latvia;

⁴ Rīga Stradiņš University, Department of Surgery, Latvia;

⁵ Rīga Stradiņš University, Department of Paediatric Surgery, Latvia

Objectives

This study reviews the updated treatment results of a rare pediatric case of pancreas divisum and chronic pancreatitis combined with a genetic disorder.

Methods

A 16-year-old girl has had a six-year history of chronic pancreatitis and recurrent abdominal pain episodes. The patient was first diagnosed in 2010 with pancreas divisum and later in 2016, diagnosed as a pancreatic secretory trypsin inhibitor (SPINK-1, N34 S) gene mutation carrier. The patient received a papillotomy in 2012 and a papillotomy with pancreatic duct stenting in 2014; however, severe pain caused the patient to frequently be admitted for hospitalization. These pain episodes were long and difficult to manage. The patient showed dilatation of the major pancreatic duct and its side branches on magnetic resonance cholangiopancreatography (MRCP) imaging along with intractable pain.

Results

The surgical treatment of the Frey procedure (pancreatico-jejunostomy) was performed at an adult hospital in October, 2016. The major pancreatic duct no longer showed signs of dilatation in ultrasonography. The patient had three recurrences of pain postoperatively at an average of one month intervals and then an interval of a year. These recurrences were much shorter and easier to manage.

Conclusions

Pancreas divisum in a combination with genetic disorders are rare in childhood and requires combined treatment, including surgery. The Frey procedure was successful in preventing dilation of the major pancreatic duct; however, the patient suffered many pain episodes within the first four months after the operation. The patient has had one severe recurrence of pancreatitis since the operation, which shows that there is a good prognosis for even longer remissions and manageable recurrences.

Change of HIV Positive Pregnant Women's Care in Riga Maternity Hospital within Past 9 Years

*Dr. Jeļizaveta Murzina*¹; *Dr. Vija Veisa*²;
*Dr. Ērika Bitiņa-Barlote*¹; *Dr. Margarita Božko*³; *Dr. Edgars Barlots*⁴;
*Prof. Dace Rezeberga*⁵; *Dr. Santa Markova*⁶

¹ Rīga Stradiņš University, Latvia; Pauls Stradiņš Clinical University Hospital, Latvia;

² Rīga Stradiņš University, Latvia;

Rīga Maternity Hospital, Latvia;

³ Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

⁴ Rīga Stradiņš University, Latvia;

⁵ Rīga Stradiņš University, Latvia;

Rīga East University Hospital, Latvia;

Rīga Maternity Hospital, Latvia;

⁶ Rīga Stradiņš University, Latvia;

Rīga Maternity Hospital, Latvia

Objectives

Analyze the dynamics of HIV positive pregnant women antenatal care, delivery type, pregnancy outcomes and neonatal period complications during 2010–2018.

Methods

1. Review of delivery charts in Riga Maternity hospital archive (with diagnosis B20 ICD-10), according the questionnaire.
2. Comparison of data in two patient cohorts depending on delivery year: 1st group (2010–2014; n = 194) and 2nd (2015–2018; n = 166).
3. Data analysis with Microsoft Excel 2013 and SPSS 22 programs.

Results

In 2015–2018 ART before pregnancy was used more frequently (9.8%; vs 43.4%; $p < 0.0005$), as well as during pregnancy (52.4%; vs 86.1%; $p < 0.05$).

In both groups 21.7% (95% CI 17–26.4%) of women still did not receive any ART. The elective Caesarean Section (CS) rate has decreased during the last years (65.4% in 1st, 47.6% in 2nd), but, emergency CS (20.5% vs 30.7%), and vaginal delivery rate (8.7% vs 13.8%) has increased. Neonatal period complications were more frequent in the 1st group (n = 103, 53.4% vs n = 59, 35.5%, $p = 0.02$). The most common complications were related to prematurity, perinatal infection, intrauterine growth restriction, birth asphyxia, birth trauma.

Conclusions

During past years ART usage during pregnancy has increased according to Latvian Association of Gynecologists and Obstetricians guidelines, revised in 2015. Pregnancy and neonatal period related complications rate has decreased. There is still need to improve multidisciplinary prenatal care to reduce neonatal complications.

Paediatric Acute Scrotum Diagnostics and Treatment: Evaluation at Riga Children's Clinical University Hospital within 2009–2018

*Dr. Aleksandrs Mikitins*¹; *Dr. Marisa Maija Butnere*²;
*Dr. Ainars Gilis*³; *Dr. Daila Pugacevska*⁴; *Dr. Mohit Kakar*⁴;
*Prof. Arnis Enģelis*⁴; *Prof. Aigars Pētersons*⁴

¹ *Children's Clinical University Hospital, Latvia;*

² *Rīga Stradiņš University, Faculty of Continuing Education, Latvia;*

³ *Children's Clinical University Hospital, Department of Paediatric Surgery, Latvia;*

⁴ *Rīga Stradiņš University, Department of Paediatric Surgery, Latvia*

Objectives

Testicular torsion (TT) is one of the most common (30–40%) afflictions in acute scrotum (AS), and is commonly seen in early childhood until age three and puberty. The clinical signs of AS include local pain, erythema, and edema with possible nausea and vomiting. In the case of TT, urgent surgery is required for testicular detorsion and fixation. The aim of this study is to evaluate the results of AS diagnostics and treatment at Children's Clinical University Hospital (CCUH) in Riga, to identify factors leading to adverse AS outcomes, and to improve practical recommendations.

Methods

This retrospective study was conducted analyzing medical records of 540 AS patients treated in CCUH between January 2009 and December 2018.

Results

The average annual incidence of AS is 64 patients with a mean pre-hospitalization symptom onset of 18 h. 60% of AS patients were Morgagni hydatid torsion (HT) cases, which 94.6% treated surgically. Ultrasonography was performed in 50% TT and 63.7% HT with a precision of 82% and 100% respectively. All TT cases had detorsion, in which 76% had fixation of both testicles, 16% had one side fixation, and 8% without testicular fixation. 29.4% TT resulted in orchiectomy with the mean onset of 52 h. TT cases in which surgical treatment was within six hours of onset had 94% unaffected function.

Conclusions

1. The risk for orchiectomy in TT cases is significantly affected by the duration of AS anamnesis. Essential factors impact duration include delayed in seeking medical attention along with misdiagnosis in the pre-hospitalization phase.
2. It is imperative to inform patients and their parents, but also general practitioners and other emergency care specialists about AS, its diagnostics and treatment, as to reduce the number of orchiectomies.
3. Obligatory contralateral testicular fixation must be implemented as per EAU recommendations.

Serum and Urine Biomarkers Leucine-Rich Alpha Glycoprotein-1, Neutrophil Gelatinase-Associated Lipocal, and Interleukin-6 in Determining Acute Complicated and Uncomplicated Appendicitis: Preliminary Results

*Dr. Mohit Kakar*¹; *Dr. Marisa Maija Butnere*²; *Dr. med. Aigars Reinis*³;
*Prof. Juta Kroiča*³; *Prof. Arnis Eņģelis*¹; *Prof. Amulya Saxena*⁴; *Renars Broks*³;
*Vladislavs Jansins*⁵; *Prof. Aigars Pētersons*⁶

¹ Children's Clinical University Hospital, Latvia;

Rīga Stradiņš University, Department of Paediatric Surgery, Latvia;

² Children's Clinical University Hospital, Latvia;

Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

³ Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;

⁴ Chelsea Children's Hospital, United Kingdom;

Chelsea and Westminster NHS Fdn Trust, United Kingdom;

Imperial College London, United Kingdom;

⁵ Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

⁶ Rīga Stradiņš University, Department of Paediatric Surgery, Latvia

Objectives

Early diagnostics of acute appendicitis is essential to provide effective treatment for children, and therefore, there is demand for early, accurate predictive appendicitis biomarkers. The aim of this study is to determine whether serum and urine biomarkers leucine-rich alpha glycoprotein-1 (LRG-1), Neutrophil gelatinase-associated lipocal (NGAL), and interleukin-6 (IL-6) should be included in the early diagnostic algorithm.

Methods

Patients aged 7–17 were included and divided into three groups: No. 1 diagnosed with acute complicated appendicitis (AcA) (n = 21), No. 2 with acute uncomplicated appendicitis (AnA) (n = 17), and No. 3 control (n = 19). AcA and AnA had repeated analysis on the second and fifth postoperative day. Statistical analysis was performed using Microsoft Excel 2016 and STATGRAPHICS Centurion 18.

Results

The average LRG-1 levels were: group No. 1 day 0 – 11.4 ng/mL, day 2 – 11.2 ng/mL, day 5 – 13.5 ng/mL; group No. 2 – 19.2 ng/mL, 16.2 ng/mL, 21.9 ng/mL; group No. 3 – 22.7 ng/mL.

The average NGAL levels were: group No. 1 serum 169.1 ng/mL, 137.0 ng/mL, 92.5 ng/mL, and in urine 4.6 ng/mL, 9.8 ng/mL, 3.3 ng/mL; group No. 2 serum 168.4 ng/mL, 92.3 ng/mL, 82.0 ng/mL, and in urine 2.3 ng/mL, 6.4 ng/mL, 4.4 ng/mL; group No. 3 serum 103.3 ng/mL and in urine 7.1 ng/mL.

IL-6 levels were: group No. 1 in serum 119.3 pg/mL, 24.0 pg/mL, 13.0 pg/mL, and in urine 15.6 pg/mL, 37.5 pg/mL, and 2.1 pg/mL; group No. 2 serum 46.9 pg/mL, 10.1 pg/mL, 10.4 pg/mL, and in urine 10.5 pg/mL, 21.8 pg/mL, 5.9 pg/mL; group No. 3 serum 14.6 pg/mL and in urine 34.1 pg/mL.

This is an ongoing study, in which more participants will be admitted and statistical analysis will be presented.

Conclusions

1. NGAL on day 0 also is increased in appendicitis when compared to the control group as well as there is a tendency for a retained higher serum concentration in AcA on day 2.
2. The levels of serum LRG and urine NGAL could not precisely determine the active infectious process until now. However, urine IL-6 at day 0 could possibly be used as a diagnostic marker.

Role of *Yersinia Enterocolitica* Antibody Serum Level in Paediatric Acute Complicated and Uncomplicated Appendicitis: Preliminary Results

*Dr. Mohit Kakar*¹; *Dr. Marisa Maija Butnere*¹;
*Dr. med. Aigars Reinis*²; *Prof. Juta Kroiča*²; *Prof. Arnis Enģelis*¹;
*Prof. Amulya Saxena*³; *Prof. Aigars Pētersons*¹

¹ *Children's Clinical University Hospital, Latvia;*

Rīga Stradiņš University, Department of Paediatric Surgery, Latvia;

² *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;*

³ *Chelsea Children's Hospital, United Kingdom;*

Chelsea and Westminster NHS Fdn Trust, United Kingdom;

Imperial College London, United Kingdom

Objectives

Yersinia enterocolitica is a known cause for acute febrile gastroenteritis and epithelioid granulomatous lesions. However, in the last decade international cases of granulomatous appendicitis with *Yersinia enterocolitica* have been reported more frequently. The general understanding is that acute complicated appendicitis (AcA) is a complicated intraabdominal infection, but recent studies suggest that this disease may develop due to direct invasion of specific pathogenic microorganism. Some earlier studies have confirmed a polymicrobial process, however, the dominating antigen causing AcA has not been identified. The aim of this study is to determine *Yersinia enterocolitica* antibody blood serum level in all patient groups and whether it affects AcA.

Methods

Patients aged 7–17 were included and divided into three groups: No. 1 diagnosed with AcA (n = 21), No. 2 with acute uncomplicated appendicitis (AnA) (n = 17), and No. 3 control (n = 19). Serum analysis for *Yersinia enterocolitica* antibodies was taken on the first day of hospital admission and sent to an independent laboratory using the titration method. Histological examination of the appendices were evaluated for granulomatous appendicitis.

Results

Group No. 1 all had negative serum analysis for antibodies to *Yersinia enterocolitica* as well as 12 fecal specimens that also were negative for *Yersinia* and *Shigella*.

Group No. 2 all had negative serum analysis and eight fecal specimens were also negative.

Group No. 3 had two positive serum analysis in patients treated for blunt trauma, and one negative fecal specimen.

This is an ongoing study, in which additional participants will be admitted and statistical analysis will be presented.

Conclusions

1. Current statistical evidence trends toward that serum antibodies to *Yersinia enterocolitica* are independent from acute pediatric appendicitis.
2. Serum antibodies to *Yersinia enterocolitica* may be present in unrelated non-infectious patients.

Positive Group B Streptococcus and Outcome of Early Neonatal Period

*Dr. Gīta Jansone*¹; *Dr. Maija Koka*²; *Dr. Elizabete Pumpure*¹;
*Dr. Vija Veisa*¹; *Prof. Dace Rezeberga*³; *Dr. Irina Morozova*⁴;
*Ļubova Lapidus*⁴; *Dr. Santa Markova*¹

¹ *Rīga Stradiņš University, Latvia;*
Rīga Maternity Hospital, Latvia;

² *Rīga East University Hospital, Latvia;*
Rīga Stradiņš University, Latvia;

³ *Rīga Maternity Hospital, Latvia;*

Rīga East University Hospital, Latvia;

Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;

⁴ *Rīga Stradiņš University, Latvia*

Objectives

To determine the prevalence of positive Group B Streptococcus (GBS) and evaluate the outcome of newborns in early neonatal period.

Methods

Retrospective case control study was performed by obtaining data from medical records in Rīga Maternity Hospital from woman who had known GBS screening result and term delivery in year 2017. Women were separated into two groups: GBS positive (697 patients, Group 1) and GBS negative (755 patients, Group 2). Data were analysed via SPSS v21.0.

Results

In Year 2017 and 2018 positive GBS were 12.6% of all mature deliveries. In Group 1 there were 76.6% (n = 534) vaginal deliveries, in Group 2 - 77.7% (n = 587), p = 0.540. In Group 1 Apgar score after 1st minute ≤ 7 was 13.6% (n = 95), in Group 2 - 14.5% (n = 110). In Group 1 Apgar score after 5th minute ≤ 7 was 1.2% (n = 9), in Group 2 - 0.5% (n = 4). Newborns were closely observed after delivery in 13.3% (n = 93) in Group 1 and in 8.5% (n = 64) in Group 2; p < 0.001. In Group 1 blood cultures were taken in 3.5% cases (n = 25) from which positive result was found in 4.0% (n = 1) (St. epidermididis). In Group 2 blood cultures were taken in 2.9% cases (n = 22) from which positive result was found in 13.6% (n = 3) (St. epidermididis \times 2, St. hominis). C-reactive protein (CRP) was obtained in 94.4% in Group 1 (n = 658) and 37.8% (n = 285) in Group 2. 99.1% (n = 691) newborns in Group 1 and 98.7% (n = 745) in Group 2 were discharged in normal condition.

Conclusions

In Group 2 Apgar score after 5th minute were slightly better than in Group 1. Newborns in Group 1 more often were observed after delivery and in this group CRP was analysed 2.5 times more frequently than in Group 2. In Group 1 there were no cases of GBS identified in obtained blood cultures.

External Anal Sphincter Muscle Recovery Detected with Surface EMG after Perineal Tear: Case Study

*Dr. Vita Zacesta*¹; *Dr. Laura Rācene*²;
Prof. *Haralds Plaudis*³; Prof. *Dace Rezeberga*⁴

¹ *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;*

² *Rīga Stradiņš University, Department of Obstetrics and Gynaecology;
Rīga Maternity Hospital, Latvia;*

³ *Rīga Stradiņš University, Department of Surgery, Latvia;
Rīga East University Hospital, Latvia;*

⁴ *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;
Rīga East University Hospital, Latvia;
Rīga Maternity Hospital, Latvia*

Objectives

The aim of the study was to observe changes in external anal sphincter muscle (EAS) function activity during voluntary contractions after 19 months of perineal rehabilitation.

Methods

A 33 years old G3P2 had vaginal delivery (40 week pregnancy, cephalic presentation, labour time: 5 h 1st stage, 45 min 2nd stage, weight 4.4 kg) with fourth-degree tear. Two surgical repairs were performed: immediately after delivery by obstetrician and 6 months later by proctologist. Surface EMG signals were detected from the EAS with a minimally invasive rectal probe including 16 equally spaced electrodes. Measurements were performed in two sessions: four days after (A) and 19 months after delivery (B). The signals were analyzed in order to extract the amplitude distribution during rest and during maximal voluntary contraction (MVC). The subject was verbally encouraged to maximally squeeze the EAS around the probe for 10 s.

Results

The patient's faecal incontinence score according to FIS1 was 10/20 in the first session (A) and 1/20 in the second (B). In A she complained of faecal urgency and flatus incontinence while in B she had no complains. The average EMG amplitude during sessions A was $12.6 \pm 3.1 \mu\text{V}$ and $15.8 \pm 2.4 \mu\text{V}$ during rest and MVC respectively indicating that the patient was not able to voluntarily activate the muscle, while during session B it was $14.2 \pm 3.5 \mu\text{V}$ and $48.8 \pm 19.4 \mu\text{V}$ during rest and MVC respectively. The activity distribution was uniform in both sessions during rest and MVC.

Conclusions

The signal amplitude increased of three times in session B as compared to session A, showing a significant recovery of the sphincter muscle function. Intra anal sEMG in obstetrics could provide a valuable tool to detect EAS damage and a new insight for assessing non invasively muscle recovery after delivery or after perineal surgery.

Up-Regulation of FOXP3 T Regulatory Lymphocytes in Patients with High-Grade Squamous Intraepithelial Lesions

*Dr. Androniks Mitildzans*¹; Prof. *Sergejs Isajevs*²;
Prof. *Dace Rezeberga*³

¹ *Rīga East University Hospital, Latvia;*

Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;

² *Rīga East University Hospital, Latvia;*

University of Latvia, Faculty of Medicine;

Institute of Clinical and Preventive Medicine, Latvia;

³ *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;*

Rīga East University Hospital, Latvia;

Rīga Maternity Hospital, Latvia

Objectives

Regulatory (FOXP3+) T cells (Tregs) comprise a subpopulation of CD4+ T cells that suppress autoreactive immune cells, thereby protecting organs and tissues from autoimmunity. Novel therapeutic strategies for cervical cancer and squamous intraepithelial lesions (SIL) focus on immune-modulatory and cancer vaccination approaches.

The aim of this study was to analyze the role of T regulatory cells (Tregs), CD4 and CD8 T lymphocytes in low and high grade squamous intraepithelial lesions (LSIL and HSIL).

Methods

62 patients were enrolled in the study in Rīga East University Hospital. Each patient had undergone a biopsy or electroexcision of the cervix. The immunostaining for CD4, CD8 and FOXP3 was performed on tissue samples of control group (n = 10), patients with LSIL (n = 32) and patients with HSIL (20) lesions.

Results

Obtained results showed that the numbers of CD4 T-lymphocytes did not differ between the patients with LSIL and HSIL. However, patients with HSIL had significant CD8 T-lymphocytes upregulation compared to patients with LSIL (16 ± 4 vs 8 ± 2 cells/mm², $p = 0.001$). In addition patients with HSIL with concomitant epithelial koilocytosis demonstrated increased numbers of FOXP3 positive T-lymphocytes compared to patients with LSIL (2 ± 6 vs 6 ± 2 cells/mm², $p = 0.02$).

Conclusions

Up-regulation of T regulatory lymphocytes in patients with HSIL suggested the pivotal role of Tregs for counteracting the host immune response for the progression from LSIL to HSIL. Prime targets for new immune-based non-invasive therapies for the HSIL treatment could be beneficial.

Analysis of Submitted Complaints in Field of Obstetrics and Gynaecology to the Ministry of Health of the Republic of Latvia Health Inspectorate

Dr. Margarita Pukite

University of Latvia, Faculty of Medicine

Objectives

The aim of this study was to compile and analyze data of submitted complaints in the field of obstetrics and gynecology to the Ministry of Health of the Republic of Latvia Health Inspectorate.

Methods

During the period of two years, 122 complaints were examined, of which 35% (n = 43) were expert's reports and 65% (n = 79) were cases of the Medical Risk Fund. In obstetrics 73 cases were analyzed - 40 complaints about the quality of neonatal care and 33 about the quality of maternity care. In gynecology 49 cases were analyzed - 11 complaints about outpatient healthcare and 38 about the quality of healthcare in hospitals. In the study author's research protocol was applied as an instrument of research method including area to be studied, medical institutions and persons involved, action taken, existence or absence of harm.

Results

Obtained data indicated 58 complaints about health institutions in Riga and 64 institutions in regions. The medical practitioners involved in the complaints were certified gynecologists obstetricians, neonatal doctors, geneticists, midwives and others. Seven complaints revealed the shortcomings of the medical institution in the provision of medical equipment. Data analysis showed that involved medical practitioners most often did not recognize problems before, but acted according to the clinical situation when addressing the problem. Damage was acknowledged in 7% of all cases (n = 8), and no damage was admitted in 93% of all cases (n = 114) examined.

Conclusions

1. The complaints received are related to the quality of healthcare, which is indirectly influenced by the lack of national guidelines.
2. The most frequent complaints were about regional authorities in relation to the technical facilities of the hospitals.
3. By law medical practitioners in their professional activity are free in the choice of the method of diagnostics, treatment and the follow-up, which have an impact on the decision-making of medical practitioners.

Time Critical Paediatric Neurosurgery in Latvia

*Paula Kļaviņa¹; Dagnija Pētersone¹;
Anna Buza²; Dr. med. Reinis Balmaks³*

¹ Rīga Stradiņš University, Faculty of Continuing Education, Latvia;
Children's Clinical University Hospital, Latvia;

² State Emergency Medical Service, Development Planning Department, Latvia;

³ Children's Clinical University Hospital, Department of Paediatrics, Latvia;
Rīga Stradiņš University, Department of Clinical Skills and Medical Technology, Latvia

Objectives

The purpose of this audit was to determine the time from injury to neurosurgical decompression for children with acute head injury in Latvia.

Methods

Patients aged 5 months to 18 years old with head injury who were admitted to the pediatric intensive care unit from 2014 to 2018 and underwent neurosurgery within 24 hours were included. Data were collected from the Children's Clinical University Hospital (CCUH) and the State Emergency Medical Service medical databases. Data were tested for normality and expressed as mean and standard deviation (SD) or median and interquartile range (IQR), as appropriate. T test was used for calculation of difference of means.

Results

A total of 22 patients were included - 9 (41%) girls and 13 (59%) boys; the median age was 88.3 months (IQR 17.0-127.1). Eight (36%) patients had mild, three (14%) moderate and eleven (50%) severe head trauma. Eleven (50%) patients were directly admitted to CCUH with median transfer time 57.0 min (IQR 46.2-73.8) and eleven (50%) were taken to the regional hospitals with median primary and secondary transfer times of 39.5 min (IQR 27.3-78.3) and 372.1 (IQR 289.3-455.5), respectively. The mean of total time from the accident to neurosurgical decompression was 316.5 min (SD 221.2) for direct admissions and 610.5 min (SD 240.4) for secondary transfers (difference of means 294.0 min, CI 95%: 88.5-499.4; $p = 0.007$).

Conclusions

Children with acute head injuries in Latvia did not meet the recommended time to neurosurgical intervention even when admitted to CCUH directly. This audit warrants a revision of care for children with time-critical head injuries.

Assessment of Competence Components in Infant Floating to Increase Parents' Competence Level

Ph.D. Alina Kurmeleva

*Latvian Academy of Sport Education;
Rigas Health Center "Kengarags", Latvia*

Objectives

Many parents often don't understand the nature of infant floating and are unable to perform it properly. They lack the knowledge, skills and practical abilities to handle the aquatic environment appropriately. It is important to discover parents' desire and belief in improving the quality of infant floating in order to indicate parental competence components that can be improved. Therefore, the aim of this study is to analyse the assessment of further refined of parents' competences components in infant floating.

Methods

An assessment survey of parental competences in infant floating was performed from the beginning of September 2017 until the end of October and was organised at various branches of Riga Health Centre. 112 respondents participated voluntarily in the survey (parents attending swimming pools and infant floating lessons with infants). The choice of the questions posed and the design of the questionnaire was based on works, opinions and methodological concepts by various authors. Each question of survey has five options expressed on a five point scale. Results of the survey were processed by using MS EXCEL software application "STATISTIKA" designed by Professor Dravnieks J. of the Latvian Academy of Sport Education and descriptive statistical method was used as a basis for carrying out statistical analysis.

Results

According to results of research it was determined that in order to increase the level of parental competence in infant floating, it is necessary to pay attention to the acquisition or improvement of main components: knowledge of exercise performance, impact on the body, contraindications of floating, observance of safety in water, skills and abilities to perform exercise in water, usage of safe holding positions in water.

Conclusions

Results of the research show that, all the surveyed parents should definitely supplement or acquire additional knowledge, skills and abilities in order to increase their level of competences in infant floating.

Influence of RV Vaccination on Course of Disease in Patients Diagnosed with Rota Virus Gastroenteritis at Children's Clinical University Hospital

Dr. Eva Grudule; Prof. Dace Zavadska

Rīga Stradiņš University, Latvia

Objectives

To compare the course of the Rota GE disease in Rota virus vaccine vaccinated and non-vaccinated hospitalized patients in Children's Clinical University Hospital (CCUH).

Methods

A prospective study included all patients with Rota virus gastroenteritis hospitalized in CCUH during one-year period from June 2017 until May 2018. Data from medical records were collected, as well as the parents' questionnaire on vaccination coverage, reasons on why vaccination was not carried out. The obtained data were analysed by IBM SPSS.

Results

All of the data were gathered out of 270 patients with Rota GE. 85.92% (n = 232) of whom were non-vaccinated, 12.59% (n = 34) were vaccinated and 1.48% (n = 4) were incompletely vaccinated against RV. Vomiting was observed in 84% (n = 192) of non-vaccinated patients, compared to 32% (n = 11) in vaccinated patients (p = 0.002). On arrival at the emergency department 49% (n = 114) of non-vaccinated patients was observed reduced diuresis, among vaccinated patients - 20% (n = 7) (p = 0.014).

Febrile temperature was observed during the disease in 85.3% (n = 198) of non-vaccinated patients, compared to 44.1% (n = 15) in vaccinated patients (p = 0.012). But in 13 of 15 vaccinated patients had also co-infection (for example, Noro GE, urinary tract infection, bronchitis and other).

Conclusions

In our study we found direct correlation between the vaccination status of patient and the severity of the disease. The time spent in hospital for unvaccinated patients was up to 2 × longer than for vaccinated patients.

How to Distinguish Abusive Head Trauma

Paula Kļaviņa¹; Dr. med. Arta Bārzdīņa²

¹*Rīga Stradiņš University, Faculty of Continuing Education, Latvia;*

Children's Clinical University Hospital, Latvia;

²*Children's Clinical University Hospital,*

Department of Paediatric Intensive Care Unit, Latvia;

Rīga Stradiņš University, Latvia

Objectives

To determine, which clinical signs are relevant in distinguishing abusive head trauma (AHT) from non-abusive head trauma (nAHT).

Methods

This is a retrospective descriptive study. Patients from 0–3 years old who were hospitalized in the Pediatric Intensive Care Unit (PICU) with intracranial injury (ICI) were included between 2007–2018. Chi-square test, p value for calculation was used in SPSS software.

Results

69 patients were included and were separated into the following 3 groups: 1. group confirmed AHT with 14 patients (20.29%), 2. group nAHT with 37 patients (53.62%) and 3. group unclarified head injury (UHI) with 18 patients (26.09%). Retinal hemorrhages were present in 1. group 64.3%, 2. group 13.5% and 3. group 83.3% ($p = 0.001$). Apnoe was present in 1. group 57.1%, 2. group 24.3% and 3. group 55.6% ($p = 0.025$). Seizures were present in 1. group 64.3%, 2. group 13.5% and 3. group 72.2% ($p = 0.001$). Skull fractures were present in 1. group 14.3%, 2. group 75.7% and 3. group 22.2% ($p = 0.001$).

There were also significant differences ($p = 0.001$) between groups with signs of subdural hematoma which were present in 1. group 78.6%, 2. group 32.4% and 3. group 83.3%. Epidural hematoma was present in 1. group 0%, 2. group 48.6% and 3. group 11.1% ($p = 0.001$). There were no significant differences ($p > 0.05$) between groups with head and/or neck bruising and rib fractures. Because of insufficient data, long bone fractures were not evaluated.

Conclusions

There were significant differences in the frequency between nAHT and the other two groups in the following clinical signs: retinal hemorrhages, apnea, seizures, skull fractures and also between subdural and epidural hematoma. Several similarities were found between AHT and UHI groups, and there is a possibility that the patients with UHI had suffered from physical abuse.

Efforts to Control Caesarean Section Rate: Lithuanian Experience

Prof. *Rūta Nadišauskiene*

*Lithuanian University of Health Sciences,
Department of Obstetrics and Gynaecology*

The caesarean section (CS) rate had been increasing for several decades worldwide. In Lithuania it has increased from 9.49% in 1995 to 24.71% in 2010. Similar rates were reported in Canada (27%), the USA (33%), Brazil (50%) or Australia (31%). On the other hand, northern European countries, such as Finland (16%) or Norway (17%), are known for lower rates. CS not only increases societal economic burden but also has huge impact on the future fertility potential of the woman. This has led to debate among OB/GYN, health care policy makers and service users to define strategies in order to reduce the rate CSs.

In 2012, the Robson classification was implemented in Lithuanian hospitals. This was encouraged by the Lithuanian Society of Obstetricians and Gynaecologists. This intervention has led to the reduction of the CS rate from 26.01% in 2012 to 21.65% in 2014. After finding out that this classification can work as audit system and it helps to identify the groups of women who are responsible for the increasing CS rate the most, the Lithuanian Ministry of Health (MoH) has decided to make this classification compulsory since 2016.

In 2015, a national quality improvement course (QIC) for obstetrical skills improvement was organized for obstetric staff. A part of it was an intra-partum care. This course was a part of the Lithuanian–Swiss Cooperation Programme. This intervention has led the decrease of the CS rate from 21.65% in 2014 to 20.81% in 2016.

Specialists OB/GYN Integrated Perinatal Care Committee (IPCC) with the support from the MoH has initiated CS rate as a quality indicator. Since 2018 all the hospitals will get financial incentives if the number of CS will not exceed certain numbers.

Pre-Pregnancy BMI and Gestational Weight Gains Correlation with Pregnancy Outcome

*Ilze Dupuža*¹; *Dr. med. Natālija Vedmedovska*²; *Kristīne Buķe*¹

¹ *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

² *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia*

Keywords: gestational weight gain, pre-pregnancy BMI, delivery outcome, neonatal health, pregnancy complications.

Objectives

The purpose of this study is to analyse, how baseline body mass index and gestational weight gain affects delivery outcome, neonatal health and pregnancy complications.

Methods

A total of 1051 medical history cases of pregnant women and neonates who were delivered between January 2016 and December 2016 in Maternity Hospital of Riga were included in this study. SPSS version 23.0 was used for statistical analyses. Women were divided into 4 groups according to the pre-pregnancy BMI and gestational weight gain.

Results

Both pre-pregnancy BMI and gestational weight gain correlated significantly with gestational age at delivery (BMI $P = 0.015$; GWG $P = 0.003$), Caesarean section (BMI $P = 0.001$; GWG $P = 0.05$), uterine dysfunction ($P = 0.001$), mean neonatal weight ($P < 0.001$) and macrosomy ($P < 0.001$), and maternal complications during pregnancy, such as gestational hypertension ($P < 0.001$) and preeclampsia (BMI $P < 0.001$; GWG $P = 0.007$). Also pre-pregnancy BMI statistically significantly correlated with gestational weight gain ($P = 0.002$), labor induction ($P = 0.006$), progressive fetal distress ($P = 0.001$), intrauterine infection ($P = 0.004$), neonatal clavicle fracture during delivery ($P = 0.02$), Apgar score at first minute ($P = 0.007$) and after 5 minutes ($P = 0.002$) and gestational diabetes ($P = 0.001$). But gestational weight gain also correlated significantly with preterm birth ($P = 0.032$) and acute fetal distress ($P = 0.005$).

Conclusions

There is statistically significant correlation between delivery outcome, neonatal health and pregnancy complications. The outcome of the birth, the newborn condition, and avoidance of complications during pregnancy can be improved by following and adjusting the pre-pregnancy weight and gestational weight gain.

Role of Confidential Enquiry into Maternal Deaths Analysis in Decrease of Maternal Mortality in Latvia

Prof. *Dace Rezeberga*¹; Dr. *Maira Jansone*²;
Dr. *Inese Blodniece*³; Dr. *Egils Lapiņš*³; *Vija Bathena-Krastina*⁴;
*Signe Irša*⁵; Prof. *Gunta Lazdāne*⁶

¹ *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;
Rīga Maternity Hospital, Latvia;*

Rīga East University Hospital, Latvia;

² *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia;*

³ *Rīga Maternity Hospital, Latvia;*

⁴ *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;
Rīga Maternity Hospital, Latvia;*

⁵ *Pauls Stradiņš Clinical University Hospital, Latvia;*

⁶ *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia*

Objectives

Maternal mortality in Latvia is one of the highest in the EU countries. Confidential Enquiry into Maternal Deaths (CEMD) has been implemented in Latvia since 2013. The first report (2016) presented the analysis of maternal death cases during three year period 2013–2015. Several recommendations were developed and many of them have been already implemented in obstetrical care or implemented in the Strategy on Improvement Maternal and Child Health in 2018–2020, developed by the Ministry of Health. Objective of this study was to analyze the impact of the CEMD in Latvia.

Methods

CEMD expert group performed confidential analyzes of maternal death cases during two 3-year periods and compared the data between two groups of patient: 1st group consisting of 20 maternal deaths cases in 2013–2015 and 2nd group – of 9 maternal death cases in 2016–2018.

Results

In the 1st group 9/20 mothers died from the direct causes and 11/20 – from the indirect causes. In the 2nd group there were 3/9 death cases from the direct causes and 6/9 indirect causes. Maternal mortality cases were reduced twice during the second period, but death from the direct causes by two thirds. One of the outcomes of the CEMD was improved team training and increased professional capacity of medical staff involved in maternity care. In both groups, there were cases with insufficient or no antenatal care and problematic social adaptation resulting in limited access to health care services. Since 2016 two maternal deaths from suicide were registered – an important warning on necessity to pay more attention on mental health and pregnancy in Latvia.

Conclusions

Outcomes of the CEMD can and should be used for development of the national strategy in further improvement of the quality of maternal and newborn health care and in decreasing the risk of maternal death in Latvia.

Implementation of ICD-10 (ICD-PM) Perinatal Mortality Audit Tool: Analysis of Maternal Condition at Time of Perinatal Death

*Dr. Inese Blodniece*¹; Prof. *Dace Rezeberga*²;
Prof. *Gunta Lazdāne*³; Dr. *Santa Markova*¹

¹ *Rīga Maternity Hospital, Latvia;*

² *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;*
Rīga Maternity Hospital, Latvia;

Rīga East University Hospital, Latvia;

³ *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia*

Objectives

Consistent information about the nature and cause of perinatal death is needed for improving the quality of care and ensuring the best possible perinatal outcomes. Objective of the study is to analyze the role of maternal conditions in perinatal deaths and possibilities of prevention of perinatal losses in Riga Maternity Hospital. The WHO ISD-PM perinatal audit has been implemented in the Riga Maternity Hospital since 2017.

Methods

All 38 perinatal death cases in 2017 were analyzed. All perinatal death cases were divided into three groups: antenatal (A), intranatal (I) and neonatal (N). The five existing ICD-10 groups of maternal conditions in perinatal death have been rearranged into five groups denoted with a leading "M" (maternal) as follows: M1 – complications of placenta, cord and membranes, M2 – maternal complications of pregnancy, M3 – complications related to labour and delivery, M4 – the medical and surgical complications which may not be related to the present pregnancy, M5 – no maternal conditions.

Results

The largest group was the group M1 (A14+I2+N3) in total 20/38 (53%) cases. Placental dysfunction, infarction, insufficiency were found in 9/38 (24%). In the group M2 there were 5 cases of very preterm deliveries caused by incompetent cervix and in 4 cases complicated with chorioamnionitis. Group M3 consisted from 2 cases. In both cases potentially avoidable factors were identified. There were 2 perinatal death cases in the group M4 – both due to severe preeclampsia. Healthy mother's group (M5) consisted of 9 (24%) perinatal death cases, 4 of pregnancies were terminated because of birth defects.

Conclusions

Implementation of the WHO perinatal audit approach in the Riga Maternity Hospital confirms importance of in-depth analysis of maternal conditions in preventing perinatal deaths. It links to revision of existing guidelines and development of new ones covering the most topical situations and pathologies.

Cesarean Section Rates in Latvia Using Robson Classification System

Ph.D. *Irisa Zīle*¹; Dr. *Laura Rācene*²; Prof. *Dace Rezeberga*³

¹ *The Centre for Disease Prevention and Control, Latvia;*

Rīga Stradiņš University, Latvia;

² *Rīga Maternity Hospital, Latvia;*

Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;

³ *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;*

Rīga Maternity Hospital, Latvia;

Rīga East University Hospital, Latvia

Objectives

Significant differences among European countries can be seen in the proportion of Caesarean sections (CS). PERISTAT data shows that the median CS rate was 27.0%. A quarter of countries had rates below 21%. The aim was to analyze CS rates using Robson Ten Group Classification System (TGCS).

Methods

Data from the Medical Birth register were used. All births in Latvia are compulsorily notified to the registry. All women who delivered in 2017, were classified using the TGCS (n = 20406). The CS rates overall and in each Robson group were calculated, as was the contribution of each group to the overall CS rate.

Results

The mean maternal age for CS deliveries is 31 year (± 5.7) vs vaginal – 29 (± 5.5). The overall CS rate is 22.7%.

The major contribution to the overall CS rate was made by the groups 1, 2 and 5. The 5th classification group – cephalic presentation at term with a history of previous CS is the largest part of all CS – 37.1% (1718/4636). The CS rate in this group was 86.5% (1718/1987).

In the 2nd group (single cephalic nulliparous pregnancy at term with induction or CS before labour) CS were performed in 12.1%. Inside of this group the CS rate was 36.9% (562/1522). In the 1st group (single cephalic nulliparous pregnancy at term with spontaneous labour) CS were 18.6%. The CS rate in this group was 14.8% (863/5814).

CS was a common practice in the cases of breech deliveries with the rate 83.9% (239/285) in the 6th and 74.7% 7th group (168/225).

Conclusions

Women in Groups 1, 2 and 5 were the largest contributions to the overall CS rate. Strategy has to be developed with a focus to reduce CS rate in nulliparous women groups. Further analyses on CS rate in different hospitals in Latvia is needed.

Massive Rectal Bleeding in Child Due to Rectal Venous Malformation: Case Report

Dr. Jānis Karlsons¹; Prof. Zane Ābola²; Prof. Arnis Enģelis²;
Dr. Paulis Laizāns³; Prof. Aigars Pētersons²

¹ Children's Clinical University Hospital, Latvia;

Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

² Rīga Stradiņš University, Department of Paediatric Surgery, Latvia;

Children's Clinical University Hospital, Latvia;

³ Children's Clinical University Hospital, Department of Paediatric Surgery, Latvia

Objectives

Congenital venous malformations of the gastrointestinal tract are rare but significant causes of unremitting gastrointestinal bleeding and chronic anemia. Treatment options vary depending on the location of lesion and extent of involvement. Herein, we present a rare case of an extensive, contiguous rectal venous malformation complicated by refractory hematochezia and anemia.

Case presentation

This is a case report of 5 y.o child who was admitted several times to Children's Clinical University Hospital, Rīga surgical ward due to periodic rectal bleeding. Since the age of 1.5 patient underwent several surgeries due to right thigh and urinary bladder arteriovenous malformation.

Six month after last surgery he had begun to complain of bloody stool, which increase in amount and had an episode with a blood loss of about 200 ml. At the last admission his hemoglobin was 5.0 g/dL and was needed several blood transfusions. Patient had several rectoscopies and a colonoscopy, which suspected an arteriovenous malformation. MRI and CT angio were done, where arteriovenous malformations were not detected. After continuous rectal bleeding with an unclear reason he underwent Digital subtraction angiography without seen pathology. After negative findings he underwent hemorrhoidectomy and diagnostic laparoscopy, which showed enhanced venous drawing in rectum and sigmoid colon.

Within a multidisciplinary consilium, angio surgeon proposed a percutaneous pararectal puncture with contrasting. The procedure showed cavernous malformation and a sclerotherapy with atoxisclerol 1% (20 mg/2 ml) was performed. After this procedure rectal bleeding stopped. Patient was discharged and came back 2 weeks later to repeat the sclerotherapy.

Conclusions

Extensive, contiguous colorectal venous malformation is a challenging diagnosis to be made up in children and requires a multidisciplinary approach. Sclerotherapy with aetoxisclerol is effective but not commonly accepted as a treatment of choice.

Ability to Turn a Breech Baby with Particular Exercises

Inese Kanneniece; Maruta Hoferte

Rīga Stradiņš University, Department of Sports and Nutrition, Latvia

Objectives

The aim of the study was to investigate whether particular exercises from the 32nd week of pregnancy can promote the turning of breech baby to cephalic presentation. This issue is about increasing interest of need for such exercises for pregnant women in a particular situation from gynaecologists, midwives and physiotherapists.

Methods

The research/questioning and individual research methods were used in the study – theoretical study in the form of literature review, as well as the empirical research method – sampling, data acquisition and processing.

The study involved 22 pregnant women between the ages of 23 and 38 who had pregnancy with the fetus in breech position. 20 participants agreed to participate in the study in a voluntary manner. Women were divided into two study groups – in Group 1 the participants (n = 12) performed the particular exercises, the other participants (n = 8) – in the control group – Group 2, did not perform any exercises. In addition, the study included the psycho-emotional state of the women who performed the exercises, and the presence of daily physical activities before and during pregnancy.

Results

In Group 1 fetuses turned head down in 6 cases (50%). In Group 2, fetuses turned head down in 2 cases (25%). In Group 1 all participants (100%) admitted to feel satisfied with the experienced method, even if the result was not achieved. 4 participants (20%) had regular physical activities before and 7 participants (35%) from 20 had regular physical activities during the pregnancy.

Conclusions

Particular set of exercises offered to pregnant women with a fetus's breech presentation was relatively effective, especially when comparing the results with the control group. For most participants the physical activity before and during pregnancy was not in line with the recommendations of the World Health Organisation and was assessed as low.

Association between Infant's Feeding Habits and Iron Metabolism in Latvia

*Inga Sirina*¹; *Dr. med. Ieva Strēle*²;
*Inese Sikсна*³; Prof. *Dace Gardovska*⁴

¹ *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

² *Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia;*

³ *Rīga Stradiņš University, Faculty of Medicine, Department of Paediatrics, Latvia;*
Institute of Food Safety, Animal Health and Environment "BIOR", Latvia;

⁴ *Rīga Stradiņš University, Department of Paediatrics, Latvia;*
Children's Clinical University Hospital, Latvia

Objectives

Anemia caused by a low iron level is the most common form of anemia. Iron plays an important role in infant's development. Research objective was to find association between specific infant nutritional habits and iron metabolism.

Methods

Food frequency and three 24 hour dietary recall questioners were used. A total of 73 infants from 9 to 12 month of age were included in the study. In addition blood samples for iron metabolism indicators: mean corpuscular volume (MCV), serum ferritin (SF), iron, iron binding capacity, soluble transferrin receptor (sTfR), hemoglobin (Hb) were collected. Iron deficiency anemia (IDA) was defined as: Hb < 110 g/l and SF < 12 mg/l or MCV < 74fL, iron deficiency (ID) as: SF < 12 mg/l; MCV < 74fL; sTfR > 2.4 mg/l.

Results

ID was found in 7 infants, 3 had IDA. Median consumption of iron was 6.7 mg (IQR = 5.4) per day. 30% (8/27) of infants who had introduced cow's milk in the diet had iron level below norm compared to 6% (2/32) who hadn't ($p = 0.0171$). Infants with adequate nutritional iron consumption had normal SF level in 95% (21/22) compared to 76% (29/38) with inadequate nutritional intake ($p = 0.0552$). Higher proportion of infants had SF in normal level consuming less iron with animal foods: in 100% (20/20) who consumed < 10% iron with animal foods, in 78% (18/23) who consumed 10–20%, in 71% (12/17) who consumed > 20% ($p = 0.0405$). SF was in normal level in 93% (26/28) of infants who didn't consume legumes compared to 72% (21/29) who did ($p = 0.0425$).

Conclusions

Iron is consumed less than recommended daily intake. There is correlation between infant nutritional habits and iron metabolism in organism. More extensive study with representable sample size and more influencing factors (mother's diet and iron metabolism) should be investigated.

Incidence and Risk Factors of Late Onset Neonatal Sepsis in Newborns Treated at Children's Clinical University Hospital Neonatology Clinic in 2017

Dr. Oksana Loginova

Children's Clinical University Hospital, Latvia

Objectives

Sepsis is among the leading morbidity and mortality causes in newborns. The frequency of neonatal sepsis is one to five cases per 1000 live births. Newborn sepsis is defined as a clinical syndrome up to the 28th day of life with signs of systemic infection and isolation of the bacterial pathogen from the blood. The onset of late neonatal sepsis (LOS) is considered to be ≥ 72 hours after birth. Clinical manifestations of sepsis in newborns are non-specific, and therefore, laboratory examinations play a crucial role in diagnostics of sepsis. Considering the high incidence of sepsis in newborns worldwide, it is essential to study the clinical and laboratory features of LOS, in order to improve early sepsis diagnostics.

Methods

The retrospective study on late onset sepsis in newborns, were diagnosed and treated at the Children's Clinical University Hospital, Neonatology Clinic, in 2017. Quantitative processing of data with SPSS Statistics (Mann-Whitney).

Results

Late-onset neonatal sepsis occurred in 62 infants. Extremely preterm 30%, very preterm 30%, moderate to late preterm 8.1% and 4.8%, term 25%. Average day of illness was 14.9. Gram positive pathogens were the commonest causative organisms in LOS (27.6%, 17.2%, 10.3%). Development of early diagnostic markers allow clinicians to better assess the risk of infection and need for antibiotic therapy (IL-6 $p = 0.000$, CRP $p = 0.000$).

Conclusions

LOS has become an important cause of morbidity and mortality among preterm infants with need for prolonged hospitalization and use of invasive procedures and devices. In spite of ongoing efforts in early diagnosis, treatment, and prevention, neonatal sepsis still stay a challenge to for neonatologists.

Comparison of Tactics in Conservatively Treated Acute Uncomplicated Appendicitis in Children's Clinical University Hospital for Children Aged 7–16 Years in 2015 and 2018

*Dr. Sandra Ozoliņa; Dr. Anete Rozentālberga;
Dr. Timurs Zurmutāi; Prof. Aigars Pētersons*

*Children's Clinical University Hospital, Latvia;
Rīga Stradiņš University, Latvia*

Objectives

To compare and analyze the count of conservatively treated acute uncomplicated appendicitis (AUA), choice of antibiotics (AB) and hospital stay in year 2015 and 2018, recurrence of the disease.

Methods

Patients data (7–16 years old) with conservatively treated AUA in Children's Clinical University Hospital (CCUH) with diagnosis K35 (SSK 10 classifier) in 2015 and 2018 were selected in data storage system Andromeda. The study excluded patients who received surgical treatment (ST), whose data were missing or who signed refusal. In 2015 243 patients were selected, 87 (35.8%) received nonoperative treatment (NOT) and 156 (64.2%) – surgical treatment (ST). In 2018 – 294 patients were selected of which 106 (36.1%) underwent NOT, but 188 (63.9%) had ST. Statistical analysis was performed in MS Excel and IBM SPSS.

Results

In 2015 the most commonly used AB combinations are Ampicillin/Metronidazole (n = 37; 45.7%), Ampicillin/Gentamicin (n = 13; 16%) and Ceftriaxone/Metronidazole (n = 7; 8.6%) and the average duration of hospital stay is 4.7 days (2–12 days; median 4; moda 4), in 2018 – AB choice is Ampicillin/Metronidazole (n = 103; 96.3%) and hospital stay – 3.7 days (1–10 days; median 4; moda 3).

The recurrence of disease in NOT AUA in 2015 was observed in 18 (22.2%) patients. 15 (83.3%) appeared within the 1st year after AUA episode, 2 (11.1%) two years but 1 (5.6%) – more than 3 years after AUA episode.

Conclusions

1. In 2018 the most commonly used AB in AUA is Ampicillin/Metronidazole. In 2015 there was a greater variety of choices.
2. In 2018 the hospital stay has decreased by 1 day.
3. Recurrence of disease most frequently occurs during the 1st year after AUA episode (n = 15; 83.3%).
4. NOT in AUA is an effective method, but the number of relapse is significantly high (n = 18; 22.2%).

Endometritis Aspects after Caesarean Section, Risk Factors

Dr. Katsiaryna Rimaido

*University of Latvia, Department of Obstetrics and Gynaecology;
Rīga Maternity Hospital, Latvia*

Objectives

The aim of the current study was to analyse and investigate the risks of post delivery endometritis (PE) after Caesarean section (CS).

Methods

Study in a large academical hospital Maternity department during 2017 year. Devotion the patients in 2 groups. 1 group – 25 women with complications after CS. 2 group – 25 women without any complications. The data were analysed by statistical program Biostat.exe.

Results

During 2017 year 530 CS, among them 25 (4.7%) with complications. The average age in 1 group 26.0 ± 4.3 years, in 2 group 28.9 ± 5.6 years. Authentically more often in 1 group the first delivery ($\chi^2 = 5.954$, $p = 0.015$). Authentically more often in 2 group is multipara ($\chi^2 = 4.708$, $p = 0.030$). Anamnese gynaecologia dubia authentically more often in 1 group ($\chi^2 = 7.912$, $p = 0.005$). In 1 group always is extragenital pathology ($\chi^2 = 7.308$, $p = 0.007$). Preeclampsia is authentically often in 1 group ($\chi^2 = 7.308$, $p = 0.007$). Subinvolutio uteri authentically in 1 group ($\chi^2 = 20.589$, $p = 0.000$).

Conclusions

The common feature of Post Sc complications is non typical clinic. The first sign – subinvolutio uteri. PE the most common maternal infectious complication of childbirth, occurring more often after CS. Recommendations – lead healthy way of life, to realise the reproductive function before 30, planning the pregnancy, to cure in time genital / extragenital pathology.

Impact of Disability on Sexual Health of Women

*Dr. Ieva Briedīte^{1,2,3}; Zane Rostoka⁴;
Gabriela Saulīte⁴; Ieva Pītkēviča⁴*

¹ Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;

² Rīga Maternity Hospital, Latvia;

³ Capital Clinic Riga, Latvia;

⁴ Rīga Stradiņš University, Faculty of Medicine, Latvia

Objectives

There are about 40 million women and girls with disabilities in the European Union, whose sexual health is often ignored, leading to a lack of education and communication on these issues. The aim of the study was to understand the impact of disability to women's sexual activity and also recognize factors for reduction of sexual desire.

Methods

A cross-sectional study was conducted in different associations for disabled people in Latvia from November 2018 to January 2019. Data were collected from questionnaires, self-filled by women with disabilities; further analysis with Microsoft Excel and SPSS 21.0.

Results

The research included 31 women at the mean age of 44 (SD 14.01; range 23–75) with very severe 12 (38.7%), severe 11 (35.5%) and moderate 8 (25.8%) disabilities, 3 (9.7%) of them have or had oncological diseases. 11 (35.5%) are in a marriage, 26 (83.9%) noted that they have regular or irregular sex life. 24 (77.4%) are partially satisfied with existing sex life, but 11 (35.5%) of respondents marked that it has worsen after obtaining disability status. 10 (32.3%) women noted that they have had sexual intercourse that they have never enjoyed, 9 (29.0%) – disability has had a major impact on their sexual health. 17 (54.8%) women noted that level of sexual activity will certainly not change in the future due to disability status, 21 (67.7%) would be interested in maintaining a sexual activity. 8 (25.8%) women noted that disability has influenced the partner's attitude, 22 (71.0%) – it is harder to find a partner in general. 15 (48.4%) respondents noted that disability has changed reproductive plans. 5 (16.1%) marked that they have faced sexual violence – forced sexual intercourse, physical harassment and threatening.

Conclusions

Regardless of the disability level women are still interested in maintaining a sexual activity. It has been noted that disability has an impact on building personal relationships and finding a potential partner.

Implementing Safety and Quality Improvement into Medical Practice

Prof. *Eugene Minevich*

Stone Center Cincinnati Children's, United States

“Medicine used to be simple, ineffective and relatively safe, but now it is complex, effective and potentially dangerous.”

Sir Cyril Chantler

As healthcare providers we need to be prepared for inevitable changes in the healthcare system and strive:

1. To improve the patient and family experience with healthcare delivery;
2. To be efficient in the delivery of care;
3. To provide the ‘Safest’ and ‘Highest’ quality care that we can for our patients (Zero preventable harm to patients and staff).

The overriding component that leading to Serious Safety Events is a deviation from standard of care. To eliminate serious harm in healthcare we must improve key processes design, embrace high reliability culture and enrich human factor integration.

As good stewards of medicine we need to be fluent in systems-based thinking, problem analysis, communication skills and appropriate management of medical errors.

Growth Hormone-IGF-1 Axis in Diagnosis and Treatment of Growth Disorders

Prof. *Martin Savage*

William Harvey Research Institute, United Kingdom

The growth hormone (GH)-IGF-1 axis is the key endocrine mechanism which regulates linear growth in children. IGF-1 is important for fetal growth and the GH-IGF-1 axis is essential for the growth of children throughout childhood and adolescence. Understanding of this axis helps to understand normal growth and is relevant to the investigation of children with short stature. Measurement of GH, IGF-1 and IGFBP-3 is helpful in the diagnosis of growth disorders such as GH deficiency and GH resistance. Measurement of IGF-1 is important to optimise the GH dose during therapy and is therefore relevant to adherence to GH therapy and to safety, as theoretically high IGF-1 levels may increase the risk of malignancy during adult life.

Human Bocavirus 1 Infection in Hospitalised Children with Lower Respiratory Tract Infection

*Dr. Inga Ziemele*¹; *Anda Vilmane*²;
*Santa Rasa*²; *Man Xu*³; *Klaus Hedman*⁴;
*Ph.D. Maria Söderlund-Venermo*³; Prof. *Dace Gardovska*⁵;
*Zaiga Nora-Krukle*²; Prof. *Modra Murovska*²

¹ *Children's Clinical University Hospital, Latvia;*

² *Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia;*

³ *University of Helsinki, Department of Virology, Finland;*

⁴ *University of Helsinki, Helsinki University Hospital Laboratory Service, Finland;*

⁵ *Rīga Stradiņš University, Department of Paediatrics, Latvia*

Objectives

Human bocavirus 1 (HBoV1) is one of the most common respiratory viruses that is currently accepted as a pathogen, causing upper and lower respiratory tract infections (LRTIs) in children. Clinical symptoms of HBoV1 infection range from mild to life-threatening respiratory illnesses. The aim of this study was to identify the presence of HBoV1 DNA and determine HBoV1-specific IgM and IgG antibodies in hospitalized children less than five years of age with LRTI, and to describe the clinical characteristics associated with acute HBoV1 infection.

Methods

In this study, 102 children, aged 28 days to 60 months, were included and treated as inpatients for presumptive LRTI. Blood sample and nasopharyngeal aspirate (NPA) were collected from each enrolled patient. NPAs underwent HBoV1 NS1-PCR. HBoV1 serology was done by an enzyme immunoassay (EIA).

Results

HBoV1 DNA was detected in 35.3% (36/99) of the NPA samples. The mean age of patients positive for HBoV1 DNA in NPAs was 25.3 months (range 6 to 59 months).

HBoV1-IgM antibodies were detected in 78.9% (15/19) of HBoV1-DNA positives and in 18.6% (19/102) of all patients, most frequently in patients aged 13 to 24 months (32.4%, 12/37). Patients aged 28 days to 12 months (n = 25) were all negative for HBoV1-IgM. Of the HBoV1-IgM positives, 63.1% (7/19), and in total 64.7% (66/102), were HBoV1-IgG positive. HBoV1 IgG seroprevalence increased constantly with age (p = 0.002). The mean age of the patients positive for HBoV1-IgG was 26.8 months (range 2 to 59 months). All HBoV1-IgM positive patients had fever, cough and abnormal auscultatory findings, and 73.6% (14/19) had chest wall in-drawing, 52.6% (10/19) had wheezing, and 42.1% (8/19) had tachypnea.

Conclusions

HBoV1 DNA is commonly detected in NPAs among hospitalized children with LRTI. Furthermore, LRTI caused by HBoV1 occurs more often in children up to the age of 2 years.

Prognostic Importance of Complications after Primary or Interval Cytoreductive Surgery in Advanced Stage Ovarian Cancer

Ph.D. Ivars Silinš

*University Hospital of Uppsala, Department of Colorectal Surgery
and Department of Gynaecology, Sweden*

Macroscopically radical surgery is the goal of ovarian cancer treatment. Relapse-free and overall survival are much shorter if residual tumor exceeds even 1 mm during primary debulking surgery (PDS) or interval debulking surgery (IDS).

This study included 208 patients with primary ovarian cancer stage IIB-IVB and 41 patients with relapsed ovarian cancer treated between 2009 and 2017 at the Department of Obstetrics and Gynaecology, University Hospital, Uppsala, Sweden. PDS was performed in 129 patients (62%), and NACT with subsequent IDS in 79 patients (38%). Complete cytoreduction, CC-0, was achieved in 155 (74.5%) cases. CC-1 was achieved in 35 patients (16.8%).

Median overall survival after PDS with CC-0 was 79 months compared to 45 months after PDS with CC-1, and 37 months after IDS with CC-0.

We analyzed the risk for high-grade 3-4 morbidity (Clavien-Dindo classification of surgical complications) within 30 days after cytoreductive surgery by evaluating the impact of patient-, disease- and surgery-related factors.

Class 3a to 5 morbidity was observed in 60 (24.1%) of 249 analyzed patients. The incidence of high-grade morbidity decreased from 41% to 17% when comparing 2009–2013 versus 2014–2017.

Platelet count, albumin concentration, PCI (peritoneal carcinomatosis index) exceeding 20, CC-0, large bowel resection including colectomy and SCS (surgical complexity score) exceeding 8 were significant risk factors in univariate analysis. High-grade morbidity class 3-4 did not influence overall survival ($p = 0.47$). In the multivariate analysis, platelet count remained an independent factor for overall survival (HR 9.25; 95% CI 1.74 to 49.21), while albumin concentration ($p = 0.086$) and large bowel resection ($p = 0.07$) tended to influence survival.

Possibility of Nutrition Deficiency and Alteration of Anthropometric Data in Children with Food Allergy

*Dr. Zane Melluma*¹; Assoc. Prof. *Laila Meija*²

¹ *Children's Clinical University Hospital, Latvia;*

² *Rīga Stradiņš University, Department of Sports and Nutrition, Latvia*

Objectives

Aim of the study – to assess the nutrition and anthropometric markers in children with food allergy, elaborate the recommendations on the bases of the research results, to improve the care for the child with a food allergy.

Methods

It was cross sectional, quantitative study with the descriptive analyses, including questionnaire and food diary analyses. Study analysed data from questionnaires about 50 children (age up to 6 years) as well as data from 5 food diaries. Questionnaire included information about child's age, sex, anthropometric data, what food allergens are excluded from child's diet, symptoms as well as there duration, any use of additional supplements etc.

Results

Research included 26 boys and 24 girls, median age 1.25 years; for 64% elimination diet was suggested by paediatric allergy specialist; 48% eliminated allergen for up to three months, 22% – more than one year; 48% excluded only one allergen, 30% – two allergens, 22% – more than three allergens; 31 child exclude all dairy products, 26 excluded – eggs; in most cases (66%) symptoms involved skin, in 24% involved both skin and gastrointestinal system; 98% never consulted dietitian; children excluding cow milk as well as all dairy products, had lower weight-for-length, weight-for-age as well as BMI-for-age ($p < 0.05$) in comparison to children who excluded other allergens. Children who excluded more than three allergens had lower weight-for-length and BMI-for-age ($p < 0.05$) in comparison to those who excluded only one allergen.

Conclusions

Conclusion – for some proportion of the children with food allergy, growth markers deviate from normal and nutritional deficiency (total intake of fats, carbohydrates as well as calcium) cannot be excluded. Care of the child with food allergy could be improved by regular growth assessment and exclusion of any potential nutritional deficiencies, with the help of paediatric dietitian or nutrition specialist.

Self-Assessment of Changes of Sexual Life in Women after Vaginal Delivery

Dr. Ieva Briedīte^{1,2,3}; Marta Ūdre⁴; Anna Pentjugova⁴

¹ Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;

² Rīga Maternity Hospital, Latvia;

³ Capital Clinic Rīga, Latvia;

⁴ Rīga Stradiņš University, Faculty of Medicine, Latvia

Objectives

Many pregnant women report fear of possible influence of childbirth on appearance of their genitals and sexual function. Aim of this study was to evaluate impact of vaginal delivery on female sexual life.

Methods

Descriptive cross-sectional study using patient questionnaires about changes of sexual life after previous vaginal delivery was carried out in Rīga Maternity Hospital, including 93 postpartum women. Study was approved by the Ethics Committee of Rīga Stradiņš University. Data were analyzed using Microsoft Excel and SPSS 23.

Results

6 (6.5%) age 18–25, 28 (30.1%) age 26–30, 39 (41.9%) age 31–35, 20 (21.5%) age over 35. 39 (41.9%) continued their sexual life less than 6 weeks after delivery, 39 (41.9%) in 2–3 months after delivery, 9 (9.7%) 4–6 months and 5 (5.4%) later than 6 months. 35 (37.6%) were afraid to have sexual intercourse and tried to avoid it, 58 (62.4%) used contraception, most frequently it was condom (63.3%), 26 (28.3%) were afraid of unplanned pregnancy. 20 (21.5%) noticed changes in their sexual life after delivery. 14 (15.1%) reported worsening, 65 (69.9%) no changes and 14 (15.1%) reported improvement. 20 (21.5%) noticed decrease of libido, 63 (67.7%) no changes, 7 (7.5%) increase of libido. 36 (38.7%) were concerned about possible visual changes of outer genitalia. 9 (9.9%) did not feel orgasm after delivery, 17 (18.5%) complained about loss of lubrication, 17 (18.3%) complained about discomfort and pain during intercourse. 49.9% did not discuss their problems with gynecologist, because did not find this problem important (44.2%), did not know that there is solution (18.6%) or felt shy to talk (16.3%).

Conclusions

Despite the fear of negative influence of vaginal delivery on sexual life, mostly there are no negative changes. However there is part of women with complaints that negatively affect their quality of sexual life.

Microbiological Peritoneal Fluid Analysis in Paediatric Patients with Surgically Treated Appendicitis

*Dr. Jana Protasa; Prof. Zane Ābola; Dr. med. Astra Zviedre;
Prof. Arnis Enģelis; Dr. Paulis Laizāns*

Children's Clinical University Hospital, Latvia

Objectives

To evaluate microbiological findings of peritoneal fluid in patients with surgically treated appendicitis. To assess the clinical significance of sensitivity of microorganisms to antimicrobial therapy and impact on length of stay in a hospital.

Methods

Retrospective clinical and laboratory data of 464 patients which underwent appendectomy during years 2017–2018 in Children's Clinical University hospital (CCUH) were obtained from "Andromeda" software. SPSS 22.0 software was used for statistical analysis.

Results

Total of 464 appendectomies was carried out in CCUH during years 2017–2018, 332 (73.8%) of them laparoscopically. 16 patients (3.4%) underwent appendectomy due to other pathology than appendicitis and were excluded from the study. In 316 (70.2%) cases peritoneal fluid was collected during the operation and microbiologically tested. In 140 (31.1%) cases no pathogen in peritoneal fluid was found. Pathogens which were identified – E. coli (122), different Bacteroides, especially B. fragillis (76), Streptococcus constellatus (53), Streptococcus anginosus (40) and Pseudomonas aeruginosa (24). In 95 (21.1%) cases antibacterial resistance was found, most frequently to Ampicillin (61; 13.6%), followed by Amoxicillin/clavulanic acid (25; 5.6%) and Tetracycline (11; 2.4%). Ampicillin resistant E. coli was found in 49 (10.8%) patients. The average length of stay in hospital was 5.8 days. In our study 14 (3.1%) patients received antibacterial therapy to which pathogen was not sensitive to. Netherless there was no statistically significant difference in groups that received antibiotic that pathogen was sensitive or resistant to. Length of stay in hospital statistically was associated with factors such as peritonitis (local, diffuse, no peritonitis), type of operation and whether complications occurred.

Conclusions

1. In more than two-thirds of cases in peritoneal fluid bacteria were found (E. coli, Bacteroides and Streptococci).
2. Hospital stay did not depend on a microbiological finding of peritoneal fluid culture.
3. In 10% Ampicillin resistant E. coli was identified.

Postpartum Endometritis – Clinical Challenge from Microbiological Point of View

*Dr. Laura Rācene*¹; *Dr. Kārlis Rācenis*²; *Dr. Zeltīte Rūsa*³;
Prof. *Juta Kroiča*²; Prof. *Dace Rezeberga*⁴

¹*Rīga Maternity Hospital, Latvia;*

²*Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;*

³*NMS Laboratory, Latvia;*

⁴*Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia*

Objectives

Postpartum endometritis is a common febrile morbidity, treated ineffectively it can lead to sepsis and cause mortality. We analysed common causative agents of postpartum endometritis and their antimicrobial susceptibility to currently used empiric therapy of amoxicillin-clavulanate and clindamycin.

Methods

Microbiological data about cervical and vaginal swabs from patients with postpartum endometritis admitted to Rīga Maternity hospital were analysed. Data from January until November 2018 were used. Only positive cultures with detected antimicrobial susceptibility were included. Strict commensal microorganisms from analysis were excluded. Bacterial identification was carried out according to standard clinical specimen detection methods. Antimicrobial susceptibility was detected according to EUCAST standard V8.0. Antimicrobial susceptibility data were analysed using MS Excel 2010.

Results

In total 217 swabs were taken for bacterial identification. In 66% (n = 143) antimicrobial susceptibility was detected. We analysed data about 58% (n = 126) of strains as 17 were excluded because of their belonging to strict commensals. In 70% (n = 88) of cases Gr+ cocci grow out, accordingly, GDS (*Enterococcus* spp., *S. gallolyticus*) 52% (n = 46), viridans group streptococci 20% (n = 18), CoN staphylococci 18% (n = 16), GBS 6% (n = 5), *S. aureus* 3% (n = 3). In 30% (n = 38) of cases Gr- rods were detected, accordingly, *E. coli* 77% (n = 30), *Enterobacter* spp. 8% (n = 3), *K. pneumoniae* 8% (n = 3), other Gr- rods 5% (n = 2). In group of Gr+ cocci resistance towards penicillin, erythromycin, clindamycin, ciprofloxacin, tetracycline, co-trimoxazole, gentamicin, rifampicin was 21 (24%), 13 (15%), 8 (9%), 6, 5, 3, 3, 1 out of 88, respectively. In group of Gr- rods resistance towards ampicillin, amoxicillin-clavulanate, co-trimoxazole, ciprofloxacin, gentamicin was 27 (71%), 6 (16%), 8 (21%), 4 (11%), 1 out of 38, respectively. Two *E. coli* strains were ESBL positive.

Conclusions

Gr+ cocci were isolated more commonly than Gr- rods. Mainly isolated microorganisms were group B streptococci and *E. coli*. In 16% of cases in Gr- group and 9% in Gr+ group empiric antimicrobial treatment was ineffective according to antimicrobial susceptibility.

Spontaneous Rupture of Spleen During Pregnancy: Diagnostic Challenge

*Dr. Anna Kornete*¹; *Dr. med. Anna Miskova*¹;
*Prof. Dace Rezeberga*¹; *Dr. Marite Puksta*²

¹ *Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;*

² *Riga East University Hospital, Latvia*

Objectives

Spontaneous rupture of the spleen during pregnancy is rare and frequently misdiagnosed. The factors responsible for rupture of the spleen are not well established. It often occurs in pre-existing pathology of the spleen, infectious diseases or after the trauma.

Methods

The clinical case demonstration presents the pregnant woman with acute abdominal pain due to spontaneous rupture of the spleen and poor pregnancy outcome.

Results

A 30-year-old woman G6, P3 at 35th weeks of gestation presented at the emergency department after a syncope. The patient had complaints of general weakness, cold sweats, acute, progressive pain in the left flank, lower abdomen and back for more than five hours. On admission clinical examination revealed pale, cold skin, pulse 90/min, BP 90/60 mmHg. The uterus was tender, the cervix was closed, there were no uterine contractions or vaginal bleeding. FHR was 30–40/min. Laboratory revealed WBC 15.0 cells/ μ L, RBC 2.7 cells/ μ L, Hb 8.2 g/dL, platelets 120.0 cells/ μ L. As the situation was interpreted as placental abruption, emergency C-section was performed. A stillbirth fetus was delivered. There was no uterine cause of the bleeding, though active bleeding was identified at the splenic hilum consistent with rupture of the spleen. A splenectomy was performed with the total blood loss of 5000 ml. Histologic examination of the spleen showed an edema and hemorrhage without any specific changes. Blood test revealed primary Epstein-Barr virus infection.

Conclusions

Despite the rarity with which splenic rupture occurs in pregnant women, consideration and early recognition of the diagnosis can be crucial. Spontaneous rupture of the spleen during pregnancy is difficult to diagnose because the clinical feature may mimic uterine rupture or placental abruption. Since delay in diagnosis and treatment increases maternal and fetal morbidity and mortality, precise maternal and fetal assessment in pre-hospital stage is pivotal.

Treatment Options in Children with Perianal Abscess

*Dr. Anete Rozentalberga*¹; *Dr. med. Astra Zviedre*²;
*Prof. Arnis Engelis*²; *Prof. Aigars Petersons*²

¹*Rīga Stradiņš University, Faculty of Continuing Education, Latvia;*
Children's Clinical University Hospital, Latvia;

²*Children's Clinical University Hospital, Latvia;*
Rīga Stradiņš University, Department of Paediatric Surgery, Latvia

Objectives

The aim of this study was to analyze the efficacy of antibacterial therapy and recurrence rate of patients with or without using antibacterial therapy.

Methods

A single center study included the retrospective data analysis of symptoms, C-reactive protein (CRP), white blood count (WBC), treatment and outcome among patients aged 0–2 years old admitted to Children's Clinical University Hospital with a diagnosis of perianal abscess and a fistula-in-ano (January 2015 to January 2018). The data were analyzed using descriptive and statistical methods.

Results

A total of 68 children (65 males, 3 females) patients were included and divided into two groups – patients with antibiotic (AB) usage (n = 34) and patients without AB usage (n = 34). Mean age was 5.25 months. The elevated levels of CRP and WBC were found in 27.78% (95% CI 7.09–48.47) (n = 5). There was no significant difference in elevated CRP and WBC levels between both groups ($\chi^2 = 0.86$; p = 0.35). Primary treatment was incision and drainage in 94.12% (95% CI 88.53–99.71) (n = 64). Recurrence rate of 3 year period was 39.71% (n = 27). The recurrence rate of the perianal abscess was found 47.06% (n = 16) of cases in patients with AB usage and 32.35% (n = 11) of the patients without antibiotic usage. There was no significant difference in recurrence rate between both groups. ($\chi^2 = 0.98$, p = 0.32).

Conclusions

Although management of perianal abscess is still controversial, a surgical approach is the most common treatment method. Elevated inflammatory markers and use (or non-use) of antibiotics have no significant impact on the recurrence rate in the current study.

Influencing Factors on 24-Hour Blood Pressure Measurements in Childhood Coarctation of Aorta

*Pauls Silis*¹; Prof. *Ingūna Lubaua*¹;
*Dr. med. Inga Lāce*¹; *Skaiste Sendzikaite*²

¹*Rīga Stradiņš University, Department of Paediatrics, Latvia;*

²*Vilnius University, Institute of Clinical medicine, Centre of Heart and Chest Surgery, Paediatric Centre, Lithuania*

Objectives

Find characteristic changes in 24 hour blood pressure measurements (24 h BPM) of patients with a history of coarctation of the aorta ages 6–17 years, and possible influencing factors.

Methods

Patients in Latvia's Children's Clinical University Hospital (CCUH) database with a history of coarctation of the aorta ages 6–17 years were interviewed to obtain patient history data, and 24 h BPM, ultrasound measurements of the carotid intima-media thickness (cIMT), flow mediated dilation (FMD) of brachial arteries. The results were analysed using SPSS version 20. Samples were compared using the Mann-Whitney test or t-test.

Results

Of the 64 patients in the CCHU database with coarctation of the aorta, 41 gave consent and underwent all the aforementioned diagnostic tests, 15 (36.6%) were girls, 26 (63.4%) were boys. The average age of the patients was 12.2 [8.7–15.7] years. In 24 h BPM the systolic blood pressure (SBP) load (percentage of measurements exceeding the 95th centile for sex and age) had a median of 30.8% [IQR 6.3–54.1], and diastolic blood pressure (DBP) load – 7.7% [IQR 3.7–13.3]. There were no statistically significant differences in SBP or DBP load between boys and girls, patients with normal vs thickened left cIMT, patients with normal vs decreased left FMD. Patients who have ever had a correction of the coarctation with a stent had higher SBP loads (Me 47.1% [IQR 23–60.7]) than those who have never had a stent used for correction (Me 16.7% [IQR 5.3–38.8]) ($p = 0.031$), no such difference was found for DBP load.

Conclusions

In this patient sample patients who have undergone correction of coarctation of the aorta with a stent in their lives have higher SBP loads than patients who have never had a stent implantation. No differences in SBP and DBP load was found depending on gender, left cIMT thickness or left FMD.

Positive Group B Streptococcus and Perinatal Use of Antibiotics

*Dr. Maija Koka*¹; *Dr. Gita Jansone*²; *Dr. Elizabete Pumpure*²;
*Dr. Irina Morozova*³; *Ļubova Lapidus*³; *Dr. Vija Veisa*²;
*Prof. Dace Rezeberga*⁴; *Dr. Santa Markova*²

¹ *Rīga Stradiņš University, Latvia;*
Rīga East University Hospital, Latvia;
² *Rīga Maternity Hospital, Latvia;*
Rīga Stradiņš University, Latvia;
³ *Rīga Stradiņš University, Latvia;*
⁴ *Rīga Maternity Hospital, Latvia;*
Rīga East University Hospital, Latvia;
Rīga Stradiņš University, Latvia

Objectives

To determine the prevalence of positive Group B Streptococcus (GBS) and to evaluate the use of antimicrobial therapy peripartum and in early neonatal period.

Methods

Retrospective case control study was performed by obtaining data from medical records in Rīga Maternity Hospital from women who had known GBS screening result and term delivery in year 2017. Women were separated into two groups: GBS positive (697 patients, Group 1) and GBS negative (755 patients, Group 2). Data were analysed via SPSS v21.0.

Results

In Year 2017 and 2018 positive GBS were 12.6% of all mature deliveries. In Group 1 there were 76.6% (n = 534) vaginal deliveries, in Group 2 - 77.7% (n = 587). In Group 1 antibacterial intrapartum prophylaxis didn't receive 8.7% (n = 56) and it was insufficient in 9.6% (n = 62). Newborns were closely observed after delivery in 13.3% (n = 93) in Group 1 and in 8.5% (n = 64) in Group 2; p < 0.001. Antibacterial therapy in Group 1 received 12.2% (n = 85), in Group 2 - 6.8% (n = 51) newborns; p < 0.001. In Group 1 blood cultures were taken in 3.5% cases (n = 25) from which positive result was found in 4.0% (n = 1) (*St. epidermidis*). In Group 2 blood cultures were taken in 2.9% cases (n = 22) from which positive result was found in 13.6% (n = 3) (*St. epidermidis* x2, *St. hominis*). C-reactive protein (CRP) was obtained in 94.4% in Group 1 (n = 658) and 37.8% (n = 285) in Group 2. 99.1% (n = 691) newborns in Group 1 and 98.7% (n = 745) in Group 2 were discharged in normal condition.

Conclusions

GBS colonization occurred in 12.6% of all respondents. The administration of antibacterial therapy in the early neonatal period was more likely in Group 1. Despite of inadequate antimicrobial profiles in 18.3% of cases, 99.1% of newborns in GBS positive group have been discharged in a generally satisfactory condition. Newborns in Group 1 more often were observed after delivery and in this group CRP was analysed 2.5 times more frequently than in Group 2. In Group 1 there were no cases of GBS identified in obtained blood cultures.

Where is “Sexual and Reproductive Health and Rights” in Curriculum of Medical Faculty Students?

Prof. *Gunta Lazdāne*¹; Prof. *Helle Karro*²;
Prof. *Rūta Nadišauskiene*³; Prof. *Dace Rezeberga*⁴

¹ Rīga Stradiņš University, Institute of Public Health, Latvia;

² University of Tartu, Department of Obstetrics and Gynaecology, Estonia;

³ Lithuanian University of Health Sciences, Department of Obstetrics and Gynaecology;

⁴ Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia

Objectives

Many international policy documents emphasize importance of sexual and reproductive health (SRH) and the role of medical professionals in achieving full potential of SRH.

The objective of this study was to study the place of SRH in the curriculum for undergraduate medical students.

Methods

Heads of departments of obstetrics and gynaecology in three universities: University of Tartu in Estonia, Lithuanian University of Health Sciences in Lithuania and Rīga Stradiņš University in Latvia, were interviewed using a common questionnaire based on the overview of SRHR programmes in universities in Europe.

Results

SRH at some stage of the undergraduate studies for medical students is present in all universities, however, the approaches and amount of credit points linked to SRH between universities. The comprehensive programme covering SRH in the University of Tartu involves “Health Promotion”, “Medical Ethics”, “Patient Centeredness in Health Care and its Development” and “Obstetrics and Gynaecology”, elective courses “Principles for Sexuality Education” and “Intimate Partner Violence”. Starting from the 2nd year of studies up to the graduation, students are familiarized with the SRH including the influence of cultural and socio-economic aspects. It is an integrated approach in presenting the concept and details related to SRH.

Conclusions

Involvement of all departments of the universities involved in the training of future medical professionals is required to ensure that future doctors become part of the health system supporting and improving SRH. Exchange of experience between the universities is to be encouraged.

Caesarean Section for Nulliparous Women with Single Cephalic Full-Term Pregnancy in Spontaneous Labor

Dr. Laura Rācene¹; Līva Ušpele¹; Prof. Dace Rezeberga²

¹*Rīga Maternity Hospital, Latvia;*

²*Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia*

Objectives

To analyse risk factors for Caesarean section (CS) and labour outcomes in group of nulliparous women with single cephalic term pregnancy in spontaneous labour.

Methods

A retrospective study of data obtained from medical records about all women who delivered in Rīga Maternity Hospital from January 1 to December 31, 2017. Deliveries were classified according to Ten Group Classification System (TGCS). The Group 1 (nulliparous women with single cephalic term pregnancy in spontaneous labour) was analysed.

Results

Group 1 was second biggest group 24.9% (1620/6512), CS rate in group was 16.4% (265/1620), and the contribution to the overall CS rate – 4.1%. It had the second biggest contribution to overall CS rate after Group 5 (cephalic presentation at term with a history of previous CS). Maternal age > 35y – 79 (4.9%), body mass index > 30 kg/m² – 76 (4.7%), oxytocin – 558 (34.4%), epidural anaesthesia – 611 (37.7%), episiotomy 343 (21.2%), STAN – 67 (4.1%), neonatal weight ≥ 4000 g – 196 (12.9%), Apgar score < 7 at 5 min – 5 (0.3%), admitted to neonatal intensive care unit – 66 (4.1%). There was no significant statistical difference between use of oxytocin, STAN monitoring, epidural anaesthesia and body mass index between the two – the vaginal delivery and CS in labour groups. Statistically significant factor in labour outcome was found to be neonatal weight ≥ 4000 g: vaginal deliveries – 10.5% (142/1355), CS in labour – 20.4% (54/265), $p < 0.05$.

Conclusions

CS rate could be increased by fetal macrosomia, which can lead to dystocia and cephalopelvic disproportion. Safe reduction of the primary CS demands different approaches. It is necessary to revisit the definition of labour dystocia because a lot of research show that labour actually slower than it has been considered in past. Upright childbirth positions are recommended to decrease malpresentation.

Prediction of Poor Outcome in Critically Ill Children Using Clinical Evaluation, Scoring Systems and Biomarkers

*Dr. Roberts Gobergs*¹; *Dr. Dagnija Pētersone*²;
*Prof. Corsino Rey Galan*³; *Dr. med. Reinis Balmaks*⁴

¹ *Rīga Stradiņš University, Department of Pathology,
Children's Clinical University Hospital, Latvia;*

² *Children's Clinical University Hospital, Latvia;*

³ *University of Oviedo, Department of Paediatrics, Spain;*

⁴ *Rīga Stradiņš University, Department of Clinical Skills
and Medical Technology, Latvia;
Children's Clinical University Hospital, Latvia*

Objectives

Standardised scoring systems can help to determine the probability of death in the pediatric intensive care unit (PICU) by utilising a selection of clinical and laboratory data and they are rather accurate on the population level.

However, on individual patient level the decision-making is often based on the experience of the health care professionals.

We aimed to compare the ability of healthcare professionals to evaluate clinically the probability of a poor outcome with previously published standardised tools and biomarkers.

Methods

We conducted a prospective and descriptive study in the PICU of Children's Clinical University Hospital (CCUH) from August, 2017 to October, 2018. Following data were collected:

- 1) clinical evaluation of the probability of death made by primary care team and expressed as an interval with lower (LL) and upper limit (UL);
- 2) Pediatric index of mortality (PIM2);
- 3) plasma C-reactive protein (CRP) concentration;
- 4) outcome at hospital discharge (survival, sequel).

Based on PIM2 the patients were sorted into four groups (less than 1, 1 - 5, 5 - 15 and more than 15%).

Results

A total of 294 patients were enrolled, 56.8% (n = 167) of them were male. The mortality rate was 3.1% (n = 9). The median PIM2 was 0.8% (0.1-2.3) and CRP - 71.0 mg/l (8.8-459.3). The LL - UL range in the first PIM2 group was 0.2-3.2%, in the second group 2.7-9.8%, in the third group 5.0-14.9% and in the fourth group 19.9-40.2%. There was a correlation between the LL and UL PIM2 (r = 0.30, p = 0.001 and r = 0.34, p = 0.001 respectively) and plasma CRP concentration (r = 0.12, p = 0.019 and r = 0.10, p = 0.047). The difference of means between LL and PIM2 was 5.4% (CI 95% 4.3-6.4).

Conclusions

The clinical evaluation of the probability of death correlated with standardised scoring systems, however, overestimated the mortality.

Low Carbohydrate Nutritional Plan for Autistic Spectrum Children

*Ph.D. Silvija Abele*¹; *Dr. med. Laila Meija*²;
*Ph.D. Lilian Tzivian*³; *Prof. Valdis Folkmanis*³

¹ *University of Latvia, Faculty of Biology;*

² *Rīga Stradiņš University, Department of Sports and Nutrition, Latvia;*

³ *University of Latvia, Faculty of Medicine*

Objectives

Objective of the study is to investigate the potential of low carbohydrate diet and supplements in reducing autistic spectrum expression in children.

According to the American Psychiatric Association, autism spectrum disorder (ASD) is a complex developmental condition that involves persistent challenges in social interaction, speech and nonverbal communication, and restricted/repetitive behaviors. According to Centers for Disease Control and Prevention (CDC, 2014), about 1 in 59 children have been identified with ASD. Children with ASD often have digestive problems and significant nutritional deficiencies. In several nutritional and dietary intervention studies, it has been demonstrated that, by addressing underlying digestive conditions, one can alleviate expression of some autistic symptoms.

Methods

The ongoing study involves a quantitative, case-control 3-month treatment study of a nutritional and dietary intervention. The participants are 17 children from Latvia and UK (ages 2-17 years) with diagnosis of autism spectrum disorder (ASD) or autistic symptoms still waiting to be diagnosed. 10 Children are in the Intervention group, 7 children are in the control group with no intervention planned. This study involves a low carbohydrate dietary plan, namely, Specific Carbohydrate Diet/Gut and Psychology Syndrome diet (SCD/GAPS) and a few nutritional supplements (essential fatty acids, ascorbyl palmitate, probiotics, vitamin D, vitamin C).

Results

Autistic symptoms and digestive symptoms will be evaluated by parents using several validated questionnaires at the beginning of the study and again after 3 months. Preliminary results of the study will be presented.

Conclusions

The Gluten-Free/Casein-Free diet is one the most frequently used dietary intervention for ASD. This approach is safe and has demonstrated some benefits. Adams et al. (2018) demonstrated that a comprehensive nutritional and dietary intervention is effective at improving nutritional status and some autism symptoms in most individuals with ASD. Improving of some digestive and some autistic symptoms for children with ASD is expected in the ongoing study.

Insulin Resistance and Leptin Levels in Children

*Ilze Justamente*¹; Prof. *Dace Reihmane*²;
Prof. *Līga Ozoliņa-Molla*²

¹ *University of Latvia, Faculty of Biology, Latvia;*

² *Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia;*
University of Latvia, Institute of Cardiology and Regenerative Medicine

Objectives

Increasing prevalence of obesity is one of the most important current health problems not only in adulthood but also in childhood. Increased fat mass leads to higher levels of leptin that may play a role in the development of insulin resistance (IR), because of its strong relation to adiposity. The IR is associated with type 2 diabetes, metabolic syndrome and hypertension; it is also an independent risk factor for cardiovascular diseases (CVD). The purpose of this study is to evaluate insulin resistance, leptin concentrations and obesity levels among 9-10 year old children.

Methods

105 children (age 9-10 years) from 13 schools in Latvia were enrolled in "Physical Activity and Children overall Health" study. Insulin and glucose analysis were performed in E.Gulbis clinical laboratory to determine insulin homeostasis coefficient (HOMA-IR). Based on WHO body mass index BMI percentile scale two study groups were formed, children with normal BMI (NOR, N = 70) and overweight/obese children (OB, N = 35). Data were processed with SigmaPlot 12.5.

Results

There was a significant difference between the NOR and OB group in HOMA-IR: 1.176 ± 0.485 vs 2.705 ± 1.819 ($p < 0.001$); and leptin: 3.418 ± 3.567 pg/ml vs 10.405 ± 7.115 pg/ml ($p < 0.001$). Leptin was significantly and positively associated with HOMA - IR ($r = 0.486$; $p < 0.001$), BMI ($r = 0.690$, $p < 0.001$), WC ($r = 0.597$, $p < 0.001$).

Conclusions

Increased tissue resistance to insulin was more common among children with excess body mass and obesity, represented also by higher leptin levels. As known, hyperleptinemia has been independently associated with CVD, thus confirming the importance of a need for an early screening in children with increased BMI and WC.

Significant Diagnostic Tools for Blunt Abdominal Trauma in Children

*Dr. Olga Mežale*¹; *Dr. med. Astra Zviedre*²;
*Prof. Arnis Enģelis*²; *Prof. Aigars Pētersons*²

¹ *Children's Clinical University Hospital, Department of Emergency Aid, Latvia;*

² *Rīga Stradiņš University, Department of Paediatric Surgery, Latvia;*
Children's Clinical University Hospital, Latvia

Objectives

The aim of the study was to identify the most common injury pattern of abdominal trauma and early diagnostic methods in hemodynamic stable patients with the blunt abdominal trauma (BAT) under the age of 18 years.

Methods

A retrospective study was made to evaluate the injury patterns, laboratory and ultrasound (US) findings among patients aged 0–18 years old admitted to Children's Clinical University Hospital emergency department with a diagnosis of BAT (January 2013–November 2017). All patients were divided in two groups – with and without intraabdominal organs injury (IAOI). Data was analyzed with SPSS with significance defined as $p < 0.05$.

Results

A total of 105 patients (boys 77% ($n = 81$) and girls 23% ($n = 24$) were included. Patients with IAOI were 45% ($n = 47$) and patients without IAOI – 55% ($n = 58$). The spleen – 27 (57%) and liver – 13 (28%) were most common injured organs. In both groups the most common injury was direct blunt blow to the abdomen. A significant statistical difference was found between the injury pattern and organs lesion ($\chi^2 = 18.704$, $p < 0.001$). There were significant difference in the increased white blood count (WBC) and liver enzymes rates between the both groups ($\chi^2 = 12.339$; $p < 0.001$ vs $\chi^2 = 8.248$; $p = 0.005$). The significant statistical difference between two groups in other laboratory findings (C-reactive protein, hemoglobin, hematocrit, pancreatic enzymes) was not found. US was used as the first radiological method in all cases (sensitivity 91% and specificity 89%). In 91% of cases IAOI was identified. A significant statistical difference was found in combining US and laboratory methods for IAOI ($\chi^2 = 21.596$, $p < 0.001$).

Conclusions

The most common injury pattern in children for BAT was direct blunt blow and the most injured organ was spleen. US in combination with laboratory finding can identify IAOI.

Postpartum Endometritis: Prevalence of Childbirth-Related Risk Factors in Riga Maternity Hospital

*Dr. Anita Ungure*¹; *Sofija Semenistaja*²;
*Dr. Elizabete Pumpure*³; *Dr. Ieva Briedīte*⁴

¹ *Rīga Stradiņš University, Faculty of Continuing Education, Latvia;*

² *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

³ *Rīga Stradiņš University, Faculty of Continuing Education, Latvia;*

*Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;
Riga Maternity Hospital, Latvia;*

⁴ *Rīga Maternity Hospital, Latvia;*

Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia

Objectives

Postpartum endometritis (PPE) is a polymicrobial infection of decidua, which manifests as febrile morbidity 24 hours postpartum. There have been identified several pregnancy and childbirth related risk factors for this condition. The aim of this study was to analyse the prevalence of risk factors related to childbirth in women diagnosed with PPE in Riga Maternity Hospital.

Methods

This was a retrospective study of data collected from the medical records of Riga Maternity Hospital during the period from January 2017–December 2018. Study was confirmed by the Ethics Committee of Riga Stradiņš University. All data were analysed using IBM SPSS 22 analytics software.

Results

The study included 161 cases of women with PPE, which composed 1.3% from all deliveries in this period (total n = 12476). 98.8% (n = 158) of women had at least one risk factor for PPE during the labour. There were 26.7% (n = 43) vaginal deliveries, 2.5% (n = 4) instrumental vaginal birth, 62.7% (n = 101) acute cesarean section (SC) and 8.1% (n = 13) elective SC. 37.3% (n = 60) of women had induced labour. Premature rupture of membranes was reported in 39.2% (n = 53) and prolonged second stage of labour in 12.4% (n = 20) of cases. The prevalence of newborn macrosomia was 26.1% (n = 42). In 45.3% (n = 73) of cases at least one manipulation was performed - most common was curettage during SC - 17.4% (n = 28) and repair of vaginal or perineal tears in 16.1% (n = 26) of cases.

Conclusions

This study shows that most of the women had at least one childbirth-related risk factor, more than half of the cases had underwent acute SC, which is considered as the most significant risk factor for PPE. Knowledge about the prevalence of risk factors could benefit in rising awareness of prevention of PPE. This study will be continued by selecting a control group with further risk factor analysis.

Management of Labor for HIV Positive Patients in Latvia: Type of Labor Depending on Viral Load, Vertical Transmission Prevention

*Elīna Gelderiņa*¹; *Liene Timule*²;
*Gīta Jansone*³; Prof. *Dace Rezeberga*⁴

¹ Rīga East University Hospital, Latvia;
University of Latvia, Department of Obstetrics and Gynaecology;

² Rīga East University Hospital, Latvia;
University of Latvia, Department of Obstetrics and Gynaecology;

³ Rīga Stradiņš University Latvia;
Rīga Maternity Hospital, Latvia;

⁴ Rīga Stradiņš University, Department of Obstetrics and Gynaecology Latvia;
Rīga Maternity Hospital, Latvia;
Rīga East University Hospital, Latvia

Objectives

The HIV infection affects the body's defences against infectious diseases. WHO statistics: 36.9 million HIV infected in 2017, only 59% (21.7 million) receiving ART. CDC of Latvia: 19.0 cases per 100 000 in 2017; 2016 – 18.5 per 100 000, compared to European CDC: 5.9 cases per 100 000 in 2016. HIV diagnosis during pregnancy is associated with the need to initiate therapy, adequate provision, control of viral load, reduction vertical transmission risks to the child (the most common cause of HIV infection in children worldwide). ART reduces the viral load in blood, secretions. Guidelines suggest, if viral load < 10E3 ml, an elective cesarean section is performed. Zidovudine is administered intravenously prior to surgery. For viral load > 5E1 ml, delivery is planned through natural delivery routes. In cases of non-detectable viral load after 34–36 weeks of pregnancy, the risk of transmission is 0–0.5%. Aim: to study labor planning management for HIV positive pregnant women depending on therapy, viral load, other infections.

Methods

Retrospective study from 2014 to 2018 was performed, including 227 pregnant women diagnosed with HIV infection hospitalized at Rīga Maternity Hospital to provide labor assistance. Patient medical records were used for data collection. Data statistically analysed.

Results

24.7% (n = 56) vaginal deliveries, 75.3% (n = 171) operative, 50% of those with co-infection with HCV. Treatment during pregnancy: regular 65%, from those with undetectable viral load 76.7%. The risk of vertical transmission decreases if patients have higher education (rS = -0.422, p < 0.01) and registered marriage (rS = -0.366, p < 0.01).

Conclusions

The number of C-Sections decreased by 4.9% between 2014 and 2018, with more accurate disease control and implementation of guidelines. Women with lower levels of education and unregistered marriages are expected to be at higher risk of vertical transmission (to child) and lower compliance with ART.

High-Risk Pregnancy Outcome: Case Report on Maternal Mortality

Dr. Katrīna Kalniņa; Dr. Maira Jansone; Aļona Prutkova

Pauls Stradiņš Clinical University Hospital, Latvia

Keywords: maternal mortality, high-risk, social care.

Objectives

Maternal death still remains a challenge in Latvia. CEMD provided in years 2013–2015 has shown that important role plays lack of care in socially deprived group of population. The case report presented shows evidence of the mentioned above.

Case description

34 years old woman was admitted to the emergency department of Pauls Stradiņš Clinical University Hospital at 12:13 complaining about haematemesis and abdominal enlargement for the last two weeks. From history – the patient had a positive pregnancy test 6 months ago. The patient had two children, both taken away from her five years ago because of alcohol abuse and child neglect. Seven years ago she had hepatitis C diagnosed, but no treatment was started. The patient also suffered from hypertension, hypothyreosis, and obesity. At the admission patient's medical state was critical: severe dyspnoea and peripheral edema. Abdominal ultrasound showed massive ascites, hydrothorax, and diffuse liver damage. After paracentesis an inhomogeneous mass was visualized in small pelvis. As due to imaging difficulties pregnancy was not visualized, gynaecological exam was not performed. At 12:50 patient became unresponsive, cardiopulmonary resuscitation was started, but at 13:20 death was confirmed. An autopsy found pregnancy in about 30 gestational weeks. Also, cirrhotic liver, pulmonary and cerebral edema, ascites, esophageal and gastral varicose veins, splenomegaly, and chronic pancreatitis were visualized. Conclusions. A complex of circumstances has led to a severe outcome – maternal death. Adequate social care, medical care and involvement of society was lacking for this patient. According to patient's history a suspicion of pregnancy was to be made. The discussion about post mortem c-section is still going on in Latvia.

Conclusions

1. Social services should monitor strictly socially deprived groups of population.
2. Pregnancy always should be ruled out in case of women in reproductive age.

Improving Outcomes in Paediatric Neurocritical Care

Matthew Goldsmith

*Washington University School of Medicine,
St. Louis Children's Hospital,
Department of Pediatrics,
United States*

Mortality in pediatric critical care has been historically quite low (recently as low as 2% in some pediatric intensive care units). Paradoxically, this can make it difficult to study the effect of therapeutic interventions, especially when using mortality as a clinical endpoint. Over the past 15 years, we have, through a process focusing on multi-professional collaboration to develop best practices, developed a neurocritical care program that has led to significantly improved outcomes in some areas of neurocritical care such as traumatic brain injury.

Newborn Surgery – Way from Survival to Quality of Life-Long-Term Developmental Follow-up

Prof. *Udo Rolle*¹; *Antje Allendorf*²

¹ *University Hospital Frankfurt,*

Department of Paediatric Surgery and Paediatric Urology, Germany;

² *University-Hospital of the Goethe-University,*

Department of Paediatric Surgery and Paediatric Urology,

Department of Neonatology, Germany

Objectives

Severe congenital anomalies and relevant intestinal disorders (necrotizing enterocolitis-NEC) carry a high risk of morbidity and mortality. Nevertheless, the progress of neonatal, intensive care and paediatric surgical treatment resulted in a high survival rate in this patient population. Major surgery and anesthesia in newborn age might lead to a neurodevelopmental delay. We, therefore, investigated the neurodevelopmental outcome of newborn patients treated for major gastrointestinal malformation and NEC at a 2-year follow-up.

Methods

Patients with relevant congenital gastrointestinal tract malformations (n = 40) and NEC (non-surgical Group A, n = 13, surgical Group B, n = 24) were identified. Neonatal characteristics and anesthesia data were retrospectively collected. Based on information about neonatal characteristics and socioeconomic background, a matched pair was found. All participants were tested at the corrected age of 24 months with the Bayley Scales of Infant Development II-Assessment.

Results

The outcome was split into the psychomotor (PDI) and the mental developmental index (MDI). The congenital gastrointestinal patient group achieved a mean PDI of 103, the peer group 106; these were not significantly different. The mean MDI was 102 in the patient group and 110 in the control group. This difference was significant (p = 0.022). Detailed analysis of the items showed no significance for non-verbal items; however, there was a significant difference in verbal items (p = 0.029). Further analysis showed no correlation between relevant anesthesia data and the neurodevelopmental outcome. The non-operated NEC group achieved a mean PDI of 106, and those in the operated group achieved a mean PDI of 90. These values were significantly better in the non-operated group. The mean MDI's were 99 in the non-operative NEC group and 85 in the operated NEC group, with a significant difference.

Conclusions

The lower MDI scores due to worse verbal abilities in the congenital gastrointestinal patient group needs to address this group as to be at risk with respect to language development. The significant lower MDI and PDI in surgically treated NEC patients demonstrate the stringent necessity of further systematic prospective research and longer follow-up for the patients.

Hepatitis A Virus Genotypes Detection by Sequencing for Outbreaks and Sporadic Case Investigations in Latvia between 2008 and 2018

*Oksana Savicka*¹; *Reinis Zeltmatis*²; *Anastasija Aniscenko*²;
*Dr. med. Jelena Storozenko*³; Prof. *Baiba Rozentale*⁴;
*Rita Korotinska*⁵; *Jurijs Perevoscikovs*⁵

¹ *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Riga East University Hospital, Latvian Centre of Infectious Diseases,
National Microbiology Reference Laboratory, Molecular Typing Department;*

² *Riga East University Hospital, Latvian Centre of Infectious Diseases,
National Microbiology Reference Laboratory;*

³ *Rīga Stradiņš University;
Riga East University Hospital, Latvian Centre of Infectious Diseases,
National Microbiology Reference Laboratory;*

⁴ *Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia;
Riga East University Hospital, Latvian Centre of Infectious Diseases;*

⁵ *Centre for Disease Prevention and Control of Latvia*

Objectives

Hepatitis A is a disease under mandatory notification. Molecular detection and typing of VP1/P2a region of hepatitis A virus is used for genotypes detection and outbreak investigation. The last hepatitis A outbreak was started in 2008 and the spread of infection was due to transmission among drug users and after that led to a community. Between January 2017 and August 2018 5537 strains (22%) from 25 032 hepatitis A laboratory-confirmed cases notified by 24 EU/EEA were sequenced. 4217 (76%) cases belong to three HAV genotype IA outbreak strains: VRD_521_2016, RIVM-HAV16-090, V16-25801.

Methods

In 2008–2018 226 HAV samples were sequenced and analyzed by HAVNET database in National Microbiology Reference Laboratory.

Results

Phylogenetic analysis shows that from 226 sequences are detected: HAV IA genotype – 180, HAV IB – 33, HAV IIIA – 13. HAV IA genotype results: outbreak in 2008 from 100 samples 89 are identical and 6 are with 1 nucleotide change; in 2017–2018 from 74 samples 29 belong to VRD_521_2016 cluster, 6 to RIVM-HAV16-090 cluster, 17 form separated cluster, 16 are sporadic cases, 6 are identical by 2 samples; in 2012–2016 from 11 samples 5 are sporadic cases, 2 are identical to samples from 2017, 2 sample from 2014 are identical, 2 samples from 2015, 2016. HAV IB genotype results: 17/33 and 4/33 sequences are identical, 12/33 are sporadic cases. 13 sequences of HAV IIIA genotype are different.

Conclusions

HAV molecular epidemiological data shows that 3 subgenotypes circulate in Latvia: IA (79.7%), IB (14.6%) and IIIA (5.7%). In outbreaks prevails HAV IA genotype with 16.1% identity to VRD_521_2016 cluster, 3.3% to RIVM-HAV16-090 cluster, 9.4% form separated cluster, 49.4% from 2008 outbreak, 21.8% are sporadic cases. 51.5% HAV IB genotype is from one outbreak. Suspected countries of origin of the virus: Germany, Spain, Bulgaria, France, UK, Netherlands, Estonia, Russia, Uzbekistan, Kazakhstan Ukraine, Morocco, India, Pakistan, Tajikistan, Turkmenistan, Egypt.

Human Leukocyte Antigens Class II Alleles Impacting Response to 5–7-Year Antiretroviral Therapy in Latvian Cohort

*Mg. Vladislavs Jasinskis*¹; *Dr. med. Jelena Eglite*¹;
*Oksana Kolesova*¹; *Diana Kasjko*¹; *Inga Azina*²;
*Prof. Baiba Rozentale*³; *Prof. Ludmila Viksna*⁴

¹ *Rīga Stradiņš University, Joint Laboratory of Clinical
Immunology and Immunogenetics, Latvia;*

² *Rīga Stradiņš University, Latvia*

³ *Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia
Rīga East University Hospital, Latvian Centre of Infectious Diseases;*

⁴ *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Rīga East University Hospital, Latvia*

Objectives

The antiretroviral therapy (ART) aims at suppressing viral replication and strengthening individual's immune system in patients with HIV-1. The Human Leukocyte Antigens (HLA) of the Major Histocompatibility Complex are among factors responsible for effectiveness of ART. The aim of this study was to reveal an impact of HLA Class II alleles on the response to long-time ART by assessing their effect on a change in CD4 cell count when a change in the viral load is controlled.

Methods

The sample included 69 patients (17 females and 52 males) aged 20 to 50 with HIV-1 infection, who undergoing ART in Latvian Centre of Infectious Diseases. The median period of observations was 5.7 years. CD4 cell count and viral load were analyzed at the baseline and end of the period of observation. HLA typing was performed by polymerase chain reaction with low resolution sequence specific primers.

Results

The results confirmed significance of an increase in HIV-1 viral load for predicting a decrease in the level of CD4 cell count. A multiple hierarchical linear regression analysis confirmed that an increase in HIV-1 viral load predicts a decrease in the level of CD4 cell count. No one allele contributed positively to its change. In addition, HLA-DRB1*04 and HLA-DQB1*06:01 alleles contributed negatively to the level of CD4 cell count.

Conclusions

Among the alleles under investigation, HLA-DRB1*04 and HLA-DQB1*06:01 demonstrated statistically significant association with a decreasing level of CD4 count over the ART period of 5 to 7 years. These studies pointed at HLA-DRB1*04 genotype as a HLA marker with an adverse effect in HIV-1 patients.

Epidemiology of Invasive *S. pneumoniae* Disease in Latvian Children over the Period of Seven Years (2012–2018)

*Dr. Hedija Čupecā*¹; *Dr. med. Ilze Grope*²;
*Prof. Angelika Krūmiņa*³; *Ph.D. Larisa Savrasova*⁴; *Dr. med. Indra Zeltiņa*³;
*Prof. Anita Villeruša*⁵; *Dr. Jeļena Galajeva*⁶

¹ Rīga Stradiņš University, Latvia;

² Rīga Stradiņš University, Faculty of Continuing Education, Latvia

³ Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Riga East University Hospital, Latvia;

⁴ Rīga Stradiņš University, Latvia;

⁵ Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia;

⁶ Riga East University Hospital, National Microbiology Reference Laboratory, Latvia

Objectives

Review IPD (invasive pneumococcal disease) data of Latvian children from 2012 to 2018. Analyze age specific IPD serotypes, antibacterial susceptibility and incidence.

Methods

Analysis of IPD data based on the data from The Centre for Disease Prevention and Control (CDPC) of Latvia.

Results

Data for 2012 to 2018, show 390 cases of IPD reported in Latvia with mean annual incidence 3.3/100 000. In pediatric population there were 24 reported cases of IPD (0–18 years). Mean age for IPD was 41 months, with slight gender difference – male to female ratio 2.6:1. The highest incidence ratio (2.2) was seen in 2015. There were no fatal cases reported. 21 of 24 IPD cases were serotyped. Five most common serotypes were 23F (14.3%), 7F (14.3%), 3 (9.2%), 9V (9.2%), 6B (9.2%). Non-PCV serotypes (3, 35B, 15B, 35F, 21, 17F, 23B) were found in 43.5% off all (21) IPD cases. Only one case there were determine resistance to antimicrobials – resistance to penicillin with serotype (19F).

Conclusions

Data leads to think of underreporting of pediatric IPD in Latvia. Data seem limited do to the cases when conformation of causative agent is not done or not reported to CDPC. Even reported data shows the rising awareness of non-PCV serotype role in IPD in pediatric population. Possibly an *S. pneumoniae* carriage study would give more evidence to characterize serotype circulation.

Parvoviruses and Inflammatory Neurological Disorders

*Zaiga Nora-Krūkle*¹; *Anda Vilmane*¹; *Anna Terentjeva*²;
*Dr. Normunds Sūna*³; *Silvija Roga*⁴; *Dr. med. Sandra Skuja*⁵;
*Santa Rasa*¹; Prof. *Modra Murovska*¹

¹ *Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia;*

² *Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia;*
Rīga Stradiņš University, Faculty of Medicine, Latvia;

³ *Rīga East University Hospital, Gaīļezers, Department of Neurology and Neurosurgery, Latvia;*

⁴ *Rīga Stradiņš University, Latvia;*

⁵ *Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia*

Objectives

Aetiology of meningitis / meningoencephalitis and encephalopathy in most cases remains unknown despite the fact that viruses have been implicated in the development of neurodegenerative diseases. Human parvovirus B19 (B19V), human bocaviruses (HBoVs) and human parvovirus 4 (hPARV4) are members of Parvoviridae family. It is suggested that yet unidentified pathogen may circulate in body and in certain circumstances may cause the disease therefore, it is important to evaluate the role of B19V, HBoVs and hPARV4 in mentioned neurological disorders.

Methods

To determine the presence of B19V, HBoVs and hPARV4 in peripheral blood and / or cerebrospinal fluid (CSF) of patients with meningitis / meningoencephalitis (n = 42), unspecified encephalopathy (UEP; n = 28), and blood donors (BD; n = 50), as well as in brain tissue and blood of post mortem (PM) individuals with (n = 56) and without UEP (n = 59; control group) – methods of molecular virology, optical and electron microscopy were used.

Results

Presence of B19V genomic sequence was detected in 16.7% of patients with meningitis / meningoencephalitis and in 6% of BD, HBoVs – in 52.4% of patients and 28% of BD, but hPARV4 genomic sequence was absent in DNA samples of patients' and control groups.

B19V genomic sequence in blood and plasma DNA was revealed in 21.4%, HBoVs – in 20% and hPARV4 in none of patients with UEP. Whereas in blood and tissue of PM individuals with UEP – B19V, HBoVs and hPARV4 genomic sequences were detected in 42.9%, 41.7% and 5.4%, but in PM individuals without UEP – in 30.5%, 24% and 3.4%, respectively.

Within the central nervous system, the main target of B19V is oligodendrocytes. The greatest number of B19V-positive oligodendrocytes was found in the white matter of the frontal lobe.

Conclusions

In part of cases B19V and HBoVs may be potential contributors in development of meningitis / meningoencephalitis or encephalopathy. The morphological changes observed in the encephalopathy group, propose a possible B19V involvement in the demyelination process.

Invasive Pneumococcal Disease in Latvia in PCV10 Vaccination Era, 2012–2017

*Ph.D. Larisa Savrasova*¹; Prof. *Anita Villeruša*²;
*Dr. Hedija Čupeca*¹; *Dr. med. Ilze Grope*³; Prof. *Angelika Krūmiņa*⁴;
*Dr. Jeļena Galajeva*⁵; *Dr. med. Indra Zeltiņa*⁶

¹ Rīga Stradiņš University, Latvia;

² Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia;

³ Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

⁴ Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Rīga East University Hospital, Latvia;

⁵ Rīga East University Hospital, National Microbiology Reference Laboratory, Latvia;

⁶ Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Rīga East University Hospital, Latvia

Objectives

The aim was to determine the impact of vaccination on circulating *S. pneumoniae* serotypes, in order to inform recommendation for vaccination policy.

Methods

Laboratory confirmed IPD cases are passively notified to the Centre for Disease Prevention and Control of Latvia by laboratories and clinicians. IPD surveillance data were analysed and incidence by age, sex, case fatality and trend in serotypes calculated.

Results

From 2012 to 2017, 390 cases of IPD were reported, mean annual incidence 3.3/100 000. The notified incidence remained stable from 2012–2014 (2.7), peaked in 2015 (4.4) and fell to 3.8 in 2017. Riga represented 73% (284/390) notifications. Mean annual incidence was highest in infants (5.6) and in ≥ 65 years (5.5). Incidence was higher in males (26.4) compared to females (13.7) (IR - 1.9 CI (1.6–2.4)). Total case fatality was 19% (73/390) and 25% (32/127) in cases aged ≥ 65 years. 89% (347/390) of isolates were serotyped. The proportion of PCV10 vaccine serotypes fell from 50% (20/40) in 2012 to 26% (18/68) in 2017 (Chi-square test for trend $p = 0.0002$). In 2017, 31% (21/68) serotypes were 23-valent pneumococcal polysaccharide vaccine (PPV23) and 26% (18/68) non-vaccine. The same trends are seen stratifying by age groups (5–14, 15–64 years and ≥ 65 years).

Conclusions

IPD surveillance data indicate evidence of *S. pneumoniae* serotype replacement from PCV10 to nonPCV10 or non-vaccine serotypes. We recommend the Immunization politic makers to consider the possibility of changing the vaccine against pneumococcal disease to cover more *S. pneumoniae* serotypes. An *S. pneumoniae* carriage study would give more evidence to characterize serotype circulation. Limitations: As surveillance data may not be complete, we recommend to evaluate IPD surveillance system for completeness and representativeness of surveillance data.

Understanding How Targeting Annexin A1 May Control Inflammation in Systemic Lupus Erythematosus

*Ph.D. Kristine Oleinika*¹; *Hannah Bradford*¹;
*Scott Crichton*²; *Ph.D. Fiona Dempsey*²;
Prof. *David A. Isenberg*¹; Prof. *Claudia Mauri*³

¹ *University College London, Division of Medicine, United Kingdom;*
Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;

² *MedAnnex Ltd, United Kingdom;*

³ *University College London, Division of Medicine, United Kingdom*

Objectives

In systemic lupus erythematosus (SLE) defective apoptotic cell clearance, aberrant B and T cell activation, and various autoantibodies contribute to disease pathogenesis. Therapeutic management of SLE remains a significant challenge, and biological treatments modulating B or T cell effector functions have had variable success in clinical trials. We have generated a monoclonal antibody that targets annexin A1 (AnxA1), a protein expressed on the surface of early apoptotic cells, and shown to modulate B and T cell responses. We explore whether targeting AnxA1 may modulate immune cell activation and control inflammation in SLE.

Methods

We extensively characterized the surface expression of AnxA1 in peripheral blood B, T and myeloid cell subsets from SLE patients and healthy controls (HC) by flow cytometry. We obtained peripheral blood with ethical approval from the Ethics Committee of UCLH-NHS Trust. We also quantified the levels of AnxA1 in the serum of SLE patients and HCs by ELISA. We explored the effects of AnxA1 targeting on peripheral blood mononuclear cells (PBMC) in the in vitro cultures by assessing their activation and cytokine production.

Results

Patients with SLE have increased frequency of AnxA1-expressing peripheral blood leukocytes, including AnxA1⁺ CD8⁺ T cells and neutrophils. We also observed increased serum concentrations of AnxA1 in SLE patients compared to HCs. In vitro functional analysis revealed that AnxA1 targeting in PBMCs cultures causes the expansion of immature B cells, previously ascribed with regulatory function, with reciprocal reduction in mature and memory B cells. We also observed increased frequency of plasmablasts, associated with both pro- and anti-inflammatory roles, through antibody and IL-10 production, respectively. Interestingly, B cell IL-10 was increased in these cultures, further suggesting that AnxA1 targeting leads to the induction of B cells with a suppressive phenotype.

Conclusions

We suggest a possible mechanism by which AnxA1 targeting may counter inflammation in patients with SLE.

Review of Current Nanoparticle-Based Approaches for Combating Multi-Drug Resistant Bacteria

Prof. *Inese Čakstiņa*

Rīga Stradiņš University, Institute of Oncology, Latvia

Objectives

Infectious diseases along with oncological and cardiovascular diseases remain to be leading causes of morbidity and mortality worldwide. Multi drug resistant (MDR) bacteria is the greatest challenge in public health. The acquired resistance of pathogens presents a key problem for many antibacterial drugs. Such Gram-positive bacteria as methicillin-resistant *Staphylococcus aureus* have been given a great attention over the past decades. Infections caused by Gram-negative microbes have recently been recognized as a major critical issue in healthcare. The development of new antimicrobial drugs targeting Gram-negative bacteria is far behind to that of Gram-positive bacteria. In this presentation, a new nanoparticle based approach combating the MDR Gram-negative bacteria will be reviewed based on the literature analysis.

Methods

The overview on current nanoparticle based approaches for combating MDR bacteria will be given based on literature analysis using the articles of Lam et al., 2016, *Nature Microbiology* (Combating multidrug-resistant Gram-negative bacteria with structurally nanoengineered antimicrobial peptide polymers (SNAPPs)), Baptista et al., 2018, *Frontiers in Microbiology* (Nano-strategies to fight multidrug resistant bacteria – “A battle of the Titans”) and Chen et al., 2018, *Advanced Drug Delivery Reviews* (A review on core-shell structured unimolecular nanoparticles for biomedical applications).

Results

Based on the study by Lam et al., 2016 SNAPPs in the form of 16- and 32-arm star peptide polymer particles S16 and S32 were synthesized and their antibacterial efficacy was determined by their minimum bactericidal concentration (MBC) against a range of Gram-positive (*Streptococcus* mutants and *S. aureus*) and Gram-negative (*E. coli*, *P. aeruginosa*, *K. pneumoniae* and *A. baumannii*) bacteria. SNAPPs displayed effective activity against all Gram-negative species tested. In vivo efficacy of SNAPPs using mouse peritonitis model demonstrated that S16 is capable of treating colistin-resistant *A. baumannii* and potentially other CMDR Gram-negative infections. Mechanistic studies where *E. coli* was incubated in presence of S16 and then analysed using fluorescence imaging, flow cytometry and cryo-TEM assays provided evidence for membrane association, membrane disruption, outer membrane fragmentation and cell lysis.

Conclusions

Nanoparticle complexes (including SNAPPs) has a great therapeutic potential. Still, it is important to understand the mechanisms by which they impact bacterial viability.

SNAPPs could be distinguished as a new class of antimicrobial agents potentially capable to combat Gram-negative pathogens resistant to conventional antibiotics.

Use of Spectrophotometry in Differentiation of Bacteria

Dr. med. Roberts Lozins; Dr. med. Dzintars Ozoliņš

*University of Latvia;
Traumatology and Orthopaedics Hospital, Latvia*

Objectives

The aim of the study was to determine if spectrophotometry could be used to distinguish one bacteria from another.

Methods

The study was conducted by preparing 4 McFarland unit suspensions of 13 reference cultures of bacteria with and without silicon dioxide. The suspensions were analysed using a spectrophotometer. The absorbance was measured at a wavelength of 285–700 nm and 285–1100 nm. After that the measured absorbance of each bacteria it was compared to a different bacteria using t-test: Two-Sample assuming unequal variances.

Results

The results indicate that the best results for comparing bacteria is at 285–700 nm with silicon dioxide. At such conditions, it was possible to distinguish one bacteria from another in 74.6% of the comparisons. Without silicon dioxide the odds of distinguishing one bacteria from another dropped to 71.8%, but the worst results were with a wavelength interval of 285–1100 nm. At this interval with silicon dioxide the number was 69.2%, but without silicon dioxide it was only possible to distinguish bacteria at 52.6% of the time. It would indicate that a smaller wavelength interval is best suited for comparing bacteria. For Gram-negative bacteria the spike at the end of the graphs presented by the spectrophotometer was larger than it was for Gram-positive bacteria. This criteria could be used to distinguish Gram-negative bacteria from Gram positive-bacteria.

Conclusions

Spectrophotometry might be used to distinguish one bacteria from another or at least Gram-negative bacteria from Gram-positive bacteria. Further studies with different particles and wavelengths could provide better results.

Continuous Venovenous Hemofiltration (CVVH) May Improve Long-Term Survival in Sepsis Patients

*Dr. Georgijs Moisejevs^{1,2}; Jānis Seilis¹;
Armands Počs¹; Eva Bormane²; Anda Grigāne²; Dace Trumpika²;
Regīna Baufāle²; Ināra Bušmane²; Oļegs Šuba³;
Dr. med. Alise Silova⁴; Dr. med. Linda Gailīte¹; Prof. Ģirts Briģis⁵*

¹ Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia;

² Riga East University Hospital, Department of Nephrology and Renal Replacement Therapy, Latvia;

³ Riga East University Hospital, Department of Toxicology and Sepsis, Latvia;

⁴ Rīga Stradiņš University, Scientific Laboratory of Biochemistry, Latvia;

⁵ Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia

Objectives

So far it is not clear, whether the use of Continuous venovenous hemofiltration (CVVH) as the method of detoxification for sepsis patients does influence the indicators of recovery. CVVH in the case of sepsis is initiated before patients develop absolute indications and is being used as extracorporeal detoxification method. Aim of study is to analyse hazard ratio of CVVH initiation for short-term (7 days) and long-term (28 days) fatal outcomes in sepsis patients.

Methods

A retrospective study of 127 patients who were treated at Riga East University Hospital with diagnosis “sepsis” during the time period from 2014 to 2017 and in whom CVVH was used. SPSS software was used to analyze data, and hazard ratio (HR) was calculated using Cox regression method.

Results

Among study patients 47.2% (60/127) were males, median of age 68 years (IQR 58–76). All patients were divided into two groups according to CVVH initiation criteria: 63/124 (49.6%) had absolute indications and 64/124 (50.4%) had relative indications. On the 7th day and on the 28th day of hospital admission survival rates for sepsis patients were 83/127 (65.4%) and 53/127 (41.7%), respectively. During all hospital length of stay survival rate of sepsis patients was 47/127 (37.0%). For the short-term and long-term outcomes initiation of CVVH based on the absolute indications was associated with higher mortality rates HR = 2.19 (95% CI 1.17–4.08) and HR = 2.08 (95% CI 1.30–3.34), respectively, in comparison to relative indications. After adjustment to other prognostic factors (sepsis origin, need of mechanical lung ventilation, SOFA score, lactate concentration etc.) only long-term higher mortality rates showed significant association with CVVH initiation based on absolute indications HR = 1.96 (95% CI 1.08–3.56).

Conclusions

CVVH in sepsis patients based on relative indications may improve long-term patient survival by the possible ability of the method to clear cytokine storm.

Frequency of Malaria Incidence and Laboratory Diagnostic Possibilities in Latvian Center of Infectology

*Dr. Zanete Zalgaucka*¹; *Dr. Oksana Konstantinova*¹;
*Dr. Tatjana Atrohova*¹; *Tatjana Romanova*¹;
*Dr. med. Jelena Storozenko*²; Prof. *Baiba Rozentale*³

¹ *Rīga East University Hospital, Latvian Centre of Infectious Diseases,
Department of Immunochemistry and Parasitology;*

² *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Rīga East University Hospital, Latvian Centre of Infectious Diseases;*

³ *Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia;
Rīga East University Hospital, Latvian Centre of Infectious Diseases*

Objectives

Malaria parasites are microorganisms from the genus *Plasmodium* and people are infected through the bite of infected female *Anopheles* species mosquitoes. This infection is mostly found in tropical and subtropical areas. Every year many people die from malaria and according to the latest WHO estimates, released in December 2016, there were 212 million cases of malaria in 2015 and 429 000 deaths. The aim of our study was to find out how often malaria was found in Latvia in the period from 2013 to 2017 and to compare two investigation methods: blood film microscopy (“the gold standard”) and immunochromatographic method (rapid diagnostic test).

Methods

Study took place in 2013–2017 in Latvian Centre of Infectious Diseases. Venous blood samples with EDTA anticoagulant were examined by two methods: blood film microscopy and immunochromatographic method (Rapid test for malaria Pan/Pv/Pf – (Device)). For microscopic examination two thick smears and two thin smears were prepared. All smears were stained by Leishman method and examined under a microscope (magnification 100X). Immunochromatographic method is based on the detection of malarial antigens (HRP-II (histidine rich protein II) and p LDH (Plasmodium lactate dehydrogenase). The detection system for *P. falciparum* malaria is based on the detection of *P. falciparum* specific (Pf HRP-2) which is a water soluble protein that is released from parasitized erythrocytes of infected individuals. The detection system of *P. vivax* is based on the presence of *P. vivax* specific p LDH, *P. ovale* and *P. malariae* is achieved through the pan band malaria specific p LDH.

Results

Within five years 312 blood samples were examined, which included 49 positive results (from 15 infected patients). Thin and thick smears allow identification of *Plasmodium* species causing the infection. The number of infected red blood cells can also be calculated to determine parasitemia which was given in percentages. In 45 (92%) positive samples *P. falciparum* parasites were revealed with parasitemia 0.1% to 9%. In 3 (6%) positive samples – *P. ovale* and in 1 (2%) positive sample – *P. vivax*. The evaluated results by both methods coincided.

Conclusions

Compared with microscopy, malaria rapid diagnostic tests do not require extensive training or well-maintained equipment, but these test results are qualitative and do not provide important information, such as parasitemia. When microscopy is not readily available and we suspect malaria, rapid diagnostic test may be used instead of blood smears, however microscopy remains the reference method (“the gold standard”). Latvia is a malaria non-endemic country and cases of malaria are infrequent and introduced from other countries, but nevertheless we must remember about this severe disease and be prepared to diagnose this infection.

Novel Marker Enabling Diagnosis of Autoimmune Thyroiditis

*Dr. Katerina Todorova*¹; *Dr. Alina Sultanova*²;
*Maksims Cistjakovs*²; *Dr. Rositsa Milcheva*¹;
*Rosen Spasov*¹; *Zdravka Petrova*¹; *Ekaterina Pavlova*¹;
*Evelina Shikova*³; Prof. *Modra Murovska*²

¹ *Institute of Experimental Morphology, Pathology and Anthropology with Museum, Bulgaria;*

² *Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia;*

³ *National Centre of Infectious and Parasitic Diseases, Bulgaria*

Objectives

During the last years the number of studies is focused on importance of viral infections in development of autoimmune diseases and conditions involving autoimmune pathomechanisms, like myalgic encephalomyelitis / chronic fatigue syndrome (ME / CFS). Evidences on human herpesvirus-6 (HHV-6) infection are collected, in particular in cases of autoimmune thyroiditis (AIT), considering its possible triggering role in autoimmunity development.

There we investigated presence of HHV-6 antigens and ST6GalNAc1 (regulates protein glycosylation, affects cell-cell interaction and functions of intracellular molecules) expression in thyroid tissue samples of patients with and without signs of AIT to trace sensitivity of ST6GalNAc1 as a novel biomarker in autoimmunity research.

Methods

Thyroid tissue samples from 19 patients after thyroidectomy (11 cases of Hashimoto and Graves' diseases and 8 from patients with Struma nodosa without signs of AIT) were collected. To detect HHV-6 antigens we used HHV-6 (2001):sc-65463 (SCBT) with subsequent conjugation with Rabbit Anti-Mouse IgG (Alexa Fluor 488) for immunofluorescence; or with secondary RAMB (Dako) antibody and peroxidase DAB staining method for visualization in light microscope. The sialyltransferase expression in thyroid tissues was tested by immunohistochemistry and rabbit anti ST6GalNAc1 antibody (Avivasysbio).

Results

The results of the screenings by light and confocal microscopy affirmed the presence of HHV-6 antigens in the cells of the thyroid follicular walls and in the colloid matrix in 7 out of 11 AIT patients. Tissue samples of five of them displayed clear ST6GalNAc1 immunopositivity in the follicular cells of the walls and clusters of monocytes in the colloid of some follicles. In none of the follicular struma cases without signs of AIT, HHV-6 antigen was found, however slight or missing enzyme expression was observed.

Conclusions

Our preliminary findings present evidence that upregulation of ST6GalNAc1 can be used as an additional biomarker in the autoimmune process associated with the presence of HHV-6 infection.

Relationship between N-Acetyltransferase Phenotype and Hepatotoxicity of Antituberculosis Drugs in Latvian Tuberculosis Patients

*Dr. Anda Vīksna*¹; *Viktorija Igumnova*²; *Ilva Pole*³;
*Dr. Ginta Balode*¹; Prof. *Iveta Ozere*¹; *Dr. Renāte Ranka*²

¹ Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Rīga East University Hospital, Centre of Tuberculosis and Lung Diseases, Latvia;

² Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;
Latvian Biomedical Research and Study Centre;

³ Rīga East University Hospital, Centre of Tuberculosis and Lung Diseases, Latvia;
Latvian Biomedical Research and Study Centre

Objectives

Tuberculosis (TB) still is global health problem. Isoniazid, rifampicin and pyrazinamide have hepatotoxic potential and are in first line TB chemotherapy. Drug-induced hepatic dysfunction usually occurs in first few weeks of intensive phase of TB therapy. Studies show relationship between N-acetyltransferase (NAT-2) genotype of the encoding gene, isoniazid acetylation speed and hepatotoxicity. However, such information is not available in Latvia. Knowledge on acetylator phenotype would allow personalization of drug dosage in individual patient.

Methods

The aim of the study was to determine relationship between NAT-2 acetylator phenotype and drug induced hepatotoxicity. Prospectively newly diagnosed drug-sensitive TB patients hospitalized in the State Centre of TB and Lung Diseases from September 2017 to March 2018 who signed informed consensus were included in study. Blood samples were collected prior treatment initiation and after 10–12 days of chemotherapy. Drug induced hepatotoxicity was detected by increased alanine aminotransferase (ALT) and aspartate aminotransferase levels (AST). DNA was obtained from the blood serum sample using the phenol-chloroform-isopropylalcohol method. A 1093-bp DNA fragment which contains the entire coding region of the NAT2 gene was amplified by PCR and subsequently sequenced on both strands by Sanger method. The sequence analysis and 7-SNP panel identification was performed using CodonCode Aligner software with the sequence of human gene (EC 2.3.1.5) (GenBank: X14672.1) as the reference.

Results

Totally 27 TB patients were included in study. The mean age of participating patients was 47.9 (\pm 15.24) years, range 19–82 years. Majority of them had pulmonary TB (26/27 (96%)). Ten types of NAT-2 encoding gene were identified: NAT2*4, NAT2*5A, NAT2*5B, NAT2*5C, NAT2*6A, NAT2*6B, NAT2*6C, NAT2*6J, NAT2*7B, NAT2*13. Genotypes determining slow acetylation of isoniazid were determined in 20/27 (74%) of patients, genotypes determining intermediate acetylation were detected in 7/27 (26%) of patients. All patients had liver transaminases within normal values before TB chemotherapy. In group of patients having intermediate acetylation phenotype, ALT did not increase after 10–12 days of chemotherapy. In group of patients with slow acetylation phenotype liver transaminases increased after 10–12 days of treatment: mean ALT was 18.77 U/L (\pm 14.20) prior chemotherapy, and 78.13 U/L (\pm 117.48) after 10–12 days of chemotherapy ($p < 0.0001$); mean AST was 24.55 U/L (\pm 27.29) prior chemotherapy, and 79.66 U/L (\pm 123.26) after 10–12 days of chemotherapy.

Conclusions

1. Slow isoniazid acetylation phenotype dominated in study participants.
2. Hepatotoxicity of first line antituberculosis drugs was observed in patients with slow acetylation phenotype.
3. Standard isoniazid dose recommended for treatment of drug sensitive tuberculosis may be too high for patients having slow isoniazid acetylation phenotype; possibly the dose should be individually tailored in such patients to avoid drug induced hepatotoxicity.
4. Due to small number of patients, the cohort may be not completely representative. A larger prospective study would be necessary to confirm the findings.

Measles Virus Genotypes Circulating in Latvia, 2011–2018

*Oksana Savicka*¹; *Dr. Tatjana Kolupajeva*¹;
*Anastasija Aniscenko*¹; *Diana Dusacka*¹; *Reinis Zeltmatis*¹;
*Maira Petrova*¹; *Edite Bleidele*¹; *Natalija Repuscenko*¹;
*Sanita Kuzmane*¹; *Larisa Firstova*¹; *Dr. Natalija Zamjatina*¹;
*Dr. med. Jelena Storozenko*¹; *Jurijs Perevoscikovs*²

¹ Rīga East University Hospital, Latvian Centre of Infectious Diseases,
National Microbiology Reference Laboratory;

² Centre for Disease Prevention and Control of Latvia

Objectives

The aim was to characterize Measles viruses (MV) circulated in Latvia in 2011–2018.

Methods

Laboratory confirmation of Measles cases was done by positive Measles IgM ELISA in sera and/ or positive RT-PCR in throat swab, urine, saliva or blood plasma. PCR positive samples were used for MV isolation in Vero-Slam culture. MV RNA positive samples and virus isolates (n = 54) were subjected to Sanger sequence analysis of 450 nucleotides comprising the most variable C-terminal region of the nucleoprotein (N) gene.

Results

In period 2011–2018 in Latvia were registered 63 Measles cases. One imported Measles case was confirmed in 2011 and 3, 36 and 23 laboratory confirmed cases were registered in outbreaks occurred in 2012, 2014 and 2017/2018 (by 1st November) respectively. During this period 47 clinical samples and MV isolates from 31 persons were successfully genotyped in NRL. In 2011 and 2012 outbreaks D4 genotype was detected. Two samples with D4 genotypes of 2012 outbreak were confirmed by WHO Regional reference laboratory (RRL) in Robert Koch Institute, Germany, as D4 Manchester. In 2014 and in the beginning of 2017/2018 outbreaks circulation of B3 genotype was observed. Eight out of nine specimens of 2014 outbreak were confirmed in RRL as B3 Harare but one sample of 2017/2018 outbreak as B3 Dublin. Circulation of genotype B3 Dublin in Latvia was observed from the end of 2017 till the August of 2018 (13 out of 18 successfully genotyped samples). Later D8 genotype was introduced and detected in 5/18 samples.

Conclusions

Molecular studies showed introduction and circulation of 3 different Measles genotypes in Latvia in period 2011–2018: D4 (n = 4) in 2011 and 2012, B3 (n = 22) in 2014 and the end of 2017 / first half of 2018, and D8 (n = 5) in the second half of 2018.

Biocompatibility of Biomaterials In Vivo and Antibacterial Efficiency In Vitro

Ph.D. Ingus Skadiņš¹; Prof. Jūta Kroiča¹; Dr. med. Ilze Šalma²

¹ *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;*

² *Rīga Stradiņš University, Department of Oral and Maxillofacial Surgery, Latvia*

Objectives

The principal aim of this study is to compare the antibacterial efficiency of hydroxyapatite (HAp) saturated with ciprofloxacin and polyL-lactic acid polymer (PLLA) with a controlled release of antibiotics with HAp saturated with cipro without PLLA, and to evaluate the expression of inflammatory cytokines (IL-10, β -defensin-2 and TNF-alpha) in tissue surrounding implanted biomaterials in vivo.

Methods

Biomaterial samples were implanted in subcutaneous pockets of chinchilla rabbits and the implantation wound was contaminated with *S. epidermidis* (ATCC 12228) and *P. aeruginosa* (ATCC 27853) reference cultures. Four weeks later, using standard ELISA kits (USCN life science and MyBioSource, USA) according to the manufacturer's instructions, the level of IL-10, TNF-alpha and beta-defensin-2 was determined in the surrounding tissue (internal and external zone) around the biomaterial and in tissue within a distance of 1.5 cm from the biomaterial. Antibacterial efficiency was tested via the disk diffusion test, which is the standard laboratory method for testing antibacterial susceptibility.

Results

In comparison to the control group, normal levels of inflammatory cytokines were found in the direct tissue area around biomaterial samples and in the distance tissue area after implantation of biomaterial with ciprofloxacin and contamination with *P. aeruginosa* and *S. epidermidis*. Statistically significantly higher levels of inflammatory cytokines were found in direct tissue area around biomaterial samples and distance area after implantation of biomaterials without ciprofloxacin and wound contamination with *P. aeruginosa* and *S. epidermidis*. The average antibacterial length biomaterials with ciprofloxacin and PLLA against *S. epidermidis* was 278.4 h \pm 12, against *P. aeruginosa* was 249.6 h \pm 12, but for biomaterials with ciprofloxacin without PLLA was 69.6 h \pm 15.09 against *P. aeruginosa* and *S. epidermidis* was 91.2 h \pm 15.09. Antibacterial characteristics were not observed for group of biomaterials without ciprofloxacin.

Conclusions

Biomaterials with ciprofloxacin and polymer coating have longer antibacterial properties against both bacterial cultures. A biodegradable coating ensures the gradual release of ciprofloxacin from the biomaterial. An increased level of inflammatory cytokines (IL-10, β -defensin-2, TNF- α) compare to control group indicates an active inflammatory process after biomaterial without antibiotics implantation and contamination with bacterial cultures.

Whole-Genome Sequencing for Prediction of Mycobacterium Tuberculosis Drug Resistance in Comparison with Phenotypic Drug Susceptibility Testing

*Darja Aļeiņikova*¹; *Ilva Pole*²; *Jānis Ķimsis*³; Prof. *Iveta Ozere*⁴;
*Dr. Inga Norvaiša*⁵; *Dr. Renāte Ranka*¹

¹ *Latvian Biomedical Research and Study Centre;*

Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;

² *Rīga East University Hospital, Centre of Tuberculosis and Lung Diseases, Latvia;*
Latvian Biomedical Research and Study Centre;

³ *Latvian Biomedical Research and Study Centre;*

⁴ *Rīga East University Hospital, Centre of Tuberculosis and Lung Diseases, Latvia;*
Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;

⁵ *Rīga East University Hospital, Centre of Tuberculosis and Lung Diseases, Latvia*

Objectives

The aim of this study was to compare the acquired whole-genome sequencing (WGS) data with phenotypic drug susceptibility testing (DST) results in Latvian Mycobacterium tuberculosis (MT) isolates.

Methods

During this study, one local outbreak (years 2005–2016) of 8 patients with pulmonary tuberculosis (TB) was analysed. In total, there were 10 cases of TB, as two patients had a relapse. MT DNA samples, as well as phenotypic DST, spoligotyping and IS6110 RFLP results were provided by Centre of Tuberculosis and Lung Diseases. For WGS analysis, single-end fragment library was prepared using Ion Xpress™ Plus Fragment Library Kit and sequencing was performed on Ion Proton™ System. WGS data were analysed using PhyResSe automated tool.

Results

All clinical isolates had SIT50 spoligotype which refers to H3 genotype (Euro-American lineage). It matches WGS results. In phenotypic DST 9 cultures were streptomycin-resistant and one culture was resistant to streptomycin and ofloxacin. In contrast, PhyResSe automated tool detected the gyrB Asp461Asn mutation in all sequenced samples. This “high confidence” SNP is related to fluoroquinolone resistance.

Conclusions

Drug resistance prediction by WGS method significantly differed from phenotypic DST results. Further analysis of identified mutations is needed to explain the differences.

Distribution of HCV and HBV Genotypes in Latvia, 2017–2018

*Dr. med. Jelena Storozenko*¹; *Dr. med. Ludmila Guseva*¹;
*Olegs Vasins*¹; *Dr. Tatjana Kolupajeva*¹; *Galina Muzje*¹;
*Jekaterina Ancerevica*¹; Prof. *Baiba Rozentale*²

¹ *Rīga East University Hospital, Latvian Centre of Infectious Diseases,
National Microbiology Reference Laboratory;*

² *Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia;
Rīga East University Hospital, Latvian Centre of Infectious Diseases*

Objectives

The aim of the study was to evaluate distribution of HCV and HBV genotypes in Latvia, 2017–2018.

Methods

In this study the genotyping results of 3660 HCV and limited group of 69 HBV infected patients were included. HCV genotyping was done by rt-PCR (Abbott m2000 system), followed by molecular hybridization (Versant, Siemens) in case of not differentiated genotype (GT) 1 subtype. HBV genotyping was performed by rt-PCR (AmpliSens HBV-genotype). HCV and HBV viral loads were detected by rt-PCR (Abbott m2000 system).

Results

All patients were HCV RNA or HBV DNA positive with viral load 2–8 log. In this study in HCV infected patients GT1 was predominant – 64.4% (2357 / 3660), followed by GT3 – 32.3% (1178 / 3660), GT2 – 3.0% (109 / 3660) and GT4 – 0.4% (916 / 3660). In GT1 subtype 1b was found more often – 94.0% (2168 / 2357). In 492 out of 2168 (22.7%) cases subtypes of GT1 were not differentiated by rt-PCR. In all this samples 1b subtype was detected by additional molecular hybridization step. HCV genotypes GT1, GT3, GT2 distribution was comparable with our 2011–2015 data (GT1 – 62.5%, GT3 – 33.8%, GT2 – 3.2%), while GT4 circulation was detected only in our 2005–2010 study.

HBV genotyping was started in NRL in 2017. Only two HBV genotypes – A and D were found. Most HBV belonged to genotype D – 78.3% (54 / 69), the rest 21.7% (15 / 69) – to genotype A. This results differ from published in 2005 HBV genotyping data for Latvia performed in patients after renal transplantation, when genotype D was found only in 57% of cases.

Conclusions

Distribution of HCV genotypes GT1, GT2 and GT3 in Latvia, 2017–2018 remains stable over time in Latvia. HCV GT4 circulation was detected after some years of interruption. Only two HBV genotypes – A (78.3%) and D (21.7%) were found. This distribution is typical for Europe: A is prevalent in Northern Europe, D – in Eastern Europe.

Fournier Gangrene: Single-Centre Experience

Dr. Jānis Bērziņš

*Rīga East University Hospital, Gaīļezers,
Urology and Oncologic Urology Clinic, Latvia*

Objectives

The objective of this study is to research the latest books and publications on Fournier gangrene, and to compare the results with the data collected from Riga East University Hospital, and its experience in treating this disease in the last eight years.

Methods

All the patients from year 2010 to 2018 who were treated for Fournier gangrene in Riga East University Hospital were identified. The medical records of these patients were studied, and data about their age, comorbidities, length of hospitalization, laboratory and microbiology tests, treatment etc. was collected. The data was then analyzed with standard statistical methods, and represented as charts and graphs, and compared with data about the epidemiologic, etiologic, diagnostic and therapy aspects of Fournier gangrene found in literature.

Results

The epidemiologic data of the studied patients coincides with that of the literature from USA and Europe. Men in their 5th and 6th decade are more commonly affected. The data on risk factors also coincides with published information – almost fifth of the study's patients have diabetes, several have alcohol dependency. The exact etiologic factor, responsible for the disease process in studied patients has not been always identified, often due to lack of formal records in the medical history. Data on causative organisms matches the data found in most relevant sources – most commonly Fournier gangrene is caused by intestinal flora, streptococcus and staphylococcus. In every case there were at least 2 pathogens isolated from the wound material, with the mean at 3.5 different genera per patient, which exactly coincides with information found in literature. The treatment strategies used in Riga East University Hospital were also analyzed, and it has been concluded, that it corresponds with the proposed treatment in all of the literature studied, including European Association of Urology (EAU) guidelines, as urgent debridement is the cornerstone of surgical therapy. Antibacterial therapy used also meets the standard of Fournier gangrene treatment, in that it has always been started early, and is at least double, broad spectrum antibiotic. Although it had been noted, that the combinations of the drugs used were not always as suggested by the EAU guidelines. The mortality rate in the study patients were 33%, but in the latest major research papers in USA, the reported mortality is lower.

Conclusions

Fournier gangrene is a urological emergency, and the mortality rates for this disease remains high, despite modern surgical and antibacterial treatment options. The information collected from Riga East University Hospital patients with Fournier gangrene in the last 8 years coincides with the literatures data on this subject. The research directions in which the study of this disease can be continued is by obtaining data from other regional hospitals in Latvia, and analyzing the data in conjunction with the results of this paper.

Expression of Chemokine Receptors CCR1 and CCR2 in EBV Latency III Burkitt Lymphoma and Lymphoblastoid Cell Lines

*Ph.D. Svetlana Kozireva¹; Zanna Rudevica²;
Ph.D. Ainars Leonciķis²; Prof. Modra Murovska¹;
Ph.D. Irina Holodnuka¹*

¹ *Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia;*

² *Latvian Biomedical Research and Study Center*

Objectives

The aim of this study was to investigate impact of latent EBV infection on the CCR1 and CCR2 mRNA expression in the Burkitt lymphoma (BL) cell lines with different EBV latency programs and assess the effect of the chemokine MCP-1 on the CCR2 mRNA expression.

Methods

CCR1 and CCR2 mRNA expression was determined by quantitative Real-time PCR. To assess the effect of MCP-1 on the CCR2 mRNA expression, BL cell lines were starved for 3 h and then cultured in the presence of MCP1 (500 ng/ml). After the 3 h, 6 h, and 24 h stimulation with MCP1, the total RNA was purified and CCR2 mRNA expression was determined by Real-time PCR.

Results

CCR1 mRNA expression was detected in the BL cell lines with EBV Latency III and in some cell lines with EBV Latency I, but the CCR1 expression level was markedly higher in the LCL and BL cell lines with EBV Latency III. CCR2 was highly expressed in the LCL and BL cell lines with EBV Latency III, while the lack of the CCR2 mRNA was observed in the EBV-negative and EBV Latency I cell lines. Upon MCP1 activation, the CCR2 mRNA expression pattern in the BL cell lines (Latency III) with the high level of the CCR2 expression differs from that in BL cell lines with low CCR2 expression levels.

Conclusions

The obtained results suggest an impact of EBV on the CCR1 and CCR2 expression. The migration ability of the cells toward CCL2 correlates with the CCR2 mRNA expression upon MCP1 activation.

Experience of Pertussis Laboratory Diagnosis

*Dr. med. Jelena Storozenko¹; Galina Muzje¹;
Jekaterina Ancerevica¹; Dr. Tatjana Kolupajeva¹;
Irena Davidjuka¹; Sanita Kuzmane¹; Prof. Baiba Rozentale²*

¹ Rīga East University Hospital, Latvian Centre of Infectious Diseases,
National Microbiology Reference Laboratory;

² Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia;
Rīga East University Hospital, Latvian Centre of Infectious Diseases

Objectives

To evaluate effectiveness of serology and molecular methods in the laboratory diagnosis of pertussis.

Methods

Laboratory confirmation of children and adults pertussis cases in NRL was done by positive B. pertussis Toxin IgA ELISA in single sera, rise of B. pertussis Toxin IgG antibodies in paired sera detected by ELISA and / or positive multiplex rt-PCR for detection of B. pertussis, B. parapertussis and B. bronchiseptica in dry throat or nasal swabs, or swabs in transport medium. Data about beginning of clinical symptoms and vaccination status were not provided to laboratory.

Results

In 2017 y. 960 sera samples were tested for B. pertussis Toxin IgA and 918 for Toxin IgG. In 68 cases results were consistent with acute pertussis infection: 59/960 IgA results were positive and in 9 out of 60 paired sera rise of B. pertussis Toxin IgG was proved. In the same period 240 samples were tested by multiplex rt-PCR with 24 positive B. pertussis DNA, 2 positive B. parapertussis DNA and 1 B. bronchiseptica DNA. Only 57/240 cases were tested both by molecular methods and serology. In 36/57 cases no prove of acute pertussis was found non by serology non by PCR. In 10 B. pertussis DNA positive cases (9 children, 1 adult) serology results in sera collected in the same time as PCR samples did not demonstrated evidences of acute B. pertussis infection. In 4/10 patients second blood samples were collected and seroconversion of IgG was demonstrated. In 13 PCR negative cases (6 children, 7 adults) ELISA results were IgA positive (11/13) or indeterminate (2/13). Reasons of such discordant results may be late time of PCR sample collection or false positive serology results.

Conclusions

PCR demonstrated possibility of earlier diagnosis comparing to serology especially in children. Interpretation of laboratory results may be done only in context with vaccination status and data about beginning of clinical symptoms.

Diversity and Factors Associated with Occurrence of Legionella Pneumophila in Drinking Water Supply Systems

*Olga Valcina*¹; *Daina Pule*¹; *Artjoms Malisevs*¹;
*Svetlana Makarova*¹; *Lelde Grantina-Ievina*¹;
Prof. *Aivars Berzins*¹; Prof. *Angelika Krumina*²

¹*Institute of Food Safety, Animal Health and Environment "BIOR", Latvia;*

²*Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Riga East University Hospital, Latvia*

Objectives

L. pneumophila is an opportunistic environmental pathogen of engineered water systems. Free-living protozoa (FLP) are considered as a vector and reservoir for bacterial population and serves as additional protection for pathogenic bacteria against high temperatures and disinfectants. In addition, non-renovated water supply systems and low hot water temperature may be contributing factors for spread of *Legionella*.

The aim of this study was to evaluate diversity and factors associated with proliferation of *Legionella* in water supply systems.

Methods

Overall 1283 samples from taps and showerheads were collected from 273 multi-floor apartment buildings and 40 hotels in all regions of Latvia. Isolation and identification of *Legionella pneumophila* was carried out according to ISO 11731. Genotyping was conducted according to the standard Sequence-Based typing method of the EWGLI using 7 genes. Isolation and cultivation of FLP was performed using previously described protocols (Schuster, 2002; Thomas, 2006). Identification of FLP was performed by microscopy and 18S Ribosomal DNA PCR and sequencing protocol (Schroeder, 2011) for *Acanthamoeba*.

Results

At least once *L. pneumophila* was observed in 160 of 273 (59%) apartment buildings and in 26 of 40 (65%) hotels. The highest occurrence was observed in hot water samples, where 52% of samples tested positive. In 76% of cases hot water temperature did not exceed 50 °C at the point of water consumption.

Occurrence of FLP was statistically higher in *Legionella* positive samples with FLP present in all *Legionella* positive samples. Most frequently observed FLP genus were *Acanthamoeba*, *Vermaoeba* and *Valkampfia*.

In this study 26 different sequence types were found, including four new sequence types, however, at the same building, more than 2 different types were not detected.

Conclusions

Better understanding of molecular diversity and occurrence associated factors would provide a basis for more targeted intervention measures.

HIV-1 Integrase Inhibitors Resistance among Antiretroviral Treatment-Experienced Patients in Latvia

*Oksana Savicka*¹; *Diana Dusacka*¹; *Anastasija Aniscenko*¹;
*Dr. Tatjana Kolupajeva*¹; *Dr. med. Jelena Storozenko*¹;
*Anastasija Sangirejeva*²; Prof. *Baiba Rozentale*²

¹ Rīga East University Hospital, Latvian Centre of Infectious Diseases,
National Microbiology Reference Laboratory;

² Rīga East University Hospital, Latvian Centre of Infectious Diseases

Objectives

To investigate development of integrase strand-transfer inhibitors (InSTi), protease inhibitors (PIs) and reverse transcriptase inhibitors (RTIs) drug resistance mutations (DRM), following the virological failure of the Raltegravir (RAL) or Dolutegravir (DTG) containing regimen.

Methods

Sequencing of HIV-1 integrase gene (ViroSeq HIV-Integrase, Abbott) and HIV pol gene (ViroSeq HIV genotyping kit, v.2.0; Abbott) was performed on blood plasma samples of 18 HIV-1 infected patients with observed virological failure (HIV viral load > 50 kop/ml) on InSTIs containing treatment regimen. Characteristics of patients: 11/18 – male, 7/18 – female, mean age – 37 years. InSTi resistance mutations were defined according to the IAS-USA 2017 list. For HIV-1 subtyping REGA v.2.0 tool was used.

Results

Median HIV-1 viral load was 3.93E5 kop/ml (1.17E+03 – 3.76E+06). Most of HIV-1 sequences were classified as subtype A1 (78%, 14/18), the rest – as subtype B (22%, 4/18). Major Integrase drug resistance mutations were found in 7/18 samples, majority of samples (5/7) were from patients infected with HIV-1 subtype A1. The following mutations were found: E92Q-3/7, S147G-1/7, Y143C/H-2/7, Q148R-1/7, N 155H-4/7. These mutations resulted in resistance to Elvitegravir (EVG) – in all 7 out of 7 cases with major integrase drug resistance mutations (including 1 possible resistance). In 6 cases resistance to EVG was combined with resistance to RAL (including 2 possible resistances). In all 7 sequences with InSTIs mutations also NRTI and / or NNRTI major drug resistance mutations were found. In 3/18 sequences only NRTI and / or NNRTI mutations were detected.

Conclusions

In limited group of 18 antiretroviral treatment experienced patients with virological failure after integrase inhibitors containing regimen in 38.9% (7/18) resistance at least to 1 or more InSTi class drugs was found.

Assessment of Biofilm Production by Pathogenic Bacteria Isolated from Tonsillar Crypts of Patients with Chronic Tonsillitis

*Dr. Renata Klagisa*¹; *Dr. med. Arta Olga Balode*¹;
*Renars Broks*²; Prof. *Juta Kroica*²; Prof. *Ligija Kise*³

¹ *Pauls Stradiņš Clinical University Hospital, Latvia;
Rīga Stradiņš University, Latvia;*

² *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia*

³ *Rīga Stradiņš University, Department of Otorhinolaryngology, Latvia*

Objectives

Microorganisms in tonsillar crypts have opportunity for longtime interactions with immune system. Biofilm production is important characteristic of bacteria and can facilitate chronicization of the tonsillopathy. Bacteria in biofilm display elevated resistance to antibiotics, disinfectants, host immune system clearance. Research objectives are to assess biofilm producing ability of isolated pathogens from tonsillar crypts of patients with chronic tonsillitis.

Methods

Punch biopsy samples from tonsillar crypts were taken for microbiological testing. Identification of microorganisms was performed with MALDI-TOF mass spectrometry. Microtitre plate method was used for the in vitro cultivation and quantification of bacterial biofilms. The OD (optical density) of each well was measured using micro-titre plate reader. Cut-off value (OD_c) was defined as three standard deviations above mean OD of the negative control. Strains were divided as following: $OD \leq OD_c$ = no biofilm producer, $OD_c < OD \leq 2 \times OD_c$ = weak biofilm producer, $2 \times OD_c < OD \leq 4 \times OD_c$ = moderate biofilm producer, $4 \times OD_c < OD$ = strong biofilm producer.

Results

From tonsillar crypts of 68 patients with chronic tonsillitis following 60 pathogenic bacteria were assessed for biofilm production: *S. aureus* - 22/60, *K. pneumoniae* - 19/60, *E. coli* - 4/60, *S. pyogenes* - 3/60, *S. pneumoniae* - 3/60, *A. ewoffii* - 2/60, *S. anginosus* - 2/60, *N. subflava* - 1/60, *M. organii* - 1/60, *H. influenzae* - 1/60, *K. oxytoca* - 1/60, *E. aerogenes* - 1/60. Using micro-titre plate method 8.3% (5/60) of strains was no biofilm producers, 41.7% (25/60) of strains - weak biofilm producers, 43.3% (26/60) of strains - moderate biofilm producers, 6.7% (4/60) of strains - strong biofilm producers.

Conclusions

Isolated pathogens from tonsillar crypts were weak (41.7%), moderate (43.3%) or strong (6.7%) biofilm producers. Only 8.3% of strains did not produce biofilm. During further studies the role of strong biofilm producers has to be evaluated as biofilm production plays a key role in the pathogenesis of chronic tonsillitis.

Human Papillomaviruses in Eastern Europe: Issues and Tendencies

*Maksims Cistjakovs*¹; *Ph.D. Alina Sultanova*¹;
*Olga Jermakova*¹; *Liba Sokolovska*¹;
*Dr. Svetlana Capenko*¹; *Dr. Baiba Lesina-Korne*²;
*Prof. Modra Murovska*¹; *Dr. med. Ieva Ziedina*³

¹ Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia;

² Pauls Stradiņš Clinical University Hospital, Gynaecology and Maternity Unit, Latvia;

³ Rīga Stradiņš University, Scientific Laboratory of Transplantology, Latvia

Objectives

Despite of very active use of vaccination worldwide, human papillomavirus (HPV) infection prevalence in Eastern European countries (EEC), including Baltic countries, remains high mainly as a result of a historical absence of effective screening programmes and poor vaccine uptake. The aim of this study was to acquire new data on HPV frequency in Latvian women and to compare results with available data on prevalence of HPV in EEC.

Methods

Overall, 122 women were enrolled in this study. From them 43 women were studied deeply as a potential risk group for development of long-lasting persistent HPV infection since they were receiving immunosuppressive therapy after renal graft transplantation, and remaining 79 were healthy women who were visiting gynaecologist for preventive examination.

For the detection of HPV infection patients' samples (blood and vaginal swabs) were collected two weeks after transplantation with following collection on six months and one year after transplantation. Different polymerase chain reactions (PCR) for detection of high risk HPV (HR-HPV) genomic sequences and ELISA kit for detection of anti-HPV IgG antibodies were used.

Results

Results of PCR with consensus primers showed that 66 out of 122 (54%) women cervical swab DNA samples were positive for HPV genomic sequences, and from them in 17 cases one or more high-risk HPV types were defined. More often, HPV (including high-risk HPV types) sequences were found in women with immunosuppression than in healthy women (65% (28/43) vs. 38% (30/79), respectively). The most frequent high-risk HPV types among individuals were HPV-18, HPV-56 and HPV-16.

Conclusions

Recent results on HPV prevalence and annual cervical cancer incidence rate are showing that EEC still have higher burden of HPV related cancers and our current data among Latvian women are supporting these findings.

Early Diagnostic Biomarkers for Diagnosis of Acute Bacterial Infections

*Dr. med. Aigars Reinis*¹; *Dr. Mohits Kakars*²; Prof. *Juta Kroiča*¹;
Prof. *Arnīs Enģelis*²; Prof. *Aigars Pētersons*³; *Ph.D. Ingus Skadiņš*¹;
*Dr. med. Dagnija Rostoka*¹; *Dr. Reinis Rugājs*¹

¹ *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;*

² *Rīga Stradiņš University, Department of Pediatric Surgery, Latvia;*

³ *Rīga Stradiņš University, Latvia;*

Children's Clinical University Hospital, Latvia

Objectives

Prompt diagnosis of an acute bacterial infection enables clinicians to act timely, make a more informed decision and achieve better treatment outcomes.

Methods

Although non-specific, different inflammatory markers are increasingly being used by specialists (when surgical interventions to obtain patients' specimens are not performed), for example, to detect the development of implant-associated infections or acute exacerbations of chronic infections. These inflammatory markers are TNF-alpha, neutrophil gelatinase-associated lipocalin (NGAL) and leucine-rich alpha-2-glycoprotein (LRG). The latter two have recently been receiving more attention and have been used to help diagnose acute appendicitis and kidney injury.

Results

NGAL is generally expressed by neutrophils, less so by renal, prostate, respiratory and cells of the gastrointestinal tract. Its production increases when cells are subject to stress such as inflammation due to bacterial infections, ischemia or malignancy. Theoretically, when an acute bacterial infection ensues, NGAL is initially produced at the site of infection and subsequently enters the bloodstream. Consequently, the premise is that the marker could be used to detect early, acute appendicitis. LRG-1 is expressed during differentiation of granulocytes and it also belongs to acute-phase proteins, the production of which is stimulated by Il-6, Il-1b and TNF-alpha. Its levels in blood can increase during microbial infections or in case of tumours. LRG-1 is expressed during granulopoiesis, when it is involved in the formation of different surface receptors on granulocytes. The exact functions of LRG-1 are not fully understood.

Conclusions

There are studies suggesting the use of LRG-1 as an early marker for acute appendicitis. However, many questions still remain and further research is being conducted.

First Application of Next Generation Sequencing in Human Donor Cornea Preservation Medium: New Method in Pathogen Detection

Dr. *Davide Borroni*¹; Ph.D. *Mohit Parekh*²;
Dr. *Carlos Rocha de Lossada*³; Ph.D. *Stefano Ferrari*⁴

¹ Rīga Stradiņš University, Doctoral Studies, Latvia;

² University College London, Ophthalmology, United Kingdom;

³ Hospital Regional Universitario Carlos Haya, Department of Ophthalmology, Spain;

⁴ Fondazione Banca degli Occhi del Veneto, Italy

Objectives

The aim was to investigate the profile of microorganisms in the storage media of human donor corneas using next generation sequencing (NGS).

Methods

Seven samples from organ culture (OC) group (Cornea Max, Eurobio, France) with one control (sterile media without any cornea) and; seven samples from hypothermic storage group (Cornea Cold, Eurobio, France) with one control were used for this study. The corneas were placed in respective storage media for 14 days before collecting the samples. Storage media (2 mL) from each sample were collected in RNAase-free tubes and shipped for next generation sequencing (NGS). Simultaneously, another 1 mL media sample was used for conventional diagnostic method (CDM) using Bactec instruments.

Results

In both, OC and hypothermic storage samples, the most abundant genera were *Pseudomonas*, *Comamonas*, *Stenotrophomonas*, *Alcanivorax*, *Brevundimonas* and *Nitrobacter*. *Acidovorax*, *Acetobacter* and *Hydrogenophilus* were detected mostly in the hypothermic storage group. The only fungal pathogens detected belonged to the genus *Malassezia*, and was abundant in both the storage conditions. CDM was negative for microorganism in all the samples. The positive results from the metagenomics group are assumed to be genomic material and not viable microbes.

Conclusions

Using NGS, the media used to preserve human corneas has evidence of microorganisms not detected using CDM. It is unclear whether these microorganisms are not detected due to the inhibitory effect of the antimicrobials in the media, or whether these microorganisms are sequestered in the tissue from the antimicrobials or are non-viable. CDM may have to be performed to determine the presence of truly viable organisms along with metagenomic approach, which obtains full taxonomic and functional profiling of an organism. Metagenomics can serve as a full diagnostic approach especially to track infections caused by donated corneas. The antibiotic cocktail in the storage media for human donor corneas is efficient.

Vaccination Against Influenza among Health Care Staff and Medical Students in 2017–2018

*Dr. Aija Leidere-Reine*¹; *Dr. Anna Medne*²;
Prof. *Ludmila Viksna*³; *Dr. med. Indra Zeltiņa*³

¹ *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;*

² *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

³ *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Riga East University Hospital, Latvia*

Objectives

The aim of the study was to identify the number of influenza-vaccinated health workers and medical students and overall attitude towards vaccination.

Methods

During the 2017/2018 influenza epidemic season, questionnaires from 284 respondents were collected. Selection criteria for offering the questionnaires: an adult person who is a student of the Medical Faculty of Rīga Stradiņš University and / or is in employment relationships with Riga East University Hospital, Pauls Stradiņš Clinical University Hospital or Children's Clinical University Hospital. Uncompleted questionnaires were not processed. Data processing from survey was done using Microsoft Excel.

Results

- During the 2017/2018 influenza season, out of 284 respondents, 53 healthcare workers were vaccinating against influenza (18.66%).
- The highest number of vaccinated persons was in group between 36 and 45 years of age (54.71%), most of which were doctors, i.e. 24 or 45.24%.
- In the opinion of respondents, the factors affecting the vaccination coverage are:
 - in 51.76% of cases, the employer does not pay for the vaccine, and staff do not want to pay themselves for the vaccine;
 - 6.69% of employees do not want to get vaccinated because they believe that their immunity is strong enough;
 - 5.28% have the opinion that the effectiveness of the vaccine has not been sufficiently studied;
 - 1.06% think they have some contraindications.
- Employer pays for vaccine for 26.41% of respondents and 70.67% of them have been vaccinated.
- The medical staff's knowledge of the need for annual vaccination is 54.60%, with the lowest rate among the groups of medical students (53.66%) and sanitary / nurse assistants (83.33%).

Conclusions

Comparing the influenza vaccination coverage among healthcare workers in Latvia with data from other countries, the vaccination coverage is low, which is because:

- vaccination against influenza is not a mandatory requirement for healthcare workers and medical students;
- not all employers provide their employees with paid vaccination against influenza.

Markers of Genetic Predisposition in Tuberculous Pneumonia Patients in Latgale, Latvia

*Ksenija Kramica*¹; *Jelena Eglite*²; *Oksana Kolesova*²;
*Aleksandrs Kolesovs*³; *Dr. Tatjana Kramica*⁴; *Galina Titovica*⁵;
*Diana Dzerina*⁵; *Glafira Nikolajeva*⁵; Prof. *Ludmila Viksna*⁶

¹ Rīga Stradiņš University, Latvia;

² Rīga Stradiņš University, Joint Laboratory of Clinical Immunology
and Immunogenetics, Latvia;

³ University of Latvia, Department of Psychology;

Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;

⁴ T. Kramicas family doctor's practice, Latvia;

⁵ Daugavpils Regional Hospital, Latvia;

⁶ Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia

Objectives

The aim of the study was to assess markers of genetic predisposition to tuberculosis (TB) in Latgale. To define a significance of the Major Histocompatibility Complex (Human Leucocyte Antigens, HLA) as the factor affecting susceptibility for TB.

Methods

Patients of Lung Disease and Tuberculosis Ward of Daugavpils Regional Hospital participated in the prospective study. Inclusion criteria were: 18 years of age or older, not pregnant, not incarcerated, confirmed pulmonary TB, and negative HIV1/2 test result. For genetic analysis 5 ml of blood with EDTA was used and stored at -20 °C. To determine risk and protective alleles HLA Class II gene, HLA-profiles of 100 people (without active TB) were used. HLA typing in HLA-DRB1, HLA-DQA1 and HLA-DQB1 loci was performed by a polymerase chain reaction with low resolution sequence specific primers. DNA extraction was performed by using QIAamp® DNA Blood Kit. Amplification was performed by thermocycler "DT-Lite". IBM SPSS 22.0 was used for the analysis.

Results

There were 26 patients (16 males and 10 females) aged between 18 and 85 with bilateral TB pneumonia and without HIV infection. In all patients, bilateral TB pneumonia was confirmed. At the time of study, 25 patients were undergoing the first-line anti-TB therapy and one patient was undergoing the second-line anti-TB therapy because of primary resistance of *Mycobacterium tuberculosis*.

HLA-DRB1*07 and HLA-DRB1*11 alleles were identified as risk alleles for TB. HLA-DRB1*15 allele was a protective one. Comparative analysis with the results of other studies of different populations in Europe and Asia was performed.

Conclusions

The results demonstrated that the subpopulation of Latgale can have specific risk and protective HLA Class II alleles for tuberculosis. Despite of a relatively high statistical significance, the further study is needed for a more precise assessment.

Microbial Translocation Markers in HIV and HCV Patients

*Dr. Monta Madelāne*¹; *Dr. Ģirts Šķenders*²; *Dr. Dace Rudzīte*²;
*Andrejs Ivanovs*³; *Prof. Ludmila Vīksna*⁴

¹ *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;*

² *Riga East University Hospital, Latvia;*

³ *Rīga Stradiņš University, Statistics Unit, Latvia;*

⁴ *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Riga East University Hospital, Latvia*

Objectives

HCV and HIV infections are associated with increased intestinal permeability and consequent microbial translocation that contributes to systemic immune activation. HCV and HIV co-infection accelerates progression of liver disease and progress more rapidly to liver fibrosis however the mechanisms involved in this process are not fully understood. One of the enhancing mechanisms can be increased levels of microbial translocation. The extent of microbial translocation can be assessed by direct measurement of bacterial DNA or RNA fragments and Lipopolysaccharide (LPS), and indirectly by different markers, such as soluble CD14 (sCD14), LPS binding protein (LBP) and Endotoxin core antibodies. The aim of the study was to analyze differences of Endotoxin core IgM antibodies (EndoCab IgM) and sCD14 levels in HCV mono-infected and co-infected with HIV patients.

Methods

Prospective case control study included 24 HCV and 25 HCV/HIV positive HAART naïve patients. Patient plasma samples were measured for EndoCab IgM and sCD14 levels. Demographic data, levels of ALT, AST, platelet count (PTL) and fibrosis 4 (FIB4) score were analysed in both patient groups. Differences between groups were assessed by using Mann-Whitney U test. Correlation was assessed by using Spearman correlation test.

Results

EndoCab IgM levels were higher in HCV monoinfected patients Me = 0.546 MU/ml (IQR = 0.324–0.709) vs. HCV/HIV group Me = 0.463 MU/ml (IQR = 0.189–0.658), but statistically not significant, $p = 0.271$. sCD14 levels were significantly higher in HCV/HIV co-infected group Me = 65.89 ng/ml (IQR = 52.24–78.26) vs. HCV group Me = 52.16 ng/ml (IQR = 39.56–73.94), $p = 0.03$.

No statistically significant correlations were found between sCD14, EndoCab IgM levels and FIB-4 score.

Conclusions

Increased level of sCD14 as well as lower levels of EndoCab IgM antibodies in HIV/HCV group could suggest enhanced bacterial translocation and systemic immune activation in HIV/HCV coinfecting patients.

Purification of Recombinant Hepatitis E virus Capsid Protein VLPs and Assessment of Their Immunogenicity in Common Marmosets

*Ekaterina Bayurova*¹; *Ilya Gordeychuk*²; *Alexey Chumakov*¹;
*Karen Kyuregyan*³; *Olga Isaeva*³; *Amir Tukhvatulin*⁴;
*Denis Logunov*⁴; *Mikhail Mikhaylov*³

¹Chumakov Federal Scientific Center for Research and Development of Immune-and-Biological Products of the Russian Academy of Sciences;

²Chumakov Federal Scientific Center for Research and Development of Immune-and-Biological Products of the Russian Academy of Sciences; Sechenov First Moscow State Medical University, Russian Federation;

³Russian Medical Academy of Continuous Professional Education; Mechnikov Research Institute for Vaccines and Sera;

⁴Gamaleya Research Center of Epidemiology and Microbiology, Russian Federation

Objectives

Hepatitis E virus (HEV) is a major cause of human acute hepatitis in many areas of the world with over 20 million cases of infection, over 3 million cases of acute hepatitis, and over 70 000 deaths each year. HEV genotypes (GT) 1 and 2 infect only humans and other primates, while GT 3 and 4 can be transmitted between humans and a number of non-primate animal species. Recently the first vaccine against HEV based on recombinant capsid protein of HEV GT 1 was licensed in China. Still, there is a lack of human and veterinary vaccines based on HEV GT 3 which is detected in the majority of autochthonous cases of hepatitis E in European countries. Here we report a procedure of purification of vaccine antigen based on recombinant HEV GT 3 capsid protein and its immunogenicity in common marmosets (*Callithrix jacchus*).

Methods

Sequence encoding amino acids 110- 660 of HEV GT 3 capsid protein was optimized for bacterial expression and cloned into an expression vector pET3. The resulting protein was purified by metal affinity chromatography in native conditions. Purification was confirmed by SDS-PAAG and western blot with His-tag and protein-specific antibodies. The VLP fraction of the antigen was separated. For immunogenicity tests four common marmosets were injected three times (days 0, 21, 42) intramuscularly with glutoxim-adjuvanted antigen. ELISA test, CFSE lymphoproliferation test and IFN- γ production assay were performed to evaluate specific immune response.

Results

The purified 60 kDa protein was recognized both by anti-His-tag and protein-specific antibodies. Immunization of common marmosets with adjuvanted VLPs lead to production of IgG, IFN- γ and proliferation of T-cells.

Conclusions

Thus, we developed a procedure of purification of vaccine antigen based on recombinant HEV GT 3 capsid protein. Immunization of common marmosets with this antigen lead to activation of both humoral and cellular immune response.

Evaluation of Laboratory Diagnostics of Scabies – Noteworthy Reminder

*Kristīne Liepiņa*¹; *Linda Maule*¹; *Gatis Pakarna*¹; *Vera Bondareva*¹;
*Solvita Selderīna*¹; *Dr. med. Jeļena Storoženko*^{1,2}

¹ *Rīga East University Hospital, Latvian Centre of Infectious Diseases, Latvia;*

² *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia*

Objectives

The aim of the study is to assess actuality of scabies by analyzing the total number of assigned laboratory tests, the distribution of positive scabies per year and determining the seasonality of disease. In order to determine seasonality of scabies, positive results were counted for spring / summer and autumn / winter season. A working hypothesis is: in autumn / winter scabies is more common than in spring / summer season.

Methods

Patient skin samples of scabies from 2014 to 2018 which were investigated in the laboratory of The Latvian Centre of Infectious Diseases were analyzed for this study. The study included data of primary patients only. Laboratory diagnosis of scabies mite is based on microscopy of skin scrape.

Results

Between 2014 and 2018, 1403 skin samples were tested for scabies, of which 338 (24%) were positive and 1069 (76%) were negative. Total number of analyses: 267 in 2014; 265 in 2015; 261 in 2016; 271 in 2017; 339 in 2018. Positive results of scabies in 2014 – 58 (22%), 2015 – 60 (23%), 2016 – 61 (23%), 2017 – 60 (22%) and 2018 – 99 (29%). The incidence of scabies in spring / summer was 12.8 ± 3.2 cases, in autumn / winter was 21 ± 7.7 cases, mean \pm SD. Using the Wilcoxon statistical test ($p < 0.05$), a statistically significantly higher incidence of scabies was found in the number of cases in autumn / winter season ($p = 0.007$).

Conclusions

The data obtained reveal annual examination of scabies and growing number of positive scabies in 2018. Increased number of scabies is in autumn / winter. Even though scabies is not a reportable disease and the findings do not reflect the situation in Latvia as a whole, scabies is a contagious disease that circulates in society and can potentially lead to outbreaks of the disease.

Infectious Keratitis – Frequent Indication for Penetrating Keratoplasty

*Dr. med. Guna Laganovska; Dr. Anete Kursite;
Kristiana Cacka; Elizabete Sapale Salmane*

¹ *Rīga Stradiņš University, Department of Ophthalmology, Latvia*

Objectives

One of the most common causes of urgent penetrating keratoplasty is infectious keratitis with corneal ulcers. The aim of the study is to analyze the postoperative results of penetrating keratoplasty depending on the agent of the infection and applied postoperative treatment.

Methods

The results of postoperative period after penetrating keratoplasty performed 2017–2018 were analyzed 1 month, 3 month and 8 month after surgery. I group of patients (14 patients) received local combined therapy (antibiotics+corticosteroids) and systemical corticosteroids. Due to infectious agent, if it was know, additional systemical antimicrobial therapy was used in postoperative period (II group – 17 patients). The grade of redness of eye was analyzed.

Results

In the study were included 31 patients after penetrating keratoplasty due to corneal ulcer with perforation of cornea. One month after surgery there was no significant difference between grade of redness in group I and II patients, but three and eight months after operation patients had better results with adequate additional therapy (redness in group I – grade II, in group II – grade I).

Conclusions

The results of the postoperative period after penetrating keratoplasty are better if the infection is known and additional therapy is used. The authors have declared that there is no conflict of interest.

May Some Viruses be Beneficial?

Dr. med. Simona Donina

Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia

Objectives

The aim was to give a brief overview regarding potential benefit of human viruses in context of human virome and diseases.

Methods

Data were identified by searches of PubMed, and references from relevant articles using the search terms “virome”, “phage therapy”, “live virus vaccines”, “oncolytic viruses”, “in situ vaccination”, “melanoma treatment with oncolytic viruses”.

Results

The virome has an important impact of the health of humans as the source for traditional viral pathogens. Some benefiting from our viruses are described: viral infections at a young age may help host immune system develop properly, providing protection against later infections and preventing immune overreactions that lead to allergies (Cadwell, 2015), live virus vaccines are used for disease prevention (Minor, 2015).

Increasing reports of antimicrobial resistance and limited new antibiotic discoveries and development have fuelled innovation in other research fields and led to a revitalization of bacteriophage studies. Phage therapy mainly utilizes obligatory lytic phages to kill their respective bacterial hosts, while leaving human cells intact and reducing the broader impact on commensal bacteria that often results from antibiotic use. Phage therapy is rapidly evolving and has resulted in cases of life-saving therapeutic use and multiple clinical trials (Furfaro et al., 2018; Raghavendra et al., 2018).

Potential benefit of resident viruses is related to their preference for rapidly dividing cells. Oncolytic viruses (OVs) can preferentially infect and kill malignant cancer cells, without imparting similar lytic effects on normal cells. In addition to their direct oncolytic activity, OVs can awaken the otherwise suppressed immune system of cancer-bearing hosts and consequently promote beneficial antitumor immunity (Gujar et al., 2017). OVs potently induce the release of the full range of tumor associated antigens into an inflammatory environment via tumor lysis and contribute to the establishment of tumor-specific T-cell immunity (Achard et al., 2018; Hanakan, 2016).

Conclusions

Viruses are being redefined as more than just pathogens. Some viruses are beneficial for humans and can be used for therapeutic purposes.

Patient-Reported Outcomes in Evaluation of Socio-Economic Impact of Myalgic Encephalomyelitis / Chronic Fatigue Syndrome to Society

*Diāna Arāja*¹; *Derek Pheby*²; *Rachael Hunter*³;
*Elenka Brenna*⁴; *Lara Gitto*⁵; *Uldis Berķis*⁶; *Asja Lunga*¹;
*Andrejs Ivanovs*¹; Prof. *Modra Murovska*¹

¹ Rīga Stradiņš University, Latvia;

² Buckinghamshire New University, United Kingdom;

³ University College London, United Kingdom;

⁴ Università Cattolica del Sacro Cuore, Italy;

⁵ Università di Roma, Italy

⁶ Ministry of Education and Science, Department of Higher Education, Science and Innovation, Latvia

Objectives

Research is performed in framework of COST (European Cooperation in Science and Technology) Action 15111 EUROMENE (European Myalgic Encephalomyelitis / Chronic Fatigue Syndrome (ME / CFS) Research Network) to investigate the opportunities to use the patient-reported outcomes in evaluation of socio-economic impact of ME / CFS to society.

Methods

To achieve the objectives of the research, a study based on the patient-reported survey has been carried out in the United Kingdom (UK), Italy and Latvia. The survey includes questions on the socio-economic consequences of the disease. For data processing and analysis, the methods of economic analysis and statistical analysis are embraced.

Results

A part of the study conducted in the UK covered 262 patients with ME / CFS and healthy controls. The analysis shows marked lower economic well-being of people with ME / CFS in comparison with healthy controls. Taking into account the prevalence of ME / CFS in the UK population, the total cost of illness was estimated at £ 1713 million per year. The study of Italian 87 participants with ME / CFS found that 23% were unemployed and 55% had an income less than 15 000 Euro per year. By estimating the cost of medical procedures and the cost of lost working time, the study arrived at an estimate for the total economic burden of the disease in region. In Latvia the patient-related data are classified by ICD-10 code, and data on ME / CFS patients are dispersed between categories of G93.3, R53 and B94.8 codes, so correct epidemiological data are not available. In order to make an accurate determination of the real costs of ME / CFS for Latvian patient the survey is launched with expected coverage of 300 patients.

Conclusions

Myalgic Encephalomyelitis / Chronic Fatigue Syndrome is a poorly understood, complex, multi-system disorder, characterized by difficulties of diagnostic, therefore the patient-reported outcomes is a significant tool to discover the undiagnosed patients and collect the data for evaluation of socio-economic impact of Myalgic Encephalomyelitis / Chronic Fatigue Syndrome.

Liver Echinococcosis – How Immunogenetic Tests Can Improve Diagnosis and Management Tactics

*Dr. Sniedze Laivacuma*¹; Prof. *Ludmila Viksna*¹;
*Dr. med. Jelena Eglite*²

¹*Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Riga East University Hospital, Latvia*

²*Rīga Stradiņš University, Joint Laboratory of Clinical Immunology and Immunogenetics, Latvia*

Objectives

The aim of this study was to assess the relationship between HLA Class II alleles in two groups of patients in Latvia: patients with cystic and alveolar echinococcosis. HLA DRB1/DQA1/DQB1 are the most polymorphic of the HLA class II genes and therefore it can be used for individual identification and, according to literature data, the conclusion can be drawn that there are alleles of HLA that are associated with increased risk of developing a disease and alleles that are associated with a decreased risk of the progress of the disease.

Methods

The study included 37 patients from Riga East University Hospital – with echinococcosis, 29 patients with cystic echinococcosis, 8 patients with the alveolar echinococcosis and 100 healthy control persons without echinococcosis. The HLA Class II allele genotyping was performed by RT-PCR-SSP. The odds ratios (OR), with 95% confidence intervals (95% CI), were calculated using the statistical analysis performed with IBM SPSS Statistics for Windows, version 22.0.

Results

In the event of cystic echinococcosis a more severe course of a disease can be anticipated in the presence of HLA DRB1 alleles *17:01 and *04:01, DQB1 *03:02, DQA1*04:01 and haplotypes HLA-DRB1*04:01/DQB1*03:01/DQA1*01:03, HLA-DRB1*11:01/DQB1*06:02-8/DQA1*01:03, HLA-DRB1*11:01/DQB1*06:02-8/DQA1*01:03. In-group with alveolar echinococcosis is associated with the HLA DRB1 alleles *17:01 and *11:01, DQB1 *03:01 and haplotypes HLA-DRB1*17:01/DQB1*03:01/DQA1*01:02, HLA-DRB1*11:01/DQB1*03:01/DQA1*01:03 and HLA-DRB1*11:01/DQB1*03:01/DQA1*03:01. The following haplotypes can be identified as protective in all patient groups: DRB1*01:01/DQB1*03:01/DQA1*01:01 and HLA-DRB1*01:01/DQB1*02:01-2/DQA1*02:01.

Conclusions

Immunogenetic data could prove significant for therapy planning in accordance with the individual characteristics of a patient, because no data on the optimum duration of therapy and whether the therapy can be terminated without facilitating the relapse of the infection are currently available.

Characterisation of High Risk HPV Variants Circulating in HIV-Infected Women with Squamous Cell Cervical Carcinomas in North-West Region of the Russian Federation

*Dr. Maria Issagouliantis*¹; *Andrei Runov*²; *Timofei Savostjanov*³;
*Elena Kurchakova*⁴; *Dr. Maria Demenkova*⁵;
*Dr. med. Ljubov Albegova*⁵; *Dr. Anastasia Karlsen*⁶;
*Dr. med. Maria Shabaeva*⁷; *Ph.D. Valery Ilinsky*⁸;
*Dr. Anna Krasnenko*⁹; *Dr. Kirill Tsukanov*⁹; *Dr. Maxim Vonsky*¹⁰

¹ Rīga Stradiņš University, Department of Research, Latvia;

² Institute of Cytology, Russian Academy of Science;

³ City Clinical Oncological Dispensary, Russian Federation;

⁴ Institute of Cytology, Russian Academy of Science;

⁵ City Tuberculosis Hospital No 2, Russian Federation;

⁶ Gamaleya Research Center for Epidemiology and Microbiology, Russian Federation;

Medical Academy for Continuous Professional Education, Russian Federation;

⁷ First Pavlov State Medical University of St.-Petersburg, Russian Federation;

⁸ Genotek Ltd., Russian Federation;

Institute of Biomedical Chemistry, Russian Federation;

⁹ Genotek Ltd, Russian Federation;

¹⁰ Institute of Cytology, Russian Academy of Science

Objectives

High carcinogenic risk human papillomaviruses (HPV) persistent in squamous cell cervical carcinoma in immunocompetent patients are well characterized. This information directed the design of the prophylactic anti-HPV vaccines included in the mandatory vaccination calendar in many countries around the world. Situation is different in the immunocompromised patients. Majority are infected with HPV 16 and 18, but harbor also other high cancerogenic risk HPV genotypes (HR HPV), and also other ones, traditionally not considered as highly oncogenic. Furthermore, there is no sufficient information on the sequences of dominant HPV variants, specifically of HPV 16, circulating in these patients, their variability and possible divergence from the sequences of viruses circulating in the immunocompetent individuals. This information is crucial to guide the design of prophylactic, and potentially therapeutic HPV vaccines adapted to immunocompromised individuals, including HIV-1 infected women and men. Aim of this study was to explore distribution and diversity of HR HPV types present in squamous cell cervical carcinomas in HIV+ compared to HIV- women.

Methods

Study was approved by the ethical committee of the Gamaleya Research Center of Epidemiology and Microbiology (Moscow, Russia) (protocol 11, June 3, 2017). Included were samples from HIV-TB- (n = 10), HIV-TB+ (n = 8), HIV+TB- (n = 13) and HIV+TB+ (n = 9) patients from the collection of the City Clinical Oncology Dispensary (St. Petersburg, Russia). DNA was isolated from pathomorphologically verified FFPE samples of squamous cell cervical carcinomas using Allprep DNA/RNA FFPE Kit (Quagen). DNA of high carcinogenic risk HPV (types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58 and 59) was identified by four quadruplex real-time PCR with a β -globin gene as a control (Amplisens HPV HCR genotype-FL; Interlabservice, Russia). HPV DNA copy number was estimated by the difference of the threshold cycle value (Δ Ct) for the given HPV and control single-copy gene. Full genomic sequences of HPV16 were obtained by next generation sequencing was performed on Illumina HiSeq 2500 platform (Denature and Dilute Libraries for HiSeq Clustering, Illumina with Sequencing in Rapid Run Mode) with 100PE reads. Human reads were filtered out by mapping to hg19 human reference genome. Leftover reads were de novo assembled, and contigs were mapped via BLAST to viral reference genomes collection.

Results

In HIV-TB- samples, we detected HPV16 in 8/10 samples, in 75% (6/8) as mono-infection, and HPV33 and 18, in 2/10 cases, in 50% (1/2) as mono-infections. In HIV-TB+ samples, HPV16 was present in 75% (6/8), HPV31 in 62.5% (5/8), HPV 18, 33 and 35, in 37.5% (3/8) and HPV 39 and 52, in 12.5% (1/8 cases). 100% samples were infected with multiple HPV types: 2 in 37.5%, 3 in 50% and 4 in 12.5% cases. HPV16 was present in 75% and was dominant in 83% (5/6) cases of co-infections. In HIV-TB+ samples (n = 13), predominant HPV strain was HPV16 (85% cases; 11/13). HPV18 was present in 31% (4/13), HPV33 in 8% (1/13) and HPV39 in 16% cases (2/13). Eight tumors (61%) were infected with one HPV type, of this, 75% (46% of total, 6/13) were cases of HPV16 mono-infection. Other mono-infections were rare. Five HIV-TB+ tumors were co-infected with two HPV types, HPV18 was present in 60%, HPV33 and 39, in 20% co-infections each. Although HPV16 was present in 100%, it dominated only in 20% (1/5) cases, i.e. in significantly lower % than for HIV-TB+ individuals (p = 0.03) indicating certain diminishment of the role of HPV16 in HPV-driven carcinogenesis in HIV-infected individuals. In tumors from HIV+TB+ individuals (n = 9), we detected HPV16 (100%), 18 (33%), 31 (44%), 33 (55%), 35 (33%), 45 (11%), 52 (22%), 56 (33%) and 59 (11% cases). Most HIV-TB+ samples (78%, 7/9) were cases of co-infections with 2 (1/9), 3 (2/9), 4 (1/9), 5 (2/9) or 7 (1/9) HR HPV types. HPV16 was dominant in only 29% (2/7) cases of mixed HPV-infection in HIV+TB+-individuals resembling mono-HIV infection, altogether in 25% (3/12) of all HIV+-infected, which was significantly lower than in TB-mono-infection (p = 0.02). We performed NGS of HPV16 isolates present in tumors of 1 HIV-TB-, 2 HIV-TB+, 2 HIV+TB- and 1 HIV+TB+-infected individuals, and found high degree of conservation of their full genomic sequences.

Conclusions

Presence of HPV DNA was identified in squamous cells cervical carcinoma samples in all cases both in HIV+ and in HIV- individuals. HPV types 31, 33, 35, 39 and 52 were revealed only in tumor tissues of patients immunocompromised by HIV-infection. TB mono- and HIV/TB-co-infections resulted in further expansion of the spectrum of HPV types detected in cervical carcinomas (HPV 31, 33, 35, 39, 45, 52, 56 and 59), reflected also by increased frequency of mixed infections with HR HPV genotypes. Furthermore, HIV-1 infection affected the profile of HR HPV types present in tumor tissues diminishing the role of HPV16 in favor of other HR HPV types. Our results indicate the need for large-scale population-based study to refine the design of preventive and/or therapeutic anti-HPV vaccine for immunocompromised patients.

Modern State of Vaccine Development, DNA Vaccines

Dr. Maria Issagouliantis

*Rīga Stradiņš University, Latvia;
Karolinska Institutet, Sweden;
Gamaleya Research Center for Epidemiology and
Microbiology, Russian Federation*

Objectives

DNA is a rapidly developing vaccine platform for cancer, infectious and non-infectious diseases. The objective is to overview the progress in development of DNA vaccines against infectious diseases and cancer, and share experience in development and applications of experimental DNA vaccines.

Methods

Overview of methods used in design of DNA immunogens, their delivery, and approaches to screen the immune response induced by DNA immunization, evaluate its efficacy and prognose performance in human applications.

Results

Plasmids used as immunogens encode proteins to be further synthesized in vaccine recipients. DNAs are mainly synthetic, ensuring enhanced expression. Their introduction into the host induces antibody and cellular responses. The latter are often more pronounced, and mimic the events occurring in infection, especially viral. There are few distinct ways by which the vaccine antigen can be processed and presented, which determine the resulting immune response, and which can be manipulated. Routinely, the antigen synthesized within the host cell, is processed by proteasome, loaded onto, and presented in complex with MHC I molecules. Processing can be re-routed to lysosome, or immunogen can be secreted to be further presented in complex with MHC II. We have tested both approaches, using a panel of signal for retargeting of processing, the best were signals from Lysosome Associated Membrane Protein I ensuring MHC class II presentation and induced of a mixed Th1/Th2 type of immune response. Apart from expression, vaccination efficacy depends on DNA delivery. DNA immunogens are generally administered by intramuscular or intradermal injections, usually followed by electroporation, which enhances delivery by 1000-fold.

In Vactrain project, we have accumulated vast experience in electroporation of plasmid DNA into rodents, and lately also non-human primates, with successful induction of specific immune response. Other techniques are also used as noninvasive introduction by Biojectors, skin applications with plasters and microneedles/chips, sonication, magnetofection, and even tattooing. An intense debate on the pros and cons of different routes of delivery is ongoing. A number of studies have compared the effect of delivery methods on the level of immunogen expression, and magnitude and specificity of the outcoming immune response. According to some, delivery route determines the immunogenic performance, according to others, it can modulate the level of response, but not its specificity or polarity. Our data obtained in Vactrain project supports the latter option.

Conclusions

Progress of research aiming at optimization of DNA vaccines design, delivery, and immunogenic performance led to marked increase in their efficacy in large species and man. New DNA vaccines to use in treatment of infectious diseases, cancer, allergies and autoimmunity are forthcoming.

Intercellular Adhesion Molecule-1, Macrophage Migration Inhibitory Factor and Plasminogen Activator Inhibitor-1 Relationship to Sepsis Clinical Severity

Dr. *Linda Bara*¹; Dr. med. *Jelena Eglite*²; Ph.D. *Peteris Oss*³; Dr. med. *Vinita Cauce*⁴;
Dr. med. *Sandra Gintere*⁵; Prof. *Ludmila Viksna*⁶; Prof. *Angelika Krumina*⁶

¹ Rīga Stradiņš University, Department of Family Medicine, Latvia;

² Rīga Stradiņš University, Joint Laboratory of Clinical Immunology and Immunogenetics, Latvia;

³ Pauls Stradiņš Clinical University Hospital, the Intensive Care Unit, Latvia

⁴ Rīga Stradiņš University, Department of Physics, Latvia;

⁵ Rīga Stradiņš University, Department of Family Medicine, Latvia;

⁶ Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia

Objectives

A biomarker is a characteristic by which a (patho)physiologic process can be identified. Biomarkers can be of diagnostic value to discriminate infection from noninfectious conditions or to determine the causative pathogen, of prognostic value (assigning risk profiles and predict outcome), and in the future may be aid in selection and monitoring of therapy.

Inflammatory mediators, cell adhesion molecules (intercellular adhesion molecule-1/ICAM-1), redox active substances macrophage migration inhibitory factor / MIF and plasminogen activator inhibitor-1 must be considered to be central hubs in the inflammatory process. However, their exact pathophysiologic function and prognostic value are still poorly understood.

The aim was to determine if serum levels of endothelial adhesion molecule-1, macrophage migration inhibitory factor and plasminogen activator inhibitor-1 were associated with the development of severe clinical course in adult patients with sepsis.

Methods

Blood samples from 80 septic patients were collected within 24 h after the time of sepsis diagnosis in intensive care unit and second time after 7 days (total 160 blood samples). In all patients we measured plasma levels of intercellular adhesion molecule-1 (ICAM-1) and macrophage migration inhibitory factor (MIF) and plasminogen activator inhibitor-1 (t PAI-1) using reagent kit - Merck Millipore, HCYTOMAG-60K-04. In the septic group, severity of illness was estimated using the quick Sequential Organ Failure Assessment (qSOFA) score.

A "positive" qSOFA Score (≥ 2) suggests high risk of poor outcome in patients with suspected infection. These patients should be more thoroughly assessed for evidence of organ dysfunction. The resulting study data were entered into an electronic database (Microsoft Excel 2010) and evaluated using SPSS software.

Results

The study included 80 patients, of which 49 (61.3%) died. All sepsis patients $n = 80$ (100%) within 7 days of hospitalization in intensive care unit, statistically significant increase in score after quick SOFA scale, $p = 0.002$.

A relationship was observed between the qSOFA scale on day 1 and the biomarker t PAI-1, correlation coefficient was $r = 0.572$, $p < 0.001$ as well as day 7 $r = 0.360$, $p = 0.001$. However, there was no statistically significant relationship between the MIF and qSOFA scales, ie, day 1 $r = 0.131$, $p = 0.246$, day 7 $r = 0.122$, $p = 0.281$ and ICAM-1 1st sepsis diagnostic day was $r = 0.078$, $p = 0.492$, day 7 $r = 0.102$, $p = 0.368$. Sepsis patients showed ICAM-1 concentration on day 1 was Me 12245.347 (Q1 6228.500; Q3 33372.419) pg/ml, but on day 7 Me 11107.250 (Q1 4774.00; Q3 30356.503) pg/ml, $p = 0.022$. The statistician did not change the biomarkers MIF and PAI-1 significantly, on day 1 MIF was Me 93.266 (Q1 47.750; Q3 177.669) pg/ml, but on day 7 Me 99.004 (Q1 45.000; Q3 201.723) pg/ml, $p = 0.580$. PAI-1 concentration on day 1 was Me 5857.250 (Q1 3928.511; Q3 9589.500) pg/ml, on day 7 Me 6222.208 (Q1 4003.950; Q3 8553.728) pg/ml, $p = 0.337$.

Conclusions

High levels of serum t PAI-1 was associated with the development of severe clinical course (SOFA = 3) of sepsis patients. In 7 days in sepsis patients, blood serum concentrations of biomarker ICAM-1 increased, $p = 0.022$, what could be a significant biomarker for the evaluation of sepsis severity. There was no statistically significant relationship between sepsis clinical severity, dynamics, and biomarkers MIF and t PAI-1. However, the study would be important to continue and increase the number of patients included in the study that could change the statistical results.

Common Variable Immunodeficiency (CVID) in Latvia's Population

*Dr. med. Natalja Kurjane*¹; *Violeta Zubkova*²; *Dr. Inta Jaunalksne*³;
*Dr. med. Tatjana Prokofjeva*⁴; *Dr. Natalija Gerula*³; *Dr. Petra Krike*³;
*Prof. Inese Mihailova*⁵; *Dr. med. Viktorija Kenina*⁵

¹ *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvia

² *Rīga Stradiņš University, Latvia;*

³ *Pauls Stradiņš Clinical University Hospital, Latvia;*

⁴ *Children's Clinical University Hospital, Latvia;*

⁵ *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia*

Objectives

Common variable immunodeficiency (CVID) is the most common immunodeficiency in adults. CVID is a heterogeneous antibody deficiency syndrome. There are disorders of dysfunctional antibody production resulting from a disruption of B cell differentiation at different stages. Typically, patients present with recurrent bacterial infections of the respiratory and gastrointestinal tract. A subgroup of patients is characterized by autoimmune manifestations, lymphoproliferation and / or granulomatous inflammation. The aim of this study was to investigate the features of the clinical and immunological signs in CVID patients in Latvia.

Methods

Twenty three patients were diagnosed with CVID in Latvia according to the criteria of European Society of Immunodeficiency during the period from 1994 till 2018. Retrospective study was performed where were analysed immunological blood tests and clinical histories of these patients.

Results

Mean age of CVID diagnosis was 40 years \pm 24. Clinically, CVID patients have had recurrent infections such as bronchitis, pneumonia, pleurisy, bronchiectasis, asthma, purulent sinusitis, furunculosis, recurrent lymphadenitis. Also some of them had autoimmune diseases such as diabetes mellitus and celiac disease. 2 patients had lymphoproliferative disorders such as Hodgkin and Non-Hodgkin lymphoma. The laboratory tests showed hypogammaglobulinemia with the variable changes in cell immunity. IgA was performed in all cases and the mean IgA was $< 0,06$ (normal ranges 0.7-4.0 g/l), mean level of IgG was 1.2 (normal range is 7.0-16.0 g/l) and IgM - 0.1 (normal range 0.4-2.3 g/l).

Conclusions

CVID is primary immune deficiency, which is usually diagnosed in late stages. Timely diagnosed and timely given treatment with immunoglobulin replacement therapy can predict the development of the complications of this disease. Future investigations with the genetic testing methods in these patients can confirm more severe CVID associated with lymphoproliferative or autoimmune diseases.

Clinical Characteristics of Urosepsis Patients Treated in Intensive Care Unit

*Dr. Arvis Freimanis¹; Dr. Sanda Siliņa¹; Dr. Sandis Laizāns²;
Dr. Linards Rēdmanis¹; Prof. Vilnis Lietuvietis¹*

¹ Rīga East University Hospital, Urology and Oncologic Urology Clinic, Latvia;

² Rīga Stradiņš University, Latvia

Objectives

Urosepsis is a life-threatening situation accounting for up to 25% of all sepsis cases and is associated with a very high mortality risk. The characteristic of the patient profile and early active treatment is essential in the clinical setting.

Methods

The study analyzed retrospective data of patients that were admitted in the tertiary level intensive care unit (ICU) in Rīga East university hospital due to severe urosepsis from 2015–2017. The primary outcomes analyzed were the mortality rate, urinary tract obstruction and surgical interventions. Additionally, mortality risk factors and the microbiology and antibacterial usage was evaluated.

Results

The study analyzed data of 128 patients. The mean hospital stay was 14.719 days (from 1 to 40 days) and the mean ICU stay was 5.033 days (from 1 to 39 days).

All together 29 (22.7%) patients died. 55 (45.8%) patients were with urinary tract obstruction and 65 (50.8%) were without obstruction. Upper urinary tract obstruction was observed in 43 (33.6%) cases, and with the most common reason of urinary stones in 91%. Lower urinary tract obstruction was observed in 36 (28.2%) cases.

53.9% of all patients underwent urinary drainage procedures. Most common methods of urinary drainage were double-JJ placement in 19 (27.5%) cases, nephrostomy in 18 (26.0%) cases, urinary catheters in 11 (15.9%) cases and cystostomy in 10 (14.5%) cases. No significant difference regarding the primary outcome was observed between the two groups ($p = 0.255$).

The mean age was 71.352 years (from 21 to 95 years), 72 (56.3%) females and 56 (43.8%) male patients and there was a significant correlation between age and mortality ($P = 0.002$). As well as the severity and number of significant concomitant diseases were associated with a higher mortality. Regarding microbiology most common pathogens observed in the urine were *E. Coli* - *Enterococcus* sp. *Klebsiella* pn., *Proteus mirabilis*, *Staph. aureus*. Bacteremia was diagnosed in 60.4% of cases and the microbiological pattern was similar to urine microbiology. No correlation between bacteremia and lethal outcome was observed. The most common resistance was observed to Ampicillin 43.8%, Ciprofloxacin 25.8%, Amoxicillin / Clavulanic acid 24.2%, Ceftriaxone 17.2%, Gentamycin 19%, Piperacillin / tazobactam 14.2%. ESBL was diagnosed in 16 cases. All together in 47.7% (61 cases) resistance to at least one antibacterial agent was found. Most used primary antibiotics used are Ceftriaxone 43.8%, Piperacillin / Tazobactam 27.3%, Ciprofloxacin 14.8%, Meronem 4.7%, Amoxicillin / Clavulanic acid 2.3% and Imipenem / Cilastatin 3.1%.

Conclusions

Urosepsis is a serious and life-threatening condition with a high mortality risk, especial in those with older age and severe and multiple co-morbidities. With early, aggressive and source-oriented treatment there is no significant difference between obstructive and nonobstructive UTI.

Drug resistance bacteria are common, and the antibacterial treatment should be in accordance of local resistance patterns.

Comparison of Knowledge, Action and Alert Level of Parents when Their Children Experience ARVI within Different GP Practices in Different Regions in Latvia

Maija Latkovska; Dace Raudive; Dana Semjonova

Rīga Stradiņš University, Faculty of Continuing Education, Latvia

Objectives

1. Compare parents knowledge, action and alert level in case of ARVI in their children in different regions of Latvia, considering age of parents, education, number of children in their family, age of children, distance to the nearest children's hospital, and co-morbidity of their children.
2. To identify the factors that influence parents' behavior when their children is ill with ARVI.
3. Determine parental satisfaction with the availability of family doctor, hospital emergency department and with available information about ARVI.

Methods

Surveys were conducted in 3 different family doctor practices, one located in the center of Riga, second – in the suburbs of Riga, and the third in the rural area of Skulte.

Results

It was concluded that the level of knowledge for parents about ARVI in children in different regions of Latvia is relatively similar, the level of knowledge for parents with more than 1 child is higher than for parents with only 1 child, while the level of alert decreases with the increase of the number of children in the family, and with the age of parents. It were obtained that the level of alert increases for parents whose children have other illnesses. Parents most often went to see family doctor in the first and second day of illness.

Conclusions

There is a need for more information for parents with the correct action in case of ARVI, and it can be concluded that the availability of information is insufficient and parents often feel powerless in case of ARVI in their children.

Disease Register for Myalgic Encephalomyelitis / Chronic Fatigue Syndrome as an Opportunity to Encourage Integrated Care of Patients

*Diāna Arāja*¹; *Elenka Brenna*²; *Derek Pheby*³;
*Uldis Berķis*⁴; *Asja Lunga*¹; Prof. *Modra Murovska*¹

¹ Rīga Stradiņš University, Latvia;

² Università Cattolica del Sacro Cuore, Italy;

³ Buckinghamshire New University, United Kingdom;

⁴ Ministry of Education and Science, Department of Higher Education, Science and Innovation, Latvia

Objectives

Research is performed in framework of COST (European Cooperation in Science and Technology) Action 15111 EUROMENE (European Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) Research Network) to investigate the role of a disease register in integrated care of ME/CFS patients.

Methods

To achieve the objectives of this research, the methods of theoretical (literature review) and empirical research (quantitative and qualitative approach) are used. For data processing and analysis, the methods of economic analysis and statistical analysis are embraced.

Results

ME/CFS is a serious, complex, multi-system disorder, which requests an interdisciplinary approach for diagnostic and integrated care. The results of literature review performed by Italian colleagues in scope of EUROMENE show that the increased awareness of the social and economic burden of ME/CFS has driven to search for new ways of managing the condition. With reference to the most appropriate level of care, recent evidence converges in valuing the effectiveness of treating patients within primary care, with integrated care elements. However, permanent problems occur by the differences in case definitions, recognition the existence of ME/CFS by specialists, and unclear taxonomy provided by ICD (International Classification of Diseases) codes for ME/CFS. In Latvia the patient-related data are dispersed between categories of G93.3, R53 and B94.8 of ICD, so the epidemiological data show the considerably higher prevalence of ME/CFS than found in other comparable populations, therefore the disease register would be required for disease management. A Disease Register pilot study carried out in United Kingdom has validated the methods used to set it up and has provided the basis for a range of initiatives to develop the evidence base needed to understand causes, clinical interventions and access to social support needed to address this challenging disease.

Conclusions

ME/CFS is a complex condition, and a well-maintained disease register is a prerequisite to providing comprehensive and coordinated care of patients.

Viruses and Oncology: Epstein–Barr virus – Oncogenic Virus

*Ph.D. Irina Holodnuka*¹; *Ph.D. Svetlana Kozireva*¹;
*Ph.D. Ainars Leonciks*²; *Ph.D. Elena Kashuba*³

¹ *Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia;*

² *Latvian Biomedical Research and Study Center;*

³ *Karolinska Institutet, Department of Microbiology, Tumor and Cell Biology, Sweden*

Objectives

Epstein-Barr virus (EBV), a double-stranded DNA gamma-1 herpes virus (human herpes virus 4), is associated with various types of T cell, B cell, mesenchymal and epithelial cell malignancies. In spite of that, EBV is a ubiquitous virus – more than 90% of the humans carry the virus. EBV infects B lymphocytes and transforms them into lymphoblasts that express the latency III EBV-gene complex. These lymphoblasts are highly immunogenic to the primed immune system and are targeted by cytotoxic immune cells. In immunocompetent hosts, the EBV-infected lymphoblasts are rapidly eliminated, but the virus is not cleared. It persists in an episomal and virus antigen-negative form of latency (latency 0). EBV establishes an asymptomatic lifelong latent infection and continues to reactivate and replicate.

Methods

B cells were isolated from buffy coat of 3 healthy donors (Karolinska Hospital, Stockholm, Sweden) and infected with EBV strain B95-8. BL cell lines (n = 10) were from the cell line collection at MTC, Karolinska Institute (Stockholm).

Results

We have shown that EBV infection of ex vivo peripheral blood (PB) B cells up-regulates the chemokine receptors CCR1 and CCR2B during the establishment of the EBV latency III program. On the contrary, in the Burkitt lymphoma (BL) cell lines, EBV-negative and EBV latency I positive, the CCR1 and CCR2 proteins as well as their ORF-transcripts were not detected.

Conclusions

We suggest that CCR1 and CCR2B are involved in elimination of the EBV-infected latency III B cells in immunocompetent individuals by attracting the chemokine-ligands expressing cytotoxic immune cells. We also assume that the lack of CCR1 and CCR2 on Burkitt lymphoma cells contributes to the evasion of these malignant B cells from the host immune response.

This study was supported by the Latvian Council of Science research grant No. 651/2014 and the visit grants from the Baltinfect project (EU Grant agreement No. 31627) at Rīga Stradiņš University.

Cognitive Impairment in Tick-Borne Encephalitis Patients Regarding Montreal Cognitive Assessment (MoCA) Scale

*Evija Gūtmane; Dr. Zane Anna Litauniece;
Līga Mekša; Prof. Guntis Karelis*

*Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;
Rīga East University Hospital, Latvia*

Objectives

The main objective is to find out the effect of TBE on the cognitive function of the patient in the acute stage of the disease.

Methods

This is a prospective study involving adult patients with diagnosed (clinical and laboratory) TBE virus in Riga and other regions of Latvia during following time period – 01.01.2018–31.12.2018. All patients were evaluated for cognitive function following the MoCA scale.

Results

The study included 36 patients with acute TBE – 21 male and 15 female. The average age of patients was 55.69 (SD 12.44). From all patients 72.2% (n = 26) were under 60 years old. Considering the clinical forms of the disease, majority was meningitis 77.8% (n = 28). Other clinical forms were: meningoencephalitis 16.7% (n = 6) and meningoencephalomyelitis 5.6% (n = 2). The average score obtained in the MoCA test was 22.74 (SD 4.86). Overall, cognitive impairment was observed in 68.6% (n = 24) of all patients, of which mild cognitive impairment was in 91.6% (n = 22) of patients (scores of 18–26 / 30). In 2 patients scores reached mild dementia (11–17 / 30). Evaluating separately for the affected cognitive parameters, the average score in the “Visual spatial orientation” section was 3.03 (SD 1.59), “Naming” 2.86 (SD 0.35), “Attention” 4.74 (SD 1.40), “Language” 2.17 (SD 1.01), “Generalization” 1.66 (SD 0.59), “Memory recall” 2.29 (SD 1.87), “Orientation” 5.71 (SD 0.51). The most frequently affected parameters for patients were visual disturbance and recall memory, affecting a total of 65.7% (n = 23) patients (score < 4 in the relevant section).

Conclusions

Cognitive impairment is a relatively common symptom in patients with acute TBE-induced neurological disease with a potentially significant impact on the patient’s quality of life and functionality in daily activities such as work.

X-Linked Chronic Granulomatous Disease in Population of Latvia

*Dr. med. Tatjana Prokofjeva¹; Tatjana Sarajeva²;
Dr. med. Janis Krasts²; Dr. med. Ineta Grantina¹*

¹Children's Clinical University Hospital, Pediatric Clinic, Latvia;

²Children's Clinical University Hospital, Surgery Clinic, Latvia

Objectives

Chronic granulomatous disease (CGD) is an inherited primary immunodeficiency caused by functional impairment of the NADPH oxidase complex responsible for the respiratory burst in neutrophilic granulocytes and monocytes and characterized by recurrent and severe life-threatening infections with catalase-positive bacteria and fungi, dysregulated inflammation, and autoimmunity.

We demonstrate our experience in diagnostics, clinical manifestations, management and treatment patients with CGD.

Methods

Medical documentation analysis.

Results

We have 4 patients, males with X-CGD from 3 families in Latvia. The observation period was from 2 till 16 years. Age of diagnosis was 2.5 y - 2.10 y - 1.3 y - 1 mo (in sibling). 3 boys had onset of symptoms at birth (vesiculopustulosis, intrauterine infection, a thumb superficial felon) and 1 boy presented first symptoms at 5 mo (BCG-it). Among clinical features were recurrent suppurative lymphadenitis/lymphadenopathy (4 boys), multiple liver abscesses (2 boys), chronic paraproctitis (2 boys), pneumonias (4 boys) and others infections which required hospitalization in different departments. All patients had different mutations in CYBB gene. After diagnosis was made all boys received constant bisseptol (TMP/SMX) prophylaxis; antifungal prophylaxis received only in cases of infections. Rates of infections and hospitalisation needs decreased till one per 1-2 year. 3 boys were treated with HSCT at the age 12 y - 1 y 10 mo - 2 year old. Currently is 6 y 6 mo - 2 y 8 mo - 11 mo after HSCT. All patients are alive.

Conclusions

CGD can be diagnosed and treated by different specialists. We have to improve knowledge and recognitions of symptoms among surgeons, pulmonologists, infectious diseases specialist and pediatricians.

Regular TMP/SMX prophylaxis decrease rates of infections, improve quality of life and increase life expectancy of CGD patients. HSCT is only curative method.

Parvovirus B19, HHV-6 and HHV-7 Infection Markers in Synovial Fluid and Synovial Tissues of Patients with Rheumatoid Arthritis and Osteoarthritis

*Anda Kadiša*¹; *Zaiga Nora-Krūkle*²;
*Dr. med. Pēteris Studers*³; Prof., *Dr. habil. med. Valērija Groma*⁴;
Prof. *Aivars Lejnīeks*⁵; Prof. *Modra Murovska*²

¹ *Rīga Stradiņš University, Department of Internal Diseases, Latvia;
Riga East University Hospital, Latvia*

² *Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia;*

³ *Rīga Stradiņš University, Department of Orthopaedics, Latvia;*

⁴ *Rīga Stradiņš University, Institute of Anatomy and Anthropology,
Joint Laboratory of Electron Microscopy, Latvia;*

⁵ *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

Objectives

Rheumatoid arthritis (RA) and osteoarthritis (OA) are the most common chronic connective tissue diseases. Despite many long-term studies the precise triggering agent of RA is unknown. Persistent viral infections can contribute to the development of RA as well as to OA inflammation. The goal of this study was to examine the presence of HHV-6, HHV-7 and parvovirus B19 (B19V) infection markers in synovial fluid and synovial tissue of RA and (OA) patients.

Methods

6 synovial fluid and 7 synovial tissue samples from RA patients as well as 32 synovial fluid and 54 synovial tissue samples from OA patients were analyzed for the presence of viral genomic sequences using nPCR and for the presence of viral antigens using immunohistochemistry. For immunohistochemical reactions anti-HHV-6 monoclonal antibody raised against viral lysate, anti-HHV-7 raised against the tegument protein pp85 of HHV-7, and anti-parvovirus B19 NCL-PARVO monoclonal antibody raised against VP1/VP2 viral antigens were used.

Results

HHV-6 and/or HHV-7 genomic sequences were found in 5/6 RA patients and in 13/34 OA patients synovial fluid as well as in 4/7 RA and in 20/54 OA patients synovial tissues DNA samples. B19V sequence was detected in one RA and in 6 OA patients' synovial fluid, and in 3 RA and in 3 OA synovial tissue DNA samples. The more frequent concurrent HHV-6 and -7 genomic sequences were detected in synovial tissue DNA samples of RA patients compared with OA patients ($p = 0.0166$). In B19V PCR-positive RA and OA synovial tissue samples expression of B19V VP1/VP2 antigen, but in HHV-6 PCR-positive RA and OA synovial tissue samples expression of HHV-6 antigens was demonstrated.

Conclusions

Presence of HHV-6, HHV-7 and B19V infection markers in local inflammation site allows suggest these viruses as one of the etiopathogenic factors in RA and OA development.

Bacteriophage Treatment in Biofilm Associated Infections

*Dr. Kārlis Rācenis*¹; Prof. *Juta Kroiča*¹;
*Laima Mukāne*²; Dr. med. *Aivars Pētersons*³

¹ Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;

² Rīga Stradiņš University, Faculty of Pharmacy, Latvia;

³ Rīga Stradiņš University, Department of Internal Diseases, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia

Objectives

Over the last decades bacterial resistance is emerging, nevertheless other factors as bacterial biofilms strongly influence positive treatment outcome. To overcome these issues several strategies have been proposed, one such approach is bacteriophage (phage) therapy. We did detect phage and antimicrobial substance effect among established *E. coli* biofilms.

Methods

Two biofilm producing *E. coli* strains 021u with amoxicillin-clavulanate (AC) and 01206ur with fluoroquinolone (FQ) resistance isolated from patients with urinary tract infection (UTI) were used. Two commercially available phage cocktails with lytic *E. coli* phages Piobakteriofag (Mikrogen) and SES (ELIAVA) were used. To evaluate phage lytic activity spot test method was used. To combat phage resistance modified Appelmans' method was used. Biofilm growth detection and antimicrobial effect (MIC – minimum inhibitory concentration, MBEC – minimum biofilm eradication concentration) as well phage effect was determined using 96 well microtiter plates with peg lids.

Results

Both phage cocktails had lytic effect on 021u, lytic effect towards 01206ur strain after Piobakteriofag cocktail adaptation was achieved. 021u and 01206ur were both strong biofilm producers. No planktonic cell growth of 021u was detected using Piobakteriofag, however some growth was detected using SES on 021u and adapted Piobakteriofag on 01206ur. Nevertheless, after phage treatment on established biofilms bacterial growth was not detected. Using AC MBEC of 021u (MIC = 128 mg/l; MBEC > 1024 mg/l) and 01206ur (MIC = 8 mg/l; MBEC > 1024 mg/l) was > 8 and > 256 times greater than MIC, respectively. Using ciprofloxacin MBEC of 021u (MIC < 0.25 mg/l; MBEC = 32 mg/l) and 01206ur (MIC = 128 mg/l; MBEC > 1024 mg/l) was more than 128 and more than 8 times greater than MIC, respectively.

Conclusions

Both phages had biofilm eradicating effect. It was possible to overcome phage resistance with phage bacterium adaption. AC could not eradicate bacterial biofilms, ciprofloxacin showed biofilm eradicating properties in 021u, although the concentration was more than 128 times greater than MIC.

Current Trends in Foodborne Listeriosis

Prof. Aivars Bērziņš

Institute of Food Safety, Animal Health and Environment "BIOR", Latvia

Objectives

Listeriosis in humans is caused by *Listeria monocytogenes*. Foodborne listeriosis is an infection that does not result in a significant disease in healthy adults, but may occur as a severe infection in immunocompromised patients or during the pregnancy. The proportion of listeriosis cases due to foodborne transmission nowadays has been estimated to 99%. Listeriosis remain one of the most important foodborne infections in Europe.

The aim of this study was to investigate current trends in foodborne listeriosis in Europe with a focus on human listeriosis in Latvia.

Methods

Review on the current trends of foodborne listeriosis was carried out by scientific literature studies and available monitoring and surveillance data. Surveillance of human listeriosis in the EU is based on invasive forms of *L. monocytogenes* infection.

Results

The notification rate of human listeriosis has increased significantly over the last years in Europe. The number of case reports in the EU increased by 60% with a highest notification rate in 2015 (n = 2224) and highest fatality rate among foodborne infections in Europe. Often it is difficult to establish links between human cases and causative foods, however, it has been shown that WGS, when combined with epidemiological information, have the good potential to attribute relatedness among *L. monocytogenes* strains. Over the last 20 years, 159 cases of human listeriosis in were reported in Latvia, including several deaths. Until now, all cases were identified as sporadic and no single outbreak were confirmed in Latvia. However, significant increase of human listeriosis cases during years 2000 and 2018 may indicate that some listeriosis outbreaks may remain unidentified due to the lack of systematic subtyping or sequencing of clinical isolates on a routine basis.

Conclusions

Food chain surveillance data show that fish, meat, RTE products, and occasionally fresh produce can be a potential high-risk products for a susceptible population groups.

Adhesion and Colonisation of Microorganisms on Porous Ti2O and Ti2O-silver Biomaterials

*Ph.D. Ingus Skadins*¹; *Dr. Lana Micko*²;
*Dr. Liene Zvaigzne*³; *Prof. Juta Kroica*¹

¹ *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;*

² *Rīga Stradiņš University, Faculty of Dentistry, Latvia;*

³ *Rīga Stradiņš University, Faculty of Medicine, Latvia*

Objectives

Aim of this study is to compare the intensity of adhesion and colonisation of *S. epidermidis*, *P. aeruginosa* and *C. albicans* on porous Ti2O and Ti2OAg biomaterials.

Methods

A suspension of 102 CFU/ml of *S. epidermidis*, *P. aeruginosa* and *C. albicans* pure cultures under sterile conditions. Before in vitro tests biomaterial samples were weighed. The samples were incubated in suspension at 37 °C for 2 hours to determine the adhesion and 24 hours to determine the colonisation intensity. To remove the microorganisms attached to the surface of the biomaterial, samples were treated with a Vortex centrifuge for 1 minute and an ultrasound bath (45 kHz frequency) for 1 minute.

Results

S. epidermidis adhesion was $1.1 \pm \text{SD } 0.29$ CFU/0.01 g, but *P. aeruginosa* adhesion was $3.2 \pm \text{SD } 0.41$ CFU/0.01 g on TiO2 samples. *S. epidermidis* mean colonisation intensity was $21587 \pm \text{SD } 1892$ CFU/0.01 g on TiO2 samples and *P. aeruginosa* mean colonisation intensity was $39250 \pm \text{SD } 3254$ CFU/0.01 g, but *S. epidermidis* colonisation intensity on TiO2Ag samples was $9585 \pm \text{SD } 1892$ CFU/0.01 g and *P. aeruginosa* was $21000 \pm \text{SD } 3254$ CFU/0.01 g. The mean adhesion of *C. albicans* to TiO2 surface biomaterials was $0.074 \pm \text{SD } 0.11$ CFU/0.01 g, *C. albicans* to TiO2Ag surface was $0.19 \pm \text{SD } 0.26$ CFU/0.01 g. The mean colonisation of *C. albicans* on TiO2 was $1677.46 \pm \text{SD } 1265.55$ CFU/0.01 g, while the mean colonisation intensity on TiO2Ag samples was very similar – $1359.37 \pm \text{SD } 1530.85$ CFU/0.01 g.

Conclusions

The intensity of adhesion of *P. aeruginosa* is significantly higher than the adhesion of *S. epidermidis* to the surface of TiO2 ceramics. There is no remarkable difference between the intensity of colonisation of *P. aeruginosa* and *S. epidermidis* of the surface of TiO2 ceramics. The intensity of *S. epidermidis* and *P. aeruginosa* adhesion and colonisation of TiO2Ag biomaterials is lower than on TiO2 samples.

Unexpected Gram-Negative Peritonitis Associated with Previous Exit-Site Infection in Peritoneal Dialysis Patients

*Dr. Linda Štelce¹; Dr. Jevgeņijs Baroņenko¹; Dr. Ilze Puide²;
Dr. Georgijs Moisejevs³; Dr. med. Viktorija Kuzema²;
Ph.D. Inese Mihailova²; Prof. Aivars Pētersons²*

¹*Rīga Stradiņš University, Faculty of Continuing Education, Latvia;*
²*Pauls Stradiņš Clinical University Hospital, Nephrology Centre, Latvia;*
³*Rīga East University Hospital, Department of Nephrology and
Renal Replacement Therapy, Latvia*

Objectives

The aim of this study was to determine the risk of development of peritoneal dialysis (PD) related peritonitis caused by different microorganisms in patients with catheter associated infections.

Methods

In study from the 1st of January 2012 to the 11th of November 2017 212 PD patients from Pauls Stradiņš Clinical University Hospital Nephrology Centre were included where retrospective analysis was done, using PD registry data. Clinical data included previous PD catheter exit-site infections (ESI) and tunnel infection were compared between group with peritonitis and control group who had not PD-related peritonitis. Odds ratio (OR) for each factor was calculated using binary logistic regression, afterwards data adjustment was done (IBM SPSS 20.0).

Results

The study included 101 (47.9%) women, 110 men (52.1%). Median age in control group was 57.0 year, in peritonitis group – 64.0. 98 patients (46.4%) had peritonitis, 189 peritonitis episodes in total. The incidence of peritonitis was 0.495 episodes/patient-year. Gram-positive peritonitis, when compared to the control group, was associated with previous ESI 76.0% vs 42.5% ($p = 0.001$, OR = 3.516) and tunnel infection 13.5% vs 2.7% ($p = 0.034$, OR = 4.300).

Gram-negative peritonitis was associated with previous ESI 88.4% vs 42.5% ($p = 0.001$, OR = 9.605), but wasn't associated with tunnel infection 9.3 vs 2.7% ($p = 0.092$, OR = 3.761).

Culture-negative peritonitis tend to appear twice frequently in patients with previous ESI 61.8% vs 42.5% ($p = 0.078$, OR = 2.081) and tunnel infection 5.9% vs 2.7% ($p = 0.375$, OR = 2.292) with non-significant association.

Conclusions

Previous ESI increases the likelihood of developing both, Gram-positive and, surprisingly, also Gram-negative peritonitis. Tunnel infections are mostly associated with Gram-positive peritonitis. Culture-negative peritonitis wasn't associated with previous ESI and tunnel infection. Causative microorganisms of Gram-positive and Gram-negative peritonitis are different from causative microorganisms of previous ESI in most PD patients.

Further prospective research is needed to clarify the association of gram-negative peritonitis with PD catheter ESI.

Crusted Scabies: Case Report

Elza Salputra¹; Dr. med. Sanita Žigure²

¹ *Rīga Stradiņš University, Faculty of Continuing Education, Latvia;*

² *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia*

Objectives

The objectives of this clinical case report are to show the differential diagnoses for crusted scabies as well as to discuss possible risk factors for evolution of the disease.

Methods

A 10 yo girl presented to the ER with a subfebrile temperature of 37.5°C, extensive skin lesions, pruritus and a history of two kilogram weight loss in the three previous months. She had had an EBV infection and Streptococcal pharyngitis three months earlier. It is known from family history that the girl's father and grandfather suffered from psoriasis, which had been diagnosed in the patient as well two months earlier. On the physical exam the skin was extensively covered in multiple small, erythematous papules, excoriations, occasionally scales. The fingers, knees were covered in crusts. Nails were thickened and dystrophic. Crusted scabies was diagnosed clinically and local treatment as well as intravenous methylprednisolone was initiated. The lab work and chest X-ray were normal. The patient was discharged with some skin improvement.

Results

A differential diagnosis – plaque psoriasis –, was initially considered because of plaques in typical distribution, taking into account the previous diagnosis of psoriasis in the patient. No immunocompromised was found in the patient, however, the work-up was incomplete. The only risk factor we identified was social deprivation.

Conclusions

Although crusted scabies has a particular clinical picture with skin involvement the diagnosis might be difficult to reach especially in presence of confusing family and patient history. Crusted scabies is mainly associated with an immunocompromised state, particularly cellular immunity dysfunction, which wasn't clearly shown in this case.

Molecular Detection of Rickettsia in Ticks from Different Regions of Latvia

Marija Lazovska^{1,2}, *Agne Namiņa*²,
*Valentīna Čaplīgina*², *Dr. biol. Renāte Ranka*^{1,2}

¹*Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;*

²*Latvian Biomedical Research and Study Centre, Latvia*

Keywords: Rickettsia sp., tick-borne diseases, rickettsiosis, Latvia.

Objectives

Rickettsioses are emerging infections caused by Rickettsia sp. and transmitted by arthropod vectors worldwide. Most of Rickettsia species are defined as human pathogens, and can cause fever with myalgia and painful headaches; rash is also possible. In more severe cases CNS could be affected. In Europe, ticks are the main vectors of rickettsiosis, and for now in Latvia three epidemiologically-important tick species are present.

The aim was to identify Rickettsia sp. pathogens in ticks from various Latvian regions and to compare the prevalence of pathogens in different tick species.

Methods

In total, DNA was extracted from 2935 ticks collected from different Latvian regions in year 2017 and 2018. Rickettsia sp. positive samples were detected by PCR amplification of *gltA* gene; genotyping was performed by sequencing analysis. The obtained data were analysed.

Results

In total, 614 (21%) samples were Rickettsia-positive. Three Rickettsia species were detected: *R. helvetica*, *R. raoultii* and *R. monacensis*. The most abundant was *R. helvetica* (469 samples), and the rarest *R. monacensis* (3 samples). The prevalence of positive samples was different amongst Latvian regions, constituting from 0% to 40%, with lowest in the North, and highest in the West. All three species of ticks (*D. reticulatus*, *I. ricinus*, *I. persulcatus*) were found to be infected with Rickettsia, however, there was the difference between Rickettsia species. *R. raoultii* was more often detected in *D. reticulatus*, but *R. helvetica* in *I. ricinus* ($p = 0.0001$). *D. reticulatus* males were 2.5 times more frequently carrying *R. helvetica* than females ($p = 0.0074$). The high rate of infection was also observed in *I. ricinus* nymphs, almost 20% of them were Rickettsia-positive.

Conclusions

Rickettsia could be often found in Latvia, reaching 40% high prevalence rate in some Latvian regions. All three tick species are potential rickettsiosis transmitters.

Acknowledgments

This work was supported by the ERAF grant Nr. 1.1.1.1/16/A/044.

Association of Different Vaginal Flora Types with High Risk Human Papillomavirus Infection

*Olga Plisko*¹; *Dr. med. Jana Zodzika*¹;
*Dr. Irina Jermakova*²; *Prof. Dace Rezeberga*¹; *Prof. Juta Kroica*³;
*Lasma Eglite*⁴; *Inta Liepniece-Karele*²; *Dace Sivina*²;
*Diana Kunicina*²; *Ilva Senfelde*²

¹ Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;

² Riga East University Hospital, Latvia;

³ Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;

⁴ Institute of Food Safety, Animal Health and Environment "BIOR", Latvia

Objectives

Human papillomavirus (HPV) persistence may lead to development of the cervical intraepithelial neoplasia (CIN). Still factors affecting progression are not fully understood. Vaginal flora changes are associated with cervical precancerous lesions in some studies. The aim of the study was to analyze associations between vaginal flora types and high-risk HPV infection.

Methods

Study was performed in July 2016-June 2017. 109 consecutive patients aged 18 to 50 with abnormal cytology referred for colposcopy to Riga East University Hospital were included in the study group. 61 women who came for annual gynecological check-up with normal cervical cytology test were chosen as controls. Material from cervix and upper vaginal fornix was taken for testing high risk HPV types 16/18, 31, 33, 45, 58 using Real Time PCR method, and for wet mount microscopy. Colposcopy was performed and cervical biopsies were sent to histological analysis. Data analysis was performed with SPSS Statistic 23.0.

Results

In the study group 67 (61.5%) patients were HR HPV positive, in the control group – 4 (6.5%) women. In patients with high-grade lesions (CIN2+) HPV was found in 52/79 (65.8%) cases, that is significantly more often than in women with low grade lesions (CIN1) – 16/31 (51.6%) and in control group 4/61 (6.5%) ($p < 0.0001$). In CIN3+ patients 16/22 (72.7%) were HR HPV positive that is significantly more often compared with the control group ($p < 0.0001$).

Abnormal vaginal flora was observed in 26/52 (50%) cases of CIN 2+ HR HPV-positive patients and in 16/27 (59.3%) of HR HPV-negative CIN2+ women. In the control group abnormal flora was observed in 28/61 (45.9%) women. Differences between groups were not significant.

Conclusions

High-risk HPV types are more often found in case of high-grade cervical lesions. We were not able to find any vaginal flora differences between study and control groups.

Adaptation Procedure as a Method to Overcome Bacteriophage Resistance and Enhance Phage Lytic Activity against *Staphylococcus Aureus*

Dr. Dace Rezevska; Dr. Kārlis Rācenis; Prof. Juta Kroiča

Rīga Stradiņš University, Department of Biology and Microbiology, Latvia

Objectives

Increased antimicrobial resistance has become a major public health issue. It is of high importance to find an alternative to commonly used antimicrobials. Lytic bacteriophages (phages) are bacteria-specific viruses that can lyse or kill their hosts, having a potential for medical application. For this purpose it is crucial to make proper phage cocktails. Furthermore, to overcome phage resistance and to enhance lytic activity of phage cocktails adaptation procedure can be applied.

Methods

One *S.aureus* strain ATCC 15923 and seven commercial bacteriophage cocktails of Eliava (Staphylococcal, Pyo, Ses, Fersisi, Enko, Intesti) and Microgen (Pyobacteriophage) were used. For adaptation of bacteriophages modification of Appelmans' method was carried out. To determine phage titre of newly adapted cocktails plaque assay subsequently was performed. Comparison of lytic ability between original and adapted phages was accomplished by using a spot-test. A positive lytic effect was characterized as confluent lysis (+++), semi-confluent lysis (++) , overgrown lysis (+), individual plaques (+) and negative effect – as resistant or no lysis (-).

Results

Of seven phage cocktails before adaptation on *S.aureus*, all but one showed positive result, namely Pyo, Ses, Fersisi, Intesti, Pyobacteriophage as overgrown lysis (+) and Enko as individual plaques (+). Contrarily, Staphylococcal phage cocktail showed no lysis (-). The spot assays of adapted bacteriophage preparations displayed consistent improvement in lytic action. The results achieved by Staphylococcal, Ses, Fersisi, Intesti and Pyobacteriophage cocktails were classified as confluent lysis (+++), while by Pyo and Enko – as semi-confluent lysis (++) .

Conclusions

The study indicates that the adaptation procedure of seven commercial bacteriophage preparations notably improved lytic effect. Moreover, the resistance towards Staphylococcal phage cocktail was overcome. Nevertheless, there is a critical need to continue research on adaptation of bacteriophages on particular bacterial isolate, as by adaptation procedure there is a risk to narrow the spectrum of phage activity (host range).

Aeromonas spp. as One of the Causes for Bacterial Gastroenteritis in Paediatric Patients

*Irina Grāve*¹; *Dr. med. Aigars Reinis*²; *Dr. Reinis Rugājs*²

¹ *Children's Clinical University Hospital, Laboratory of Microbiology, Latvia;*

² *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia*

Objectives

Aeromonas spp. are gram-negative rods, which are isolated from water, animals and food products. Four species are considered to be important in aetiology for human disease: *A. hydrophila*, *A. veronii*, *A. caviae* and *A. dhakensis*. They are responsible for causing acute and prolonged diarrhea, skin, soft tissue and wound infections, peritonitis, pneumonias and severe bacteraemia. Risk groups for developing those infections are kids under age of five, elderly patients and immunocompromised patients. Even though *Aeromonas* spp. are scientifically proven to be important in pediatric practice, the research in Latvia is not wide.

The aim of the research was to investigate stool samples of kids with a diagnose – gastroenteritis and colitis with unidentified cause, and to find presence of *Aeromonas* spp.

Methods

2500 stool samples from patients between 0 to 16 years old were analysed in period from 04.2017 till 01.2019. Samples were applied on Biolife CIN agar plates and incubated in aerobic conditions for 48 hours in 25°C. Colonies were identified with Bruker Maldi-TOF.

Results

Aeromonas spp. (*A. caviae* and *A. hydrophila*) were identified in 42 stool samples. Also four *A. veronii* were isolated from different type of clinical material. In 30 out of 42 stool samples *Aeromonas* spp. was the only positive finding, but in the rest of the samples it was combined with other pathogens.

All patients with a positive result were in age between one month and 9 years old, 67% of kids were less than one year old.

Conclusions

There are still different opinions worldwide about including *Aeromonas* spp. in routine diagnostics, but, relying on clinical data and results of our patients, which is statistically similar to other EU countries (positive in 2–6% cases), *Aeromonas* spp. has an important role in pediatric practice. Isolation of *Aeromonas* spp. from clinical samples has a seasonality – increase of cases have been observed in Octobers.

Evaluation of Factors that Correlate with Disease Outcomes in Patients with Pneumonia in Pauls Stradiņš Clinical University Hospital

*Diana Ergle*¹; *Dr. med. Dace Zentiņa*¹; *Dr. med. Anna Salina*²

¹ *Pauls Stradiņš Clinical University Hospital, Department of Internal Medicine, Latvia; Rīga Stradiņš University, Latvia;*

² *Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

To identify factors that correlate with clinical outcomes and can be used as prognostic tools to assess the severity of disease.

Methods

Retrospective, monocentric, observational study. 51 patients with confirmed pneumonia diagnosis treated in Department of Pulmonology over time period from January till March of 2018 were included in the study. Risk factors of pneumonia and factors that correlate with severity of disease and outcomes were identified and analysed.

Results

From all patients 45.1% (23/51) were immunocompromised. Median of hospital days was 10 [7;15]. 23.5% (12/51) patients were admitted to Intensive care unit (ICU) and overall mortality was 11.8% (6/51).

Average risk factor count was 3.86 (\pm 2.27). Most frequent risk factors were older age (> 65) in 71% (36/51) cases, medications in 30% (15/51), immunosuppression (other than medications) in 43% (22/51), chronic diseases 39% (29/51). Mean laboratory results were: CRP 156.37 (\pm 110.35) mg/l, leucocyte count 12.84 (\pm 6.62) $\times 10^3$ /ml, procalcitonin 2.57 (\pm 7.02) ng/ml, sodium level 136.62 (\pm 5.41) mmol/l, fibrinogen 6 (\pm 2.37) g/l, urea 7.21 (\pm 2.70) mmol/l.

Patients with the level of procalcitonin \geq 0.5 ng/ml were statistically significantly more hospitalized in ICU 39% (9/23) compared to group with procalcitonin < 0.5 ng/ml, 12% (3/25), $p = 0.046$, but the difference in mortality in these two groups was not statistically significant 13% (3/23) vs 8% (2/25) $p = 0.66$ respectively.

There was no statistically significant correlation of other laboratory values (mentioned above), BMI, proteinuria, number of risk factors and outcomes.

Conclusions

The study population was older age with many co-morbidities. Many factors correlated with disease outcomes, but only procalcitonin showed statistically significant correlation.

Human Herpesviruses – Biology, Epidemiology and Disease Association

Prof. *Roberta Rizzo*

University of Ferrara, Italy

Of the more than 100 known herpesviruses, 8 routinely infect only humans: α herpesviruses (herpes simplex virus types 1 and 2, varicella-zoster virus), β herpesviruses (cytomegalovirus, human herpesvirus 6 (variants A and B), human herpesvirus 7), and γ herpesviruses (Epstein-Barr virus, Kaposi's sarcoma virus or human herpesvirus 8). Herpesviruses have a unique four-layered structure: a core containing the large, double-stranded DNA genome is enclosed by an icosahedral capsid which is composed of capsomers. The capsid is surrounded by an amorphous protein coat called the tegument. It is encased in a glycoprotein-bearing lipid bilayer envelope. Herpesviruses are among the most successful human pathogens. In healthy individuals, primary infection is most often inapparent. After primary infection, the virus becomes latent in ganglia or blood mononuclear cells. Each herpesvirus has evolved its own unique ecological niche within the host that allows the maintenance of latency over the life of the individual (e.g. the adaptation to specific cell types in establishing latent infection and the mechanisms, including expression of different sets of genes, by which the virus remains latent). Neurotropic α herpesviruses become latent in dorsal root ganglia and reactivate to produce epidermal ulceration, either localized (herpes simplex types 1 and 2) or spread over several dermatomes (varicella-zoster virus). Human cytomegalovirus, the prototype β herpesvirus, establishes latency in bone marrow-derived myeloid progenitor cells. Reactivation of latent virus is especially serious in transplant recipients and AIDS patients. Lymphotropic γ herpesviruses (Epstein-Barr virus) reside latently in resting B cells and reactivate to produce various neurologic complications. This review will describe the biology, epidemiology and disease association of the human herpesviruses.

Clinical Impact and Epidemiology of Emerging Human Parvoviruses

Ph.D. Maria Söderlund-Venermo

University of Helsinki, Department of Virology, Finland

Modern sequencing methods have revealed an expanding range of novel human parvoviruses. In 2005, parvovirus 4 (PARV4) was discovered in blood, and human bocavirus 1 (HBoV1) in pediatric respiratory samples. PARV4 is, in the western world, mainly detected in injecting drug users and hemophiliacs, but has not been associated with any specific symptoms, whereas HBoV1 causes mild to life-threatening respiratory tract infections in children. Three more bocaviruses (HBoV2-4) were discovered in stools, without clear clinical associations. Bufavirus (BuV), discovered in 2012, was the first human parvovirus in the Protoparvovirus genus followed by two other novel viruses, tusavirus (TuV) in 2014 and cutavirus (CuV) in 2016. These three protoparvoviruses were all originally discovered in feces of diarrheic children, and BuV has been associated with gastrointestinal symptoms. CuV was additionally observed in 4 cutaneous T cell lymphoma (CTCL) skin lesions and in one melanoma. Our research group develops a complete repertoire of methods for detection and accurate diagnosis of infections by these emerging viruses, providing insight into virus occurrence and epidemiology, as well as data of disease associations and clinical impact.

Earlier Initiation of Antiretroviral Treatment Coincides with Initial Control of HIV-1 Sub-Subtype F1 Outbreak among Men-Having-Sex-With-Men in Flanders, Belgium

Prof. *Kristel Van Laethem*

*Laboratory of Clinical and Epidemiological Virology, Rega Institute,
Department of Microbiology and Immunology, Belgium*

HIV-1 non-B subtype infections occurred in Belgium since the 1980s, mainly amongst migrants and heterosexuals, whereas subtype B predominated in men-having-sex-with-men. In the last decade, the diagnosis of F1 sub-subtype in particular has increased substantially, which prompted us to perform a detailed reconstruction of its epidemiological history. The Belgian AIDS Reference Laboratories collected HIV-1 pol sequences from all sub-subtype F1-infected patients for whom genotypic drug resistance testing was requested as part of routine clinical follow-up. This data was complemented with HIV-1 pol sequences from countries with a high burden of F1 infections or a potential role in the global origin of sub-subtype F1. The molecular epidemiology of the Belgian subtype F1 epidemic was investigated using Bayesian phylogenetic inference and transmission dynamics were characterized based on birth-death models. F1 sequences were retained from 297 patients diagnosed and linked to care in Belgium between 1988 and 2015. Phylogenetic inference indicated that among the 297 Belgian F1 sequences, 191 belonged to a monophyletic group that mainly contained sequences from people likely infected in Belgium, diagnosed in Flanders at a recent stage of infection and declared to be MSM. Together with a Spanish clade, this Belgian clade was embedded in the genetic diversity of Brazilian subtype F1 strains and most probably emerged after one or only a few migration events from Brazil to the European continent before 2002. The origin of the Belgian outbreak was dated back to 2002 and birth-death models suggested that its extensive growth had been controlled by 2012, coinciding with a time period where delay in antiretroviral treatment initiation substantially declined. In conclusion, phylogenetic reconstruction of the Belgian HIV-1 sub-subtype F1 epidemic illustrates the introduction and substantial dissemination of viral strains in a geographically restricted risk group that was most likely controlled by effective treatment as prevention.

Molecular Studies of Tuberculosis in Latvia

*Dr. Renāte Ranka*¹; *Ilva Pole*²; *Ph.D. Inta Jansone*³;
*Prof. Iveta Ozere*⁴; *Ph.D. Anda Nodieva*⁴; *Girts Skenders*⁵;
*Vija Riekstina*⁵; *Dr. Inga Norvaisa*⁵

¹ *Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;
Latvian Biomedical Research and Study Centre;*

² *Rīga East University Hospital, Centre of Tuberculosis and Lung Diseases, Latvia;
Latvian Biomedical Research and Study Centre;*

³ *Latvian Biomedical Research and Study Centre;*

⁴ *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Rīga East University Hospital, Centre of Tuberculosis and Lung Diseases, Latvia;*

⁵ *Rīga East University Hospital, Centre of Tuberculosis and Lung Diseases, Latvia*

Objectives

The incidence of tuberculosis (TB) has steadily declined in Latvia since year 2001; a rate of 24.6 cases per 100,000 persons was reported in 2017 (data from The Centre for Disease Prevention and Control of Latvia). However, Latvia is still among the high MDR-TB-burden countries, as 8% of all new TB patients were infected with MDR/XDR TB strains in year 2017. The aim of the study was to apply molecular genotyping techniques both in clinical studies and in the epidemiological investigations in order to describe and characterize pathogen's population structure in Latvia.

Methods

Spoligotyping was used to all *M. tuberculosis* isolates as a primary typing tool to define the major lineages following by MIRU-VNTR genotyping. In addition, IS6110 RFLP and Next Generation Sequencing (NGS) were applied to analyse the possible epidemiological links between patients.

Results

The results have shown that in Riga and Riga region the majority of *M. tuberculosis* isolates belonged to the Beijing, LAM and T spoligotype lineages. The pattern of the prevalence of different spoligotypes was similar to those observed in neighbouring countries. The proportion of Beijing isolates gradually decreased along the axis from Russia towards Scandinavia and Central Europe. The high diversity of strains circulating in Latvia was observed. The epidemiological relationship between clinical isolates were confirmed for numerous local outbreaks.

Conclusions

A high proportion of Beijing and LAM isolates is alarming, as these genotypes have been associated with remarkable pathogenic features such as drug resistance and increased transmissibility. In-depth NGS analysis of isolates has shown to be useful for in order to investigate the transmission dynamics of *M. tuberculosis* strains and to provide additional information of drug resistance mutations.

This study was supported by the Latvian National Research program VPP "BIOMEDICINE".

Systemic Treatment for Tinea Capitis

Dr. Eliza Salijuma¹; Dr. med. Sanita Zigure²

¹ Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

² Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia

Objectives

Tinea capitis is a fungal infection of the scalp. Mostly found in pediatric population. The most common causative agents belong to Trichophyton and Microsporum species. As the roots of hair follicles are infected and topical medicaments cannot penetrate that deep, systemic treatment is always required. The aim of this study was to find out the most recommended systemic treatment for tinea capitis.

Methods

To find out the efficacy of oral systemic antifungals for the treatment of tinea capitis, search of recent publications using PubMed database was performed.

Results

According to Chen X, et al. (2016) study which included analysis of 25 randomized controlled trials (4449 participants) griseofulvin was superior to terbinafine when infection was caused by Microsporum species, but terbinafine was better than griseofulvin for curing *T. tonsurans* infection. For coexisting Microsporum and Trichophyton infection none of the antifungal drug were superior to other. Tey HL, et al. (2011) study (included seven studies and 2163 participants) confirms that terbinafine was preferable for Trichophyton infections whereas griseofulvin for Microsporum infections. Nenoff P., et al. (2015) also reports that Microsporum infections of the scalp are more preferable treated with griseofulvin and terbinafine is less effective. Itraconazole and fluconazole are alternative treatment options for tinea capitis caused by both Microsporum and Trichophyton species (P., et al. (2015), Chen X, et al. (2016)).

Conclusions

The gained information confirms the importance of performing fungal culture before starting antifungal treatment. It is recommended to choose targeted species - specific systemic therapy for tinea capitis treatment. First choice for Microsporum should be griseofulvin, but for Trichophyton - terbinafine. Microsporum is common causative agent of tinea capitis in pediatric population of Latvia. Purchasing options for griseofulvin are limited because it is not included in Medicinal Product Register of Latvia.

Microbiological and Treatment Considerations in Patients with Pyogenic Liver Abscesses

*Iļja Drjagunovs*¹; *Dr. Sniedze Laivacuma*²; Prof. *Indra Zeltiņa*²;
Prof. *Aleksejs Derovs*²; Prof. *Angelika Krūmiņa*²

¹ *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

² *Rīga Stradiņš University, Latvia;*

Rīga East University Hospital, Gaīļezers, Latvia

Objectives

Pyogenic liver abscess (PLA) is a well-described disease in the medical literature; however, information about its characteristics in Latvia is lacking. We evaluated the microbiological distribution and corresponding antimicrobial resistance patterns of PLA, as well as treatment modalities used.

Methods

Medical records of PLA cases registered in Rīga East University Hospital clinical centre “Gaīļezers” from January 2012 to October 2018 were retrospectively reviewed. Statistical data was processed by IBM SPSS Statistics v23.

Results

Out of total 95, including 5 recurrent, cases 52.6% (N = 50) were men, mean age = 61.2 ± 15.3, range 29–95 years, and 47.4% (N = 45) were women, mean age = 68.2 ± 15.9, range 27–94 years, with a statistically significant difference in gender mean age (t (93) = -2.2, p = 0.03). Infectious agents were isolated from PLA in 65.3% (N = 62), of which 65.7% (N = 42) were monomicrobial. Most common isolates identified were *K. pneumoniae*, 40.3% (N = 25), naturally resistant to ampicillin, and *E. coli*, 22.6% (N = 14), typically sensitive. Multidrug resistant strains were isolated in 9 cases, specifically extended spectrum β-lactamases producing *K. pneumoniae* and/or *E. coli* in 4 cases, AmpC producing *Citrobacter* sp. in 2 cases and *Enterococcus* sp. in 3 cases.

In 35.5% (N = 33) ceftriaxone and metronidazole was used as the principal antimicrobial combination at hospital. Mean duration of antimicrobial treatment at hospital was 12.8 ± 5.4 days, while overall median expected duration of antimicrobial treatment was 15 days (IQR, 11–23). PLA drainage was performed in 87.4% (N = 83) for the median duration of 7 days (IQR, 6–10.75). In 86.3% (N = 82) both approaches were combined.

Conclusions

Our study indicates slight male predominance with peak PLA incidence in elderly patients. *K. pneumoniae* and *E. coli* were the most common isolates, accounting for more than half of all microbiologically confirmed cases. Although the mainstay of treatment was the combination of broad-spectrum antimicrobials and PLA drainage, the duration of antimicrobial treatment was insufficient.

Prevalence and Characteristics of Hepatitis C in Patients with Chronic Kidney Disease

*Dr. Anna Proskurina*¹; *Dr. med. Viktorija Kuzema*²;
*Dr. Anna Popova*³; *Dr. Pauls Aldiņš*⁴; *Dr. Klīta Gritāne*⁵;
*Dr. med. Ieva Ziediņa*²; *Dr. med. Ināra Ādamsons*²;
*Dr. Ilze Puiķe*²; Prof. *Aivars Pētersons*²

¹ *Pauls Stradiņš Clinical University Hospital, Latvia;*

² *Rīga Stradiņš University, Latvia;*

Pauls Stradiņš Clinical University Hospital, Nephrology Centre, Latvia;

³ *University of Latvia;*

Pauls Stradiņš Clinical University Hospital, Nephrology Centre, Latvia;

⁴ *Pauls Stradiņš Clinical University Hospital, Latvia;*

Rīga Stradiņš University;

⁵ *Rīga East University Hospital, Latvia*

Objectives

There are an estimated 40.000 people with chronic hepatitis C in Latvia. Patients with hepatitis and renal impairment are a heterogeneous group that includes patients with virus-related kidney damage and other causes of chronic kidney disease (CKD), as well as kidney transplant and dialysis. The objective was to study and obtain characteristics of chronic hepatitis C in patients with CKD.

Methods

A retrospective study was conducted at Pauls Stradiņš Clinical University Hospital Department of Nephrology. Data from the Outpatient Clinic, Hemodialysis and Peritoneal Dialysis Departments from January 2012 to August 2018 were analyzed and patients with chronic hepatitis C identified (n = 69). Additional demographic, clinical and laboratory data were obtained from hospital systems "Ārstu birojs" and "Dialab" and archived patient records. Data was statistically analyzed.

Results

Sixty-nine (2.1% of total 3189 analyzed) CKD patients with hepatitis C were identified (female 54%). Mean age was 55.9 ± 12.9 years. Extrahepatic manifestations of hepatitis C were identified in 10 (14.5%) cases: cryoglobulinaemia, membranoproliferative glomerulonephritis, porphyria cutanea tarda, non-Hodgkin's lymphoma. Hepatitis C prevalence among 137 patients on dialysis was 22.6%. Twenty-eight (40.6%) patients were treated for hepatitis C, 24 (34.8%) were cured from the infection. In those treated with direct-acting antiviral drugs (DAAs), sustained virological response was achieved in 100% of cases, including patients on dialysis and after kidney transplantation. Ten (14.5%) patients died, mostly of infectious and cardiovascular events.

Conclusions

The prevalence of hepatitis C in patients with CKD is similar to that in general Latvian population. The prevalence of HCV among dialysis patients is higher than described in literature. Even though treatment with DAAs is highly effective in CKD patients, the availability of antiviral therapy is insufficient in Latvia. Patients with hepatitis C should be screened for extrarenal manifestations.

Targeting Microbiota in 21st Century: What Do We Know about It?

Prof. *Aleksejs Derovs*

*Rīga Stradiņš University, Department of Internal Diseases, Latvia;
Rīga East University Hospital, Gaīļezers, Latvia*

Microbiota of our gastrointestinal tract is a huge community of different microorganisms that contribute to a variety of local and systemic effects vital to human living and well-being. Most of the bacteria in the gut are found in the colon. Many basic science and clinical trials over the past decades showed, that the microbiota has many complex effects on different organ systems in the body, highlighting its link to the physiology and pathophysiology. Furthermore gut dysbiosis, meaning impairment in the composition and diversity of microbiota, has been described in different animals and clinical models pointing on its casual role in the development of different diseases. Many therapeutic options have been provided to fight against dysbiosis and impact diversity of microbiota strains in case of different diseases. However to the best of our knowledge, only few of them showed somehow efficacy in clinical studies, i.e. certain probiotic strains and fecal microbiota transplantation. Studies have shown that probiotics (using certain bacteria), could be useful in diarrheal diseases (i.e. antibiotic-associated diarrhea), functional bowel disorders, and even in case of ulcerative colitis. Fecal microbiota transplantation (FMT) means the administration of fecal substrate (commonly solution) from a healthy donor into the gut of recipient to normalize the microbiome. Multiple studies have shown FMT efficacy especially in patients with recurrent *Clostridium difficile* infection. Several studies promising, that FMT could be a potential option to treat functional bowel disorders as well. In conclusion, the restoration of composition and diversity of healthy gut microbiota holds promise, that indications for probiotics and FMT in future will be much more broader.

Role of Oxidative Stress in Patients with Community-Acquired Pneumonia and Sepsis, and Its Impact on Course of Disease

Dr. med. Olegs Suba

Rīga Stradiņš University, Latvia

Objectives

Introduction. Mortality associated with community-acquired pneumonia (CAP) ranges from 4% to 12% and increases with age ≥ 65 years and disease-determining factors.

CAP complications occur in 15–20% of cases.

The mechanism of free radical-induced lung damage is still unclear.

Oxidation-associated lipid, protein and DNA damage cause tissue damage, therefore a loss of balance between oxidation and antioxidant defenses may develop, and this situation is defined as an oxidative stress (OS) that results in cell damage, malfunction, and cell death.

Only a few studies focus on OS analysis and its role in bacterial pneumonia and sepsis.

Methods

The aim of the study is to determine the prognostic value of OS in patients with CAP in comparison to severe sepsis patients of another etiology (non CAP) and healthy individuals in Riga Eastern Clinical University Hospital.

The study is quantitative, prospective. Evaluation of systemic OS and biochemical inflammatory parameters was performed.

Results

Three patient groups were randomized. The role of CAP and OS level in case of different complications was analyzed (eg: severe ARDS, severe sepsis, septic shock, etc.). Using the acquired OS laboratory research data, the prognostic course of the SIP has been determined. The incidence of OS in CAP in comparison to non-CAP severe sepsis patients and healthy subjects was investigated in RECUH.

Systemic OS and biochemical inflammatory parameters were monitored in patients with SIP, other etiology (non-CAP) sepsis and healthy individuals.

Conclusions

The organ damage caused by sepsis and OS has still not been studied enough and their pathogenetic mechanisms are not clear. The results of our research can help to understand the pathogenesis mechanisms of CAP and sepsis.

Infectology – Objective Reality in the 21st Century

Prof. *Ludmila Vīksna*

*Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Rīga East University Hospital, Latvia*

Objectives

Infectology links many scientific disciplines, including microbiology, genetics, pharmacology, epidemiology, clinical medicine and mathematics, etc. And it is because of this multidimensional cooperation that has led to the development of the discipline and success has been achieved. Which suggests that the spread of infectious diseases have largely been limited compared to previous centuries.

The aim of the presentation is to show the achievements of Latvian scientists in the field of infectology within the framework of the State Research Program, which allows them to integrate into the realities of the 21st century.

Methods

To study the interaction between viruses, bacteria and macroorganism during the development of infection, as well as mechanisms and determinants involved in this interaction, to develop innovative strategies for regulation and modulation of the infection with the assistance of a multidisciplinary consortium.

The achievement of project goals and completion of tasks are done as planned for subprojects related both to virology and bacteriology. The successful execution of the project has a positive impact on the achievement of overall program objectives, and the results obtained are used to predict the complications caused by HIV, HHV-6, HHV-7, hepatitis C and tick-borne encephalitis, to develop M. tuberculosis monitoring scheme for a practical use and to control nosocomial sepsis in intensive therapy units. In order to achieve the final goal of the project, studies should be continued as planned and the existing “tight spots” eliminated.

Results

Indicators of inflammatory tissue processes – Pro-MMP-1 and TIMP-1 – were determined in the blood of patients with HIV, hepatitis C and tick-borne encephalitis to evaluate the possibility of fibrosis development in case of these diseases.

The expression of HHV-6 U79/80, U12 and U51 genes (markers of active infection) was tested in 58 cDNA samples of thyroid tissue (29 patients). The expression of HHV-6 U79/80 gene was found in 17/29 (57%) patients, expression of HHV-6 U12 in 3/17 (17%) patients and expression of HHV-6 U51+U12 – in 2/17 (12%) patients.

Genotyping of more than 30 M. tuberculosis clinical samples with conventional methods and analysis of the obtained data was carried out. A conventional genotyping of LAM sublineage and phylogenetic studies were performed.

Conclusions

Studies have shown that the understanding of the pathogenetic mechanisms of the macroorganism is of particular importance in the context when molecular biological research achievements significantly overtake the clinical aspects of human organic research.

Prefrontal Cortex Stroke Impairs Cerebral Blood Flow in Comorbidities of Obesity and Hyperuricemia

Jasmeet Singh

University of Otago, Department of Anatomy, New Zealand

Objectives

Stroke is a leading cause of death and cognitive dysfunction worldwide, with millions of people affected at individual, family and societal levels. Comorbidities of obesity and hyperuricemia are known risk factors of stroke onset due to various microvasculature changes impairing cerebral blood flow (CBF). There have been a lack of studies using the Pericam PSI imaging system to monitor CBF in mice expressing comorbidities following a pre-frontal cortex (PFC) stroke. Therefore, we aimed to model this situation by assessing CBF changes and reperfusion, following a photothrombotic PFC stroke in three groups of mice; obese prediabetic (LLB), hyperuricemic (PLT2) and littermate (WTM) controls.

Methods

Young male C57BL/6J mice (n = 5 LLB, n = 5 PLT2, n = 5 WTM) underwent baseline CBF imaging 7 d prior to stroke induction. These sessions involved establishing optimal parameters, allowing for the best images. Subsequent imaging took place at d 1, d 3, d 7 and d 14 post stroke. Following imaging, all animals were sacrificed and their brains analysed for stroke volume infarcts.

Results

The present study did not show an overall decrease in CBF in either the LLB or PLT2 mice compared to wild-type controls. However, there was a progressive decrease in CBF in all groups with a significant reduction at d 14 when compared to baseline measurements. Stroke volume analysis showed the core infarct in the PLT2 to be 3 fold greater than WTM.

Conclusions

These findings are consistent with previous studies indicating that these comorbidities alter inflammatory markers and brain vasculature, leading to impaired CBF and decreased reperfusion of the penumbra region. It is possible that the decrease in CBF could be contributing to the delayed impairment in spatial memory previously reported by the Clarkson laboratory, although much further work is required to confirm this hypothesis.

Therapeutic Alliance and Its Relationship with Outcomes in Psychotherapeutic Treatment of Depression

Dr. Glebs Troscenkovs; Prof. Gunta Ancane

*Rīga Stradiņš University, Department of Psychosomatic Medicine
and Psychotherapy, Latvia*

Objectives

The aim was to evaluate the relationship between the strength of therapeutic alliance and outcomes in psychotherapeutic treatment of depression, by implementing the following tasks:

1. To assess the symptoms of depression and strength of therapeutic alliance before the psychotherapeutic intervention.
2. To assess the symptoms of depression and strength of therapeutic alliance after the psychotherapeutic intervention.
3. To evaluate the correlations between the strength of therapeutic alliance and outcomes in psychotherapeutic treatment of depression.

Methods

Research participant group consists of 30 patients of Rīga Stradiņš University Clinic of Psychosomatic Medicine and Psychotherapy. Depression is assessed with internationally accepted PHQ-9 (Patient-Health-Questionnaire-9) questionnaire, validated in Latvian and original in English. Therapeutic alliance is assessed with internationally accepted HAQ-II (Helping-Alliance-Questionnaire II) questionnaire, translated in Latvian and original in English. The survey is performed twice – before the 2nd session and before the 9th session. Before the 2nd session, the baseline of depressive symptoms is assessed and the first impression on therapeutic alliance after the 1st session is assessed. The following psychotherapeutic intervention includes psychodynamic psychotherapy, which is carried out by doctors of the clinic, for 8 sessions. Before the 9th session, the depressive symptoms and the therapeutic alliance are assessed repeatedly.

Statistical data analysis is performed with IBM SPSS Statistics software. Correlations are analyzed with Pearson correlation coefficients. The research is performed in accordance to ethical considerations, Declaration of Helsinki, and General Data Protection Regulation; with the permission of Ethics Committee of Rīga Stradiņš University.

Results

Data collection is in process. Results would be reported on the conference day.

Conclusions

Conclusions would be reported on the conference day.

“Open Dialog” Opportunities and Challenges at Riga Psychiatric and Narcology Centre Outpatient Mental Healthcare Centre (MHC) “Veldre” with a Hospital Facility

Dr. *Dina Ozerska*¹; Prof. *Māris Taube*²; Prof. *Douglas Ziedonis*³

¹ *Rīga Psychiatry and Narcology Centre, Outpatient Mental Healthcare Centre “Veldre” with a hospital facility, Latvia;*

² *Rīga Stradiņš University, Latvia;*

Rīga Psychiatry and Narcology Centre, Outpatient Mental Healthcare Centre “Veldre” with a hospital facility, Latvia;

³ *University of California, San Diego, United States*

Objectives

Open Dialogue (OD) is an innovative approach to intervention in acute psychiatric crises. This approach was created and developed in Finland and is based on the biopsychosocial model and includes two components:

- 1) a community-based, integrated treatment system that engages families and significant people for the social functioning of the patient;
- 2) a distinct and unique form of dialogues within open psychiatric meetings.

The purpose of OD is to improve the functional condition of patients, especially of the first-time, new patients suffering from acute psychoses or any other crisis condition of mental health. OD approach is based on 7 basic principles:

- 1) provision of first aid, taking place within 24 hours after contacting a specialist;
- 2) formation of the social network with involvement of family members and specialists;
- 3) flexibility and mobility (organizing a meeting at the patient's home / their cancellation, answering phone calls);
- 4) responsibility (a therapeutic team will assume responsibility for organizing meetings);
- 5) psychological succession (therapeutic team cares for the patient in a long term – both at the hospital and outside it);
- 6) tolerance (10–12 visits (preferably every day) for establishing of mutual relationships);
- 7) dialogue (discussion about problem, reflection, honest conversation, future tactics)

Methods

The purpose of the paper is to assess the opportunities for the use of the basic OD principles in Latvia. The study compares the OD practice with the existing practice of Latvia and analyzes the main similarities and differences. The study based on its design is qualitative, and the study method – case analysis which was based on analysis of 3 clinical cases.

Results

The obtained results show that the possibilities of the MHC Veldre with a hospital facility partially conform to the basic OD principles, while the following challenges in work with patients were observed: inability to promptly organize a process of an emergency meeting with the members of the social support system (friends, family members, family physician, etc.), insufficient flexibility of the operation, insufficient tolerance.

Conclusions

1. The ability of the MHC Veldre with a hospital facility to comply with all basic OD principles is currently complicated by the lack of technical possibilities (team, time, prompt availability, home visits, funding).
2. The basic OD principles such as responsibility, psychological succession and dialogue are the best to be applied at the MHC Veldre with a hospital facility and provide the desired therapeutic effects.
3. Knowledge of the staff on family therapy, reduction of the medication use and improvement of the technical opportunities will be the main future plans of the MHC Veldre for successful introduction of the OD method in Latvia.

Surgical Treatment for Occipital Neuralgia

Dr. Janis Zarins¹; Dr. med. Kalvis Pastars¹; Dr. Aija Dzirkale²

¹ *Microsurgery Centre of Latvia, Department of Hand and Plastic Surgery;*

² *Riga East University Hospital, Department of Radiology, Latvia*

Objectives

The aim was to evaluate long term outcome after occipital nerve preserving surgery for curative purposes of chronic occipital neuralgia (ON).

Methods

Study included 2 patients. Case no. 1: 50-year-old male was suffering from ON for 1.5 years. Conservative treatment was ineffective. Pain was persistent (VAS 10), patient could not perform daily activities and even left the job. Case no. 2: 28-year-old female was suffering from ON for 7 months after meningoencephalitis infection. Pain was temporary (VAS 8). Preoperatively both patients underwent nerve blocks and ultrasound evaluation. Both patients underwent total greater occipital nerve decompression. All nerve branches were preserved. Nerve were placed into wraparound adipofascial flap. Postoperatively patients underwent nerve gliding exercises.

Results

Histological examination revealed hypertrophy of neck muscles and thickening of the fascia compared to healthy side. No wound healing or sensation problems were observed and scar was invisible and located in hair area. In case no. 1 follow-up was 1 year. Patient is pain free (VAS 0), he is back working and enjoys daily activities again. No medication is needed. Follow-up for case no. 2 was 6 months and pain has decreased to VAS 3 at the moment.

Conclusions

Occipital nerve preserving surgery with total nerve decompression and wraparound adipofascial flap is promising surgery technique in severe ON cases. Full sensation and cosmetics are preserved.

Children's Rights to Mental Health: Health Inspectorate of Latvia Control Results 14.02.2018–30.08.2018

*Dace Roze*¹; *Liesma Balta*²

¹Ministry of Health, Medical and Public Health Services, Latvia;

²Health Inspectorate, Health Care Department, Latvia

Objectives

Children mental health and rights are priorities in 2018 worldwide. In this paper authors present mental health quality measures: are adequate personnel, are evidence based care delivered? After quality control and capacity checks, recommended how to improve mental health care and their evidence strength.

Methods

Mixed methods study – comprised of quality control, capacity check results of 9 mental hospitals and 21 (n = 21) qualitative case studies from 2 children psychiatric hospitals.

Results

Human resources are insufficient, there is a essential problem with access of children psychiatrists.

Using of the restrictive measures in hospitals:

- 1) decision of mechanical restraint of patients is not doctor's decision in 5 hospitals (2 children hospitals);
- 2) patients' legal representatives are not always informed about application of restrictive measures (1 children hospital).

Case control study:

1. 13 cases (61%) report about the Medical Treatment Law violation: 8 cases (38%) inadequacy of drug therapy: absence of monitoring of drug side effects, polypharmacy, "off label use" of drugs. 2 cases (10%) report about the use of a drug Depakine Chrono for girls. 3 cases (14%) report about children with addiction problems, who need long term rehabilitation.
2. Psychosocial rehabilitation is not available before hospitalization 18 cases (86%).

Conclusions

Build number, capacity of psychiatrists, psychiatric care Pyramid. To increase competence in child psychiatry. To decrease child psychiatrist training time. To strengthen our patient mental health care by increasing payment, multidisciplinary team. It needs Latvian guidelines for childcare and evidence based treatment.

Employees with Nonepileptic Seizures: Combined Treatment

*Liesma Balta*¹; *Dr. med. Inara Roja*²

¹ *Health Inspectorate, Health Care Department, Latvia;*

² *Rīga 1st Hospital, Outpatient Department, Latvia*

Objectives

Nowadays employees in their giving age with abnormal mental processing caused by workplace stress are suffering from conversion disorder and experience nonepileptic seizures (NES). Combined treatment (CT) for such employees includes cognitive hypnotherapeutic treatment (CHT) with mind-body relaxation, processing of stressful events, and group learning (GL) with improvement of workplace relations. Objective of our study was to investigate the benefits of the CHT and GL four weeks CT course for employees with NES.

Objective of our study was to investigate the benefits of the CHT and GL four weeks CT course for employees with NES.

Methods

11 patients (males = 5, females = 6), office employees, aged 24 to 55 years, with psychogenic NES were consulted and underwent four weeks CT course. The diagnosis of NES was made on the basis of an electroencephalogram (EEG) monitoring, neurologic examination. Group A patients (females = 4, males = 3) received four weeks CHT and GL, group B patients (females = 2, males = 2) received only GL. EEG test, a life quality assessment with Quality of Life Scale was realized in patients. Patients was asked to keep a Seizure Events Diary (SED) during CT and one month follow-up.

Results

The four weeks CT course resulted in significantly ($p < 0.05$) reduction of NES frequency with improvement of self-rated psychosocial functioning for A Group 66.6% males, 50% females.

Conclusions

Combined four weeks treatment course by use CHT and GL for office employees manage intrapsychic conflict and to deal with negative workplace stress. Suffering from psychogenic NES is helpful treatment for reducing conversion symptoms. EEG monitoring, self-testing scales is an effective option for developing the skills.

Changes in Depression Diagnostic Pattern among Family Physicians in Latvia Following Education Course “Depression School” within National Research Programme BIOMEDICINE 2014–2017

Prof. *Elmārs Rancāns*¹; Dr. med. *Anda Kīvīte-Urtāne*²

¹ *Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia;*

² *Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia*

Objectives

Annually 7.9% of the general population in Latvia are suffering from depression [1]. According to the official statistics, there were only 11 821 persons treated for Affective disorders in the State paid health care services in 2015 [2]. The point prevalence of depression in the primary care have been estimated 10.1% by the National Research Programme BIOMEDICINE 2014–2017, this means more than 70 000 depressed patients annually are coming to the Family physicians (FPs) in Latvia [3]. There are several subjective and objective factors, which diverts FPs from timely diagnostics and treatment of depression [4]. Therefore it is crucial to carry out specific educational programmes for FPs to improve diagnostics and treatment of depression in the primary care. The aim was to assess efficacy of “Depression school” on depression diagnostic pattern among FPs.

Methods

Within National Research Programme BIOMEDICINE 2014–2017 authors have developed an algorithm for diagnostics and treatment of depression, created specific educational programme and during October–December 2016 carried out 10 educational courses for FPs all over the Latvia. The data on the treatment episodes of Depressive episode (F32) and Recurrent depressive disorder (F33) in the primary care services have been collected from the National Health Service (NHS) database from 01.01.2015 till 31.12.2017. Changes between trained and control group have been calculated for time period before education – 2015–2016 and 12 months right after educational programme. Relative numbers of the depression diagnoses and episodes were calculated per one physician per one-a-year (one person-a-year). The statistical significance of differences between groups was detected by Chi-square test within OpenEpi software (p level chosen for statistical significance – 0.05).

Results

“Depression school” was attended by 209 (15.3%) out of 1366 FPs, who are in the contract with the NHS. Majority of trained were women 88.2%, half of them younger than 55 years old, 34.2% coming from the capital city, 21.2% – from other large cities and 44.6% – from rural places. None of those differences were statistically significant between intervention and control group, except, more FPs from rural places vs. capital city attended the courses. All FPs during control period (2015–2016) were diagnosing 4699 Depressive (F32) and 10 902 Recurrent depressive disorder (F33) episodes, during the 2017 – 2261 and 6384 episodes, accordingly. Comparing the trained and control groups, during control period there was on average 0.97 vs. 0.84 (N.S.) F32 and 3.29 vs. 1.76 F33 episodes in a year ($p < 0.001$). There were no statistically significant changes in number of F32, but an increase for F33 episodes (+0.30, $p < 0.001$) for control group during 2017. In contrary, statistically significant increase was observed for F32 episodes (+0.13, $p = 0.026$) and F33 episodes (+1.17, $p < 0.001$) in the trained group of FPs. During 2017 there were statistically significant differences between groups – for F32 episodes 1.10 vs. 0.82 ($p < 0.001$) and F33 diagnoses 4.46 vs. 2.06 ($p < 0.001$), accordingly.

Comparing to the diagnostic pattern within the groups observed in the first half of 2017 – F32 episodes 1.14 vs. 0.76 ($p = 0.006$) and F33 diagnoses 4.68 vs. 1.99 ($p < 0.001$) and the whole year, we observe a stable pattern of improvement.

Conclusions

In spite of initial differences between in diagnostic pattern of trained and control group of FPs, we have observed statistically significant increased and persistent pattern of depression diagnoses following participation in “Depression school”.

Development of a Working Model in Mindfulness-Based Dance Movement Therapy (DMT) and Its Application for Chronic Pain Patients

*Indra Majore-Dusele*¹; *Dr. med. Inga Millere*²;
Prof. *Vicky Karkou*³; Prof. *Inara Logina*⁴

¹ *Rīga Stradiņš University, Department of Health Psychology and Paedagogy,
Doctoral studies program Medicine, Latvia;*

² *Rīga Stradiņš University, Faculty of Public Health and Social Welfare, Latvia;*

³ *Edge Hill University, Faculty of Arts and Sciences, Faculty of Health
and Social Care, United Kingdom;*

⁴ *Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia*

Objectives

This presentation will discuss results from the first stage of a doctoral research project that aimed to evaluate a mindfulness-based DMT approach to working with chronic pain patients. In this stage 1) the development of the DMT working model will be presented that will inform the two stages following; 2) a pilot phase that will evaluate this working model with a particular patient group (quantitative variables + interviews with patients); 3) randomized controlled trial with patients in psychoemotional rehabilitation.

Methods

For this first stage, grounded theory has been selected as a qualitative design that will allow for theory construction. According to Charmaz (2014), grounded theory offers methods and systematic, yet flexible guidelines for collecting and analysing qualitative data that allow to build theories from the data. In this study, data are generated from interviews with experts. Six DMT professionals (n = 6) have been selected who use mindfulness principles and / or work with chronic pain patients in their DMT work and have publications about this topic. The publications of experts are also included as data. For data analysis the following processes are adopted: an initial and focused coding, theoretical coding, MEMO writing, theoretical sampling and categorizing.

Results

Initial findings suggest that mindfulness is used in DMT as SKILLS, STATE and PROCESS. The working model is described as repetitive creative process where relationship to the symptom (pain) is explored – staying with, detaching from automatic reactions, learning self-regulation and accepting, and mindful action.

Conclusions

Mindfulness based DMT is used as bidirectional BODY-MIND approach, where awareness of body is used as physical portal to consciousness, and awareness of mind is seen as metacognitive state – ability to observe, explore and gain the understanding of the processes and relationships between mind and body.

Acute Stroke Long Term Clinical Outcome Study – Imaging Based Selection of Patients for Mechanical Thrombectomy

*Dr. Arturs Balodis*¹; *Ph.D. Maija Radzina*¹; *Prof. Kārlis Kupcs*²;
*Prof. Evija Miglane*³; *Prof. Andrejs Millers*³; *Dr. Kristaps Jurjans*³;
*Dr. Helmutis Kidikas*⁴; *Dr. Raimonds Skumbins*⁴

¹ Rīga Stradiņš University, Radiology Research Laboratory, Latvia;

² Rīga Stradiņš University, Radiology Department, Latvia;

³ Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;

⁴ Pauls Stradiņš Clinical University Hospital, Diagnostic Radiology Institute, Latvia

Objectives

Mechanical thrombectomy (MT) in acute ischemic stroke treatment with large artery occlusion has shown a good neurological result, however multimodal computed tomography (non-enhanced CT (NECT), CT angiography (CTA) and CT perfusion (CTP)) imaging protocol provides individual patient selection for treatment.

The aim of our study was to analyze imaging based selection criteria – CTP core ASPECTS score and CTA collaterals before MT and evaluate functional outcome (mRS) after three months and two years from the reperfusion treatment.

Methods

The prospective study included 101 patients with large artery occlusion. Modified Rankin scale (mRS) was used to evaluate functional long term outcome, and two comparative ASPECTS scoring groups were defined (≥ 7 vs. ≥ 6) and collaterals (good or poor) were used for patient evaluation.

Results

MCA M1 segment occlusion 80 (79%), ICA occlusion 21 (21%). Successful recanalization after MT was 91% (TICI 2b, 3). MRS (0–2): after discharge and 3 months was 36 (36%) vs. 41 (41%) and 2 years 40 (40%). Patients mRS 0–2 with CTP core ASPECTS ≥ 7 had statistically significant better long term outcome after 2 years vs. ASPECTS ≥ 6 ($p = 0.03$) – 39/87 (42.5%) vs. 1/8 (12.5%), respectively. There was proved correlation between collaterals and ASPECTS, markedly stronger in the ≥ 7 vs. ≥ 6 ($rs = 0.963$, $p = 0.005$ vs. $rs = 0.62$, $p = 0.04$). Good collaterals showed statistically significant better outcome difference up to 1.9 times in 2 years mortality rate (good vs. poor – 21 vs. 11; $p = 0.0001$) and 2.3 times difference in mRS good outcome group (28 vs. 12; $p = 0.0001$).

Conclusions

Long term good clinical outcome in acute stroke shows significantly higher rate if initially imaging based biomarkers such as CTA good collateral pattern and CT perfusion ASPECTS core scoring are applied in patient selection for mechanical thrombectomy.

Cerebral Oximetry Guided Intraoperative Algorithm Relation to Postoperative Cognitive Function in Spinal Surgery Patients

Dr. *Sniedze Murniece*¹; Prof. *Martin Soehle*²;
Prof. *Indulis Vanags*³; Prof. *Biruta Mamaja*¹

¹ Rīga Stradiņš University, Latvia;

Rīga East University Hospital, Latvia;

² Universitätsklinikum Bonn, Anaesthesiology, Germany;

³ Rīga Stradiņš University, Latvia;

Pauls Stradiņš Clinical University Hospital, Latvia;

Objectives

Intraoperative optimization of regional cerebral oxygen saturation (rScO₂) can prevent postoperative cognitive dysfunction (POCD). Near-infrared spectroscopy (NIRS) devices can help to optimize rScO₂. One of the most important use of NIRS is the elaboration of an intraoperative algorithm to correct decreases in rScO₂. The aim of the study was to evaluate NIRS-based algorithm utility during spinal surgery and relation to POCD.

Methods

Patients undergoing spinal surgery were included. All patients received standardized general anaesthesia and cerebral oxygen saturation intraoperative monitoring using NIRS device INVOS 4100. Patients were randomized in two groups - in study group patients NIRS-based algorithm (Denault, 2014) was applied if rScO₂ dropped below 20% from baseline values or an absolute drop below 50% was seen. In control group rScO₂ was monitored blindly without any interventions. In both groups cognitive function was evaluated using Montreal cognitive assessment scale (MoCA) before and after the surgery.

Results

29 patients were included - 23 in study group, 6 in control group. In 2 study group patients (55.5 ± 2 years) NIRS-algorithm was used. Correct heads position was verified. Patients received Ephedrin boluses (5-20 mg) resulting in rScO₂ value raise above the threshold. None of the 2 patients showed POCD. All the other intraoperative readings stayed stable during reduction of rScO₂. In the control group 1 patients (39 years) rScO₂ dropped below 34% from baseline values. Patient showed postoperative cognitive decline for 4 points. Patients with rScO₂ intraoperative decrease had longer medium time of the operation 161.6 ± 96 min compared to 118.8 ± 36 min in the rest of the group (p = 0.4). Statistically significant differences in other values like preoperative hemoglobin, hematocrit, intraoperative mean arterial pressure, blood loss were not found.

Conclusions

Patients where NIRS-based intraoperative algorithm was used didn't show postoperative cognitive disturbances compared to patient where rScO₂ significant drop was seen but algorithm was not used.

Intervention in Early Psychosis: from Scientific Evidence to Clinical Practice in Latvia

*Dr. Liene Bērze*¹; *Dr. Sandra Čivčiša*²;
*Ilona Krone*³; *Dr. Jeļena Lazovika*²; *Dr. Sarmīte Kikuste*⁴;
*Dr. Inna Šapele*²; *Prof. Elmārs Rancāns*⁵

¹*Rīga Stradiņš University, Doctoral studies program Medicine, Latvia;*

²*Daugavpils Psychoneurological Hospital, Department of Mental Care, Latvia;*

³*Rīga Psychiatry and Narcology Centre, Mental Care, Latvia;*

⁴*Daugavpils Psychoneurological Hospital;*

⁵*Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia*

Objectives

There is enough evidence that early intervention in psychotic disorder management is superior to standard psychiatric treatment (Correll et al., 2018). European psychiatric association recently conducted a survey on the European status of intervention (EI) in first-episode psychosis (Maric et al., 2018), which showed that from 29 countries 18 already have EI services. There is need to develop EI services all across Europe to enable patients to have access to the best management for psychotic disorders.

Methods

Aim of the reasearch study is to adapt and start a pilot Early Intervention programme in Daugavpils, the first early intervention programme for first episode psychosis patients in Latvia. This research has a prospective quasi-experimental design, were two groups of patients will be compared: standard treatment and intervention treatment. Our primary aims are to 1) tailor an intervention programme with a multiprofessional team in a real life mental healthcare environment in Latvia; 2) evaluate primary outcomes: clinical and functional remission, treatment adherence, rehospitalization and disability. From 01.10.2017.-30.01.2018. we developed an intervention programme by adapting the structure of clinical work with psychosis patients, developing a research protocol, and communicating with administrative authorities to organize work of the intervention programme in the Daugavpils Psychoneurological out-patient unit. From 01.02.2018. we started first episode patient recruitment for the intervention programme which will end on 01.02.2018.

Results

During the first 10 months of work the programme included 29 patients, form which 20 are actively participating in the programme, 3 patients finished the programme, 2 refused to participate and 2 were drop-outs. Overall patients and their relatives reported high satisfaction with intervention treatment. During this period only one patient was readmitted to a psychiatric hospital.

Conclusions

The early intervention programme is applicable to out-patient mental care settings, there is promising efficacy in clinical and functional outcomes for first episode psychosis patients.

Prevalence of Depression and Associated Factors among Hospitalised Patients Diagnosed with Paranoid Schizophrenia after a Three-Week Course of Treatment

Dr. Maksims Ivanovs¹; Dr. med. Jeļena Vrubļevska²

¹*Rīga Psychiatry and Narcology Centre, Latvia;*

Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia;

²*Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia;*

Rīga Psychiatry and Narcology Centre, Latvia

Objectives

Estimate the prevalence of depression, identify associated factors in patients with a diagnosis of paranoid schizophrenia treated in acute sections of the Riga Psychiatry and Neurology Center.

Methods

Participants: the study included patients who admitted to acute psychiatric wards of Riga Centre of Psychiatry and Addiction Disorders from the period from 1 May to 30 May 2018 with a diagnosis of Paranoid schizophrenia. Depressive symptoms were evaluated using the Calgary Depression Scale for Schizophrenia.

Results

In the study 140 patients were included. Clinically significant depression was found in 41 patients, (22%), male – 49%, female – 51%, respectively. The average age of patients with depression was 44 years. About one third of patients lived alone. The majority of patients were unemployed, and received disability pension. Treatment period in the hospital was 30 days in average. The most frequently administered antipsychotic was first generation neuroleptic – haloperidol (83%). A larger part of patients used four or more medications (85%). During treatment, the severity of depressive symptomatology decreased by five points (22%) in a majority of the patients. Statistically significant correlation between changes in depression score and drug usage was found: haloperidol ($p = 0.008$, regression factor = 3.883), clozapine ($p = 0.031$, regression factor = 3.883). There were no correlation between depression and patient's living conditions ($p = 0.135$), patient's livelihood ($p = 0.76$), and social status of patients ($p = 0.413$). Factors such as “duration of treatment”, “age” did not significantly affect depression ($p = 0.661$, $p = 0.947$).

Conclusions

Depression is highly prevalent in patients with schizophrenia, equally affecting both genders. The outcome of treatment was dependent on the choice of medication, but did not significantly associated with gender, age, social status, living conditions, and duration of treatment.

Outcome Difference in Patients with Spontaneous Intracerebral Hematoma

Zanda Lāse

Rīga East University Hospital, Department of Neurology, Latvia

Objectives

The aim was to compare patients with different (SIH) outcomes.

Methods

A retrospective medical record review was performed in the Pauls Stradiņš Clinical University Hospital and in Rīga East University Hospital Gaīļezers. Together we collected 200 records.

Results

Demographics: Total of 157 patients were reviewed, 64 men and 93 women. Bad outcomes most pronounced were in age group 80+ y.o., second were in 45–65 y.o. and third 66–79 y.o., ($p < 0.00$) more SIH were in second group ($n = 63$). Onset systolic blood pressure (188 ± 3.9 mmHg; $p = 0.02$) and Glasgow Coma Scale (GCS; 13 ± 3 ; $p < 0.00$) were higher in live patients. Average hematoma volume were bigger in dead patients (79 ± 79 ml; $p < 0.00$). Deep hematomas were more pronounced in live patients (36%; $p = 0.01$). Intraventricular hemorrhage is more likely to be in patients with deep hematoma ($n = 56$; $p = 0.02$) and more likely those patients will have perifocal edema (26.5%; $p = 0.01$). Modified Rankin scale (mRs) after 30 day hospitalization most points were 3 ($n = 21$) and 4 ($n = 33$). If we compared ICH scale outcome percentage with our percentage in our study we had more death then ICH score predicts.

Conclusions

Patients are more likely to die in age group 80+, onset systolic blood pressure and (GCS) are higher and SIH volumes are smaller in live cases. MRs after 30 day hospitalization is more likely to be 3 and 4 point. Lobar hematomas, IVH and perifocal edema are more pronounced in dead cases. ICH score would be useful to predict outcome of our patients.

Survey of Wellbeing and Depression in International Medical Students

*Dr. Cindy Heaster*¹; *Dr. med. Sandra Gintere*²; *Dr. Līva Mača*¹

¹*Rīga Stradiņš University, Latvia;*

²*Rīga Stradiņš University, Department of Family Medicine, Latvia*

Objectives

International students are exposed to many stressors simultaneously when they leave their home environment for foreign educational institutions. Psychological pressure from a rigorous learning programme, combined with culture shock, personal factors and loss of support networks, can affect student well-being and even lead to depression. The objectives of this study include screening for depression in the quickly expanding population of international medical students at Rīga Stradiņš University.

Methods

Over 231 international medical students completed a paper version of a survey which included The Patient Health Questionnaire – 9 (PHQ-9). Data was processed using IBM SPSS Statistics 21.00. This is an ongoing study.

Results

The overall prevalence of significant depression, defined as a score of 10 or more on the PHQ-9, was found to be 32%. The prevalence of moderately severe or severe depression warranting treatment was 5.6% and 2.6% respectively.

Conclusions

This study highlights the prevalence of depression amongst international medical students, and draws attention to the need for streamlined access to existing services in order for each individual to promptly receive the support they need.

Generalised Anxiety and Autonomic Nervous System Function

*Dr. Einars Kupats*¹; *Dr. Ilja Noviks*²; *Dr. med. Jelena Vrublevska*³;
*Dr. med. Viktorija Kenina*¹; Prof. *Inara Logina*⁴

¹ *Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;*

² *Rīga Stradiņš University, Latvia;*

³ *Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia;*

⁴ *Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia*

Objectives

Patients with generalised anxiety generally complain about autonomic arousal symptoms. The objective of the present study is to evaluate the influence of anxiety on cardiovascular autonomic function.

Methods

Fifty-five participants including patients with generalised anxiety symptoms (n = 32) and healthy volunteers who served as controls (n = 23) were recruited for this study. All participants completed the 7-item Generalized Anxiety Disorder Scale (GAD-7) Questionnaire and underwent autonomic function tests, including the Ewing test battery and heart rate variability (HRV) test.

Results

There was no statistically significant association between generalised anxiety symptoms and the prevalence of autonomic abnormalities (Fisher Exact test; $p = 0.244$). Participants with generalised anxiety symptoms showed abnormal deep breathing E:I ratio in 12.5% of cases, and the 30:15 beat ratio was abnormal in 9.38% of participants. Participants with generalised anxiety symptoms had abnormal Valsalva ratio in 6.25% of cases and the LF/HF ratio was high (> 2) in 34.38% of participants. Non-anxious participants had abnormal deep breathing E:I ratio and Valsalva ratio in 4.35% of individuals, and the 30:15 beat ratio was abnormal in 13.04% of the participants. The LF/HF ratio was high (> 2) in 13.04%. The group with generalised anxiety symptoms showed low SDNN in 10% of participants, low RMSSD in 20%, low SA in 40% and high SA in 6.7% of participants. Control group showed low SDNN in 5% of participants, low RMSSD in 10%, low SA in 40% and high SA in 5% of participants.

Conclusions

The current findings suggest that there is no statistically significant relationship between generalised anxiety symptoms and cardiovascular autonomic dysfunction.

Transcranial Direct Current Stimulation : Effects on Autonomic Function and Neuropathic Pain

*Dr. Einars Kupats*¹; *Dr. Ilja Noviks*²; *Dr. med. Viktorija Kenina*¹;
*Dmitrijs Glazunovs*²; *Jana Krastina*²; *Katrina Stasinska*²;
*Dr. med. Mihails Arons*³; *Prof. Inara Logina*³; *Una Kojalo*²

¹ *Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;*

² *Rīga Stradiņš University, Latvia;*

³ *Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia*

Objectives

The objective of this study is to evaluate the effect of anodal transcranial direct current stimulation (tDCS) on pain and cardiac autonomic nervous control in individuals with peripheral neuropathic pain.

Methods

Thirty participants with peripheral neuropathic pain were recruited and were allocated to either tDCS (n = 15) or sham-tDCS (n = 15) group. Single anodal primary motor cortex tDCS was administered for 20 min at a 2-mA current intensity. Pre- and posttreatment evaluation was based on the 12-question form of the Neuropathic Pain Symptom Inventory (NPSI), quantitative sensory testing (QST) and heart rate variability (HRV) test.

Results

The active anodal tDCS over M1 but not sham treatment resulted in significant decreases in the NPSI total score ($p < 0.001$ and $p = 0.063$ respectively) 24 hours after stimulation. In addition, active treatment condition resulted in significant HRV improvement immediately after tDCS. Greater difference between thermal detection and pain thresholds was positively related to greater NPSI score decrease.

Conclusions

The current findings suggest that the use of anodal tDCS over the left M1 in patients with peripheral neuropathic pain could provide significant short-term pain relief and improves cardiac autonomic function. The differences between thermal detection and pain thresholds may be used as a prognostic biomarker of tDCS efficacy.

Clinical Manifestation of Pain Central Modulation Disturbances in Chronic Low Back Pain Patients

*Dr. med. Daina Šmite*¹; Prof. *Gunta Ancāne*²;
*Anna Hohlova*¹; *Gļebs Troščenkovs*²

¹ *Rīga Stradiņš University, Department of Rehabilitation, Latvia;*

² *Rīga Stradiņš University, Department of Psychosomatics and Psychotherapy, Latvia*

Objectives

The purpose of this study was to develop a conceptual framework to analyse clinical manifestation of pain central modulation alterations in chronic low back pain patients (CLBPP) that integrates biopsychosocial approach.

Methods

To achieve the purpose we adopted the theory mapping. Theory mapping involves drawing out links between constructs and allows the concrete display of knowledge structures, which helps with theory evaluation (Gawronski & Bodenhausen, 2015). Findings from our observational cross-sectional studies (three CLBPP cohorts, total n = 242) and data from critical literature review to describe current scope of concept and evidence of underlying pathophysiological mechanisms in pain central modulation alterations in CLBPP was analysed. In each of observational study several standardised assessment tools were used to describe clinical characteristics of CLBPP and obtained data were analysed by both parametric and nonparametric statistical methods. Critical review included recent articles based on pre-defined searching and analysis strategy.

Results

Our findings confirms that concept of pain central modulation alterations in CLBPP should be considered as wider phenomena integrating biopsychosocial perspective and it is expressed in each chronic low back pain patients regardless of dominant pain mechanism. Clinical manifestation of pain central modulation disturbances is variable and could be explained both by direct and indirect mechanisms that demonstrated definitive involvement of the central nervous system in the experience of chronic pain. Developed conceptual framework maps possible clinical manifestation of pain central modulation disturbances in conjunction with antecedents and consequences.

Conclusions

Presence of pain central modulation alterations should be taken in account both in evaluation and treatment process in CLBPP patients. Developed conceptual framework that integrates biopsychosocial approach could both help in clinical practice and direct future research.

Depressive and Anxiety Disorders Screened and Correlated to the Level of Synovial Inflammation in Patients with Hip/Knee Osteoarthritis: Pilot Study

*Dr. Mihails Tarasovs*¹; *Andris Vikmanis*²; *Dr. med. Sandra Skuja*³;
*Prof., Dr. habil. med. Valērija Groma*³; *Prof. Aivars Lejnieks*⁴

¹ *Rīga Stradiņš University, Department of Internal Diseases, Doctoral study program Medicine, Ph.D. candidate, Latvia;*

² *Rīga Stradiņš University, Department of Orthopaedics, Latvia;*

Rīga East University Hospital, Department of Traumatology and Orthopaedics, Latvia;

³ *Rīga Stradiņš University, Institute of Anatomy and Anthropology, Joint Laboratory of Electron Microscopy, Latvia;*

⁴ *Rīga Stradiņš University, Faculty of Medicine, Department of Internal Diseases, Latvia*

Objectives

Common co-morbid depressive states and chronic joint diseases demonstrate the complexity of pathogenesis. A crosstalk between chronic inflammatory joint disease and neurodegenerative pathologies and cognitive disorders is widely discussed. However, analysis using joint tissue morphological examination and comparison it with a patient's cognitive and physiological status is not complete. According to the aforementioned, the objective of this study was: 1) to determine a presence of co-morbid depressive and anxiety states in OA patients undergoing joint replacement surgery, and 2) correlate it with histopathological features of synovial inflammation and pain level scaled.

Methods

Twelve biopsy samples obtained during knee / hip endoprosthesis surgery were analyzed for the presence of inflammation using synovitis grading system proposed by Krenn. The analysis of anxiety and depression was performed using Rīga Stradiņš University validated screening tools PHQ-9 and GAD-7. Pain level and patients' functional status was analyzed using visual analog pain scale and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Data were presented as median values with interquartile range (IQR).

Results

From 12 patients, 3 (25%) were males. Patients' median age was 64 (63.5–73.5) years. PHQ-9 was 5 (3; 10). Three (25%) patients had moderate depression symptoms (PHQ-9 = 12). Depressive symptoms, occurred for years after primary established diagnosis of OA, were revealed in two cases. WOMAC in tested patients was 49.5 (42; 53). Median VAS scale median value was measured as 7 (5.25; 7.75), whereas Krenn score median value was defined as 4 (2; 6). Two patients with high level of synovial inflammation had mild depressive symptoms, and no anxiety symptoms; one had moderate depression and mild anxiety symptoms.

Conclusions

Depression and anxiety states evaluated by screening tools PHQ-9 and GAD-7 may be submitted to further analysis of co-morbid disorders. Analysis of synovial tissue samples may be used as an effective tool when suggesting on the pathogenesis of chronic arthropathy linked to depressive disorders.

Progress and Challenges in Frontotemporal Dementia Research

Dr. med. Zanda Priede; Dr. Madara Kalniņa

*Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Neurodegenerative diseases are increasingly recognized as involving abnormalities of protein metabolism. As biomarkers for distinguishing dementias with associated proteins and typical brain atrophy patterns become more available, incidence of lesser known dementias could increase. Our main goal was to understand and describe frontotemporal dementia as a wide spectrum of diseases, based on involvement of tau-protein and mutated genes. Additional task was to introduce emerging diagnostic methods in research and everyday clinical practice.

Methods

Gather latest research on frontotemporal dementia, evaluate how to integrate available diagnostic methods in clinical practice.

Results

Due to accumulation of intracytoplasmic tau, majority of FTD are classified as tau-pathies, while remaining non-taupathies are also divided based on involved protein (FTD with ubiquitinated inclusions, FTD with inclusions containing fused sarcoma protein, FTD with inclusions that are immunoreactive to p62 and ubiquitin alone). Only tau-pathies and FTD with ubiquitinated phosphorylated TDP-43 can clinically be divided as behavioral variant of FTD, semantic dementia and progressive nonfluent aphasia. Considering challenges to distinguish one subtype from another based only on clinical presentation, in future more comprehensive classification would be preferred with emphasis on involved protein. Brain imaging studies are developing, but still are used mainly for research purposes, as the situation is similar with genetic testing and other potential biomarkers.

Conclusions

While in everyday clinical practice there is limited possibility to distinguish involved proteinopathy in FTD, classification based only on pathological inclusions is still at large. Most imaging studies, genetic tests and laboratory studies are not accessible, but new formal cognitive testing designed specially for FTD could be validated and used.

It is important to differentiate FTD from other dementia causes – mediators used for different neurodegenerative dementias are not effective or could even worsen FTD symptoms.

Use of Cognitive Reflection Test for Determining Predominance of Analytical or Intuitive Thinking for Rīga Stradiņš University Students, Latvia

Dr. med. Artūrs Utināns

*Rīga Stradiņš University, Department of Psychosomatic Medicine
and Psychotherapy, Latvia*

Objectives

It has been found that in our brain there are two different modes of processing information – System 1 and System 2 processes (Kahneman & Frederick, 2002). System 1 relies on intuition, and System 2 relies on analytic thinking (Kahneman, 2013; Stanovich, 2013). Such differences appear to be dispositional and correlate with stable biological traits (Kanai et al., 2011; Schreiber, 2011), gender differences (Primi et al., 2017; Albaity et al., 2016), science understanding (Shtulman, McCallum, 2014) and impulsivity and pathological gambling (Frederick, 2005). The Cognitive Reflection Test (CRT) is one of the most widely used tools to assess individual differences in intuitive-analytic cognitive styles. The Cognitive Reflection Test (CRT) was introduced by Frederick (2005). Frederick proposed the CRT based on a dual-system theory.

Methods

Respondents were Rīga Stradiņš University students from faculties of Medicine, Dentistry and Public Health. Respondents received three CRT questions. Upon reading each CRT question, very often intuitive answer immediately comes to mind. In this test intuitive answer is incorrect. If Cognitive Reflection and analytic thinking is well developed, intuitive errors will be detected and liquidated and correct solution found. Tasks were executed on paper.

Results

CRT was completed by 127 students, 26 males and 101 females. Male respondents were more inclined to engage in system 2 while women showed more inclination to use system 1. Other results will be presented at the conference.

Conclusions

Test results match the results in other countries and CRT can be used to determine thinking systems in Latvian student population as well.

Carpal Tunnel Syndrome Therapeutic Effectiveness Evaluation

*Jolanta Umure*¹; Prof. *Ināra Logina*²; *Marija Mihailova*³

¹ *Rīga Stradiņš University, Latvia;*

Pauls Stradiņš Clinical University Hospital, Department of Neurology, Latvia;

² *Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia*

³ *Pauls Stradiņš Clinical University Hospital, Department of Neurology, Latvia;*

Objectives

1. Perform a specially designed, validated test – Pain Detect and Patients' Global Impression of Change scale (PGIC) for patients with carpal tunnel syndrome (CTS) before and one month after corticosteroid injection (CSI).
2. Evaluate the objective state of patients with CTS.
3. Assess patient neurologic and neurophysiologic data before and after the blockade and evaluate its effectiveness.

Methods

The study analyze 56 arms of different ages with mild CTS who came on neurological examination in the Neurology Outpatient Department of the Pauls Stradiņš Clinical University Hospital during the period from 01.08.2018.–01.01.2019. All patients were analyzed clinically and neurophysiologically before and one month after CSI. For clinical symptom evaluation were used Pain Detect scale, PGIC scale, compression tests, sensory tests. Median nerve sensory and motor nerve conduction study was performed.

Results

According to Pain Detect scale 61% of patients show neuropathic pain before CSI, 77% of patients presents clinical effectiveness after CSI. 96% of patients presents clinical effectiveness after CSI in PGIC scale. 86% of patients had improvement in neurophysiological studies – motor distal latency decreased after CSI. Before CSI average motor distal latency was 5.7 ms (min 4.5; max 12.9; SD ± 1.5), which was average 130% from maximal norm (min 102; max 293; SD ± 36). After CSI average motor distal latency was 5.2 ms (min 3.8; max 10.7; SD ± 1.3), which was average 120% from maximal norm (min 88; max 243; SD ± 30). We didn't find any significant correlation between the improvement of the patient's clinical condition and the improvement of electrophysiological outcomes.

Conclusions

The study concludes that Pain Detect sensitivity for neuropathic pain evaluation in patients with CTS is 61%. Patients show clinical and neurophysiological improvement after CSI, but there is no correlation between neurophysiological and clinical improvement. The study concludes that PGIC scale can be used to quickly assess the effectiveness of therapy.

Latvian Family Physicians' Experience and Attitude in Diagnosing and Managing Depression

*Dr. med. Jeļena Vrubļevska*¹; *Dr. Vineta Viktorija Vinogradova*²;
Prof. *Elmārs Rancāns*¹

¹ *Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia;
Rīga Psychiatry and Narcology Centre, Latvia;*
² *Rīga Psychiatry and Narcology Centre, Latvia*

Objectives

The aim was to identify family physicians experience and attitude in diagnosing and managing depression in Latvian primary care setting.

Methods

Family physicians completed the structured questionnaire during educational seminars on diagnosing and treating depression carried out all over Latvia within the framework of National Research Programme BIOMEDICINE 2014–2017.

Results

The overall response rate was 82.05%: 224 clinicians out of 273 participants of the educational seminars have completed the questionnaires. In total 216 questionnaires were analysed. Most of the respondents 87.5% (n = 189) were females and only 10.6% (n = 23) of recruited general practitioners were males; 1.9% (n = 4) respondents did not mention their gender. Half of the doctors were younger than 55 years old. Median practical experience of the recruited family physicians was 29.0 (IQR 15) years. Among trained doctors, 23.8% had their practice in Riga, 25.7% in other large cities and 50.5% in other territories, e.g. small cities, rural areas. Most of the doctors, or 72.2% (n = 156) agree with the statement that patients with depression use primary care facilities more often, than other patients. More than a half of physicians, or 66.3% (n = 143) quite often ask their patients about psycho-emotional status and 65.7% (n = 142) of clinicians think they can successfully assess patient's psychoemotional status and possible mental disorders. Majority, or 91.6% (n = 198) suppose that routine screening for depression is necessary in Latvia. Despite the fact that a significant number, or 62.6% (n = 135) of family physicians think their practice is well suitable for the treatment of depressive patients, half of the respondents or 50.9% (n = 110), assess their ability to build a trustful contact and motivate patients for treatment as middling.

Conclusions

Most of the family physicians critically assess their ability to build trustful contact with depressive patients and motivate them for treatment. It is necessary to introduce family physicians training program for depression in Latvia.

Novel Approaches to Evaluation of Neuropathic Pain Syndromes Including Quantitative Sensory Testing and Photoplethysmography

*Dr. Ilja Noviks¹; Dr. Einārs Kupats²;
Dr. med. Zbigņevs Marcinkevics³; Dr. med. Andris Grabovskis⁴;
Dr. med. Uldis Rubins⁴; Dmitrijs Glazunovs²;
Jana Krastiņa²; Katrīna Stašinska²; Prof. Ināra Logina²;
Dr. med. Viktorija Kēniņa²; Dr. med. Mihails Arons²*

¹ Rīga Stradiņš University, Latvia;

Latvian Maritime Medical Centre, Vecmīlgravis Hospital;

² Rīga Stradiņš University, Latvia;

³ University of Latvia, Department of Human and Animal Physiology;

⁴ University of Latvia, Biophotonics Laboratory of Institute of Atomic Physics and Spectroscopy

Objectives

The aim was to investigate possibilities to improve detection and qualification of neuropathic pain (NeP) using non-contact imaging photoplethysmography (iPPG) in complex clinical diagnostic set.

Methods

15 patients with NeP of small fiber peripheral neuropathy origin (25–65 years old) and 5 healthy subjects (22–40 years) as a control group were included. NeP syndrome was assessed by painDETECT Questionnaire and Neuropathic Pain Symptom Inventory (NPSI). Standard QST was performed determining sensory thresholds for cold, hot sensation and pain with Q-Sense system. Imaging iPPG signal was recorded from the dorsal aspect of right palm at 530 nm illumination using monochrome camera on baseline and after 20 min local skin heating (43 °C). iPPG perfusion index mapping marked heating evoked flare relative area was calculated, and results of iPPG and QST were compared.

Results

Clinical phenotype of NeP syndromes in patients was heterogeneous and painDETECT number were from 1 to 23 (mean 14), NPSI numbers were from 1 to 52 (27). QST parameters were very variable. In general hands had 3 degrees' lower warmth sensation threshold than legs ($p = 0.001$) and 2 degrees' higher cold sensation ($p = 0.001$). Other QST parameters demonstrated less consistent differences. iPPG relative flare area was significantly larger in control group than in patients. Patient analyses demonstrated tendency for iPPG relative flare area to correlate with QST determined right foot heat sensitivity ($r = 0.47$; $p = 0.07$), right foot heat pain ($r = 0.48$; $p = 0.07$), and painDETECT figure ($r = -0.44$; $p = 0.09$).

Conclusions

Diagnosis and objectification of neuropathic pain syndrome is still challenging in clinical setting. Although QST is validated method of evaluation for small fiber neuropathy the large diversity and phenotypes exist. The present results suggest that iPPG has a potential in objective assessment of neuropathic pain, however prior to its broad clinical use further detailed protocols and technical improvements require.

Diagnosing and Treatment Patterns of First-Time Patients with Alzheimer's Dementia in Riga Psychiatry and Narcology Centre Inpatient Setting

Dr. Viktorija Kučerova; Dr. med. Jeļena Vrubļevska

Rīga Psychiatry and Narcology Centre, Latvia

Objectives

1. The diagnosis of Alzheimer's dementia (AD) is delayed. Patient's dysfunction when they're admitted to the acute hospital for a first time reaches a moderate / late stage of AD.
2. Choice of medication at the Riga Psychiatry and Narcology Centre (RPNC) inpatient departments for behavioural and psychiatric symptoms correction doesn't meet guideline's treatment recommendations for AD.
3. For the most patients with AD, no specific treatment for cognitive impairment was received in the hospital's inpatient departments.

Methods

Retrospective, cross-sectional study. Research of the medical records from RPNC archival materials from January 1, 2007 to December 31, 2017 of the first-time patients with the final diagnosis F00 (ICD-10) treated in the hospital's inpatient departments. To analyse the data descriptive statistics were applied.

Results

In total, 252 patients were diagnosed with AD, mostly women (n = 193). Average patient's age was 74,12 years. 164 patients reached late stage of AD, 60 patients reached moderate stage. 196 patients received treatment with typical antipsychotics, 57 received atypical antipsychotics, 115 were treated with benzodiazepines, 101 with anticonvulsants and 18 received antidepressants for behavioural / psychiatric symptoms correction. 91 patients were treated with cholinesterase inhibitors (ChEIs), mostly ipidacrine (n = 87), only 4 of them were treated donepezil / rivastigmine. 33 patients received memantine. 155 patients were treated with other compounds, like nootropics.

Conclusions

The establishment of Alzheimer's dementia diagnosis is delayed, most patients've reached the late stage of disease when admitted to hospital.

Behavioural and psychiatric symptoms were managed mostly with typical antipsychotics, however due to the serious side effects (stroke, mortality risk) atypical antipsychotics use is preferred.

Most of patients didn't receive donepezil, rivastigmine and galantamine recommended by guidelines, also memantine prescription in hospital was poor.

Psychoneuroimmunological Effects of a New Evidence-based Intervention with Elements of Biodanza on Wellbeing and Health in Adults and Children

Prof. *Marcus Stück*¹; Dr. *Alejandra Villegas*¹; *Vineta Greaves*¹;
*Anette Raykova*¹; *Diana Sturmane*¹; *Kathrin Bauer*²;
*Dr. Hans Ullrich Balzer*³; Prof. *Ulrich Sack*⁴

¹International Research Academy BIONET, Germany;

²University Leipzig, Institute of Immunology, Germany;

³Humboldt University Berlin, Germany;

⁴University Leipzig, Germany

Objectives

Biodanza is a new approach towards health and well-being. It aims to work with dance and group experiences to reinforce intra- and inter-individual resources, reduce stress and increase well-being in children and adults. Up to 2018, around 20 studies and one systematic review about Biodanza studies have been published. In this oral presentation, the authors summarised seven Biodanza studies, which they have done on stress reduction and well-being and its effects on neuroendocrinological parameters. One object is to summarize them and to review the study outcome and quality.

Methods

We analysed 7 studies and reviewed them. All studies are quasi-experimental field studies with an experimental (Biodanza) and control group design (Body-Mind Interventions, e.g. Yoga). Following studies we took into consideration. Study 1: Process-evaluation about Biodanza on immunoglobulin A (IgA) in saliva in relation to heart rate and skin response with teachers; Study 2: Biodanza and cortisol-changes in saliva in relation to emotional regulation in pre-school teachers; Study 3: Biodanza and oxytocin in saliva in relation to skin sensitivity, color-perception and wellbeing in psychiatric patients; Study 4: Biodanza and oxytocin and emotional regulation; Study 5: Biodanza and psychoimmunological blood parameters (e.g. T-cells, NK-cells, leukocytes, adrenaline, noradrenaline); Study 6: Biodanza and cortisol, testosterone, immunoglobulin A in school children (7–12 years); Study 7: Biodanza, cortisol and its relation to emotional recognition in kindergarden-children.

Results

In several studies (Study 1–7), Biodanza has an effect on emotional regulation (e.g. impatience, ability to recover, feeling of activation, increased mood, feeling of well-being) and physiological sympathetic activity (e.g. heart rate, skin response) (Study 1). It could be shown a increased expression of different emotions which causes by a selforganisational effect on IgA in a Biodanza group in comparison with yoga groups (Study 1). In the childrens studies (6–7) were found relations between reduced cortisol and a better emotion recognition after Biodanza and a reduced testosterone level after Biodanza especially in boys. The quality of the studies are different and has limitations, for instance sample size, randomization.

Conclusions

This review about psychoneuroimmunological studies in relation to other psychological and physiological shows the potencial of Biodanza on biopsychological level to increase wellbeing and to reduce stress. Because of the review out of 7 studies we can see a clearer picture about the effectiveness of this new method in comparison to other intervention methods.

Neuropathic Pain in Hereditary Peripheral Neuropathy – Correlation with Clinical, Genetic and Neurophysiological Findings

*Dr. Elīna Millere*¹; *Dr. Einārs Kupats*²;
*Dr. Ieva Mičule*³; *Dr. Inese Kazaine*³; *Dr. Dmitrijs Rots*⁴;
*Dr. med. Linda Gailīte*⁴; *Dr. Olga Šterna*³;
*Prof. Nataļja Kurjāne*⁵; *Dr. med. Viktorija Kēniņa*⁶

¹ Rīga Stradiņš University, Institute of Public Health, Latvia;

² Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;

³ Children's Clinical University Hospital, Latvia;

⁴ Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia;

⁵ Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;

Pauls Stradiņš Clinical University Hospital, Latvia;

⁶ Rīga Stradiņš University, Department of Biology and Microbiology, Latvia

Objectives

Charcot-Marie-Tooth (CMT) disease is known as one of the most common hereditary peripheral neuropathy. CMT1 (demyelinating form) and CMT2 (axonal form) are major subtypes of CMT. Between 70 and 80 percent of individuals with CMT1 have mutations affecting the PMP22 gene (17p11.2 duplication). Neuropathic pain is an occasional symptom of CMT noticed by patients. The goal of our study was to determine the frequency of CMT patients who report neuropathic pain and to detect its correlation with clinical, genetic and neurophysiological findings.

Methods

For an assessment of neuropathic pain, we used the Neuropathic Pain Diagnostic Questionnaire (DN4), for an evaluation of patient's clinical status – CMT neuropathy score (CMTNS), 6 minutes walking test (6MWT), peripheral nerve conduction study (NCS) for electrophysiological characteristics, genetic testing for detection of 17p11.2 duplication (qPCR or MLPA) was performed for all patients to confirm CMT1A type.

Results

Baseline electrophysiological, clinical and genetic data from 53 patients were analysed. There were 32 patients with CMT1A (17p11.2 duplication) and 21 with others CMT subtypes. CMT1A patients were found to be more severely affected (CMTNS 26.5 vs. 20.5 ($p > 0.05$); 6MWT 290 m vs. 365 m ($p > 0.05$)) with more prolonged distal motor latency and more reduced CMAP amplitude. Neuropathic pain was significantly more common symptom in group of CMT1A (DN4 18/32 vs. 5/21 ($p > 0.05$)).

Conclusions

Neuropathic pain is a common symptom observed among patients with CMT. Our findings confirm that CMT1A patients more common have neuropathic pain than patients with other CMT subtypes. Severe demyelinating neuropathy and high functional disability are more common findings in neuropathic pain patients group with CMT.

Spectrum of Polyneuropathies in Children – Data of the Population of Latvia

*Dr. Elīna Millere*¹; *Dr. Inese Kazaine*²; *Laura Gribuste*³;
*Dr. Jurgis Strautmanis*²; *Dr. med. Viktorija Kēniņa*⁴

¹ *Rīga Stradiņš University, Institute of Public Health, Latvia;*

² *Children's Clinical University Hospital, Latvia;*

³ *Rīga Stradiņš University, Latvia;*

⁴ *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia*

Objectives

The objective of the study was to demonstrate the etiological and electrophysiological profile of polyneuropathies detected by nerve conduction studies (NCS) in children over a 10-year period at the Children's Clinical University Hospital.

Methods

We retrospectively studied the results of all nerve conduction studies that had been performed between 2008 and 2018 in children under the age of 18 years at The Children's Clinical University Hospital. NCS were performed in the sural nerve and at least one other motor nerve in each leg, in two sensory and one motor nerve in each hand (according polyneuropathy protocol). Two trained neurophysiologists independently re-evaluated all nerve conduction studies data.

Results

Based on NCS findings, 165 children between 2008 and 2018 were diagnosed with polyneuropathy. The NCS demonstrated a demyelinating neuropathy in 52 cases, an axonal neuropathy in 34 cases and mixed polyneuropathy in 79 cases. In our study, 130 out of 165 children with peripheral neuropathy had acquired causes, mostly diabetes mellitus (27%). The next most common aetiologies were toxic (16%) and autoimmune causes (12%). Idiopathic aetiology of polyneuropathy was defined in 24% of all patients.

Conclusions

Our study is the first study of polyneuropathies diagnosed with NCS in children in Latvian population. Most of the polyneuropathies in the present study were hereditary and diabetic neuropathies with combined (myelin and axon) damage of nerve fibres. This result agrees with the common experience in paediatric neurology.

Theoretical Justification of Empirically Derived Dimensional Model of Personality Pathology Operationalised Latvian Clinical Personality Inventory (LCPI)

*Dr. Viktorija Perepjolkina*¹; *Jeļena Koļesņikova*²;
Prof. *Kristīne Mārtinsonē*²; *Dr. med. Ainārs Stepens*³

¹ *Rīga Stradiņš University, Faculty of Communications,
Department of Sociology and Psychology, Latvia;*

² *Rīga Stradiņš University, Faculty of Public Health and Social Welfare,
Department of Health Psychology and Paedagogy, Latvia;*

³ *Rīga Stradiņš University, Military Medicine Research and Study Centre, Latvia*

Objectives

The main objective of this study was to find a common ground between the factor analytically derived dimensional model of personality pathology which emerged during the developing pathological personality trait scales of the Latvian Clinical Personality Inventory (LCPI) with other theoretically and empirically derived dimensional models of personality pathology. A combined analytical and constructive approach was used to delineate an integrative hierarchical account of the structure of abnormal personality.

Methods

Data of the LCPI scale development sample (N = 400) consisted of participants from general and clinical sample were used to find a hierarchical structure of pathological personality domains based on the results of the Explanatory factor analysis (PFA method with Oblimin rotation (Delta set to 0) were used for factor extraction) and content analysis of existing dimensional models of abnormal personality were used to find a common ground for the LCPI personality model and other existing models. This paper was supported by the project “The Development of Digitalized Personality Assessment System” (2017–2020).

Results

In the final version of the LCPI, there is a model of 33 facet-level scales characterizing pathological personality traits which form seven lower order domains, namely: Antagonism, Impulsivity (Disinhibition), Negative Emotionality, Subordination (Dependent), Asociality (Detachment), Oddity and Compulsivity. These seven domains, based on the results of the Explanatory factor analysis, in their turn, could be combined into six, five, four, and two higher order domains, and finally into the one general factor representing personality pathology as a whole. All these domains are clearly interpretable and just represent different levels of the hierarchical structure of personality pathology and on different levels of hierarchy replicates other models of abnormal personality.

Conclusions

The proposed structure resembles previously suggested accounts of abnormal personality hierarchy and provides insight into the nature of personality hierarchy more generally.

Physical Activity Predicts Brain Integrity in Frontal and Temporal White Matter in Seniors, but not Cognitive Functioning

*Kristīne Šneidere*¹; *Nourah Alruwais*²;
*Dr. Nicholas Dowell*²; *Prof. Voldemārs Arnis*³; *Dr. Jeļena Harlamova*³;
*Prof. Kārlis Kupčs*³; *Zane Ulmane*³; *Jeremy Young*⁴;
*Prof. Jennifer Rusted*²; *Dr. med. Ainārs Stepens*³

¹ Rīga Stradiņš University, Doctoral study program Psychology, Latvia;

² University of Sussex, United Kingdom;

³ Rīga Stradiņš University, Latvia;

⁴ Pontificia Universidad Javeriana Bogotá, Colombia

Objectives

Research indicate positive relationship between involvement in physical activity and cognitive functioning, as well contributes to increase in brain volume (Benedict et al., 2013). The present study aims to investigate the relationship between life-long involvement in physical activity, cognitive functioning and brain integrity in Latvian seniors with no self-reported health problems.

Methods

Forty-four seniors aged from 65 to 85 ($M = 71.90$, $SD = 5.21$) participated in the study. All participants were divided into three groups based on their physical activity experience – life-long active, recently active and sedentary. Physical activity was assessed using modified version of self-report questionnaire “Social Determinants of Health Behaviours questionnaire” (FINBALT, 2008). DTI images were acquired on a Siemens 1.5 Tesla Avanto MRI scanner. Cognitive functions were assessed using subtests from Woodcock-Johnson Test of Cognitive Abilities (Woodcock et al., 2001) and Montreal Cognitive Assessment Scale (Nasreddine et al., 2005).

Results

No significant correlations were found between physical activity and cognitive functions; however, results indicated significant relationship between sedentary lifestyle and fractional anisotropy (FA) in frontal and temporal white matter (WM) and mean diffusivity (MD) in frontal WM. Linear regression analysis indicated that sedentary lifestyle significantly prognoses FA in frontal and temporal WM ($R^2 = 0.14$, $F(1, 43) = 6.59$ and $R^2 = 0.13$, $F(1, 42) = 7.12$, $p \leq 0.05$ accordingly) and MD in frontal WM ($R^2 = 0.09$, $F(1, 42) = 5.26$, $p < 0.05$).

Conclusions

Results of the study presents a possible relationship between sedentary lifestyle and poorer WM integrity in frontal and temporal lobes. While these results comply with findings in other studies, the small sample size in this study should be taken into consideration and in the future, another study with larger sample would be beneficial.

This study is conducted under the State Research Programme BIOMEDICINE, sub-project ENABLE-LV.

Rehacom “Alertness” Indicators for Primary School Age Children in Special Education

Ieva Rugina¹; Sabīne Maciase²

¹*Rīga Stradiņš University, Department of Rehabilitation, Latvia;*

²*Rīga Stradiņš University, Faculty of Rehabilitation, Latvia*

Objectives

Intellectual disability (ID) are found in 1% of the population and they significantly affect intellectual functions, including attention and alertness. Children with ID receive education in special schools where in 2016 there were more than 7000 students in Latvia. The computerised cognitive therapy software Rehacom in Latvia is a new method for improving functionality of cognitive function, which is mainly used by occupational therapists. In this small amount of time while Rehacom is used in Latvian medical institutions, there was no trials done in special education.

Aim of this study was to find out Rehacom’s “Alertness” therapy module effectiveness for improving of alertness functions for primary school children in a special education institution.

Methods

Altogether 17 special school primary school age pupils, learning in the special education code 21015811 participated in the study. Participants were randomly assigned to the intervention group and control group.

Intervention was divided into three stages: first screening with the Rehacom screening module “Alertness” for both groups, therapy with the module “Alertness” for children from the intervention group, repeated screening for both groups with screening module “Alertness”.

Results

Screening results indicated that children with ID have disturbed alertness. After therapy the intervention group’s intrinsic alertness increased by 0.16 units, while the control group worsened by 0.83 units. Phasic alertness for the intervention group improved by 1.33 units, but for the control group they went down by 0.91 units.

Conclusions

Children with intellectual disability have observable difficulties in using alertness functions. Module “Alertness” in computerized cognitive therapy programme Rehacom after 10 sessions is effective in improving phasic alertness of primary school age children with ID but does not show significant changes in intrinsic alertness. Results show that basic cognitive functions are more difficult to affect than complex ones.

Parkinsonism-Dystonia Syndrome in Methcathinone Abusers: Journey from Clinic to Functional Activation Networks in Brain

Dr. *Julius Juurmaa*¹; Dr. *Pilvi Ilves*¹;
Dr. med. *Ainārs Stepens*²; Prof. *Pille Taba*³

¹ *University of Tartu, Department of Radiology, Estonia;*

² *Rīga Stradiņš University, Military Medicine Research and Study Centre, Latvia;*

³ *University of Tartu, Department of Neurology and Neurosurgery, Estonia*

Objectives

A distinctive movement disorder occurs in intravenous abusers of a designer psychostimulant. A mixture containing methcathinone and residual manganese from the synthesis process is injected several times daily. Symptoms typically appear during the first year of abuse; the syndrome involves varying combinations of parkinsonian features, dystonias, and speech disturbances. We will review our fifteen years of research into the clinical features, pathophysiology and outcome of this disorder, including latest results pertaining to structural and functional changes in the brain underlying the syndrome.

Methods

In our clinical and outcome study, we examined 18 intravenous drug addicts with a history of methcathinone abuse who were categorized as active, discontinued, or former users. They were reexamined after a median of 32 months. On both occasions, the subjects were assessed clinically, and using the Movement Disorder Society-sponsored revision of the Unified Parkinson's Disease Rating Scale (MDS-UPDRS). In addition, the Mini-Mental State Examination (MMSE) was used to screen for cognitive disturbances.

In our neuroimaging study, we examined 26 intravenous drug addicts with a history of methcathinone abuse, along with 36 healthy volunteers. T1-, diffusion- and T2*-weighted volumes were acquired on a 3.0 T magnetic resonance tomograph. The T1-weighted data were used to perform volumetric analysis on cortical and subcortical structures using the FreeSurfer imaging analysis suite. Diffusion- and T2*-weighted data were used to analyse white matter integrity and functional activity in the brain at rest, respectively; for these analyses, tools from the FMRIB Software Library (FSL) were used. Both voxel-wise statistical comparisons and network analyses were corrected for multiple comparisons.

Results

Overall, the subjects in the clinical and outcome study showed a slight tendency to deterioration at follow-up on clinical assessment of motor functioning, especially the active users. Notably, cognitive deterioration is not a feature of the syndrome. None of the available antiparkinsonian or antidystonic drugs appear to have an effect on symptoms.

Widespread subcortical volumetric changes were demonstrated in the neuroimaging study: there was statistically significant atrophy in both caudate nuclei, putamina and thalami, but also in the brainstem and cerebellum. Reduction of fractional anisotropy associated with increased radial diffusivity of protons was observed in white matter regions underlying the frontal cortex, indicating white matter damage as a result of demyelination in these areas. Interestingly, network analysis of functional activity in the brain at rest indicates significantly reduced functional connectivity between the primary motor cortex and striatum, and posterior ventrolateral thalamic nucleus and the primary motor cortex.

Conclusions

We have shown that the movement disorder resulting from chronic intravenous administration of methcathinone and manganese is permanent in nature, and is a result of widespread structural and functional changes in the brain. Importantly, we have demonstrated disruption of the cortico-basal ganglia-thalamocortical loop in both the input and output stages underlying this syndrome. Future prospects include the use of deep brain stimulation in abstinent and socially well integrated patients.

Screening for Symptoms of Psychological Distress in Adolescent Populations

*Dr. Ņikita Bezborodovs*¹; Prof. *Elmārs Rancāns*¹;
Prof. *Anita Villeruša*²

¹ *Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia;*

² *Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia*

Objectives

The aim of the study was to explore and evaluate existing screening instruments for symptoms of psychological distress (both internalizing and externalizing) in adolescent populations and select an instrument for clinical use in the Latvian population.

Methods

A structured exploratory search of scientific articles published in peer-reviewed journals between years 2013 and 2018 was performed, followed by a detailed review of articles that reported use of screening instruments meeting criteria for methodologically sound assessment of internalizing / externalizing problems in adolescent populations.

Results

The instruments most commonly used to screen for internalizing/externalizing problems in adolescents were: Strengths and Difficulties Questionnaire (SDQ), Pediatric Symptom Checklist (PSC), Achenbach System of Empirically Based Assessment (ASEBA), Behavior Assessment System for Children (BASC) among others. Most of the identified screening tools are available both as self-report and parent / teacher report questionnaires, some (like SDQ and PSC) are freely accessible, only two of the identified instruments are available in Latvian language (SDQ and ASEBA). Instruments varied in length (administration and scoring time), availability of validation data for different populations and cultural contexts and their psychometric properties. Only for one of the identified screening instruments (SDQ) there is an available dataset of a representative sample of the general population of Latvian adolescents (age 11 to 15), as it has been included in the year 2017/2018 international Health Behaviour in School-aged Children (HBSC) study.

Conclusions

Based on the assessment of previously reported psychometric properties, validation data in different societies and cultural contexts, feasibility and availability of the instrument, the Strengths and Difficulties Questionnaire appears to be the best option to be used in Latvian adolescent population. More research is needed to evaluate the clinical validity of SDQ as a screening tool for symptoms of psychological distress in clinical populations, and compare with available data from the general population sample.

Evaluation of Alcohol Withdrawal Syndrome by CIWA-Ar Scale and Analysis of Factors Determining Severity of Symptoms for Patients with Alcohol Dependence in Mental Hospital of Strenči, Latvia

Dr. Julija Lice¹; Dr. Sarmite Skaida²

¹ Rīga Stradiņš University, Faculty of Continuing Education,
Residency in Medicine, speciality "Narcologist" Latvia;
Mental Hospital of Strenči, Latvia;

² Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia

Objectives

The aims were to estimate the degree of severity of patients alcohol withdrawal symptoms, using CIWA-Ar scale, and to look for any correlations between the severity of alcohol withdrawal symptoms and other variables.

Methods

In this quantitative, cross-sectional study, patients with diagnosis of alcohol withdrawal who were hospitalized in SLLC Mental Hospital of Strenči ward of addiction medicine, from 01.07.2018 till 30.09.2018 with minimal hospital staying time of more than 24 hours, were chosen. Unique cases were analysed. Data were collected from patients medical cards. Descriptive statistics were performed. The normal distribution of data were analysed using Kolmogorov-Smirnov test with Lilliefors correction or Shapiro-Wilk test. To compare the continuous variables of unparalleted samples Mann-Whitney U test or Kruskal-Wallis test were used. A p value of 0.05 or less was considered statistically significant. IBM SPSS Statistics version 22 was used to perform the analysis.

Results

From 360 patients hospitalized, 317 were included (n = 282 men, 89%). Mean age were 47.7 (SD = 10.4 for men, SD = 11.6 for women). Most had secondary education (n = 258, 81.4%), were employed (n = 184, 58.0%), and were living in family (n = 224, 70.7%). Mean CIWA-Ar score was 19.61 (SD = 5.77; Min. = 0, Max. = 36), score was skewed negatively (-0.367). We found statistically significant correlation between CIWA-Ar score and hospital stay time (rs = 0.230, p < 0.001) and between CIWA-Ar and AUDIT (rs = 0.250, p < 0.001). There was no statistically significant correlation between CIWA-Ar score and the duration of alcohol use (rs = 0.095, p < 0.092) and self-reported alcohol tolerance (rs = -0.087, p < 0.120).

Conclusions

In conclusion, the greatest majority of the study population were men in working age, with a mild to moderate alcohol withdrawal syndrome demonstrated by mean CIWA-Ar score. Self-reported alcohol use were associated with objective severity alcohol withdrawal syndrome, and that the CIWA-Ar score can be used to relatively predict duration of patients treatment time.

Brief Systematic Review of Clinical Use and Reported Cases of Misuse of Phenibut

*Dr. Einars Kupats*¹; *Dr. med. Jelena Vrublevska*²;
*Ph.D. Liga Zvejniece*³; *Dr. Gundega Stelfa*³;
*Ph.D. Edijs Vavers*³; *Prof. Maija Dambrova*⁴

¹ *Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;*

² *Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia;
Rīga Psychiatry and Narcology Centre, Latvia;*

³ *Latvian Institute of Organic Synthesis;*

⁴ *Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia*

Objectives

Phenibut is a nootropic drug possessing anxiolytic and gabapentin-like anti-nociceptive effects. In Eastern Europe phenibut has been used as a prescription medication for more than a half century. To analyze increasing number of misuse and abuse reports the present study summarized currently available data on clinical use of phenibut.

Methods

A comprehensive literature search was conducted using the PubMed-NCBI database and keywords “phenibut” and “noophen”. Case reports regarding phenibut abuse, dependence and intoxication and full-text clinical trials were analyzed.

Results

Thirteen abuse / misuse case reports (15 patients) and ten clinical trials (496 patients) were included in the analysis. The majority of case reports involved male gender, individuals with history of substance abuse at an average age of 30 ± 11 years. Phenibut was the most commonly obtained from the internet and its purity and origin was not identified. The clinical features of phenibut abuse, dependence and intoxication cases included cardiovascular effects (9 of 15), anxiety (8 of 15), insomnia (7 of 15), agitation (6 of 15), hallucinations and depressed level of consciousness (4 out of 15). In addition, the dosages used (0.5–100 g/day, average dose 18.1 g/day) were much higher than the recommended daily dose in clinical trials. Analysis of phenibut side effects described in clinical trials reported adverse events only in 13.9% of patients and the most reported side effect was somnolence.

Conclusions

There are discrepancies in the reported side effects of phenibut in clinical trials and reported cases of its misuse. Phenibut should be considered as a controlled prescription medication with restriction on internet sales. Our results indicate that male individuals with substance abuse are at higher risk of phenibut abuse.

10-Year Cardiovascular Disease Risk Assessment in Schizophrenia Patients

*Agnese Gaibišele*¹; *Dr. Elīna Pūcīte*²; *Dr. Nata Gaibišele*³

¹ *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

² *Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;*

³ *Akniste Psychoneurological Hospital, Latvia*

Objectives

The aim was to estimate cardiovascular risk factors and 10-year risk of cardiovascular disease (CVD) in schizophrenia patients.

Methods

Cross-sectional study of 188 adult schizophrenia patients was conducted at Akniste Psychoneurological hospital. Demographic and clinical data (somatic comorbidities, arterial blood pressure, height, weight, total cholesterol) were obtained from medical records. Antipsychotic doses were recorded and converted to chlorpromazine (CPZ) equivalents. Data on smoking habits were collected by structured interviews. 10-year CVD risk was determined according to risk categories defined in 2016 European Guidelines on cardiovascular disease prevention in clinical practice and SCORE risk chart.

Results

Mean age of the study population (n = 188) was 53.3 years (SD ± 16) and 65% (n = 122) were male.

Very high 10-year CVD risk was estimated in 24% (n = 45) patients, high risk in 21% (n = 39), moderate risk in 36% (n = 68) and low risk in 19% (n = 36) patients. Logistic regression analysis showed that main factors associated with high and very high 10-year CVD risk were smoking (OR 6.34, 95% CI 1.87–21.52), arterial hypertension (OR 4.31, 95% CI 1.37–13.55), elevated total cholesterol (OR 2.18, 95% CI 1.38–3.45) and age (OR 1.26, 95% CI 1.16–1.37). There was no significant association between high-very high CVD risk and higher antipsychotic doses. High antipsychotic doses (CPZ equivalent > 1000 mg/d) were administered only in 32% (n = 27) patients at very high and high 10-year CVD risk group (n = 84) whereas in low and moderate risk group (n = 104) there were 58% (n = 60) patients on high doses of antipsychotics. Anamnesis of myocardial infarction or stroke was positive in 5% patients (n = 9). The most prevalent cardiovascular risk factor was smoking (51%, n = 95).

Conclusions

Less than a half of schizophrenia patients had high or very high 10-year CVD risk. The most common cardiovascular risk factor was smoking. Main factors associated with high or very high 10-year CVD risk were smoking, arterial hypertension and hypercholesterolemia.

Clinical Results and Life Quality Evaluation in Patients after Acute Cerebral Aneurysm Rupture and Endovascular Embolisation: Single Centre Experience

*Dr. med. Sanita Ponomarjova*¹;
*Dr. Linda Šmaukstele*²; Prof. *Gaida Krūmiņa*¹

¹Rīga Stradiņš University, Department of Radiology, Latvia;

Rīga East University Hospital, Department of Interventional Radiology, Latvia;

²Rīga Stradiņš University Liepaja branch, Latvia;

Liepaja Regional Hospital, Department of Physical and Rehabilitation Medicine, Latvia

Objectives

Acute cerebral aneurysm rupture is life threatening condition which should be managed in acute stage and is linked to severe neurologic deficit in cases of complications. Most common and less traumatic treatment is endovascular embolization of the aneurysm. To evaluate clinical and neurologic results of these patients after aneurysm rupture, identification of mRS and WHODAS self-assessment test was analysed.

Methods

During time period from January 1st 2016 to March 26 2018, 119 patients with acute cerebral aneurysm rupture were treated by endovascular embolization in Riga East University Hospital, Department of interventional radiology. Patients were clinically evaluated during discharge from hospital and 3-6 month after acute onset of the symptoms. Evaluation using mRS and WHODAS test were applied.

Results

Data analysis was performed on 119 patients using mRS during discharge and in 80 respondents using self-assessment test (men and woman 34 (42.5%) and 46 (57.5%) respectively) with mean age 54.2 years \pm 13.3 SD). From 119 patients 13/119 (10.9%) were not respondent, 26/119 (21.8%) were dead. Incidence of complications was 96.2% (25/119) in deceased group including secondary ischaemia - 10 (38.4%), hydrocephalus and cerebral oedema - 10 (38.4%), vasospasm - 7 (26.9%), non-neurological complications - 6 (23.0%). Modified Rankin Scale (mRS) in the day of discharge was 0 in 44 (37.0%) patients, 1 - 27 (22.7%), 2 - 3 (2.5%), 4 - 4 (3.4%), 5 - 15 (12.6%) and 6 - 19 (16.0%) cases. Self-rated disability level in study group: no disability - 16/80 (20.0%), slight disability - 24 (30.0%), moderate disability - 21 (26.3%), severe disability - 15 (18.8%), total disability - 4 (5.0%). Of the 13 independent variables, 7 (age, occupation, disability status, self-esteem in the 10-point scale, mRS at discharge, mRS at the time of the interview, drug use) showed a close correlation.

Conclusions

80% of interweaved patients are able to stay independent on a daily basis. One third of the patients continues to work. As lower are self-assessment scores, as more functional impairments are expected for the patient. It is necessary to continue the study to investigate the effects of other factors on the results. Wider uses of the evaluation scales are crucial for SAH patients not only in objectifying the patient's clinical condition but also in predicting outcomes.

Self-Assessment and Attitudes to Self-Care of Patients with Chronic Back Pain

*Dr. Ilārs Freimanis¹; Dr. Alla Haduņkina²;
Dr. Maija Māliņa³; Agnete Teivāne⁴; Magdalēna Mudule⁴;
Artūrs Bjalkovskis⁴; Prof. Ināra Logina⁵*

¹ Family doctor practice, Latvia;

² Rīga 1st Hospital, Centre of Pain, Latvia;

³ Pauls Stradiņš Clinical University Hospital, Department of Pain Care, Latvia;

⁴ Rīga Stradiņš University, Faculty of Medicine, Latvia;

⁵ Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia

Objectives

The aim of the study was to evaluate self-assessment of chronic back pain (CBP) patients and self-reporting quality-of-life measures in relationship with suggestions of occupational, physical and psychological influences on pain origin, care and prognosis.

Methods

During the cross-sectional study 67 patients (M/F – 26/41, mean age 53.13 y) with CBP were interviewed using Brief Pain Inventory (BPI) and Back Pain Attitudes Questionnaire (Back-PAQ). The patient's opinion on diagnosis, causes and therapeutic methods of CBP was clarified.

Results

The average duration of CBP was 63 months with mean 2 exacerbations per month. The worst pain in last 24 hours and on average during last week were indicated as moderate – 5.78 (SD 2.40) and 4.86 (SD 1.89) by NRS although 89.6% of patients received medicines. Pain intensity interfered general activity, mood, walking ability, normal work, sleep and enjoyment of life (BPI, moderate and week correlations) and 85.1% with CBP noticed difficult to enjoy life (Back-PAQ). The main cause why hurts the back was mentioned the occupation by 40.3% of respondents (13.4% did heavy physical job) and other 38.8% showed sedentary lifestyle and forced posture, but only 7.5% accepted role of psychological factors. However in 30% of CBP patients degenerative spine disorder was diagnosed, in 19% – disk disease, but muscle strains – only in 7%. Half of patients with CBP (53.8%) were afraid from exercises, especially vigorous (76.1%) and only 2 of all recognized physiotherapy as important relevant treatment. 77.7% of patients were concerned about vulnerability of their spine and 43.3% did not hope that pain will resolve.

Conclusions

The knowledge and education of patients about chronic back pain are insufficient, and expectations and prognosis are pessimistic in high proportion. Multimodal approach for care of this biopsychosocial phenomenon – world's leading cause of disability, is not introduced in every day practice, especially physiotherapy is not recognized.

Development of Postoperative Cognitive Dysfunction after Spinal Neurosurgery

*Dr. Reinis Berezovskis*¹; *Dr. Sniedze Mūrniece*²;
Prof. *Biruta Mamaja*²

¹ *Rīga East University Hospital,
Clinical Centre of Emergency Medicine "Gailezers", Latvia;
University of Latvia;*

² *Rīga Stradiņš University, Latvia;
Rīga East University Hospital, Latvia*

Objectives

Postoperative cognitive dysfunction (POCD) is associated with increased postoperative mortality and disability. During surgery in prone position, complications such as cardiovascular system depression may develop, which causes hypotension, hypoxia that might reflect on POCD.

The aim of this study was to determine whether patients after spinal neurosurgery in prone position suffer from POCD and factors that could contribute to POCD development.

Methods

Patients, who had neurosurgery in prone position, were included in prospective study. Patients received standard general anesthesia. Preoperative hemoglobin, hematocrit level and intraoperative data like blood loss, length of the surgery, intraoperative mean arterial pressure (MAP) were fixed. Patient's cognitive function was controlled twice – preoperatively and two days after the surgery, using the Montreal cognitive assessment scale (MOCA).

Results

In the study were included 22 patients (male – 13, female – 9, age 50 ± 16.23 years). 17 underwent microdiscectomy, 3 – transpedicular fixation; 2 – spinal tumor resection. 10 out of 22 patients (45%) showed cognitive function decline for 1–4 points. The decrease of cognitive function was discovered to be independent to sex ($p = 0.65$), blood loss (0.331), hemoglobin (0.483), hematocrit (0.129), length of the surgery (0.745), intraoperative MAP ($p = 0.786$). Medium MOCA score before surgery was 25.64 ± 3.71 , MOCA after – 25.4 ± 3.32 . Patients with POCD had higher medium age (53.6 ± 15 and 44.3 ± 15), lower medium preoperative hematocrit level ($40.3\% \pm 3$ vs. 42.6 ± 5), blood loss ($166.0 \text{ ml} \pm 108$ and $200.0 \text{ ml} \pm 108$), shorter medium length of the surgery ($108.7 \text{ min} \pm 29$ and $118.4 \text{ min} \pm 50$), higher intraoperative MAP ($92.8 \text{ mmHg} \pm 11$ and $85.1 \text{ mmHg} \pm 10$) compared to the rest of the group. There was no difference in medium Hb levels ($14.3 \text{ g/L} \pm 1$ and $14.5 \text{ g/L} \pm 1$).

Conclusions

Decreased postoperative cognitive function after neurosurgical spine surgery in prone position was detected 45% of the patients. We did not find any connection between the development of postoperative cognitive decline, preoperative laboratory findings and intraoperative parameters.

Neuroablative Procedures in Chronic Pain Management

*Dr. med. Mihails Arons*¹; Prof. *Mara Pilmane*²;
*Dr. med. Edgars Vasilevskis*³; *Dr. Igors Panihins*⁴;
*Dr. med. Irina Evansa*⁴; *Dr. Linda Zvaune*⁴;
*Jekaterina Krasnika*⁴; *Dr. Alla Hadunkina*⁴

¹ Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia;

² Rīga Stradiņš University, Department of Morphology, Institute of Anatomy and Anthropology, Latvia;

³ Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;

⁴ Medical Center D.A.P., Latvia

Objectives

Neuroablative procedures is a percutaneous minimally invasive procedure, which can be used for various chronic pain syndromes, when conservative treatment modalities have not been effective. To achieve neuroablation three methods can be used: radiofrequency, cryodestruction and chemical neurolysis. Knee joint osteoarthritis (OA) is the most frequent cause of chronic knee pain. Aim of the study is evaluate the effectiveness of genicular nerves cryodestruction in the treatment of chronic knee pain in case of stage 3 and 4 of chronic knee osteoarthritis.

Methods

Retrospective, descriptive study. Design of this study has been approved by Ethics Committee of Rīga Stradiņš University (No. 80/21.12.2017). By using fluoroscopy guidance and sensory stimulation genicular nerves were localised, then cryoablation were performed. During the procedure the temperature on the tip of the needle decreases till -78°C . The patients who had genicular nerve cryodestruction for treatment of stage 3 and 4 of knee osteoarthritis in the period of time from February till December 2017 have been enquired by phone after the procedure. 90 ± 2 days after the procedure the patients have been evaluated for pain perception (using numeric rating scale, NRS) and global perceiving effect (Likert scale). The results have been evaluated by a person, who was not involved in treatment.

Results

From 21 patients, 4 (19%) were men, 17 (81%) – women. The mean age was 74.8 ± 12 SD years. Average pain level (NRS) before the procedure was 8.2 ± 0.7 SD, 90 ± 2 days after the procedure 4.9 ± 2.1 SD. Average Likert scale value was 5.6 ± 1.2 SD. Overall 16 patients (76%) considered improvement in their condition after the procedure, 12 patients (57%) showed improvement more then 50%. No complications were occurred.

Conclusions

Genicular nerves cryodestruction is effective method of treatment of chronic pain due to stage 3 and 4 of knee osteoarthritis.

Impact of Physical Activities on Cardiovascular Autonomic Neuropathy Development and Progression in Type 2 Diabetes

*Dr. Kārlis Stirāns*¹; *Dr. Laura Stirāne*²;
*Dr. Jānis Mednieks*¹; *Dr. Santa Borisāne*¹;
*Sanita Kalva-Vaivode*³; *Dr. med. Jeļizaveta Sokolovska*²

¹ Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;

² University of Latvia, Department of Endocrinology;

³ University of Latvia

Objectives

Cardiac autonomic neuropathy (CAN) is a serious complication of longstanding diabetes. Diabetic patients have an increased prevalence of complications and risk of mortality. Our aim was to detect the frequency of CAN and evaluate the impact of physical activities on CAN.

Methods

We examined 64 type 2 diabetes patients aged 35–75, that were divided in active (interval walking trainings 3 times per week for 4 months) and control group. A mobile device with walking monitoring application was given to each patient in active group. Cardiovascular autonomic function tests were performed on tilt table: (heart-rate (HR) response to Valsalva manoeuvre (VM), HR variation during deep breathing, blood-pressure (BP) response to sustained handgrip, immediate HR and BP response to standing) before and after follow up. Ewing et al. (1985) classification was used for staging of CAN.

Results

Characteristics: mean age 58.6 ± 9.5 years, mean duration of diabetes 6.9 ± 5.1 years, mean BMI 33.5 ± 5.5 kg/m², mean HbA1c $6.9 \pm 1.3\%$. HR response to VM after trainings improved from 1.11 to 1.22 mm in active ($p = 0.00$) vs. 1.11 to 1.18 mm in control group ($p = 0.00$). HR response to standing improved from 1.023 to 1.056 mm in active ($p = 0.000$) vs. 1.041 to 1.065 mm in control group ($p = 0.000$). No significant differences in HR variation during deep breathing and BP response to standing, sustained handgrip between groups.

Initially the prevalence of possible CAN was detected in 40 (62.5%) vs. 30 (58%) after trainings, definite CAN in 15 (23.4%) vs. 5 (10%) after trainings and severe CAN in 4 (6.3%) vs. 3 patients (6%) after trainings, for 5 patients (7.8%) all tests were normal before vs. 14 (27%) after trainings.

Conclusions

Cardiac autonomic neuropathy is common complication of diabetes that often goes unrecognized. Physical activities can improve autonomic status. Cardiac autonomic neuropathy patients should avoid high-intensity physical activities unless they have been cleared by a physician to participate.

Correlation of Cardiovascular Dysfunction and Parkinson's Disease Duration and Severity

*Ramona Valante*¹; *Dr. Jānis Mednieks*²;
*Jolanta Umure*¹; Prof. *Andrejs Millers*²

¹Pauls Stradiņš Clinical University Hospital, Department of Neurology, Latvia;

²Pauls Stradiņš Clinical University Hospital, Department of Neurology, Latvia;
Rīga Stradiņš University, Latvia

Objectives

Most common nonmotor symptoms of Parkinson's disease (PD) occurring in over half the patients are related to cardiovascular dysfunction, which induces serious symptoms and affects patients' quality of life. Objectives of this study were to determine a frequency of autonomic cardiovascular dysfunction in patients with Parkinson's disease and analyze the association between disease duration and severity.

Methods

Seventeen patients (13 female) with Parkinson's disease participated in the study that was carried out at Pauls Stradiņš Clinical University Hospital Department of Neurology. PD motor symptom severity was evaluated using United Parkinson's disease rating scale (UPDRS) part III. Cardiovascular dysfunction was assessed using standardized tilt table test evaluating orthostatic hypotension and cardiac autonomic neuropathy. To assess the strength of association between two variables Pearson correlation coefficient (R) was used.

Results

Mean age of patients was 65,6 years \pm SD 8,7 (43-79). The average duration of PD was 5,3 years \pm SD 2 (the shortest was 2, but longest 12 years). Mean UPDRS score was 20,47 \pm SD 11,2 (4-48).

10 out of 17 patients had orthostatic hypotension. Correlation between orthostatic hypotension and disease duration was positive but statistically insignificant ($R = 0.089$, $p = 0.734$) But there was no correlation between orthostatic hypotension and disease severity ($R = -0.0134$, $p = 0.9605$). 12 patients had cardiac autonomous neuropathy. But there was no correlation between cardiac autonomous neuropathy, disease severity and duration (respectively $R = -0.0151$, $p = 0.9544$, $R = -0.37$, $p = 0.1437$).

Conclusions

There was no statistically significant correlation between cardiovascular dysfunction and Parkinson's disease severity and duration. There was a weak association between orthostatic hypotension and Parkinson's disease duration, but the results were statistically insignificant. To achieve statistically significant results, the study will be continued to collect more patient data.

Use of Ocrelizumab for Patients with Primary Progressive Multiple Sclerosis

*Dr. Elīna Polunosika*¹; *Dr. med. Daina Pastare*²;
*Prof. Guntis Karelis*³

¹ *Rīga Stradiņš University, Latvia;*

² *Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;
Riga East University Hospital, Latvia;*

³ *Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;
Riga East University Hospital, Latvia*

Objectives

Multiple sclerosis (MS) is the most common demyelinating disease of the central nervous system that causes irreversible disability for young adults. 10% of patients have primary progressive MS (PPMS). PPMS was not treated with immunomodulatory therapy (IMT) until 2017. Ocrelizumab is a monoclonal antibody that acts against CD20 + B cells. The drug is approved as the only method of PPMS treatment and the most commonly reported adverse events are associated with infusion reactions.

Aim: To summarize patients with PPMS in the Multiple Sclerosis Unit of Riga East University Hospital, receiving Ocrelizumab treatment. To assess Ocrelizumab side effects, tolerability and impact on the disease progression.

Methods

In a retrospective study, five PPMS outpatient medical cards were analyzed. Patients were treated with Ocrelizumab during the period from October 2017 to December 2018. Expanded Disability Status Scale – EDSS was used to evaluate patient's neurological status.

Results

Five patients received treatment with Ocrelizumab, three of them – female and two – male. Average age is 51 years (40–56). Average disease duration is 6 years (3–12). In 2017, taking into consideration the course of the disease retrospectively, the diagnosis of all patients was revised and diagnosis of PPMS was established. When initiating treatment with Ocrelizumab EDSS was: 1/5 – 5.5; 1/5 – 6.0; 3/5 – 6.5. During therapy 4/5 EDSS remained unchanged, one patient worsened to EDSS 7.5. Changes in blood and urine tests were not remarkable. No one patient had any adverse reactions observed during and after the infusion. 3/5 of patients continue treatment, 2/5 discontinued the treatment – due to social indications; disease progression.

Conclusions

Ocrelizumab is the only available therapy for patients with PPMS nowadays and is well tolerated. A longer observation period is required to evaluate the effectiveness of the therapy.

Prevalence and Sociodemographic Characteristics of Self-Reported Mild Types of Suicidal Behaviour in General Population in Latvia

*Dr. Krista Mieze*¹; *Dr. med. Anda Ķīvīte-Urtāne*²;
*Daiga Grīnberga*³; *Biruta Vēlika*³;
*Iveta Pudule*³; *Prof. Elmārs Rancāns*¹

¹ Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia;

² Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia;

³ Centre for Disease Prevention and Control of Latvia

Objectives

The aim was to assess the prevalence and identify associated sociodemographic factors of self-reported mild types of suicidal behaviour in Latvian general population.

Methods

Questions on suicidal behaviour were included in the Health Behaviour Among Latvian Adult Population survey questionnaire in years 2010, 2012, 2014 and 2016. Interviews were carried out to gather information on a representative sample of the Latvian population aged 15 to 74 (n = 12.606). The study sample was selected using a combination of stratified random sampling and quota methods. To evaluate mild types of suicidal behaviour, respondents were asked to report the occurrence of life-weariness (LW) and death wishes (DW) during the previous year. Basic sociodemographic information was also included, i.e. habitat (urban / rural), gender, age (age groups 15–34, 35–54, 55–74), nationality (Latvian / non-Latvian), cohabitation (married / cohabiting vs. single / divorced/widowed), years of education (≤ 9 , 10–13, ≥ 14), employment (employed, student / pupil, unemployed, economically inactive) and income (low, middle, high). Statistical analysis was performed using SPSS version 22.0 for IBM. Binary logistic regression was used to identify factors associated with the LW and DW. The study was approved by the Ethics Committee of Rīga Stradiņš University.

Results

The prevalence of last year self-reported LW and DW was 14.4% (n = 1812) and 9.4% (n = 1199), respectively. Several sociodemographic factors showed significance in adjusted odds ratio (OR), adjusted for all independent variables mentioned in methods. Identified significant associated factors regarding LW and DW were middle-age (OR 1.52, p < 0.001 and OR 1.74, p < 0.001) and older age (OR 1.44, p < 0.001 and OR 1.43, p = 0.002), non-cohabitation status (OR 1.65, p < 0.001 and OR 1.87, p < 0.001), education 0–9 years (OR 1.37, p = 0.005 and OR 1.74, p < 0.001) and 10–13 years (OR 1.22, p = 0.008 and OR 1.48, p < 0.001), unemployment (OR 2.13, p < 0.001 and OR 2.43, p < 0.001) and economic inactivity (OR 1.50, p < 0.001 and OR 1.68, p < 0.001), low incomes (OR 1.35, p = 0.02 and OR 1.33, p = 0.017). Rural residency (OR 1.23, p = 0.036) and Latvian nationality (OR 1.22, p = 0.006) are significant associated factors for LW, but not DW.

Conclusions

Several associated sociodemographic factors for mild types of suicidal behavior have been found, that could be useful to determine risk groups in Latvian general population.

Clinical and Sociodemographic Characteristics among First Time Psychosis Patients in Urban and Rural Regions in Latvia

*Dr. Krista Mīze*¹; *Krista Brūna*²; *Dr. Liene Bērze*;
*Jeļena Zaharova*²; *Karina Bezina*²; Prof. *Elmārs Rancāns*¹

¹ *Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia;*

² *Rīga Stradiņš University, Latvia*

Objectives

Evaluate clinical and sociodemographic differences between two first episode psychosis (FEP) patients' cohorts – urban and rural regions in Latvia.

Methods

All consecutive patients with FEP non-affective psychosis (n = 212) were interviewed in two hospitals: Riga Centre of Psychiatry and Addiction Disorders, capital city, (n = 118, 1st group), time period 01.01.2018.–30.06.2018., and Daugavpils Psychoneurological Hospital in rural region (n = 94, 2nd group), time period 01.01.2016.–31.12.2017. ICD-10 criteria for schizophrenia spectrum disorder was used, authors conducted structural interview which included sociodemographic data, duration of untreated illness (DUI), duration of untreated psychosis (DUP), Scale for the assessment of positive symptoms (SAPS), Scale for the assessment of negative symptoms (SANS), Scale for assessment of insight extended version (SAI-E). Statistical analysis was performed using SPSS version 22.0 for IBM. The study was approved by the Ethics Committee of Rīga Stradiņš University.

Results

From all consecutive FEP patients, inclusion criteria were met by 68 from 118 in 1st group, and 77 from 94 in 2nd group. In 1st group 42 (61.7%) are men, median age for group is 29 y. (IQR = 24.0–38.5), in 2nd group 44 (57.1%) are men, median age for group is 33 y. (IQR = 27.0–43.0), p = 0.067. In 1st group DUP are 4 weeks (IQR = 2.0–16.0), DUI 144 weeks (IQR = 24.0–240.0). In 2nd group DUP are 4 weeks (IQR = 1.0–12.00), DUI 96 weeks (IQR = 24.0–192.0), p > 0.05. Clinical symptomology at 1st group: positive symptoms (SAPS) median 66.0 (IQR = 53.0–82.0), negative symptoms (SANS) median 59.0 (IQR = 40.0–75.0), insight (SAI-E) 10.0 (IQR = 6.0–23.0). Clinical symptomology at 2nd group: positive symptoms (SAPS) median 67.0 (IQR = 53.0–83.0), negative symptoms (SANS) median 54.0 (IQR = 39.0–74.0), insight (SAI-E) median 9.0 (IQR = 5.5–21.0). We did not find differences between those two cohorts in positive and negative symptoms and insight.

Conclusions

Clinical and sociodemographic characteristics did not result in significant differences in DUP or DUI between urban or rural region FEP patients.

Contemporary Approach to Cognitive Assessment in Patients with Systemic Connective Tissue Disorders

*Dr. Jānis Mednieks*¹; Prof., *Dr. habil. med. Valērija Groma*²

¹*Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;*

²*Rīga Stradiņš University, Institute of Anatomy and Anthropology,
Joint Laboratory of Electron Microscopy, Latvia*

Objectives

1. Accomplishment of an overview of clinical, imaging and neuropsychological testing tools that are currently being used to assess cognitive function in systemic connective tissue disorders.
2. Presentation of first 2 brain default mode network functional MRI (fMRI) study cases from Rīga Stradiņš University study “Interdisciplinary study on the influence of inflammatory joint disease to the neurocognitive function”.

Methods

Literature review of Pubmed articles from last 5 years was carried out using combinations of search terms:

1. (“cognitive function” OR “cognitive dysfunction” OR “cognitive impairment”) AND (“MRI” or “SPECT” or “PET”) AND “systemic connective tissue disorders”;
2. (“MOCA” OR “MMSE” OR “ANAM”) AND “cognitive testing” AND “systemic connective tissue disorders”. If small number of relevant articles (< 5) was retrieved, unlimited time period was set. Descriptive analysis of relevant articles was performed.

Anatomical brain MRI and default mode network fMRI will be carried out in Pauls Stradiņš Clinical University Hospital in January 2019 using Siemens Avanto 1,5 T MRI machine.

Results

CNS involvement in systemic lupus erythematosus (neuropsychiatric lupus) was the most studied condition, both regarding neuropsychological testing and imaging studies. Other conditions explored were Sjogren’s syndrome, scleroderma, relapsing polychondritis. Structural MRI mostly had been used for the detection of subcortical white matter lesions, but some advanced techniques e.g. cortical volumetry also have been included. Functional (diffusion tensor imaging – DTI) MRI has been used to assess white matter connectivity and integrity in lupus patients and to assess structural connectome. Blood oxygen level dependent (BOLD) functional MRI has been used to assess task related brain activation and default mode network. Single photon emission computed tomography (SPECT) studies have showed global or focal brain hypoperfusion, but interestingly – also – altered GABA receptor activity. Similarly to SPECT, positron emission tomography (PET) has indicated focal or global cerebral hypoperfusion with 18FDG-PET, but it has also been used to detect disease specific biomarkers – e.g. TSPO in SLE. Regarding the use of neuropsychological cognitive screening tools, MMSE and MOCA scale have been most commonly used. Some tools that allow detailed exploration of specific cognitive domains as for example Automated Neuropsychological Assessment Metrics) ANAM have also been used in smaller number of studies.

Conclusions

The availability of novel neuroimaging techniques and specialized cognitive testing allows the detection of early cognitive changes in systemic connective tissue disorders. Meanwhile it points toward the possibility of exploration of even more subtle neurocognitive changes in early stages of inflammatory joint conditions as it is proposed in our research project.

Cervical Epidural Steroid Injection with Triamcinolone for Unilateral Cervical Radicular Pain

*Dr. med. Mihails Arons*¹; *Larisa Ksennikova*;
*Dr. Igors Panihins*²; *Dr. med. Edgars Vasilevskis*³;
*Dr. Alla Hadunkina*⁴; *Dr. med. Vladimirs Sklarevics*⁵

¹ Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia;

² Medical Center D.A.P., Latvia;

³ Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;

⁴ Rīga 1st Hospital, Department of Anesthesiology, Intensive Care and Pain Medicine, Latvia;

⁵ Rīga Stradiņš University, Scientific Laboratory of Biomechanics, Latvia

Objectives

Cervical radicular pain can be treated with epidural steroid injection (ESI) when conservative treatment modalities are failed. Injection of particulate and non-particulate steroids have been used for chronic pain with various outcomes. Particulate steroids have been implicated in paraplegia in patients with cervical radicular pain after ESI. Inadvertent intra-arterial injection of particulate steroids has been described as the mechanism of action. Triamcinolone is a long acting particulate glucocorticoid.

Methods

Retrospective, described study. Design of this study has been approved by Ethics Committee of Rīga Stradiņš University (No. 12/27.04.2017). This study was performed analyzing patients medical reports from December 2016 up to May 2017. For patients with unilateral cervical radicular pain, cervical ESI using x-ray control and contrast fluid, at the levels of C6–C7 or C7–Th1 were performed. During one procedure 40 mg. of Triamcinolone was injected. After 30 ± 2 days all patients were evaluated using Likert scale. If pain decreased more than 75% second procedure was not done. Second procedure (ESI) was done only if improvement was less than 75%. Epidural space was punctured with 18G epidural needle and verified by loss of resistance technique.

Results

Fifty four patients were included on this study. The average pain intensity was 7.2 ± 1.1 SD by the numerical rating scale. Patient's age was 49.5 ± 6.7 years. 26 (63%) woman, 17 (37%) man. 33 patients after 30 ± 2 days have had stable improvement > 75%, where no second procedure was performed. For 21 patients after 30 ± 2 days second procedure was performed. After 60 ± 2 days all patients have had improvement > 75%. No complications were noted.

Conclusions

Interlaminar epidural administration of steroids in cervical region of 40 mg of Triamcinolone is effective in case of unilateral cervical radiculopathy. This type of administration has low risk of complications. Further research is necessary for exploration of prolong action of triamcinolone.

Depression Development in Women after Legal or Missed Abortion at RAKUS “Gaiļezers” Hospital

*Dr. Jana Bojarovska*¹; Prof. *Māris Taube*²

¹Latvia;

²Rīga Stradiņš University, Latvia;

Rīga Psychiatry and Narcology Centre, Latvia

Objectives

The aim was to assess women's depression's development after legal or missed abortion.

Methods

For this prospective longitudinal study women were recruited from January 1, 2018, to December 28, 2018 at the Riga East University Hospital “Gaiļezers” hospital. In this study voluntarily participated 284 women with diagnoses O04 (medical legal abortion) and O02.1 (missed abortion). Participants were interviewed with the help of PHQ-9 Patient Depression Questionnaire at the first time via paper questionnaire 24 hours before and after missed abortion, than via telephone 1, 3, 6 and 9 months after the abortion, totaling 5 interview waves. During the research time also were analysed such sociodemographic datas: age, marital status, education, number of children in the family, history of abortions, history of depression and its treatment.

Results

Of the 284 women (mean age 27 years) legal abortion had 73.2% (n = 208) and missed abortion - 26.8% (n = 76) of the participants. Then 19% (n = 54) participants were excluded from the study due to non-compliance of the research criteria. After the first PHQ-9 test interview wave was known, that 95.7% (n = 199) of women after legal abortion had minimal depression, 1.9% (n = 4) had mild depression, 2.4% (n = 5) hadn't depression symptoms at all. After missed abortion 72.3% (n = 55) had minimal depression and 27.7% (n = 21) had mild depression. Psychological well-being of both patient groups improved over time. The last interview wave showed that majority women from both groups had minimal depression symptoms, whereas the rest of participants hadn't depression symptoms at all.

Conclusions

According to PHQ-9 Patient Depression Questionnaire women after missed abortion are more likely to suffer from mild and minimal depression than women after legal abortion, who have mainly minimal depression or no depression symptoms at all. Psychological well-being of both patient groups improved over time so that both groups of women eventually converged.

Emotion Regulation Skills and Depression¹

*Inese Paiča*¹; Prof. *Māris Taube*²; Prof. *Kristīne Mārtinsonē*¹

¹ *Rīga Stradiņš University, Department of Health Psychology and Paedagogy, Latvia;*

² *Rīga Stradiņš University, Latvia;*

Rīga Psychiatry and Narcology Centre, Latvia

Objectives

Dysfunctional emotion regulation can trigger and sustain an undesired affective state, thus contributing to the development of various symptoms and mental health disorders. The purpose of the current study was to evaluate whether there are differences regarding emotion regulation skills between a group of patients with depression and non clinical control group.

Methods

The study was based on three self-report questionnaires adapted for use in Latvia: Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), Twenty-Item Toronto Alexithymia Scale (TAS-20; Bagby, Parker & Taylor, 1994), Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) and a survey of the adaptation process of the Emotion Regulation Skills Questionnaire (ERSQ; Berking & Znoj, 2008). These questionnaires measured different aspects and both adaptive and non-adaptive skills of emotion regulation: attention towards feelings, understanding, clarity, acceptance of feelings, self-support, modification, and difficulty-finding strategies.

The clinical sample (n = 56) were patients with a depression diagnosis (F32, F33). Controls (n = 56) were adults without symptoms of depression. The Patient Health Questionnaire (PHQ-9) was used to screen for depression symptoms.

Results

Preliminary results (n = 56) showed statistically significant differences between groups in several questionnaire scales. Compared to the non-clinical sample, patients with depression presented significantly increased scores in the scales 'Lack of emotional clarity' (p = 0.02), 'Difficulty engaging in goal-directed behavior' (p < 0.01), 'Non-acceptance of emotional responses' (p = 0.001), 'Modification' (p = 0.001).

Conclusions

The results show that patients with a depression diagnosis experience difficulty in regulating their emotions and often use non-adaptive regulatory strategies that may increase the risk of recurrence of depression. The results help to identify the main difficulties – the ability to understand, accept and modify emotions when needed. However, adaptive emotion regulation skills can be purposefully mastered and improved by offering patients other forms of treatment alongside medical treatment.

Relation between Number of Magnetic Resonance Contrast Examinations and Hyperintensity in Pulvinar, Globus Pallidus, Pons and Nucleus Dentatus in Paediatric Patients

*Reinis Pitura*¹; *Dr. Dāvis Sosārs*²;
*Dr. Ilze Apine*³; Prof. *Gaida Krūmiņa*³

¹ *Rīga Stradiņš University, Latvia;*

² *Children's Clinical University Hospital, Department of Radiology, Latvia;*

³ *Rīga Stradiņš University, Department of Radiology, Latvia;*
Riga East University Hospital, Latvia

Objectives

The aim was to assess eventual association between hyperintensity of basal ganglia and the number of previous contrast-enhanced magnetic resonance (MR) examinations using linear gadolinium (Gd) contrast agent pediatric patients.

Methods

This retrospective study was performed at Children's Clinical University Hospital and included 38 patients (0–16 y.o.) with a total of 180 available pre-contrast axial T1-weighted spin-echo (pre-cT1wSE) head scans from the first six contrast-MR examinations with Omniscan. In all scans interested regions were pathology-free and there was no reduction in renal function at time the MR examinations was performed. From 180 examinations six study groups were formed with 30 scans in each (0, 1, 2, 3, 4, 5), where the number represented the respective contrast-enhanced MR examinations in patient's history. Signal intensity (SI) measurements were performed in pre-cT1wSE head examinations with Region of interest – 10 mm², in four localisations dentate nucleus (DN), globus pallidus (GP), pulvinar of thalamus (TH) and pons (P) at the left side of the head. DN:P and TH:GP ratios were calculated in post-contrast groups and compared to the 0 group as a reference for each patient individually, using paired sample T-test on SPSS 20.0.

Results

After comparing groups 1–5 to group 0, statistically significant difference was found in DN:P ratios of groups: 3 ($p = 0.029$); 4 ($p = 0.022$); 5 ($p = 0.0003$) and TH:GP ratio of group 5 ($p = 0.001$) with a confidence interval 95%.

Conclusions

A significant change in DN:P ratio shows that Gd deposits can be found in DN after 3 contrast-enhanced MR examinations in pediatric patients and has the highest Gd deposition rate in comparison to other 3 localisations, based on higher increment in DN:P rate and by TH:GP rate which showed statistically significant changes only after 5 contrast-MR examinations.

Conservative Management of Vestibular Symptoms in Cerebellar Dystopia

Diāna Raumane

*Rīga Stradiņš University, Department of Otorhinolaryngology, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Chiari malformation (CM) is a congenital structural distinction at the base of the skull that affects the brain interfering the flow of spinal fluid. CM type 1 involves the extension of the cerebellar tonsils into the foramen magnum in the 5 mm (CM-1). This is the only form of Chiari malformation to present in adult life and can be asymptomatic. Whereas, cerebellar tonsil herniation less than 5 mm (CM-0) is found much more common. These are the patients that are frequently misdiagnosed. Many of them have lead to otolaryngologists due to the symptoms of vertigo attacks, ataxia, nausea, dizziness, balance disorders, hearing ability decrease, tinnitus but history of pressure like headache in the back of the head could indicate the CM.

Methods

The aims of the study are to characterize group of patients having extension of the cerebellar tonsils in the 5 mm or less (CM-0-1) presenting with symptoms, to analyse the significance of conservative treatment results. 28 adult subjects (22 females and 6 males, mean age 42 ± 12) have been selected presenting with symptoms and extension of cerebellar tonsils to 5 mm in MRI. Other group of 24 asymptomatic CM-1 subjects have been selected (18 females and 6 males, mean age 48 ± 12). All subjects underwent an neurological and otoscopic examination, pure tone audiometry, vestibulospinal tests, and standard VNG test battery. Taking into account the severity of symptoms the medical therapy was adjusted (diuretic, capillary active agent).

Results

In symptomatic individuals sensorineural hearing loss ranges from normal to severe, mostly in one side, hearing loss fluctuates in many cases (76%), significant oculomotor disturbances (83%). During conservative therapy, vertigo, headaches and nausea improved significantly. Part of subjects (27–47%) had an improvement in symptoms after 1 month (25–38%) and after 2 months (62–70%).

Conclusions

The compression that is sufficient to cause symptoms can occur even when the cerebellar tonsils protrude by as little as 1 mm. Conservative treatment shows efficiency reducing the benign intracranial hypertension conservatively to relieve the symptoms.

Efficacy and Safety of Intravenous Alteplase in Patients with Mild Ischaemic Stroke

Dace Ziemele

Riga East University Hospital, Latvia

Objectives

The main objective is to evaluate the benefit and safety of intravenous recombinant tissue plasminogen activator (tPA) in patients with mild ischemic stroke (MIS).

Methods

A retrospective study with information obtained from medical records of patients that received intravenous tPA (alteplase) for acute stroke treatment in Riga East University Hospital "Gaiļezers" from October 2017 until June 2018. The study included 20 patients presenting with mild stroke symptoms as defined by National Institutes of Health Stroke Scale (NIHSS) score < 5 that received intravenous tPA within 4.5 hours from symptom onset. NIHSS was documented and compared at admission, 24 hours after symptom onset and at discharge. Functional outcome at discharge was assessed using modified Rankin Scale (mRS). Good outcome at discharge was defined as mRS 0-1. Other outcomes studied were intracranial hemorrhage and mortality. Data were analyzed using Microsoft Excel and SPSS.

Results

From a total of 162 patients that received intravenous alteplase for acute stroke treatment, 20 patients (12%) were defined as having a mild stroke (NIHSS < 5). These patients were analysed further. 7 were female and 13 were male. Average age was 66 years (SD 15.2). At presentation 1 patient had an NIHSS of 1, 5 patients - 2, 6 patients - 3, 8 patients - 4. 70% (n = 14) had a better mRS at discharge than at admission. 60% (n = 12) had good functional outcome (mRS 0-1) at discharge. 6 patients were discharged with mRS 2, 2 patients with mRS 4. None of the patients suffered intracranial hemorrhage or death.

Conclusions

Patients with mild stroke symptoms may benefit from treatment with intravenous alteplase. To receive more reliable data on this topic a further analysis on a larger group of patients is needed.

Haemorrhagic Transformation in Acute Ischemic Stroke – Demographics, Risk Factors and Comparison with Literature Data

*Dr. Lauma Dobelniece*¹; *Dr. Nauris Zdanovskis*²;
*Dr. Ligita Belasova*³

¹ *Vidzemes Regional Hospital, Latvia;*

Rīga Stradiņš University, Latvia;

² *Rīga East University Hospital, Latvia;*

Rīga Stradiņš University, Latvia;

³ *Vidzemes Regional Hospital, Neurology Department, Latvia*

Objectives

To determine demographics and risk factors for haemorrhagic transformation in patients with acute ischemic stroke (AIS) after thrombolysis.

Methods

In total 148 patient medical history files were retrospectively analysed from Vidzemes Regional Hospital during time period from 2015 to 2018 who were admitted to emergency department with AIS and underwent thrombolytic therapy. In total 73 were males, 75 females, average age was 71 years (SD - 9.38, min - 46, max - 88 years). Analysed data included risk factors found in literature data - gender, age, laboratory results (platelet count, blood glucose, total cholesterol (TC) and low-density lipoprotein cholesterol (LDLC) levels, comorbidities, National Institute of Health Stroke Scale (NIHSS), Bartel index score (BIS), Modified Rankin Scale (mRS), thrombolytic therapy dosage (Actilyse) and timing of thrombolysis after symptom onset.

Results

Intracerebral haemorrhage (ICH) after thrombolysis was documented in 21 (14.2%) cases - 15 were males, 6 females. Average blood platelet count in ICH patients was 222.9×103 (SD ± 59.27), non-ICH 211.56×103 (SD ± 68.98) [p = 0.47]. Blood glucose in ICH 6.88 mmol/l (SD ± 1.96), non-ICH - 7.19 mmol/l (SD ± 1.73) [p = 0.45], TC in ICH 4.9 mmol/l (SD ± 1.65), non-ICH 5.05 mmol/l (SD ± 1.48) [p = 0.67], LDLC in ICH 3.18 mmol/l (SD ± 1.43), non-ICH 3.19 mmol/l (SD ± 1.26) [p = 0.97]. Average Actilyse dosage was 72.2 mg (SD ± 12.66) in ICH and 73.2 mg (SD ± 10.92) in non-ICH patients [p = 0.67]. Average timing of thrombolysis 168.3 minutes (SD ± 30.49) in ICH, 181.2 minutes (SD ± 52.58) in non-ICH [p = 0.27]. NIHSS score at admission was 11.62 (SD ± 5.96) for ICH patients vs 9.79 (SD ± 5.55) non-ICH [p = 0.18], mRS - 4.52 (SD ± 9.79) vs 4.23 (SD ± 0.86) [p = 0.16], BIS - 25.12 (SD ± 20.44) vs 26.77 (SD ± 18.71) [p = 0.73].

Conclusions

Patients who developed ICH after AIS showed higher NIHSS and mRS scores at the time of admission, but there were no other statistically significant predictors for haemorrhagic transformation of AIS.

Evaluation of Non-Motor Symptoms in Parkinson's Disease Patients Presenting in Riga East Clinical University Hospital

Dr. Gundega Gulbe¹; Dr. Olga Minibajeva²; Prof. Guntis Karelis²

¹*Riga East University Hospital, General Neurology Department, Latvia;*

²*Riga Stradiņš University, Latvia;*

Riga East University Hospital, General Neurology Department, Latvia

Objectives

The aim of this study was to determine the prevalence of non-motor symptoms (NMS) among Parkinson's disease (PD) patients and to give more detailed review on presenting NMS groups.

Methods

This observational cross-sectional study was prospectively conducted with 30 patients presenting with idiopathic Parkinson's disease (PD) diagnosed on the basis of the UK Brain Bank criteria. NMS were screened for using the Nonmotor Symptom Questionnaire. Other assessments included measures of motor disability (Movement Disorders Society-revised Unified Parkinson's Disease Rating Scale [MDS-UPDRS] I-IV) during ON state and the assessment of disease severity (modified Hoehn & Yahr staging scale).

Results

A total of 30 patients consisting of 18 females (60%) and 12 males (40%) were recruited in this study. The average age was 65.9 ± 6.6 years. Majority of patients presented with disease severity of stage 3 ($n = 14$) evaluated by modified Hoehn and Yahr scale. The mean score of MDS-UPDRS part 1 was 11.1 ± 7.9 points. All 30 patients (100%) manifested with at least one NMS. The average NMS burden per each patient was 8.5 ± 6.6 symptoms (regarding NMSQ data) and 6.7 ± 3.3 symptoms (regarding MDS-UPDRS Part 1 data). The most common NMS according to MDS-UPDRS Part 1 assessment were fatigue, constipation, daytime sleepiness and sleep disturbances (76.7%, $n = 23$). The most common NMS according to NMSQ were urinary urgency (76.7%, $n = 23$), taste or smell disturbances (73.3%, $n = 22$), nocturia (63.3%, $n = 19$), constipation (63.3%, $n = 19$), sleep disturbances (60%, $n = 18$) and unexplained pain (43.3%, $n = 13$).

Conclusions

Our data shows that NMS have high prevalence among PD patients. Autonomic, gastrointestinal, neuropsychiatric dysfunction were among the most common NMS groups in PD patients. Recognizing and treating NMS is essential in improving the quality of life of PD patients.

Correlation between Mortality and Computed Tomography (CT) Identified Diffuse Axonal Injury (DAI) Localisation in Polytrauma Patients: Single Center Experience

*Veronika Zaiceva*¹; Prof. *Gaida Krumina*²;
*Dr. Liga Jaunozolina*²; *Kristine Rocane*⁴

¹ Rīga East University Hospital, Latvia;

² Rīga Stradiņš University, Department of Radiology, Latvia;

Rīga East University Hospital, Latvia;

⁴ Rīga Stradiņš University, Latvia

Objectives

Diffuse axonal injury (DAI), a type of intracranial trauma, is associated with poor neurological outcome and high mortality risk. Identification of DAI localization from primary computed tomography (CT) scans of intracranial trauma is important for patient survival and development of individual treatment plans.

This study determines the correlation between DAI lesion localizations in a variety of brain structures – brainstem, corpus callosum, lobar area (deep white matter (DWM)) – and mortality rate in patients.

Methods

In a retrospective study we reviewed medical records of 827 adult polytrauma patients admitted to the Rīga East University Hospital (RAKUS) emergency department between August, 2016 and July, 2018. Patients were hemodynamically stable at the time of medical examination and underwent CT scans. From 176 patients who had TBI 20 (11.4%) had DAI (11 male; 9 female patients; mean age 47 (± 18)).

Results

From a total of 20 DAI patients 11 (55%) died. Single DAI lesions were found in 17 patients (8 in brainstem; 3 in corpus callosum; 6 in DWM), from whom 8 died (highest mortality rate associated with lesions in DWM – 5 mortalities). Dual DAI lesions were found in 3 patients, from whom no one survived (2 lesions in brainstem and DWM, 1 in corpus callosum and DWM).

Conclusions

This study highlights DAI's association with low survival rate.

Higher mortality rate was detected in dual DAIs. In all cases of deaths DAI were found in DWM, which represents an intriguing potential source for further investigations.

These findings reinforce that DAI is an important factor for patient survival and should be investigated during the CT scan to improve patient outcome.

Off-Label Use of Rituximab in Neurology: Experience in Riga East University Hospital, Department of General Neurology

*Eva Šankova*¹; *Ph.D. Daina Pastare*²; Prof. *Guntis Karelis*²

¹*Riga East University Hospital, Department of Neurology and Neurosurgery, Latvia;*

²*Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;
Riga East University Hospital, Latvia;*

Objectives

To analyse the indications, treatment regimen, side effects, efficacy and outcome of rituximab usage in neurological diseases in the Riga East University Hospital, Department of General Neurology.

Methods

In this retrospective study outcome data were collected from the medical cards of five patients treated with rituximab from January to December 2018.

Results

Five patients were included (2 women and 3 men), aged 36–58 years. Neurological diagnoses were: 2 patients with chronic inflammatory demyelinating polyneuropathy (CIDP), neuromyelitis optica spectrum disorder (NMOSD), autoimmune encephalitis and rapidly progressive demyelinating multifocal brain pathology. 1 patient was treated with two infusions of rituximab 500 mg 2 weeks apart. 4 patients were treated with rituximab 1000 mg doses given 2 weeks apart. 1 patient received third dose of rituximab after 8 months.

In all cases rituximab was used when standard therapy (methylprednisolone, immunoglobulin, plasmapheresis, cyclophosphamide, azathioprine, mycophenolate mofetil, methotrexate) was ineffective or had side effects. There were no infusion-related complications. Only one patient after first dose had fever and cough (most likely cold) but he received also second dose without any side effects. 1 patient had leukopenia after infusion. Patients with CIDP had no worsening, the disease did not progress. The patient with NMOSD has not had a relapse of the disease.

Conclusions

Rituximab for neurological indications may be used as two infusion doses given 2 weeks apart every 6–8 months. Stabilization of the disease was observed in all patients. Experience is, however, too limited and follow up is needed.

Non-Motor Symptoms of Parkinson's Disease and Effect of Disease Symptoms on Patients' Activities of Daily Living

*Dr. Olga Minibajeva*¹; *Dr. Gundega Gulbe*¹; Prof. *Guntis Karelis*²;
Prof. *Natalja Kurjāne*³; *Dr. med. Viktorija Ķēniņa*³

¹ *Rīga East University Hospital, Latvia;*

² *Rīga Stradiņš University, Latvia;*

Rīga East University Hospital, General Neurology Department, Latvia;

³ *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;*

Pauls Stradiņš Clinical University Hospital, Latvia

Objectives

The objective of this study was to evaluate the incidence of non-motor symptoms in patients with Parkinson's disease (PD) considering the dominant motor symptoms and to analyze the effects of motor symptoms on the patients' activities of daily living.

Methods

Twenty three patients were included in this study (9 men (39.1%) and 14 women (60.9%); aged 66.3 ± 7.4 years) who were consulted at the Riga East University Hospital Outpatient department in 2018 (April-October). PD was diagnosed by applying the UK Parkinson's disease Society Brain Bank Clinical Diagnostic Criteria. The patients were evaluated according to the Movement Disorder Society-Sponsored Revision of the Unified Parkinson's Disease Rating Scale and by Non-motor symptoms questionnaire. Considering dominant motor symptoms the patients were divided into three groups: tremor dominant 4.35% (n = 1), akinetic-rigid 65.22% (n = 15) and mixed subtype 30.43% (n = 7) PD.

Results

The most common non-motor symptoms were loss or change in sense of taste or smell (78.3%), urinary urgency (73.9%), nocturia (69.6%), constipations (65.2%) and difficulty falling asleep or staying asleep at night (69.6%). Daytime sleepiness, uncomfortable feelings in the body like pain or cramps, fatigue and depression occur in 78.3%, 65.2%, 82.6% and 43.5% of patients with PD, respectively. The most common restrictions caused by PD on daily life were related to basic daily activities: dressing up (78.3%), handwriting (78.3%), doing hobbies and other activities (78.3%), getting out of bed or getting up from low chair (78.3%), having trouble with walking and balance (87%).

Conclusions

The prevalence of non-motor symptoms was similar among the patients with akinetic-rigid and mixed PD subtype. Daytime sleepiness followed by changed taste or smell sensation and urinary dysfunction were the most prevalent non-motor symptoms after fatigue. PD symptoms have a significant impact on the patient's activities of daily living and the most common disorder is changes in walking gait.

Efficacy and Safety of Intravenous Alteplase in Patients with Mild Ischaemic Stroke

*Dr. Andrejs Olesiks; Dr. Rems Zikovs; Dr. Ravita Gailāne;
Dr. Dace Ziemele; Dr. Linda Kande; Dr. Zane Anna Litauniece;
Prof. Guntis Karelis; Dr. Aleksejs Višņakovs*

Latvia

Objectives

The main objective is to evaluate the benefit and safety of intravenous recombinant tissue plasminogen activator (tPA) in patients with mild ischemic stroke (MIS).

Methods

A retrospective study with information obtained from medical records of patients that received intravenous tPA (alteplase) for acute stroke treatment in Riga East University Hospital "Gaiļezers" from October 2017 until June 2018. The study included 20 patients presenting with mild stroke symptoms as defined by National Institutes of Health Stroke Scale (NIHSS) score < 5 that received intravenous tPA within 4.5 hours from symptom onset. NIHSS was documented and compared at admission, 24 hours after symptom onset and at discharge. Functional outcome at discharge was assessed using modified Rankin Scale (mRS). Good outcome at discharge was defined as mRS 0-1. Other outcomes studied were intracranial hemorrhage and mortality. Data were analyzed using Microsoft Excel and SPSS.

Results

From a total of 162 patients that received intravenous alteplase for acute stroke treatment, 20 patients (12%) were defined as having a mild stroke (NIHSS < 5). These patients were analysed further. 7 were female and 13 were male. Average age was 66 years (SD 15.2). At presentation 1 patient had an NIHSS of 1, 5 patients - 2, 6 patients - 3, 8 patients - 4. 70% (n = 14) had a better mRS at discharge than at admission. 60% (n = 12) had good functional outcome (mRS 0-1) at discharge. 6 patients were discharged with mRS 2, 2 patients with mRS 4. None of the patients suffered intracranial hemorrhage or death.

Conclusions

Patients with mild stroke symptoms may benefit from treatment with intravenous alteplase. To receive more reliable data on this topic a further analysis on a larger group of patients is needed.

Clinical Features and Characteristics of Triple-Seronegative Myasthenia Gravis Patients in Latvia

*Dr. Ieva Glāzere¹; Dr. Inese Kamša²;
Prof. Nataļja Kurjāne³; Dr. med. Viktorija Ķēniņa⁴*

¹ Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;
Pauls Stradiņš Clinical University Hospital, Department of Neurology, Latvia;
² Pauls Stradiņš Clinical University Hospital, Department of Neurology, Latvia;
³ Rīga Stradiņš University, Latvia;
Pauls Stradiņš Clinical University Hospital, Department of Immunology, Latvia;
⁴ Rīga Stradiņš University, Latvia;
Riga East University Hospital, Latvia

Objectives

To assess and describe clinical picture of triple – seronegative MG patients, analyze their subtypes and rate of myasthenic crisis, investigate results of other diagnostic tests (repetitive nerve stimulation) used for MG diagnosis, as well as thymus pathology.

Methods

Patient data were collected from the Latvian Myasthenia Gravis patient's database. All patients with a confirmed diagnosis of a triple seronegative MG (negative for AChR, MuSK and LRP4 antibodies) were included in this study. Serological testing was previously performed in the Nuffield Department of Clinical Neurosciences, University of Oxford, using RIA and a cell-based assays. Clinical features, neurophysiological data and information of treatment were retrospectively analyzed. MGFA clinical grading was used for subtype detection.

Results

Totally, 60 patients were triple-seronegative (46 females, 14 males). 4 patients were missing full data, further excluded from the analysis. The average age at onset was 41.39-year-old, earliest onset – age of 15, latest onset – age of 72. Only 10 patients (17.8%) had ocular MG (MGFA Clinical Class I), rest of the group (82.2%) manifested with generalized MG according to MGFA Clinical Class: IIa – 18, IIb – 11, IIIa – 5, IIIb – 8, IVa – 1, IVb – 3. Thymus pathology was present in one-quarter (n = 14), including one case of thymic carcinoma. Repetitive nerve stimulation showed decrement in 68%. Only 9 patients experienced myasthenic crisis, all received IVIG treatment. 8 patients are currently receiving immunosuppressants.

Conclusions

Overall, the study showed a small proportion of ocular MG in triple-seronegative MG group. There was a relatively low incidence of myasthenic crisis and severe subtypes. Further analysis and larger cohort are needed to evaluate differences from seropositive MG patients. As MG was diagnosed for few patients in a period when antibody testing was not commonly available in Latvia, our study has a limitation to exclude previously seropositive patients who now have been receiving long-term treatment.

Outcome Assessment of Percutaneous Radiofrequency Thermocoagulation of Gasserian Ganglion in Treatment of Trigeminal Neuralgia

*Dr. Linda Zvaune*¹; *Dr. med. Mihails Arons*¹; *Prof. Inara Logina*¹;
*Dr. med. Edgars Vasilevskis*²; *Igors Panihins*³; *Līga Meksa*³

¹ Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia;

² Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;

³ Medical Center D.A.P., Latvia

Objectives

The aim was to assess the outcome of percutaneous radiofrequency thermocoagulation (PRT) of Gasserian ganglion for treatment of trigeminal neuralgia (TN) in terms of immediate pain relief, duration of the pain-free period, quality of life and any complication after the procedure.

Methods

56 fluoroscopic guided PRT of Gasserian ganglion procedures performed in 31 patients with classical TN between September 2013 and May 2018 in a specialized pain center were retrospectively analyzed. Globally received procedure effect (Lickert scale), pain impact on daily activities were estimated by structured telephone interview.

Results

31 patients with a mean duration of TN 10 years (± 7.5). Technically issuing all procedures. Significant pain relief immediately after the procedure was obtained in 95% (n = 29). 51% (n = 16) after PRT procedure were obtained absolutely pain-free period at least 10 months. Recurrences were observed in 45% (n = 14) patients, but the pain was episodic and well controlled with medication. A common complication after the procedure was hypesthesia, in 87% (n = 27), two of them (6.4%) severe hypesthesia, but associated with better long-term pain relief (at least 20 months). Another complication after the procedure was a cheek hematoma in one patient.

Conclusions

PRT of Gasserian ganglion is an immediately effective and safe procedure to relief trigeminal pain. Still, some patients suffer from pain recurrence and are forced to resume anticonvulsants or repeat invasive treatment. Further studies should focus on factors that could predict better long-term results of percutaneous radiofrequency thermocoagulation in TN.

Recognition and Management of Primary Headache Disorders: Cross-Sectional Study

*Dr. Linda Zvaune*¹; *Agnese Gaibisele*²; *Elina Pucite*³;
*Līga Meksa*⁴; *Dr. med. Daina Pastare*⁵; Prof. *Inara Logina*⁶

¹ Rīga East University Hospital, Department of Neurology and Neurosurgery, Latvia;

² Rīga Stradiņš University, Medical Faculty, Latvia;

³ Pauls Stradiņš Clinical University Hospital, Department of Neurology, Latvia;

⁴ Rīga Stradiņš University, Latvia;

⁵ Rīga East University Hospital, Department of Neurology and Neurosurgery, Latvia;

⁶ Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia

Objectives

The diagnosis of a primary headache (HA) disorders is clinical and based on the diagnostic criteria of the International Headache Society (ICHD-3). The aim of this study was to assess the primary headache care quality in the primary care setting.

Methods

A cross-sectional, multicenter study of 170 headache patients presenting in primary care, in two university hospitals at the emergency department (ED) and in five general practices (GP) in Riga, during a period from November 2017 to February 2018. The accuracy of HA diagnosis and management was evaluated by structured phone interview based on the ICHD-3 criteria.

Results

Of 170 respondents in the primary care (138 ED, 32 GP), 123 female (72%), male 47 (28%); mean age 42 ± 16.7 years. 34% (n = 57) unspecified “cephalgia” diagnosis was made by primary care specialists. According to the ICHD-3 criteria, 42% (n = 72) met criteria for primary HA, 52% (n = 88) for secondary HA, including 9% (n = 15) medication overuse HA (none of medication overuse HA was recognized at the primary care). 69% (n = 50) from primary HA was migraine, 25% (n = 18) tension-type HA, 3% (n = 2) trigeminal autonomic cephalalgia. 21% (n = 15) of primary HA patients reported ≥ 15 HA days/month, that meet criteria for chronic HA. 47% (n = 33) of primary HA patients has > 5 years HA history. Only 14% (n = 7) from migraine patients are taking triptans (a migraine-specific acute treatment). 40% (n = 29) had HA-related work absence during the last 3 months.

Conclusions

Primary headache disorders are under-recognized and under-treated.

Most Common Comorbidities, Stroke Etiology, Hospitalisation Length and Clinical Outcome of Patients with Acute Ischemic Stroke Having Undergone Thrombolysis Therapy

*Dr. Lauma Dobelniece*¹; *Dr. Nauris Zdanovskis*²;
*Dr. Līgita Belasova*³

¹ *Rīga Stradiņš University, Department of Internal Medicine, Latvia;*

² *Rīga East University Hospital, Latvia;*

Rīga Stradiņš University, Latvia;

³ *Vidzemes Regional Hospital, Neurology Department, Latvia*

Objectives

To determine stroke etiology, the most common comorbidities, hospitalization length and clinical outcome in patients with acute ischemic stroke (AIS) treated with thrombolytic therapy.

Methods

In total 148 patient medical history files were retrospectively analysed from Vidzemes Regional Hospital during time period from 2015 to 2018 who were admitted to emergency department with AIS and underwent thrombolytic therapy. In total 73 were males, 75 females, average age was 71 years (SD - 9.38; min - 46, max - 88 years). Analysed data included - gender, age, comorbidities, hospitalization length, stroke etiology, time from symptoms onset till hospitalization and thrombolysis, clinical outcome.

Results

Most common comorbidities were atrial fibrillation (128 patients; 86.5%), primary arterial hypertension (105; 70.9%), congestive heart failure (87; 58.8%), atherosclerosis (79; 53.4%), diabetes (28; 19%), chronic kidney disease (17; 11.5%), previous myocardial or cerebral infarction (32; 21.6%). In 10 patients (6.8%) an AIS combined with acute myocardial infarction. Cardioembolic etiology was described in 89 (60.1%) cases, atherothrombotic - 29 (19.6%), unknown - 29 (19.6%), other - 1 (0.7%). Mortality rate was 10.8% (16 patients), 5 patients were transferred to university hospital for thrombectomy, 63 (42.6%) patients were discharged home, 44 (29.7%) patients were admitted to rehabilitation ward and 20 patients were transferred to other departments to continue treatment. Average hospitalization length was 11.8 days (SD ± 3.3). The average time was determined since onset of symptoms as follows - patients were transferred to hospital on average in 111 min (SD ± 49), CT report was received in 165 min (SD ± 41), average time of starting thrombolysis since onset of symptoms was 179 min (SD ± 50).

Conclusions

The dominant AIS type was cardioembolic stroke. AF was the most common comorbidity as it is one of the most frequent stroke risk factors described in literature. The most common outcome of treatment was discharging patients home or to further rehabilitation.

Smoking Habits in Schizophrenia Inpatients

*Agnese Gaibišele*¹; *Dr. Elīna Pūcīte*²; *Dr. Nata Gaibišele*³

¹ *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

² *Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;*

³ *Akniste Psychoneurological Hospital, Latvia*

Objectives

Smoking is a major preventable health hazard and the prevalence among schizophrenia patients is particularly high. The aim of this study was to investigate cigarette smoking habits and assess the intensity of addiction to nicotine in chronic schizophrenia inpatients.

Methods

Cross-sectional study of 213 adult chronic schizophrenia inpatients was conducted at Akniste Psychoneurological hospital. Demographic data were obtained from patients' medical histories. Antipsychotic doses were recorded and converted to chlorpromazine (CPZ) equivalents. Structured face-to-face interview and Fagerström test for nicotine dependence (FTND) were applied to smoking patients.

Results

50% (n = 106) of the study population were everyday smokers with the mean age of 51.4 years (SD ± 13.2). Smoking prevalence was higher among males (54%, n = 79 of total 145 males) than among females (40%, n = 27 of total 68 females). High antipsychotic doses (CPZ equivalent > 1000 mg/d) were administered in 52% (n = 55) smoking patients (n = 106) compared to 45% (n = 48) non-smokers (n = 107). 83% (n = 88) patients completed structured interview and FTND. The mean smoking history was 30.5 years (SD ± 12.3). High nicotine dependence was estimated in 22% (n = 19) patients, moderate in 47% (n = 41) and low in 32% (n = 28) patients. 45% (n = 40 of 88 responders) patients were inclined to quit smoking.

Conclusions

A half of chronic schizophrenia patients were smokers. Average smoker is more likely to be a middle-aged male with moderate level of nicotine dependence, smoking history for tens of years and on high doses of antipsychotics.

Psychiatric Health Care Evaluation from Patients' Perspective – What Do We Know?

Dr. Natalija Berzina-Novikova; Prof. Maris Taube

Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia

Objectives

Patient experience during inpatient treatment is one of the important factors of treatment process in psychiatry. There are no questionnaires adapted in Latvia to evaluate patient experience in mental health inpatient treatment facilities. The patient experience self-assessment tool provides important information to plan treatment and establish effective patient-doctor relationships in this way improving the treatment process and influencing outcomes, treatment continuity, patient compliance and mortality rates.

Methods

The pilot study of the adaptation of the PIPEQ-OS questionnaire was conducted from June 2016 till February 2017. Pilot study was carried in one subacute psychiatric department. In the study, an anonymous patient self-assessment questionnaire containing 21 questions was used. During the adaptation process, the questionnaire was translated from English into Latvian and Russian and backwards. The quality and compliance of the translation was subsequently tested in cognitive interviews and expert discussions.

Results

231 patients of the 297 discharged patients completed the questionnaire. The response rate was 78%. 12% of the completed questionnaires were not included in data processing due to being incorrectly filled in. Two questions showed high data missing (> 20% response is missing or N/A), one of which control question was (N16). Cognitive interviews with 20 patients were carried out; the average length of an interview was 15 minutes. The subsequent factor analysis revealed 3 significant factors that reached the Cronbach's alpha index of 0.7. Patient self-assessment was done in three directions – evaluation of the outcomes, interaction with professionals and evaluation of the treatment facilities provided.

Conclusions

The questionnaire proved to be relevant to the research theme and study population. Further studies based in various inpatient units as well as comparison across different diagnostic groups are needed. Further studies on compliance and re-admission rates correlation with patient evaluation scores are needed.

Relationship between Quality of Life and Perceived Social Support for Dementia Patients in Social Care Institution

Rudīte Terehova; Ph.D. Jeļena Ļubenko

Rīga Stradiņš University, Department of Health Psychology and Paedagogy, Latvia

Keywords: dementia, social care institution, quality of life, perceived social support.

Objectives

An important goal in dementia care is to ensure a good quality of life (QoL) for people with dementia. Different factors associated with QoL of dementia patients should be explored. The purpose of this study was to examine the relationship between quality of life and perceived social support for dementia patients in social care institution in Latvia.

Methods

The study was carried out in two social care institutions in Latvia. The sample consisted of 50 dementia patients ($M = 72.36$ years, $SD = 4.97$; 38% female) and their 10 caregivers. The inclusion criteria for patients: 1) Alzheimer's disease according to the ICD-10; 2) ability to use verbal communication; 3) Mini-Mental State Examination score above 10 ($M = 17.66$, $SD = 2.21$). Caregivers: shift work 2-3 times a week with dementia patients. Patients' data were collected in individual interviews using Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975), Multidimensional scale of perceived social support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988, Latvian adaptation Voitkāne, 2001) and Quality of life in Alzheimer's Disease (QoL-AD; Logsdon, Gibbons, McCurry, & Teri, 2002; patient/caregiver versions). The Caregivers ratings were obtained separately.

Results

Data analysis showed significant positive correlations between QoL and perceived social support from friends ($r = 0.61$, $p < 0.01$), family ($r = 0.60$, $p < 0.01$), others ($r = 0.61$, $p < 0.01$). Self-ratings of QoL of dementia patients were significantly lower than ratings of their caregivers ($t(81) = -4.73$, $p < 0.00$). Therefore perspectives about QoL of persons with dementia and their caregivers are not congruent. MMSE scores had significant correlation with duration of dementia ($r = 0.39$, $p < 0.01$).

Conclusions

Self-reported QoL in dementia patients is associated with perceived social support. Determining and improving social support for dementia patients should be an essential part of care for these patients in social care institutions. The limitations and possibilities of usage of self-report measurements with dementia patients are discussed.

Current Clinical Research in Neuroradiology at Rīga Stradiņš University, Latvia

Prof. *Gaida Krūmiņa*

*Rīga Stradiņš University, Department of Radiology, Latvia;
Rīga East University Hospital, Latvia*

Objectives

The following neuroscientific studies are currently being developed and elaborated at the Department of Radiology, Rīga Stradiņš University:

1. Magnetic resonance imaging signs of brain death and their correlation with clinical and lab data.
2. Advanced neuroimaging of acute carbon monoxide poisoning: advanced MR imaging and correlation with clinical and lab data.
3. Magnetic resonance hippocampal volumetric imaging role in detecting of brain aging, early cognitive decline and dementia.
4. MRI of neurosarcoidosis and its cerebrovascular manifestations.
5. The relation between the number of Magnetic resonance contrast examinations and hyperintensity in basal ganglia on non-contrast T1 weighted images in pediatric patients.
6. Clinical results and life quality evaluation in patients after acute cerebral aneurysm rupture and endovascular embolization, single centre experience.
7. Cerebral aneurysm occlusion after endovascular embolization depending on packing density and volumetric parameters; single center experience.

The above mentioned research themes are original clinical-neuroradiological studies, being performed at the Rīga Clinical University Hospital base in collaboration with Department of Emergency Medical Care, Department of Anaesthesiology and Reanimatology, Department of Interventional Radiology, and Clinic of Neurology.

The key points of the research, groups of authors, short summary and illustration of the studies will be presented in the lecture.

Postoperative Pain Management Strategies and Delirium after Transapical Aortic Valve Implantation

*Dr. Baiba Arklina*¹; *Dr. med. Vladimirs Harlamovs*²;
*Ph.D. Eva Strike*¹; *Prof. Romans Lacis*³

¹ *Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia;*

² *Pauls Stradiņš Clinical University Hospital, Latvia;*

³ *Rīga Stradiņš University, Department of Surgery, Latvia*

Objectives

Transapical approach for trans-catheter aortic valve implantation (TA-TAVI) is a well-established surgical treatment modality for high-risk patients with severe symptomatic aortic valve stenosis. The most common pain management methods are intravenous analgesia with opioids and paravertebral anaesthesia. The risk of postoperative delirium (POD) in patients undergoing TA-TAVI exceeds 30% (Sharma V. et al., 2016). Postoperative pain and systemic opioids are recognised risk factors for POD. We hypothesized that perioperative paravertebral analgesia with local anaesthetic would reduce the need for postoperative systemic opioids and decrease the incidence of POD after TA-TAVI when compared to systemic opioid-based analgesia.

Methods

After institutional ethics review board approval, and informed consent, a prospective, randomized controlled study was conducted in patients undergoing TA-TAVI. Patients with a history of serious mental illness, delirium, severe dementia, and/or patients with contraindications to regional anaesthesia were excluded. A total of 44 patients were randomised to either paravertebral group (n = 22), or intravenous group (n = 22) with Fentanyl infusion. Patients in both groups received general anaesthesia with endotracheal intubation. Thoracic paravertebral catheter was sited before surgery in an awake patient. Patients received a bolus followed by continuous infusion of local anaesthetic up to 48 hours after surgery. Assessment of delirium was performed with confusion assessment method for ICU.

Results

Both groups were similar with respect to demographic data, preoperative medications, and comorbidities. The overall POD was detected in 12/44 (27%) patients, with 7/22 (32%) in the intravenous, and 5/22 (23%) in the paravertebral groups respectively, $p = 0.73$. Sedation and pain scores were similar between the 2 groups. Postoperative morbidity and hospital length of stay was similar between the two groups.

Conclusions

POD rates were similar in the paravertebral (study group) and intravenous (control group) after TA-TAVI procedures. Paravertebral analgesia was associated with reduced systemic opioid requirements during the 48 hours postoperatively.

Prevalence of Depression Symptoms among Latvian General School Teachers and Related Factors

*Marta Gebele*¹; Prof. *Māris Taube*²

¹ *Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia;*

² *Rīga Stradiņš University, Department of Psychiatry and Narcology, Latvia;
Rīga Psychiatry and Narcology Centre, Outpatient Mental Healthcare
Centre Veldre with a hospital facility, Latvia*

Objectives

To clarify the prevalence of depression symptoms among teachers of general education schools in Latvia, to compare data with other studies. To view the correlation of depression symptoms with health related issues.

Methods

To clarify the prevalence of depression symptoms among teachers of general education schools in Latvia, to compare data with other studies. To view the correlation of depression symptoms with health related issues.

Results

The study included 113 respondents of which 96.5% (95% CI 92.9–99.1) were female and 3.5% (95% CI 0.9–7.1) male. The majority of respondents were 37.2% (95% CI 27.4–46.9) in the 40–49 age group.

Symptoms of severe depression were 2.7% (95% CI 0–6.2) of respondents, moderately severe 6.2% (95% CI 2.7–10.6), moderate 14.2% (95% CI 8.8–21.2) mild 46.9% (95% CI 37.2–55.8), 30.1% (95% CI 21.3–38.9) respondents have no symptoms of depression.

There is a correlation between the frequency of visits to the general practitioner and the prevalence of symptoms of depression is 0.362 (95% CI 0.171–0.525 $p = 0.00008$) using Spearman's non-parametric correlation. Answering the question, "Have you had depression in the last 12 months?" – 16.8% (95% CI 10.6–23.9) no more than in previous years, 7.1% (95% CI 2.7–12.4) – a little more than before and 6.2% (95% CI 2.7–10.6) – much more than before.

Conclusions

Compared with data from other studies in Latvia, it can be concluded that the prevalence of depressive symptoms among teachers is higher than in the population. Self-assessment of depression in teachers is much higher than in the population.

Comparison of Early Psychotherapy Dropout Prevalence between Residents and Certified Physicians in Rīga Stradiņš University Clinic of Psychosomatic Medicine and Psychotherapy, Latvia

Dr. Artūrs Ancāns

Rīga Stradiņš University, Clinic of Psychosomatic Medicine and Psychotherapy, Latvia

Objectives

1. Acquire data of patient psychotherapy session attendance.
2. Calculate and compare early patient dropout prevalence for residents and certified doctors.

Methods

This was a retrospective cohort study. For this research early patient dropout was defined as a patient leaving treatment before the fifth visit. Data was acquired from the Clinics “Smart Medical” payment system. A total of 27 001 relevant records in Microsoft Excel were obtained belonging to 16 full-time residents and certified doctors (8 residents and 8 doctors) starting from the 1st of January 2013 to the 22nd of November 2018.

159 records had to be discarded for reasons such as duplicate records, various system mistakes, incomplete data and others. Thus 26 842 records were left for final analysis.

Results

Results will be presented at the conference.

Conclusions

Conclusions will be presented at the conference.

Stress, its Causes and Ways to Overcome It among Students of Medicine and Health Care Study Programmes

Dr. med. Velga Sudraba¹; Karīna Vižla²

¹*Rīga Stradiņš University, Department of Nursing and Midwifery, Latvia;*

²*Rīga East University Hospital, Latvia*

Objectives

The aim is to compare stressors and stress management methods in medicine and health care study programs (in faculties of Medicine, Dentistry, Pharmacy, Rehabilitation, Public Health and Social Welfare) for first and fourth year students studying second level professional education or professional Bachelor's education.

Methods

Two surveys made by the authors were used in the study – Socio-demographic data survey (17 questions), Test to identify stressors (27 statements; Cronbach's alpha = 0.907), and Ways of coping stress test (Folkman, Lazarus, 1985).

Results

142 respondents were interviewed, the average age 20.93 years (SD = 2.76), 90.1% women (n = 128), state - funded study place (n = 131) in the first study year (n = 107). There are statistically significant (p = 0.02) differences in the study process related stressors scale between the first (M = 2.63; SD = 0.36) and the fourth study year students (M = 2.46; SD = 0.28). There are statistically significant differences (p = 0.01) in five faculties when comparing study related stressors, stressors related to the choice of profession (p = 0.00) and stressors related to the financial situation (p = 0.03), besides higher indicators (accordingly M = 2.54; SD = 0.51; M = 2.60; SD = 0.73 and M = 2.80; SD = 0.79) are presented by students of the Faculty of Rehabilitation. Comparing the ways of coping stress (problem oriented or emotion oriented) between students of the first and fourth study year, there are no statistically significant differences, but there are statistically significant differences in Confronting overcoming and Escape and avoiding subscales comparing the indicators of respondents from five faculties.

Conclusions

The impact of stressors is more evident for first year students, in addition, fewer students are affected by stressors associated with the study process than with stressors associated with the study environment, financial situation and choice of profession. First year students are more likely to use emotionally focused stress management, fourth year students are more likely to use problem oriented stress management.

Mental Health and Quality of Doctor–Patient Relationship

Prof. *Gunta Ancāne*

*Rīga Stradiņš University, Department of Psychosomatic Medicine
and Psychotherapy, Latvia*

The doctor-patient therapeutical relationship remains one of the most powerful and at the same time most unclear treatment tools. Till now, “The doctor the best medicine” (M. Balint) is poorly understood. Usually the topic “doctor-patient therapeutical relationship” turns into topic “communication between two persons”. The processes between doctor and patient cannot be defined as “communication”, because this is very unique and special process with healing possibilities, what is not characteristic of the everyday communication process between two persons. In case of “communication” – in center is posed doctor’s responsibilities: active listening, not interrupting the patient, emphatic attitude etc., what is not the core of the concept. Therapeutical factors will be discussed and their correlations with the mental health will be analyzed.

Cardioembolic Stroke Long-Term Function Outcome in Latvian Population from 2014–2017

*Dr. Kristaps Jurjāns*¹; Prof. *Evija Miglāne*²; Prof. *Oskars Kalējs*³;
*Dr. med. Zanda Priede*²; Prof. *Andrejs Millers*²

¹*Rīga Stradiņš University, Department of Doctoral Studies, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvia;

²*Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvia;

³*Rīga Stradiņš University, Latvia;*
Pauls Stradiņš Clinical University Hospital, Department of Internal Medicine, Latvia

Objectives

Cardioembolic infarction is considered the most severe ischemic stroke subtype, with a low frequency of symptom-free at hospital discharge, a high risk of early and late embolic recurrences, and a high mortality.

Methods

In a prospective study were included all 1873 patients with ischemic stroke and atrial fibrillation admitted at the Pauls Stradiņš Clinical University Hospital, Riga, Latvia from 2014 to 2017. Patients were evaluated by modified Rankins scale (mRs) on discharge were score of 0–3 considered a satisfactorily functional outcome. Patients were interviewed by phone in 30–90–180–365 days after leaving the hospital. Standardised questions were asked about patients abilities.

Results

At time of discharge 45.33% patients had satisfactory functional outcome, 39.83% had severe disability and 14.84% had died in hospital. Only contacted stroke survivors (n = 1400) were included in further study. In 30 days since discharge from hospital 54.64% patients had satisfactory outcome, 27.21% were severely disabled and 18.14% had died. After 90 days 58.93% of patients had satisfactory outcome, 14.57% had severe disability and 26.50% had died. In 180 days 60.14% patients were on satisfactory outcome, 7.71% had severe disability and 32.14% patients had died. Finally, after one year, 58.64% patients were on satisfactory outcome, 5.14% patients were severely disabled, and 36.21% had died.

Conclusions

In Latvian population cardioembolic stroke mortality rates are very high. Most of the patients that are severely disabled at the time of discharge die in first year since leaving the hospital. Mortality rates are significantly lower in patient groups with satisfactory stroke outcome at time of discharge.

Impact of Participation in Quality Improvement Initiative and International Registry on Acute Stroke Care

*Jānis Vētra*¹; *Dr. Kristaps Jurjāns*²;
Prof. *Evija Miglāne*²; *Aleksandrs Fjodorovs*¹;
*Staņislavs Mironovs*¹; Prof. *Andrejs Millers*²

¹ Rīga Stradiņš University, Medical residency program, Latvia;

Pauls Stradiņš Clinical University Hospital, Latvia;

² Rīga Stradiņš University, Latvia;

Pauls Stradiņš Clinical University Hospital, Latvia

Objectives

The benefits of recanalization therapy in patients with acute ischemic stroke (AIS) are time dependent. Pauls Stradiņš Clinical University Hospital (PSCUH) joined a quality improvement initiative (Angels Initiative) with the focus to increase the number of AIS patients treated in stroke ready hospitals and to optimise the quality of treatment.

Our aim of this study was to evaluate recanalization therapy for AIS patients done in PSCUH during first year (2018.) participating in the quality improvement initiative.

Methods

We included patients discharged from PSCUH with diagnosis of AIS during period of one year (2018.). We collected the relevant data whether patients received the recanalization therapy and what was the door to needle and door to groin time. We compared the results between each quarter (Q1-Q4).

Results

A total of 843 patients were discharged from PSCUH with diagnosis of ischaemic stroke (I63 IDC-10).

Stroke patients treated in a dedicated stroke unit: Q1 149 (75%), Q2 179 (83%), Q3 142 (83%), Q4 212 (87%) patients.

Recanalization procedure rate out of total ischaemic stroke incidence in the hospital: Q1 48 (25%), Q2 57 (25%), Q3 43 (25%), Q4 76 (31%) patients.

Percentage of patients treated with door to recanalization therapy time < 60 minutes: Q1 36 (75%), Q2 47 (83%), Q3 41 (95%), Q4 65 (85%) patients.

Percentage of patients treated with door to recanalization therapy time < 45 minutes: Q1 19 (40%), Q2 31 (55%), Q3 30 (70%), Q4 51 (67%) patients.

Door to needle mean time: Q1 50 min, Q2 40 min, Q3 39 min, Q4 35 min.

Door to groin mean time: Q1 72.5 min, Q2 70 min, Q3 70 min, Q4 50 min.

Conclusions

Participation in a quality improvement initiative significantly improves acute stroke patient care. Increase in number of patients received treatment, admitted to dedicated Stroke unit. Reduced door to needle and door to groin time.

Comparison of Frequency and Severity Levels of Feeling Depressed and Anxious among Rīga Stradiņš University 1st and 6th Year Latvian Medical Faculty Students, Latvia

Dr. Lelde Logina; Dr. Artūrs Ancāns

Rīga Stradiņš University, Clinic of Psychosomatic Medicine and Psychotherapy, Latvia

Objectives

Medical students are at higher risk for depression and anxiety compared to other university students. Depression and anxiety has been highly associated with burnout syndrome and suicidal tendencies in physicians. The aim of this study is to compare frequency and severity levels of feeling depressed and anxious among RSU 1st and 6th year medical students.

Methods

This is a cross-sectional study of 1st and 6th year medical students.

A total of 211 students (111 – 1st year, 100 – 6th year) completed the questionnaires. Overall 81.5% were women (92 – 1st year, 80 – 6th year), 18.5% were male students (19 – 1st year, 20 – 6th year). Mean age of the 1st year students – 19.8 yr and 6th year – 24.6 yr. In this study PHQ-9 depression scale and GAD-7 generalized anxiety scale questionnaires were used. SPSS v. 25 for Windows was used to perform all statistical analyses.

Results

The frequency of feeling depressed (PHQ-9 ≥ 10) is significantly higher in the 1st year students compared to last year students (44% vs 25%).

There is a statistically significant difference in severity levels of feeling depressed between 1st and 6th year medical students ($p = 0.014$). The frequency of feeling anxious (GAD-7 ≥ 10) is significantly higher in the 1st year students compared to last year students (30.6% vs 22%). There is a statistically significant difference in severity of feeling anxious between 1st and 6th year medical students ($p = 0.012$).

Conclusions

RSU 1st year medical student frequency for feeling depressed and anxious is higher and levels are more severe as compared to 6th year students.

Slow or Fast Music Tempo and Its Impact on Psychosomatic Reactions

*Dr. Madara Kurpniece*¹; *Dr. Lelde Logina*¹;
*Prof. Gunta Ancāne*¹; *Prof. Leons Blumfelds*²;
*Kristīne Plamše*³; *Zane Bedikere*³; *Ernst Keller*³

¹*Rīga Stradiņš University, Clinic of Psychosomatic Medicine and Psychotherapy, Latvia;*

²*Rīga Stradiņš University, Department of Physiology, Latvia;*

³*Rīga Stradiņš University, Latvia*

Objectives

There is not enough research about psychosomatic reactions and their connection to music. The aim of this study is to analyze the impact of music tempo and its effect on psychosomatic reactions such as heart and respiratory rate, breathing depth and relative ventilation.

Methods

This is a cross-sectional study of respondent group consisting of 30 people (92.3% – female; 7.7% – male). Mean age – 23 years.

LabChart v. 7 program is used to examine physiologic parameters as well as ECG with 2 electrodes and respiratory belt is used to determine heart rate, respiratory rate, breathing depth and relative ventilation. Emotional state is measured by Likert scale. SPSS v. 25 for Windows is used to perform all statistical analyses.

Results

Mean breathing frequency to music in 90 bpm (beats per minute) is 15.54 bpm and to music in 141 bpm – 16.08 bpm – the difference is 0.87 ($p > 0.05$). Mean heart rate to music in 90 bpm, is 75.76 bpm, to music in 141 bpm – 76.73 bpm – the difference is 1.01 ($p > 0.05$). Mean breathing depth to music in 90 bpm is 11.37 mV and to music in 141 bpm – 12.05 mV – difference is 0.68 ($p > 0.05$). Mean relative ventilation to music in 90 bpm is 0.17 and to music in 141 bpm – 0.19 – the difference is 0.01 ($p < 0.05$).

Conclusions

Fast tempo of music statistically significantly increases relative ventilation. Fast tempo of music increases heart rate, breathing rate and breathing depth. The research is still ongoing.

Cognitive Reserve in Healthy Ageing

Prof. *Sara Mondini*

University of Padua, Italy

The concept of “reserve” has been used to explain the difference between individuals in their capacity to cope with or compensate for pathology. Brain reserve refers to structural aspects of the brain, such as brain size and synapse count. Cognitive reserve is the ability to optimize and maximize performance through recruitment of brain networks, and/or compensation by alternative cognitive strategies. The aim of the present talk is first to describe an instrument for the measurement of the quantity of cognitive reserve accumulated by individuals throughout their lifespan. This questionnaire includes some demographic data and items grouped into three sections, education, working activity, and leisure time. It represents a single index to compare data and results from different studies. All investigations evaluating cognitive abilities could benefit from this measure in place of education only. What is crucial is to understand when and how a high cognitive reserve could be beneficial for healthy ageing. The Cognitive Reserve hypothesis, in general, assumes that the fuller the life a person has had in terms of intellect, abilities and experiences, the more that person will be able to cope with difficult cognitive tasks and social events in life.

Modifiable Risk Factors for Alzheimer's Disease and Glia-Driven Neuroinflammation: What are the Links?

Prof. *Andis Klegeris*

University of British Columbia Okanagan Campus, Department of Biology, Canada

Currently, there are no effective treatment options for Alzheimer's disease; therefore, elucidating strategies for delaying or preventing this debilitating neurodegenerative disease has become an active area of research. There are several well-established modifiable risk factors for Alzheimer's disease including obesity, type 2 diabetes, physical inactivity, and diet. All these factors are known to alter peripheral immune responses, but their interaction with the immune system of the brain are not well understood. Neuroimmune reactions are orchestrated by two main non-neuronal glial cell types: microglia, which represent the mononuclear phagocyte system in the brain, and astrocytes, which support a range of neuronal functions. We hypothesized that certain peripheral mediators, which are altered by modifiable risk factors, can cross the blood-brain barrier and have direct effects on glial cell immune functions. Our cell culture experiments have demonstrated effects of insulin, incretins and short-chain fatty acids on immune functions of microglia. We have also observed altered neuroimmune status in animals exposed to moderate exercise and chronic peripheral inflammation. Therefore, direct signaling between the periphery and glial cells could be responsible for the altered risk of Alzheimer's disease. Characterization of neuroimmune regulatory mechanisms could identify new therapeutic targets for delaying or slowing Alzheimer's disease.

Psychosomatics: Expressive Style Running in Families

Prof. *Rutger Jan Van der Gaag*

Vincent van Gogh Institute for Mental Health Limburg, Netherlands

Psychosomatics is an important issue in medicine. Whilst many patients have clear-cut somatic or psychiatric diagnoses, the vast majority of patients seen in primary and increasingly in secondary care present with so called “medically unexplained symptoms”. The idea that mind and body are distinct is an awkward assumption introduced by Descartes long ago and yet still running in many minds. No so called somatic condition does not come along with anxiety and stress, and conversely anxieties, or a depressed mood will express themselves most often through physical complaints. These may range from headaches, dizziness, short-breathness, pain in the chest or in the belly, aches in limbs etc. In old days doctors were more comfortable assessing the stressful circumstances that the patient in his or her context was facing. Nowadays the patient has often googled his symptoms and has all kind of somatic fears, that are easily reinforced by doctors spending more attention to lab and imaging tests that really looking into what is wrong. As there is still a stigma on mental conditions many patients prefer to have a somatic diagnosis rather than a psychosomatic one. A vast body of research shows that the style of expressing emotions through physical complaints runs in families and gets reinforced as from childhood. Though psychotherapy is very potent in psychosomatics, a family assessment and family therapy is a strongly evidence based approach to these conditions.

Self-Management Approach in Care and Compliance Hindering Factors

Dagnija Brutane¹; Kristine Lielbikse²

¹ *Rīga Stradiņš University, Faculty of Public Health and Social Welfare,
Department of Nursing and Midwifery, Latvia;*

² *Rīga Stradiņš University, Faculty of Public Health and Social Welfare, Latvia*

Objectives

Back pain is the most common pain in society – studies conducted in different countries, show different results, but around the world, it is about 12%. Back pain is a complex biopsychosocial phenomenon. It is very important to understand that pain care should focus on the principle of caring for the whole person rather than solely for the treatment of isolated back pain. This care should be based on life style.

Methods

The aim was to find out the self-management skills of chronic lower back pain patients, their willingness to take self-management approaches to their pain management and the need for self-management support and to find out hindering factors of compliance to treatment.

The study used a mixed research method – a qualitative and quantitative research model combining methods for collecting and analyzing data – Pain Stages of Change Questionnaire, semi-structured interview with open questions, demographic data questionnaire.

Results

Patients understand the causes of the onset of chronic lower back pain, but they do not have an understanding of the illness itself. This understanding is an essential part of successful treatment and care. Patients with self-management approach in the care of chronic lower back pain are ready only at the level of reflection, but additional information and education could motivate them to become more active in self-management. Patients need support in acquiring and performing self-management skills, both informative and educational.

Conclusions

The most important conclusion is the very high need for information and education on both the disease and its treatment and care methods, since it was recognized that the prescribed treatment was not applied directly due to lack of information.

Analysis of Hyperacute Ischemic Stroke Management and Outcomes at Riga East University Hospital

*Dr. Gundega Ķauķe^{1,2}; Dr. Linda Kande^{1,2};
Dr. Dina Jeršova^{1,2}; Dr. Ravita Gailāne^{1,2}; Dr. Eva Vanaga^{1,2};
Dr. Ilga Ķikule²; Prof. Guntis Karelis²*

¹ Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

² Riga East University Hospital, Latvia

Objectives

To analyze hyperacute stroke management, clinical and functional outcomes at Riga East University Hospital.

Methods

Information for retrospective study was obtained from medical records of patients with hyperacute stroke who were admitted to Riga East University Hospital and received thrombolytic therapy from October 2017 to December 2018. Data was analysed using SPSS.

Results

Study included 256 patients. Of all patients, 51.2% (n = 131) were women, 48.8% (n = 125) were men. The average age was 74 (SD - 11.4). Mean door-to-needle (DTN) time was 39 minutes, mean time from the onset of symptoms until the thrombolytic therapy was 145 minutes. DNT time until 30 minutes was implemented on 32.8% (n = 84/256); until 45 minutes - 69.9% (n = 179/256), until 60 minutes - 90.6% (n = 232/256) of cases. All patients were evaluated using NIHSS and mRS upon admission and on discharge from the hospital. NIHSS score from 1 to 4 on admission was observed in 12.1% (N = 31), 5-15 in 62.9% (N = 161), 16-20 in 16.8% (N = 43), upon 20 in 7.4% (N = 19) of cases, no data observed in 0.8% (N = 2) of cases. On discharge these results were 51.9% (N = 133), 23.4% (N = 60), 3.5% (N = 9), 1.9% (N = 5) accordingly, no data observed in 3.9% (N = 10) of cases. Exitus letalis - in 15.2% (N = 39) of cases. On admission mRS 0-1 was assessed in 3.9% (N = 10), 2 in 3.5% (N = 9), 3 in 9.8% (N = 25), 4 in 41.0% (N = 105), 5 in 40.6% (N = 104), no data observed in 1.2% (N = 3) of cases. On discharge these results were 24.2% (N = 62), 11.3% (N = 29), 15.6% (N = 40), 16% (N = 41), 13.7% (N = 35) accordingly, no data observed in 3.9% (N = 10) of cases. Exitus letalis - in 15.2% (N = 39) of cases.

Conclusions

More than 2/3 of patients had DTN time of 45 minutes. Functional and clinical outcome improved in almost one half of patients on discharge.

Efficacy of Reperfusion Therapy in Pauls Stradiņš Clinical University Hospital Neurological Clinic in 2018 and Compare Results with Year 2017

*Dr. Nataļja Predkele¹; Dr. Krista Svilāne¹; Dr. Kristaps Jurjāns²;
Prof. Evija Miglāne²; Prof. Andrejs Millers²*

¹ *Pauls Stradiņš Clinical University Hospital, Department of Neurology, Latvia;*

² *Rīga Stradiņš University, Latvia;*

Pauls Stradiņš Clinical University Hospital, Latvia

Objectives

Intravenous thrombolysis (IVT) and thrombectomy (TE) both are reperfusion therapy methods used to treat acute ischemic stroke patients. Our aim was to assess availability and efficacy of reperfusion therapy in Pauls Stradiņš Clinical University Hospital in year 2018 and compare results with year 2017.

Methods

We analysed retrospectively collected data from Stroke register on acute ischemic stroke patients treated with IVT and/or TE in 2017 and 2018. The efficacy of applied revascularization therapy type (IVT, TE or combination of both) was assessed. Stroke severity was scored using NIHSS (National Institutes of Health Stroke Scale).

Results

In year 2018 total 875 stroke patients were admitted to the Pauls Stradiņš Clinical University hospital and 26.97% (n = 236) of them were treated with reperfusion therapy, in 2017 24.5% (n = 256) of all stroke patients (n = 1047) received reperfusion therapy. In 2018 year 53.8% (n = 127) were female, and in 2017 year the majority were female 53.1% (n = 136) as well. The average age was 72.6 (17–87 ± 12.86) in year 2018 year, but in 2017 – 70.6 (31–99 ± 11.8). Several types of reperfusion therapy were performed in 2018: IVT received 65.7% (n = 155) patients, TE – 8.1% (n = 19); combined therapy received 26.2% (n = 62) patients. In 2017 year: IVT received 67.2% (n = 172) patients, TE – 9% (n = 23), combined therapy – 23.8% (n = 61).

The median NIHSS score in 2017 before treatment was 10 points and 2 points at discharge date; although median NIHSS score in 2018 before applied treatment was 11 points and 3 points at discharge day.

Intrahospital mortality rate in patients treated with IVT and/or TE in 2018 year was 13% (n = 31); in 2017 – 11.7% (n = 30).

Conclusions

The percentage of patients with acute ischemic stroke received reperfusion therapy is higher in year 2018. Intrahospital mortality rate is similar in year 2018 and 2017.

Effectiveness of Social Support on Quality of Life of People with Epilepsy

Alexander Specking

Latvia

Objectives

Factors other than seizure frequency, have been shown to affect the perceived sense of well-being, or quality of life (QoL), in people with epilepsy (PWE). However, little is known about the challenges that PWE deal with in the UK, particularly Scotland, and the effectiveness that the voluntary social support services can have in mitigating the challenges experienced by PWE. This study aimed to discover the challenges in the lives of PWE from a local charity organisation, and investigated how support services affected the QoL of service users.

Methods

A cross-sectional mixed methods design was conducted on 30 adults with epilepsy (N Male = 11; N Female = 19). Participants were recruited through purposive sampling through a local social support charity in Glasgow, called Epilepsy Connections. The Quality of Life in Epilepsy (QOLIE-31-P) questionnaire was used as a measure of well-being. The 10-item Parent Stigma Scale (10-PSS) and the Centre for Epidemiologic Studies Depression Scale (CES-D) were used to screen for stigma and depression, respectively. Pearson correlations and a regression analysis were conducted. Three focus groups of fifteen participants (N Male = 6; N Female = 9) were held to gain a deeper understanding of the role that social support plays in the QoL of PWE. A thematic analysis was used to explore the transcripts.

Results

Our quantitative results indicated that depression and stigma represented the main psychosocial challenges to PWE, negatively affecting the QoL in PWE. Focus groups confirmed psychosocial difficulties, treatment irregularities and inefficiencies as the main challenges of PWE. Support services enabled personal growth and provided opportunities that brought about important psychological, social, structural, and emotional benefits into the lives of participants.

Conclusions

The results reveal major clinical- and public policy implications, as professional care staff is advised to work more closely with verified social support organizations to effectively alleviate the psychosocial problems that result with the development of epilepsy.

Effects of Gender and Race on Perceived Trustworthiness in Modified Trust Game

Veronica Stonko

Latvia

Objectives

Among the various traits inferred from faces, trustworthiness is one of the most important for social and economic interactions. This has made the ability to detect whether a person is likely to cooperate in a financial situation ever so important. The aim of this study was twofold: a) to investigate trustworthiness ratings between female and male participants, across female and male stimuli, and b) to investigate female and male participants' trustworthiness ratings across Asian and Caucasian stimuli.

Methods

The experiment utilised Presentation® version 18.4, where the participants provided trustworthiness ratings in the context of a Trust Game (Berg et al., 1995). A total of 416 real-face stimuli (146 Asian and 270 Caucasian; 216 female and 200 male) with a neutral-expression were used from Dr. Garrod's perception lab at Glasgow University.

A total of fifty ($N = 50$) university students participated in the study; 25 females (Mage = 20.64, SD = 2.63) and 25 males (Mage = 21.68, SD = 2.81), 40 Caucasian and 10 Asian. Four 2×2 ANOVAs were conducted, to statistically determine the effect of trustworthiness and reaction time.

Results

The results indicated that both female and male participants were more trusting towards female stimuli. These results were mediated by own-gender bias among female participants and a marginal interaction between gender of participant and gender of the stimuli, revealing that participants' ratings of the stimuli were not at random. Furthermore, the results indicated that female and male participants rated Asian stimuli significantly more trustworthy than the Caucasian stimuli, suggesting a presence of ethnic biases. Limitations and implications for future studies are discussed.

Conclusions

Overall, it is fair to conclude that whom we trust is not only a reflection of who we think is trustworthy; whom we trust is a reflection of who we are.

Relation of Time to Treatment with Alteplase and Neurological Outcome and Mortality in Patients with Severe Stroke

Dr. Rems Zikovs; Dr. Andrejs Olesiks

Latvia

Objectives

The main objective is to evaluate and compare the neurological outcome and survival of patients with severe stroke in relation to time from symptom onset to treatment with intravenous recombinant tissue plasminogen activator (tPA).

Methods

A retrospective study which included 161 patients which presented to Riga East Clinical University Hospital "Gaiļezers" with ischemic stroke symptom onset of less than 4.5 hours and received treatment with intravenous tPA (alteplase). Patients with National Institutes of Health Stroke Scale (NIHSS) > 16 were defined as having severe stroke and selected for further analysis. Patients were divided into two groups depending on time from symptom onset to treatment (< 90 minutes and ≥ 90 minutes). Neurological outcome and mortality were analysed and both groups were compared. Neurological outcome at discharge was assessed using NIHSS. Patients with NIHSS < 5 were defined as having a minimal neurological deficit.

Results

From 161 patients with acute ischemic stroke, 30 patients had a severe stroke (NIHSS 16–42). Within this group, 5 patients received treatment with alteplase in less than 90 minutes from symptom onset, 25 patients were treated after 90 minutes from symptom onset. NIHSS 1–5 at discharge was observed in 40% of patients in the first group and 8% of patients in the second group. There were no deaths in the first group. The mortality rate was as high as 40% in the second group.

Conclusions

From the results of this study we can conclude that time from symptom onset to treatment with intravenous alteplase strongly affects the neurological outcome and survival of patients with severe stroke. Earlier treatment (< 90 minutes) is associated with a better neurological outcome and lower mortality.

Implantation-Related Measurements in CBCT – How Trustworthy are They?

*Dr. Liene Zamure; Ph.D. Laura Neimane;
Prof. Andrejs Skaģers; Dr. Zanda Bokvalde*

Rīga Stradiņš University, Institute of Stomatology, Latvia

Objectives

Dental implantology is a widely researched field and technology improves daily. The precision needed for the procedure is crucial in aesthetics and the success of the implant. Studies show free hand implant placement has no statistical significance in success compared to template guided surgery. A different situation is from the radiological point of view.

Methods

Two independent doctors were given the exact same 30 preoperative and 30 postoperative CBCT's of both maxillary and mandibular implantation sites. 169 implantation sites were measured by two of the authors using the same protocol 2 times with at least 2-week interval:

- 1) distance to the closest relevant anatomical structure;
- 2) bone ridge width at the alveolar core;
- 3) bone width in the planned / existing implant apex site;
- 4) bone density in the ridge core area;
- 5) bone density in the ridge area in the planned / existing implant apex site.

All the data was collected and the ICC analysis was performed. ICC can be in the values from 0–1. The ICC values are considered as very good if above 0.9; good – 0.75–0.9; average – 0.5–0.75; and weak if below 0.5.

Results

Using ICC interrater and intrarater consentaneity was evaluated. First the measurer No. 1 intrarater analysis, measurer No. 2 intrarater analysis, and both measurer interrater analysis. The best results in between of both measurers can be observed in the measurement No. 1 and No. 4 respectively 0.85–0.79–0.8 and 0.75–0.75–0.8; measurements No. 2 and No. 3 show average consentaneity (0.59–0.58–0.66 and 0.6–0.73–0.66); intrarater consentaneity for measurement No. 5 is weak (0.46–0.48) but interrater consentaneity is average (0.69).

Conclusions

Although measurement No. 1 could be considered the most difficult to repeat identically because of the biggest range of value and subjective evaluation of location, it has the best results proving radiologically measured location for a dental implant can be repeated by same or another measurer promising predictable results.

Environmental Effects on Mechanical Properties of Dental Composite

*Ksenija Priladiša¹; Jurgis Siliņš¹;
Dr. Tatjana Glaskova-Kuzmina²; Jevgenijs Proskurins³;
Sandra Bērziņa⁴; Elizabete Jaunozola⁴*

¹ Rīga Stradiņš University, Faculty of Dentistry, Latvia;

² University of Latvia, Institute for Mechanics of Materials;

³ Rīga Stradiņš University, Faculty of Medicine, Department of Physics, Latvia;

⁴ Rīga Stradiņš University, Faculty of Dentistry, Department of Conservative Dentistry and Oral Health, Latvia

Objectives

Dental composite materials (CM) are widely used in dentistry for restorations. One of the biggest concerns of dentists is how well the material will function in the oral conditions, is it suitable for the compressive force of the occlusion, but at the same time will the material fulfill the aesthetic needs of the patient. Among the main parameters that minimize or exclude filling's failure, such properties as compressive strength, modulus and maximal deformation are important to evaluate when choosing a material in dental practice.

The aim of this study was to determine how mechanical properties of commercially available dental CM change in simulated intraoral conditions.

Methods

The investigated material was 3M ESPE Filtek™ Ultimate A2 Enamel Shade which is widely used in dental clinic and preclinical studies for anterior and posterior restorations.

The test specimens were prepared according to standard ASTM D695 in the form of prisms of sizes 10 × 5 × 5 mm. First, the mechanical properties of dental composite were determined in initial state. The mechanical testing in compression was performed by using servo-hydraulic testing system MTS 5T at a speed rate 1 mm/min until failure. The compressive modulus, strength and maximal deformation were evaluated from the stress-strain curves obtained for five CM specimens.

Then, for the investigation of environmental effects three groups of five specimens were immersed in the following solutions at app. 50 C: 1) distilled water (pH = 6), 2) water and vinegar solution (pH = 4), and 3) alkaline mineral water (pH = 8) until equilibrium moisture content. After that, the mechanical testing in compression was repeated.

Results

It was experimentally confirmed that the CM specimens which were stored in different simulated intraoral conditions have reduced mechanical properties in comparison with the CM specimens tested in dry / initial conditions.

Conclusions

The reduction of mechanical properties was due to environmental degradation and decrease of the lifespan of the restoration.

Expression of Gene Proteins, Interleukins and β -defensin in Cleft-Affected Tissue

*Iveta Jankovska*¹; Prof. *Māra Pilmane*²; Prof. *Ilze Akota*³

¹*Rīga Stradiņš University, Department of Orthodontics, Latvia;*

²*Rīga Stradiņš University, Department of Morphology, Latvia;*

³*Rīga Stradiņš University, Department of Oral and Maxillofacial Surgery, Latvia*

Objectives

The aim of the study was to investigate cleft-affected tissues in children with cleft lip and palate in order to detect appearance frequency of β -defensin 2, interleukins (IL4, IL6, IL7, IL8, IL10) and gene proteins (MSX1, RYK, PAX9, IRF6).

Methods

The study group included 10 patients with cleft lip and palate. During nose surgery tissue samples from bone and cartilage have been taken, and stained with immunohistochemistry for β -defensin 2, IL4, IL6, IL7, IL8, IL10 and MSX1, RYK, PAX9, IRF6 gene proteins. To record the relative frequency of indices a semi-quantitative counting method widely used in the literature was employed.

Results

Results showed prominent expression of IL10 (mean value 47.28 ± 4.26 in visual field) followed by IL7 (35.62 ± 11.18) in cartilage of patients, but slightly less pronounced expression of IL8 (30.14 ± 8.74), IL6 (22.52 ± 10.88) and IL4 (14.81 ± 6.94). The expression of β -defensin 2 was prominent (34.52 ± 11.79) and similar to expression of IL7 in tissue samples of cartilage. MSX1, PAX9, RYK and IRF6 (17.67 ± 5.94 ; 16.14 ± 5.52 ; 16.57 ± 5.22 and 11.86 ± 4.21) in cartilage was less pronounced than interleukins and β -defensin 2. MSX1 (12.44 ± 3.34), PAX9 (6.89 ± 2.14), RYK (11.0 ± 5.92) and IRF6 (9.1 ± 4.76) gene proteins expression in bone showed mostly rare occurrence of positive structures.

Conclusions

Significant expression of IL10 and β -defensin 2 and IL7 in cartilage proves the prominent immune response in cleft affected hard tissue. Mostly indistinct MSX1, PAX9, RYK and IRF6 gene proteins expression in bone might be an indicator of not complete cellular differentiation, proliferation and migration events in cleft disordered hard tissue.

Condylar Bony Changes and Signs of Temporomandibular Joint Disorders in Class III Orthognathic Surgery Patients

Dr. *Jevgenija Podčernina*¹; Prof. *Ilga Urtāne*²;
Prof. *Pertti Pirttiniemi*³

¹ *Rīga Stradiņš University, Institute of Stomatology, Latvia;*

² *Rīga Stradiņš University, Faculty of Dentistry, Latvia;*

Rīga Stradiņš University, Institute of Stomatology, Latvia;

³ *University of Oulu, Department of Oral Development and Orthodontics, Finland*

Objectives

The aim was to investigate the prevalence and transition of radiologically detected condylar bony changes with respect to the signs of temporomandibular joint disorders (TMD).

Methods

The study included 33 (11 females, 22 males) patients diagnosed with skeletal Class III malocclusion, who underwent one jaw (27.3% of cases) or bimaxillary (72.7% of cases) orthognathic surgery. The mean age of the patients at surgery was 22.2 ± 2.9 years. Cone beam computed tomography (CBCT) images and clinical examination data were analysed. CBCT images were obtained before surgery (mean 1.67 ± 2 months) (T1), after 1.21 ± 0.5 years (T2) and at the last follow-up at 4.48 ± 0.6 years (T3) after surgery. Condylar bony changes were assessed and classified in accordance with the criteria of Hatcher et al. (1997) as follows: normal condyle, condylar remodelling and degenerative joint disease. Clinical examination was performed at a long-term follow-up (T3) in accordance with the Research Diagnostic Criteria for TMDs.

Results

The total score for condylar bony changes – surface flattening, subcortical sclerosis and the presence of osteophytes, statistically significantly ($p = 0.000$) increased for both sides at a long-term follow-up. Percentage of patients, diagnosed with radiologically detected features of degenerative condylar changes, statistically significantly ($p = 0.020$) increased from 6.1% at T1 to 24.2% at T3. The most common sign of TMD was pain in masticatory muscles (18.2% of patients). The changed bony structure was not associated with pain of joints or muscles.

Conclusions

The incidence of radiologically detected features of degenerative condylar changes increased after orthognathic surgery. No association between condylar bony changes and signs of TMD was found at a long-term follow-up.

Antibacterial Effect of Temporary Cements: In Vitro Study

*Dr. Kārlis Ozoliņš*¹; Prof. *Una Soboļeva*²; Dr. med. *Aigars Reinis*³

¹ Rīga Stradiņš University, Institute of Stomatology, Department of Prosthodontics, Latvia;

² Rīga Stradiņš University, Department of Prosthetic Dentistry, Latvia;

³ Rīga Stradiņš University, Department of Biology and Microbiology, Latvia

Objectives

The aim of the study was to determine if the temporary cements (TC) used in prosthodontic clinic have antibacterial (a/b) properties, do they differ between TC types and do these properties change by adding Vaseline.

Methods

Six TC's in standard setting were tested – Temp Bond (TB) E, NE, Clear (Kerr); Relyx Temp E, NE (3M); Temposil (Coltene). Four TC's with addition of Vaseline were tested: TB E, NE (Kerr) and Relyx Temp E, NE (3M). Ten 90 mm Petri dishes with Columbia CNA agar were prepared and coated with *Streptococcus mutans* 1174. strain. With sterile glass rod 9 wells in each Petri dish was made. Freshly mixed TC with sterile 10 ml syringe were placed in wells. One TC type per Petri dish were tested. After incubation period (48 h in 37 °C anaerobic thermostat) digital photographs (with standardized protocol) were taken and zones of inhibition around TC's were analysed and measured by ImageJ software. Two separate measurements were made by the same investigator with a 4-week interval. Data collected were statistically analysed (Wilcoxon signed-rank test; Mann-Whitney test; Kruskal-Wallis test).

Results

There was no statistical significance between two measurements made by investigator ($p > 0.05$). Temp NE (Kerr), Relyx Temp NE (3M) and Temposil (Coltene) did not form zone of inhibition. Statistical analysis revealed that inhibition zone sizes of TC's: Kerr Temp Bond E, Clear and Relyx Temp E (3M) differ significantly ($p < 0.001$). A/b effect of TB E compared to TB E with Vaseline (Kerr) and a/b effect of Relyx Temp E and Relyx Temp E with Vaseline (3M) showed statistically significant differences ($p < 0.024$).

Conclusions

The results in this in vitro study clearly state that there are cements with no antibacterial activity against *Str.mutans*. TC's which show a/b activity are different with their a/b effects. A/b properties of TC's change when adding Vaseline following instructions of the manufacturer.

Patient Motivation and Education of Oral Hygiene, Treatment of their Partial and Complete Dentures

Antons Maksimovs; Anna Keiviša

Rīga Stradiņš University, Faculty of Dentistry, Latvia

Objectives

The aim is to identify patient problems associated with cleaning dentures, to show dentists how many patients do not follow the rules of dental hygiene.

Methods

Review of the scientific publications and a summary of the results. Information gathering using other authors' researches.

Results

Poor condition of complete and partial dentures seen in the population is mainly due to irregularly cleansing habits and also less usage of cleansing solutions. Dentists should give proper instructions regarding maintenance of denture hygiene.

Conclusions

Now and in the future, dentists need to pay more attention to their patients, not only the prosthetics of the teeth, but also the teaching of people, patients how to care for dentures.

Interconnection between Facial Asymmetry and Occlusal Features

*Dr. Signe Silineviča; Prof. Gundega Jākobsone;
Alla Beļaka; Natālija Šilova*

Rīga Stradiņš University, Latvia

Objectives

The aim was to assess the asymmetry of soft tissues, in respect to the occlusal features such as crossbite, malocclusion and deviation of the midlines.

Methods

The sample was collected from an ongoing growth study at Rīga Stradiņš University. It consisted of 61 males and 50 females with a median age of 15.9 (15.2-16.3). To acquire the scans, a 3dMD face scanner was used. Occlusion was assessed by intraoral scans. 21 landmarks were identified. The original and mirrored faces were superimposed. 2D and 3D measurements were done.

Results

There was a statistically significant difference between the several 2D and 3D measurements ($p < 0.05$). Results showed that, males have longer and narrower upper region of the face and wider and shorter chin region ($p < 0.05$). The results also showed a statistically significant association between both, the crossbite and the vertical asymmetry when 3D measurements were used ($p = 0.036$), and between facial convexity angle and crossbite ($p = 0.048$) although, only when 2D measurements were used. 61 individuals had malocclusion - unilateral or bilateral, and statistically most of them had asymmetry in the chin region ($p = 0.036$) and a deviated lower lip ($p = 0.037$). There was a statistically significant correlation between deviation of the midline of the lower dental arch and facial asymmetry in the region of the upper arch ($p = 0.029$), deviation of the lower ($p = 0.022$) and upper lip ($p = 0.047$), chin ($p = 0.002$), midpoint of the corners of the mouth ($p = 0.023$) and facial convexity (2D) ($p = 0.049$).

Conclusions

We found an interconnection between several occlusal features such as crossbite, malocclusion, deviation of the midline of the upper or lower arch with asymmetry in the lower region of the face.

Maxillary and Mandibular Reconstruction with Osteocutaneous Fibula Flap: 10-Year Experience of Single Surgeon Team

*Dr. Jānis Zariņš¹; Dr. med. Kalvis Pastars¹;
Dr. Juris Tārs²; Anna Ivanova³; Dr. Elza Rāte²;
Dr. Romāns Dzalbs²; Dr. Vadims Neļjodovs⁴*

¹ *Microsurgery Centre, Department of Hand and Plastic Surgery, Latvia;*

² *Oncology Centre of Latvia, Department of Head and Neck Surgery;*

³ *Rīga Stradiņš University, Department of Oral and Maxillofacial Surgery, Latvia;*

⁴ *Rīga Stradiņš University, Latvia*

Objectives

The aim of our study was to report a 10-year experience of single surgeon team using osteocutaneous fibula flap for oromandibular and oromaxillary reconstructions.

Methods

From 2008 till 2018 a total of 50 vascularized fibula flaps were used for maxillary and mandibular tumor reconstructions.

Results

35 were males, 15 were female patients with mean age of 55.6 years (12-79). Mandibular reconstruction was done in 47 cases (94%), maxillary reconstruction – in 3 cases (6%). Squamous cell carcinoma was found in 45 cases, ameloblastoma in 4 cases, plasmacytoma in 1 cases. Single skin paddled osteocutaneous fibula flap was used in 42 cases for intraoral defects, but in 8 cases double skin paddled flaps were used to reconstruct both intra and external facial tissue defects. Double-barrel fibula flap was used in 5 cases. Flap survival rate was 96%: 2 flaps went necrotic due to the vessel thrombosis and infection. All patients were tracheostomy free at the discharge from hospital. 5-year disease specific survival for late stage squamous cell carcinomas was 53%. University of Washington Quality of Life Questionnaire revealed normal quality of life without severe disabilities, mostly affecting patients without dental rehabilitation.

Conclusions

Osteocutaneous fibula flap provides many single staged reconstruction options for complex fascial bone and soft tissue defects, maintaining functions of oral cavity and cosmetics.

Merkel Cell Carcinoma of Head and Neck Region: Review of Two Cases

Prof. *Egils Korņevs*¹; *Ingus Apse*²;
*Dr. med. Kalvis Pastars*³; *Dr. Juris Tārs*¹

¹ *Oncology Centre of Latvia, Department of Head and Neck Surgery;*

² *Rīga Stradiņš University, Department of Oral and Maxillofacial Surgery;*

³ *Microsurgery Centre, Latvia*

Objectives

The aim was to report two cases of Merkel cell carcinoma referred to Latvian Oncology Centre Department of Maxillofacial surgery in 2018 and to draw attention on the complexity of approach of handling these kind of cases.

Methods

Both patients were referred to the Latvian Oncology Centre, Department of Head and Neck surgery in 2018 as complex cases. First patient (woman, 68 y.o.) complained about recurrent parietal located growth. In 2017 primary tumour was resected and diagnosed as basal cell carcinoma. Pre-surgical biopsy was inconclusive. Surgical excision with flap reconstruction from muscle latissimus dorsi afterwards was carried out. Post-surgical examination led to diagnosis of Merkel cell carcinoma. Second patient (man, 62 y.o.) complained about primary growth noticed 2 years before and located on the right side of the temporal and zygomatic region. Pre-surgical biopsy was inconclusive. Surgical excision and rotational flap from cheek was done. Post surgical biopsy led to the diagnosis of Merkel cell carcinoma.

Conclusions

Even though no distal or local lymphatic invasions and no organ metastasis were found, patient will be monitored closely and follow-ups are mandatory, as high metastasis rates have been reported in literature previously. By multiple material inspections differentiated diagnosis might still be expected in cases of Merkel cell carcinoma.

Comparison of Intraoral Scanner and Extraoral Scanner

Dr. Aira Kalniņa; Prof. Una Soboļeva

*Rīga Stradiņš University, Institute of Stomatology,
Prosthetic Dentistry, Latvia*

Objectives

Our objective was to, in an objective and independent study, determine the accuracy and repeatability of an intraoral scanner, compare it to an extraoral scanner for obtaining a virtual model which would be used for the manufacturing of fixed dentures.

Methods

In the in vitro study, three prepared teeth were analyzed – dd 13, 12, 21. Two types of impression were made – a scan in mouth using an intraoral scanner – 3Shape Trios, second as a polyvinyl siloxane impression and prepared in stone model, scanned with an extraoral scanner (3Shape 370). Both footprints were saved in the STL file format and the differences were read by the Ortho Analyzer™ Software program. Data analysis using the ANOVA test was used for the precision analysis.

Results

In the precision analysis, intraoral scans vary from 89.43 µm (SN 53.95 µm) from the extraoral scanner. Significant differences were found in the incisal edge and the prepared margin, but no differences were found between the various comparisons ($p = 0.298$). Repeatability showed statistically significant differences: extraoral scans differed by 13.06 µm (SN = 14.89 µm), intraoral scan – 26.33 µm (SN = 17.9 µm). There was a statistically significant difference between the subject ($p < 0.001$).

Conclusions

The repeatability of both intraoral and extraoral scanners is clinically acceptable, although, the extraoral scanner is slightly more precise. Another experimental design study should be carried out to determine the accuracy of the various constructions which were made so that it could be decided which of the methods provides a more precise clinical outcome.

Clinical Manifestations of Burning Mouth Syndrome

Dr. Viktors Jankovskis; Dr. med. Guntars Selga

Rīga Stradiņš University, Institute of Stomatology, Latvia

Objectives

The aim was to determine pain intensity, salivary flow rates, and depression and anxiety levels in patients with burning mouth syndrome (BMS).

Methods

250 out of the 1114 patients of the Institute of Stomatology of the Department of Oral Pathology were diagnosed with BMS (23.08.2017.-19.12.2018). Out of those 110 (97 females, 13 males) were included in the study. Pain was measured using the visual analogue scale, salivary flow for stimulated (norm 1–2 ml/min) and non-stimulated saliva (norm 0.3 ml/min) was measured after patients had spat into a tube for 5 minutes, using sialometry. Depression and anxiety were determined using the hospital anxiety and depression scale. Mean (\pm SD) and Spearman's correlation coefficient were calculated. Results were compared with other studies.

Results

Mean age of respondents was 58.89 ± 14.2 years. Mean of non-stimulated and stimulated salivary flow rate was 0.27 ± 0.26 ml/min and 1.10 ± 0.74 ml/min respectively. Mean of depression levels was 4.46 ± 3.41 , anxiety levels was 6.2 ± 3.99 , and the median was 3.5 ± 4.0 and 5.0 ± 4.6 respectively. Mean of pain intensity in the morning was 3.8 ± 2.39 , afternoon – 4.8 ± 2.64 , and evening – 6.65 ± 3.54 , median and interquartile range was 4.0 ± 4.0 , 4.0 ± 3.0 , 7.0 ± 4.0 respectively. Statistically significant negative correlations were noted between age and unstimulated ($r = -0.263$, $p \leq 0.005$) as well as stimulated salivary flow ($r = -0.243$, $p \leq 0.05$), and positive correlations with age and depression ($r = 0.233$, $p \leq 0.05$). Negative correlations were found between pain in the evening and depression ($r = -0.374$, $p \leq 0.001$) as well as anxiety ($r = -0.442$, $p \leq 0.001$).

Conclusions

Incidence of BMS was 22.4%. Non-stimulated salivary flow was below the norm, but the stimulated was within the norm and both had a negative correlation with age. Maximum pain levels were in the evening and had a negative correlation with depression and anxiety. The current study's anxiety and depression levels were comparatively lower compared to other studies and pain intensity levels were similar to other studies.

Basal Cell Nevus Syndrome – Diagnosis and Treatment

*Dr. Julianna Muceniece; Anna Ivanova;
Dr. Jelena Moisejenko-Golubovica*

*Rīga Stradiņš University, Institute of Stomatology,
Oral and Maxillofacial Department, Latvia*

Objectives

Gorlin-Goltz or basal cell nevus syndrome is a comparatively rare genetic syndrome characterized by multiple basal cell carcinomas, odontogenic keratocysts, palmar and plantar pits, skeletal abnormalities and other developmental defects.

Methods

35 years old patient with history of acute manifestation of jaw cyst and basal cell carcinoma surgical treatment from march 2018 till present days – has been presented.

Results

Young patient was delivered to emergency department in march 2018 with complains of swelling and pain in left lower jaw. After performing an x-ray procedure – multiple jaw cysts was observed. iCAT 3Dscan presented a large defect also of Maxillary sinuses bilaterally – odontogenic jaw cysts.

Symptomatic cystic structure (in region d34 till ramus of mandibule) was decided to be treated with decompression method – cystostomy during 6 month, with follow-up 1x month. Due to multiple facial lesion – patient was sent to dermatologist where 8 nodular basal-cell carcinomas were found on the face and 5 on patient back. Stage II (according TNM clasification) basal-cell carcinomas was surgically treated by local excision. No recurancy after 3 and 6 month post-op where seen. Patient has now been recomended to perform x-ray of chest ares, EKG, ultrasonography of neck and abdomen and have a genetic consultation. Patient still is under follow-up.

Conclusions

Basall cell nevus syndrome is a rare condition witch provides a multidisciplinary approach in management. Meticulous extraoral and intraoral examinations, along with radiographs, help in confirming the diagnosis of Gorlin-Goltz syndrome.

3D Nasolabial Appearance in Patients with Unilateral Complete Cleft Lip, Alveolus and Palate and Control Group

Dr. med. Ieva Bāgante; Prof. Ilze Akota

Rīga Stradiņš University, Oral and Maxillofacial Surgery, Latvia

Objectives

Aim of the study was to evaluate and compare the nasolabial appearance in patients with unilateral cleft lip, alveolus and palate (UCLP) and control group.

Methods

All consecutive 35 patients born between 1994 and 2004 with nonsyndromic complete UCLP were included. Of 35 patients, 30 responded for recall with mean age 14 years (range 10–18). In the control group, 35 non-cleft participants at 10 years of age were included. The nasolabial anthropometry was performed in 3D images with 25 anthropometric landmarks and 18 distances.

Results

In UCLP group, statistically significant difference between cleft and non-cleft side was found in alar wing length. The difference in control group between left and right side was not significant. In UCLP group the symmetry index showed a statistically significant difference in length of red lip from crista philtrum to midline, nose lateral length and alar wing length. In control group, the symmetry index showed statistically significant asymmetry of nostril height. Comparing symmetry index between UCLP and control group, statistically significant difference was found in the length of white lip, nose lateral length and alar wing length.

Conclusions

Symmetry of the nasolabial appearance in patients with UCLP differed from control group. Symmetry index was informative for nasolabial symmetry comparison of the UCLP group and the control group as there was variation in age and stature, excluding direct comparison of anthropometric distances.

Correlation of Manual Dexterity Test Results with Average Mark of Practical Part of Preclinical Course of the Faculty of Dentistry

Natalja Šilova; Sandra Bērziņa; Solvita Graudiņa

*Rīga Stradiņš University, Department of Conservative Dentistry
and Oral Health, Latvia*

Objectives

The objectives are to find out: the correlation between the students' manual dexterity test results and average mark of the practical part of the preclinical course; manual dexterity level for right handed and left handed students.

Methods

82 students participated in the study (77 students were right handed and 5 were left handed). The dental bur stand with 24 burs was used for the test. The test consisted of the following tasks: place as many burs as possible in the stand within 30 seconds using tweezers and dominant hand, non-dominant hand and both hands. And the same three tasks in indirect vision.

Spearman's coefficients were calculated: between the results of each task and student's average mark in the preclinical course; between the sum of all results and student's average mark.

Results

Statistically significant weak correlation was found between the test results of dominant hand and the average mark of the preclinical course. As well as statistically significant weak correlation between the sum of results and the average mark.

In indirect vision the majority of students was able to insert from 0 till 1 bur, but this result didn't have statistically significant correlation with the average mark.

During the study we noticed, that students with a dominant left hand generally showed better results. It was easier to do tasks with non-dominant hand for left handed students than for the right handed students. However, it didn't have statistically significant correlation with the average mark.

Conclusions

Students with better manual dexterity test results have better average mark in the practical part of the preclinical course. It was difficult to work in indirect vision for most part of students. Left handed students manipulate both hands equally well. For the right handed students working with the left hand is more difficult.

Quality of Metalceramic Crown and Soft Tissue Health

Dr. Elīna Blūma; Prof. Aldis Vidžis

Rīga Stradiņš University, Department of Prosthetic Dentistry, Latvia

Keywords: metalceramic, periodontal health.

Objectives

The purpose of artificial crown is to fit into the oral cavity, be functional, aesthetic and not irritate soft tissues. As aesthetic demands increase, patients have a desire for natural-looking artificial teeth and healthy gum tissue. The aim of the study is to find out the quality of single metalceramic crown and how does quality affect soft tissue health around artificial crown.

Methods

The patients included (N = 75 female and male aged 25–55) were with good general health and condition not causing changes in the periodontal tissues. The tooth with the single metalceramic crown was selected for study and intact analog tooth from opposite side of the tooth rim for control. The quality of the artificial crown was evaluated retrospectively using modified United States Public Health Service (USPHS) criteria. The periodontal health was evaluated measuring bleeding on probing (BOP), plaque index (PI) and pocket depth (PPD) in study and control teeth. The data were compared using programm IBM SPSS 20.0 and MS Excel.

Results

USPHS criteria showed results including all crowns in the alpha rating (α) and beta rating (β). Assessing the clinical parameters more diverse data were obtained: shade of crown (α - 75%, β - 25%), proximal contact (α - 62%, β - 38%), marginal adaptation (α - 59%, β - 41%). Comparing data they showed connection between quality (incomplete marginal adaptation, poor proximal contacts) and increased signs of gingival inflammation ($p < 0.05$).

Conclusions

The metalceramic crowns have acceptable quality (α - alpha rating). Frequently observed slight deviations was of shade of crowns, marginal adaptation and proximal contacts. Worsening of USPHS criteria ratings from alpha to beta can increase inflammation in periodontal tissues. Slight aesthetic inconsistencies do not cause soft tissue health changes.

Efficiency of Revitalisation Procedures in Permanent Teeth with Incomplete Root Formation and Pulp Necrosis: Preliminary Results

Dr. *Katrīna Andrejeva*¹; Ph.D. *Anda Mindere Gūbele*²;
Prof. *Anda Brinkmane*²

¹ *Rīga Stradiņš University, Institute of Stomatology,
Department of Endodontics, Latvia;*

² *Rīga Stradiņš University, Faculty of Dentistry, Department of
Conservative Dentistry and Oral Health, Latvia*

Objectives

Revitalization or regenerative treatment approaches in teeth with incomplete root formation and pulp necrosis have become part of the therapeutic endodontic spectrum and should be considered as an alternative to conventional apexification.

The purpose of this study is to investigate the efficiency of the latest European and American Endodontic Association revitalization protocols on further root development and and pulp like tissue formation in permanent teeth with incomplete root formation, pulp necrosis and apical periodontitis.

Methods

Six patients were selected for pulp revitalization procedure according to the latest protocols published by European and American Endodontic associations. Treatment was performed on two visits. During the first visit root canal was irrigated with sodium hypochlorite, saline water and 17% EDTA, calcium hydroxide paste was placed in the root canal for 4 weeks for continuous disinfection. On the second visit a blood clot was created or iPRF placed in the canal, covered with collagen matrix. Root canal orifice was sealed with white mineral trioxide aggregate, liner and permanent restoration. Patients were recalled after 3 months to see the preliminary results of revitalization procedures.

Results

During follow-up, all patients were asymptomatic and radiography revealed gradual reduction of periapical radiolucency within the first 3 months.

Conclusions

Current clinical and radiographic evidence shows successful preliminary results of revitalization procedures as the reduction of the radiolucency is indicative of healing being in progress. Continuous follow-ups after 6, 9, 12, 18 and 24 months and after that annually for 5 years are necessary to observe whether the teeth will continue apexogenesis with further root development and pulp like tissue formation after revascularization procedures.

Cone-Beam Computer Tomographic Study of Root and Canal Morphology of Maxillary First and Second Permanent Molars

*Dr. Krista Drava*¹; *Ph.D. Anda Mindere Gūbele*²;
*Prof. Anda Brinkmane*²

¹*Rīga Stradiņš University, Institute of Stomatology, Department of Endodontics, Latvia;*

²*Rīga Stradiņš University, Faculty of Dentistry, Department of Conservative Dentistry and Oral Health, Latvia*

Objectives

Understanding tooth anatomy is crucial for effective endodontic treatment. Many studies have reported three dimensional differences in root and canal morphology using CBCT scans in different populations, but none applies for Latvian or East European populations. The aim of this study was to identify the root and canal morphology of the maxillary first and second molars and incidence of second mesiobuccal canal in MB root in Latvian population using CBCT imaging.

Methods

Digital CBCT images of the maxillary first and second molars were collected from patients who had undergone CBCT scanning for diagnostic purposes at Rīga Stradiņš University, Institute of Stomatology from November 2017 to November 2018. Data of 85 patients were collected. The number of roots and canal morphology were tabulated according to Vertucci classification.

Results

94.4% of all maxillary first molars showed 3-root configuration, whereas maxillary second molars showed 3-, 2-, and single root configuration. For the maxillary first molars, the most common Vertucci classifications for the mesiobuccal root were type IV (2-2, 38.9%), type II (2-1, 25%) and type I (1, 16.7%). For maxillary second molars, the most common Vertucci classifications for the mesiobuccal root were type I (1, 33.3%), type II (2-1, 31.1%) and type IV (2-2, 20%).

Conclusions

Most of the first maxillary molars showed 3-root configuration, second maxillary molars showed diverse root configuration. Incidence of the second mesiobuccal canal in MB root of maxillary first molars in Latvian population were 83.3%, whereas in second maxillary molars incidence of second mesiobuccal canal were 66.7%.

Role of Clinical and Iatrogenic Factors in Success Rate of Orthograde Endodontic Retreatment: Preliminary Results of a Follow-up Study

*Dr. Lauma Saulīte*¹; *Ph.D. Anda Mīndere-Gūbele*²;
*Prof. Anda Brinkmane*²

¹ Rīga Stradiņš University, Institute of Stomatology, Department of Endodontics, Latvia;

² Rīga Stradiņš University, Faculty of Dentistry, Department of Conservative Dentistry and Oral Health, Latvia

Objectives

Nonsurgical endodontic retreatment is an option to save the patient's natural tooth and often deals with intracanal obstructions, such as ledge or root canal calcification. Currently there are few studies showing the impact of intracanal factors on endodontic retreatment results.

The aim of this study was to identify the incidence of intraoperative factors encountered during orthograde root canal retreatment and their impact on success rate after observation period of 4 years.

Methods

Data were obtained from orthograde retreatments using warm vertical Gutta-Percha obturation method. All cases were performed by certified endodontist in year 2014. Main patient dropout reasons for those reachable by telephone included living abroad or far from the capital city. In recall a total of 20 patients were examined clinically and radiographically (PAI index). A statistical analysis (chi-square) was used to calculate correlation between possibilities to overcome intraoperative obstacles and success rate of treatment.

Results

Overall success rate was 68%. Seventy per cent of all cases had an intracanal obstruction. Teeth with non-treatable intracanal obstacle had success rate of 66%, teeth with obstacle removed had 80% success ($p = 0,572$). One tooth was extracted for unknown reasons. Teeth without preoperative lesion had no apical lesion developed.

Conclusions

Intracanal obstructions are a common finding in endodontic retreatment. Success rate increased if obstacle was overcome. Limitation of the study is the small sample size, leading to no statistical difference between the possibility to overcome obstructions and success rate.

Intercenter Study of Different Surgical Techniques in Patients with Complete Unilateral Cleft Lip Alveolus and Palate (UCLAP)

Prof. *Ilze Akota*¹; Dr. med. *Ieva Bagante*¹; *Jan Lenz*²;
*Linas Zaleckas*³; *Marianne Soots*⁴; Prof. *Karsten Gundlach*²

¹ *Rīga Stradiņš University, Faculty of Dentistry, Department of Oral
and Maxillofacial Surgery, Latvia;*

² *Rostock University, Germany;*

³ *Vilnius University, Lithuania;*

⁴ *Tartu University, Estonia*

Objectives

The aim was to describe the established network for intercenter comparison of treatment outcomes of children with complete unilateral cleft lip alveolus and palate (UCLAP) among three cleft centers using different techniques for primary lip and nose surgery.

Methods

In prospective study all consecutive children with non-syndromic complete UCLAP with primary surgery performed from year 2000 were included. Outcomes of 87 patients were examined using standardized minimum records from birth up to 5 years of age: surgeons have compared standardized photographs using rating score with regard to red lip, white lip, scarring and nose. Statistical evaluation was done.

Results

Observations revealed no significant differences of results when comparing 5 year old patients from three centers. In one third of patients (I) lip surgery was carried out by using the waveline technique and nasoalveolar molding (NAM) presurgically. In the second third (II) surgeons achieved lip closure by using the rotation-advancement technique. Presurgically Hotz' plate was used, patients underwent primary rhinoplasty including septoplasty and postoperative NAM in addition. In another third (III) neither pre- nor postoperative molding was done, surgeons used Pfeifer's technique. In centers I and II lip closure was performed within 6 months of age, in centre III within 3 months of age. Preoperative NAM has influenced wideness of cupid's bow and philtrum as well as position of the ala on the cleft side (Center I). Primary rhinoplasty has influenced aesthetic outcome when comparing the results of nasal rating (Center II).

Conclusions

Network to achieve improvement of care for children with clefts treated in participating centers was established and standardized records could be collected. Preoperative NAM and primary rhinoplasty have long-term effects on aesthetic results.

Success and Longevity of Porcelain Laminate Veneers: Retrospective Study

*Māra Valdmāne*¹; Prof. *Pēteris Apse*²

¹ *Rīga Stradiņš University, Institute of Stomatology, Latvia;*

² *Dental Clinic Adenta, Latvia*

Objectives

Dental veneers are a popular way to restore anterior teeth both aesthetically and functionally with minimal tooth reduction. The aim of this study investigates over 15 yr period the success and survival of dental porcelain veneers in a private practice.

Methods

Dental veneer records over a 15 yr period in Adenta Dental Clinic were reviewed. Data that provided pre and posts treatment records and follow-up were included. Fifty-five patient records were selected with a total of 311 placed porcelain laminated veneers (PLV). Where available photographic records were also reviewed. Age and sex of the patients were recorded. Aesthetics and available natural tooth surface (from photographs) were recorded. Bruxism, occlusion and any recorded trauma were detailed. Decemetation, fractures, discoloration, cracks were recorded as irreversible failure or as being redeemable.

Results

All veneers were prepared and cemented by one operator (P.A.). Veneers were fabricated using IPS e.max Ceram (Ivoclar Vivadent) porcelain and cemented with Panavia F2.0 Kuraray Dental or Rely X 3M ESPE. All were prepared with incisal coverage. A total of 24 patients (44%) or 52 veneers (17%) exhibited one or more of the listed complications. Thirteen (4%) had catastrophic failure and had to be remade. Thirteen (4%) had debonded and were subsequently rebonded. One case of crack formation was identified and one demonstrated marginal discoloration due to marginal leakage. Success rate probability using the Kaplan–Meier method at 5 yrs was 0.851 (95% CI 0.810; 0.895); 7 yr was 0.815 (95% CI 0.766; 0.866) and at 10 yrs it was 0.768 (95% CI 0.705; 0.837).

Conclusions

Although PLV are not without complications, this retrospective study from a private practice perspective veneers is a good treatment modality for restoring esthetic and function with a minimal biological price.

Oral Lichen Planus Prevalence and Severity Diagnostic Using Natural Tissue Fluorescence

Jānis Millers; Dr. med. Guntars Selga

*Rīga Stradiņš University, Faculty of Dentistry,
Department of Oral Medicine, Latvia*

Objectives

The aim was to determine prevalence, lesion severity levels using fluorescence and compare them with other lesion scoring system in patients with oral lichen planus (OLP).

Methods

121 patients of the Institute of Stomatology of the Department of Oral Pathology were clinically diagnosed with OLP and their pictures taken with white light and fluorescence (29.08.2017.-04.12.2018). Out of those 52 patients (7 males and 45 females) were included in the study.

White light and natural tissue fluorescence images of the lesions were taken with digital camera. White light photography was analysed using severity scoring system (Escudier et al., 2007). Fluorescence images made with VELscope were analysed using ImageJ (image processing software developed at the National Institutes of Health, USA). At ImageJ two constant round fields were selected, one placed on a lesion and second used as control, placed on normal mucosa. Then mean gray value within selected areas was measured and processed. Spearman's correlation was calculated to compare both lesion severity scoring systems.

Results

Mean age (\pm SD) of the affected group was 57.36 ± 13.6 years, of which 87% were females. Mean lesion inflammation severity levels were 0.387 ± 0.172 (minimum 0.067, maximum 0.692). Graduating in three levels (0.05-0.30; 0.31-0.50; 0.51-), 38.5% cases were in the first level, 40.4% in the second level and only 21.2% - in the third level. Statistically significant correlation were noted between scoring systems $r(50) = 0.62$, $p < 0.001$.

Conclusions

Analysing OLP lesion severity level, more patients have moderate inflammation. Higher prevalence of clinically diagnosed oral lichen planus is among middle-aged women. There is a significant correlation between visual oral lichen severity scoring system and software processed fluorescence image technique. VELscope could be used as symptomatic oral lichen planus severity diagnostic and treatment effectiveness tool.

Late Facial Growth Results for Patients with Complete Unilateral Non-Syndromic Cleft Lip and Palate Treated by One-Stage and Two-Stage Palatal Repair

*Dr. Inta Zepa*¹; Prof. *Ilze Akota*²

¹ Rīga Stradiņš University, Faculty of Dentistry,
Department of Orthodontics, Latvia;

² Rīga Stradiņš University, Faculty of Dentistry, Department of Oral
and Maxillofacial Surgery, Latvia

Objectives

The aim of the present study was to evaluate the facial growth results for patients with complete non-syndromic unilateral cleft lip and palate (UCLP) treated by one-stage and two-stage palatal repair surgery at Riga Cleft Lip and Palate Centre.

Methods

We studied 93 patients with complete non-syndromic UCLP treated at Riga Cleft Lip and Palate Centre, Latvia: 40 consecutive patients born between 1980 and 2004 who were operated by one-stage palatal closure protocol and 53 consecutive patients born between 1980 and 2004 who were operated by two-stage palatal closure protocol. Lateral cephalograms of patients at 14 years of age or older were analysed and cephalometric data were used to determine craniofacial morphology.

Incidence of re-operation for residual defects was counted.

Mann-Whitney U test was used to compare the significance of differences in the cephalometric results of the two samples. Level of significance was set at 95%. The method errors were calculated using the Dahlberg formula. Fisher's exact test was used to assess the significance of differences in the theoretical need for orthognathic surgery.

Results

Most parameters studied were similar except more vertically deficient growth of maxilla for one-stage palatal repair group. Upper face height was shorter for one-stage palatal repair group. Incidence of re-operations was 10.6% for one-stage palatal repair group and 10.3% for two-stage palatal repair group.

Theoretical need for orthognathic surgery was similar but slightly higher for one-stage palatal repair group.

Conclusions

Facial growth results for patients with complete non-syndromic unilateral cleft lip and palate (UCLP) treated by one-stage and two-stage palatal repair surgery at Riga Cleft Lip and Palate Centre were clinically similar at 14 years of age or older.

Dental Implants – Peri-Implantitis and 5-Year Follow-Up after Implantation of Biphasic Calcium Phosphate (HAp/ β TCP) Granules

Dr. Vadims Kļimecs

Rīga Stradiņš University, Institute of Stomatology, Latvia

Objectives

Implant based treatment is a growing part in modern dentistry. Loss of alveolar bone around dental implants is revealed in 5-10% of patients. A dental implant is considered to be a failure if it is lost, mobile, or shows peri-implant bone loss of greater than 1.0 mm in the first year and greater than 0.2 mm a year after.

In the peri-implantitis treatment together with operative and conservative treatment bone substitutes are often used to replace the bone defect, one of the materials is biphasic calcium phosphate.

The aim of study is to analyze the results of peri-implantitis treatment, where in addition to the classical surgical technique, the bone defect around the dental implant was filled with BCP bio-ceramic granules.

Methods

This clinical trial included 18 patients. The main criterion for selecting the patients for this study was the presence of peri-implantitis at any stage, whereas the time of implant placement and the appearance of the first symptoms of peri-implantitis was not taken into account.

An important criterion for the selection of the patients was the surgery treatment with addition of BCP, which were developed and produced by Riga Technical University (RTU), Riga Rudolfs Cimdins Biomaterials Innovation and Development Centre.

Another important patient selection criterion in this study was the presence of a 3D CT before and after treatment of peri-implantitis.

Results

Patients at least 5 years follow-up show good clinical results, which are further confirmed by 3D CT.

To simplify the assessment of the quality of the treatment using the costuming agent based on calcium hydroxyapatite, the percentage of bone tissue loss (the depth of the bone pocket) was taken with respect to the body of the dental implant before and after therapy.

Another method to prove the quality of treatment is measurement of bone densitometry. The results of densitometry indicate an improvement in the mineralization of bone tissue quality.

Conclusions

Comparing the indices of radiological measurement of the depth of the osseous pockets, radio densitometry of the bone structures before and after treatment of peri-implantitis with the use of pure calcium hydroxyapatite, may be concluded that long-term results after 5 years are stable. The radiodensity of bone tissue after the application of synthetic biomaterial based on calcium hydroxyapatite differs a little from the intact bone of the patient, which may indicate a high degree of mineralization after implantation of calcium hydroxyapatite crystals.

Osteoporotic Bone Reaction to Implantation of Biphasic Calcium Phosphate Bioceramics

*Dr. Aleksandrs Grišulonoks*¹; Prof. *Andrejs Skaģers*¹;
*Dr. med. Ilze Šalma*¹; Ph.D. *Laura Neimane*²;
Assoc. Prof. *Jānis Ločs*³; Dr. *Vadims Kļimecs*²

¹ *Rīga Stradiņš University, Institute of Stomatology, Department of Oral and Maxillofacial Surgery, Latvia;*

² *Rīga Stradiņš University, Institute of Stomatology, Latvia;*

³ *Rīga Technical University, Institute of General Chemical Engineering, Rīga Biomaterials Innovation and Development Centre, Latvia*

Objectives

Osteoporosis is described by the World Health Organization as a progressive systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture. Involvement of different bones in disturbances of bone mineralization more exactly can be evaluated in experimental osteoporosis. Jaws are less involved in osteoporosis but in the same time those are suffering from treatment of osteoporosis. Aim of this study was to measure bone mineral density in lower jaw, far away from bioceramic's implantation site in rabbits with experimental osteoporosis.

Methods

Experimental osteoporosis was induced on twenty 8 months old female rabbits by ovariectomy and methylprednisolone course daily i/m 6 weeks 1 mg/kg. Bone defect was made in femur trochanter major region and filled with 0.5 mm granules of pure biphasic calcium phosphate (BCP, HAp/TCP 30/70) and TCP granules saturated with Strontium 5% (Sr). In control groups were 2 healthy rabbits and 4 with experimental osteoporosis without implantation of bioceramics. After 3 months animals were euthanased and samples from different bone parts were taken.

Results

Average HU value of rabbits jaw premolar region in control group without osteoporosis was 782.53, average HU value in control group with osteoporosis 677.75 statistically significant in comparison with biphasic calcium phosphate group - 0.008 ($p < 0.05$) and statistically significant in comparison with Strontium group - 0.001 ($p < 0.05$), average HU value in group only of biphasic calcium phosphate granules - 437.14, but average HU value in group, were granules were saturated with Strontium - 446.14. Difference between them was not statistically significant - 0.92 ($p > 0.05$).

Conclusions

1. Bone mineral density in premolar region of lower jaw of rabbits with experimental osteoporosis is significant lower as in healthy animals.
2. There are no statistically significant changes of in lower jaw after implantation of BCP HAp/TCP 30/70 granules in trochanter major of femur what can be explained by structure of lower jaw in premolar region consisting almost completely of lamellar cortical bone with slow speed of bone remodeling and changes of mineral content.

Impact of Education and Motivation on Oral Health

*Dr. med. Julija Kalnina; Prof. Anda Brinkmane;
Dr. med. Egīta Senakola*

Rīga Stradiņš University, Department of Conservative Dentistry and Oral Health, Latvia

Objectives

To evaluate the impact of education and motivation on the oral health status of children after 24 months.

Methods

The study included 158 ten-year-old children (70 girls, 88 boys). In order to evaluate the impact of education and motivation, the changes in caries intensity, Green-Vermillion and CPITN index were compared after 24 months. Caries intensity was determined for teeth (T) and surfaces (S) by DMF index. For assessment plaque and dental calculus, a simplified Greene - Vermillion oral hygiene index was used. Periodontal status was assessed by CPITN index. During the visit, children underwent professional oral hygiene. Children were motivated to maintain good oral health. Oral health status was determined every six months for two years. In the analysis of data of the study subjects, descriptive and analytical statistical methods were used.

Results

At baseline, the mean DMF T index was 1.88 (SD = 2.01), the mean DMF S - 2.99 (SD = 3.59). After 24 months, DMF T increased 1.9 times ($p < 0.001$), reaching 3.71 (SD = 2.78). The mean DMF S also increased ($p < 0.001$), reaching 6.06 (SD = 5.45) after 24 months. After 24 months, the highest increase in the number of filled teeth - 2.4 times, reaching 2.73 (SD = 2.19) ($p < 0.001$). The mean Greene - Vermillion index was 2.21 (SD = 0.99) and decreased 1.4 times ($p < 0.05$), after 24 months, this index reaching 1.55 (SD = 0.64). At baseline, the mean number of sextants with healthy periodont was 1.36 (SD = 1.99). During the study, it increased, however these changes were not statistically significant as the number of bleeding sextants. The mean number of sextants with dental calculus was 1.31 (SD = 2.11) at baseline. During the study, the number decreased two times ($p < 0.001$) after 24 months.

Conclusions

The patient education and motivation have implications on the oral health. However, family is one of the most important social supporters in education of children.

Characteristics of a Th-POK Expression in Oral Squamous Cell Cancer

Prof. *Regīna Kleina*¹; Ph.D. *Madara Dzudzilo*²; Prof. *Ingrīda Čēma*³;
Dr. med. *Anita Dabužinskiene*⁴; Ph.D. *Daina Lutinska*¹

¹ *Rīga Stradiņš University, Department of Pathology, Latvia;*

² *Rīga Stradiņš University, Doctoral studies program Dentistry, Latvia;*

³ *Rīga Stradiņš University, Department of Oral Medicine, Latvia;*

⁴ *Lithuanian University of Health Sciences, Institute of Anatomy*

Objectives

Th-POK is an oncogenic transcription factor involved in oncogenesis but little is known about its role in human malignancies (Xuyu Z. et al, 2011, C. Guo et al, 2014). Expression of Th-POK in oral mucosa is not surveyed enough (D. Sartini et al, 2015).

The purpose of study was to analyze the expression of Th-POK in oral squamous cell cancer (OSCC) at different its grades.

Methods

We used archived paraffin blocks with OSCC from 43 patients. 10 samples with normal oral mucosa were in the control group. Th-POK antigen detection was done by EnVision method. Intensity of IHC reaction was classified semiquantitatively as absent (0), weak (1), intermediate (2) and strong (3) but its expression was evaluated accordingly three levels: 1 (1–33% positive epithelial cells), 2 (34–66%), 3 (67–100%).

Results

Clinical manifestation of OSCC in our cases was ulceration but 3 cases were as erythroplakia. OSCC was diagnosed in a floor of the mouth – 40%, tongue – 20%, gingiva – 20%. Grade 1 and 3 cases were 25% each but more common was G 2 (50%). Average age of female was 63.5 but male – 58.8 years. Background pathologies for SCC were papilloma with dysplasia (n = 2) leukoplakia (n = 2) and chronic sialadenitis (in the edge of duct, n = 1). In control cases Th-POK antigen was expressed in basal layers of oral mucosa, its intensity was intermediate and of 1st level positivity. In OSCC was patchy expression of Th-POK in all layers of mucosa. Its intensity varied from strong till weak but expression was mainly of 2nd level. Immunoreactivity disappeared in apoptotic cancer cell groups but is present in parakeratotic cells. This marker clearly demonstrate chromatin changes, koilocytosis in cancer cells and aberrant expression in organoids and keratohyalin granules.

Conclusions

There is overexpression of Th-POK in OSSC but there is no correlation between antigen expression, its intensity and the grade of OSSC.

Use of Toothpastes with Optimal Fluoride Concentration in Latvia

*Ph.D. Ilze Maldupa*¹; *Ph.D. Ilona Viduskalne*¹; *Ph.D. Jūlija Kalniņa*¹;
*Ph.D. Līga Kroniņa*¹; Prof. *Sergio Andres Uribe Espinoza*²;
*Dr. med. Egīta Senakola*¹; Prof. *Anda Brinkmane*¹

¹ *Rīga Stradiņš University, Department of Conservative Dentistry and Oral Health, Latvia;*

² *Universidad Austral de Chile, Department of Oral Radiology*

Objectives

Toothpaste with > 1000 ppm fluoride effectively prevents tooth decay. In the market, it is possible to find pastes with different concentrations of fluoride. Our aim is to quantify the use of toothpaste in Latvia according to the concentration of fluoride labeled in the toothpaste.

Methods

After approval of the Rīga Stradiņš University Ethics Committee, a cross-sectional survey-based study was carried out in December 2018 in nine schools all over Latvia. A previously validated questionnaire was used to collect demographic information and type of toothpaste used by each family member. Descriptive statistics were obtained using program R and the tidyverse package.

Results

A total of 307 children and their families participated. The response rate was 69.4% and 10 questionnaires were discarded for being incomplete. A total of 203 questionnaires gave information about 1016 family members (mean age – 25.9 years, range – 1–84). We registered 228 different kinds of toothpaste of which 54 were without fluoride. In 11.8% of families one toothpaste for all household members is used, but in 57.1% of families, special children toothpaste is chosen for children. A 15.6% of people reported the use of toothpaste without fluoride, 15.1% with less than 1000 ppm and 62% use toothpaste with fluoride over 1000 ppm. The proportion of people who use fluoride-free toothpaste is greater in adult age group (19%) and those, who use toothpaste with 550 ppm or less, greater in children aged 1–5 years (32%).

Conclusions

In 62% of Latvian families, toothpaste containing optimal concentration of fluoride are used. This suggests that there is a significant percentage of families that occupy toothpaste with little or no effectiveness against tooth decay. Efforts should, therefore, be made to communicate to patients about the correct use of this important preventive and therapeutic strategy to reduce dental caries.

Structure of Patients with Midface Fractures: Single Institution Experience

Dr. Julianna Muceniece; Prof. Ģirts Šalms

*Rīga Stradiņš University, Institute of Stomatology, Department of Oral
and Maxillofacial Surgery, Latvia*

Objectives

Midface fractures (MF) remain a significant challenge due to disfigurement, potential complications and technically problematic surgery. MF incidence and structure vary between countries due to economic, cultural and social diversity; no comprehensive data on Latvian patients have been published.

Methods

Medical histories of 538 consecutive MF cases from Centre of Dentistry and Facial Surgery of Pauls Stradiņš Clinical University Hospital (Riga, Latvia) were retrospectively reviewed in period October 31 year 2011 till November 1st year 2012. Data on the patients' gender and age, trauma cause and site were statistically analysed by IBM SPSS v.21 statistical software, Spearman rho correlation and t-test were calculated.

Results

81% were males, female patients were older (37 vs 30y, $p = 4E-8$). The trauma cause was criminal in 51% patients, domestic in 36% and sports in 13%. Male gender was significantly associated with criminal ($p = 0.0004$) and sports trauma ($p = 0.006$), while female gender with domestic trauma ($p = 1E-8$). Older age correlated with increase of domestic ($p = 4E-7$) and decrease of sports trauma ($p = 1E-8$). 62% patients had nasal fractures, 28% zygomatic, 4% both and 6% isolated orbital (blowout) lesion. Younger age was associated with nasal lesions ($p = 1E-8$), while older patients - with zygomatic fractures ($p = 2E-6$). Blowout lesions were more common in female patients ($p = 0.006$). Nasal fractures associated with sports trauma ($p = 3E-6$), while zygomatic - with domestic trauma ($p = 0.05$). Zygomatic lesions were predominantly left-sided (69%). Orbital fractures was found in 24.7% patients, their incidence positively correlated with older age ($p = 1E-8$), criminal trauma ($p = 0.024$), injuries of zygomatic bone ($p = 7E-16$) and negatively with nasal fractures ($p = 2E-33$). 88% patients were surgically treated, the rate decreased with age ($p = 0.0001$).

Conclusions

The study results demonstrated that structure of MF was gender and age-related. The causes of MF in the studied cohort with predominating criminal trauma are typical for developing countries.

Impact of Bone Mineral Density on Volume of Edentulous Jaw Bones

*Ph.D. Anda Slaidina*¹; *Dr. med. Baiba Springe*¹;
*Dr. Evija Nikitina*¹; *Prof. Una Soboleva*¹; *Prof. Aivars Lejnietis*²

¹ *Rīga Stradiņš University, Department of Prosthodontics, Latvia;*

² *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

Objectives

Eas to detect impact of general bone mineral density (BMD) on volume of the edentulous jaws of postmenopausal females.

Methods

In the present study were included 127 postmenopausal edentulous females aged 54–91 years (average age 70.4 ± 8.9 years), attending for dental implant treatment.

For all patients were made: bone mineral density measurements (BMD) of lumbar spine and both hips by dual energy X-ray absorptiometry (DXA) (Lunar DEXA DPX-NT, GE Medical Systems) and cone beam computer tomography (CBCT) (Next generation i-CAT, Kavo eXam vision). From DXA analysis the T-score reading was used. CBCT images were analysed with Dolphin Imagining software. Volumes of the maxilla, mandible and fontal part of the mandible were calculated. Pearson correlation was used to determine correlation between different variables.

Results

There was correlation between worst BMD (worst reading from lumbar sipne and hips) and volume of mandible ($r = 0.345$, $p = 0.0001$), frontal part of the mandible ($r = 0.267$, $p = 0.002$) and maxilla ($r = 0.227$, $p = 0.01$). There was correlation between lumbar spine BMD and volume of mandible ($r = 0.348$, $p = 0.0001$), frontal part of the mandible ($r = 0.286$, $p = 0.001$) and maxilla ($r = 0.25$, $p = 0.005$). There was correlation between hips BMD and volume of mandible ($r = 0.207$, $p = 0.021$). There were no significant correlations between hips BMD and volume of frontal part of the mandible and volume of maxilla.

Conclusions

Postmenopausal female with reduced general BMD had reduced volume of the edentulous mandible and maxilla.

Acknowledgements

Project: Nr.1.1.1.2/VIAA/1/16/139

Assessment of Biocompatibility and Osteoinductive Potential of Amorphous Calcium Phosphate in Mice: Experimental Model

*Elina Makarova*¹; *Jana Vecstaudza*²; *Dr. Reinis Vīlskersts*¹;
*Dr. Einars Kupats*³; *Ph.D. Janis Kuka*⁴; *Dagnija Loca*²;
*Jānis Locs*²; *Prof. Maija Dambrova*¹

¹ Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;
Latvian Institute of Organic Synthesis, Laboratory of Pharmaceutical Pharmacology;

² Rudolfs Cimdins Riga Biomaterials Innovations and Development Centre,
Institute of General Chemical Engineering, Riga Technical University, Latvia;

³ Rīga Stradiņš University, Department of Neurology and Neurosurgery, Latvia;
Latvian Institute of Organic Synthesis, Laboratory of Pharmaceutical Pharmacology;

⁴ Latvian Institute of Organic Synthesis, Laboratory of Pharmaceutical Pharmacology

Objectives

Calcium phosphate biomaterials have been widely used in the field of bone regeneration. The aim of the study was to test the biocompatibility and ectopic osteoinductive potential of amorphous calcium phosphate (ACP) granules with high specific surface area.

Methods

The ACP effect on MG-63 human osteoblast-like cell viability was tested to evaluate safety prior to in vivo experiments. Extracts from ACP (RTU/RBIDC, Latvia) were prepared according to the ISO 10993-5 (extraction ratio: 0.1 g/ml) in complete culture medium. Biocompatibility of ACP granules was tested after the subcutaneous implantation. Ectopic bone formation properties of ACP were tested and compared with the reference MBCP+® (Biomatlante, France) granules in male SW mice (3 mice/group) after intramuscular implantation. To monitor the changes in implanted biomaterial site, computer tomography scans were acquired using Insyte FLECT/CT tomography system. At week 21 after intramuscular implantation, calcium phosphate implants were retrieved to assess the new bone formation and collagen component by histological analysis.

Results

ACP extracts had no significant influence on the viability of MG-63 cell after 24–72 h of incubation. After subcutaneous implantation ACP granules integrated in surrounding tissues without fibrous capsule formation and inflammation as indicated by histological analysis. No changes in distribution and relative density of intramuscularly implanted ACP and MBCP+® biomaterials during 21 weeks were observed by in vivo computed tomography. After 21 weeks, an ingrowth of fibrous, granulation tissue and vessels were observed in both ACP and MBCP+® groups. No significant inflammation was found in any of the groups. Newly formed bone tissue and osteoid were found in MBCP+® group, while not observed in ACP group.

Conclusions

These data indicate that ACP granules with high specific surface area have good biocompatibility. MBCP+® demonstrated the ability to induce new bone formation while for ACP biomaterial the osteoinductive properties were not observed.

Will Mineral Trioxide Aggregate Replace Calcium Hydroxide in Treating Carious Exposures in Adults?

Prof. *Rita Kundziņa*

The Arctic University of Norway

Direct pulp capping (DPC) of carious exposures remains a controversial treatment for mature teeth. Pulp capping material calcium hydroxide (CH) was introduced almost 100 years ago. Among adult patients, DPC with CH show a rather low success rate. Twenty years ago, mineral trioxide aggregate (MTA) was first tested and since that several experimental studies show that it produces better dentine bridge formation than does CH. Histological studies have primarily been based on healthy teeth, undermining the generalizability of the results to adult patients with carious exposures. A recent randomized clinical study showed that MTA is more effective than conventional CH dressing as a direct pulp capping material in molars with carious pulpal exposures in adult patients.

It also challenges the treatment of choice guidelines for carious exposures in adult molars, particularly if high-quality endodontics is not available.

Using Genetics to Identify Causal Risk Factors and Biological Mechanisms for Cleft Lip and Palate

Sarah Lewis

University of Bristol, United Kingdom

Around 70% of clefts display a complex mode of inheritance in which risk is determined by both genetic and environmental risk factors. More than 40 common genetic variants have been identified via genome wide association studies (GWAS) which contribute to this risk. In addition, observational studies suggest that maternal lifestyle factors such as smoking, drinking alcohol, BMI and diet may be risk factors for cleft lip and palate, however the evidence for these risk factors remains inconclusive. The reason for this is because of inaccurate and biased reporting of exposures, and confounding by other lifestyle factors.

At the University of Bristol, UK we have pioneered a method for using common genetic variants to determine whether modifiable risk factors cause disease. This method is called Mendelian randomization and uses genetic variants which are not susceptible to confounding as proxies for the exposure of interest to obtain an unconfounded estimate of the relationship between an exposure and an outcome. I will demonstrate examples of where this method has been used to show that maternal smoking has a causal influence on birth weight and outline how we will use this method to identify cause risk factors for cleft.

I will discuss how further GWAS, including GWAS of the mothers of children with a cleft, may be used to identify further modifiable risk factors for cleft and to elucidate biological pathways to specific cleft subtypes. I will present results which show that common genetic variants for cleft lip and/or palate are associated with philtrum width among the general population and discuss how such analyses can shed light on the biological pathways involved in cleft formation.

Research of Bone Tissue Substitute Materials in Latvia

Prof. *Jānis Ločs*

Rīga Technical University, Institute of General Chemical Engineering, Latvia

RTU Rudolfs Cimdins Riga Biomaterials Innovations and Development Centre (RBIDC) has collaborated for more than 20 years with RSU Department of Maxillofacial Surgery (DMS). RBIDC and DMS have conducted both experimental and clinical trials for novel synthetic biomaterials. RBIDC has developed several kinds of biomaterials for different applications, including composite biodegradable materials with drug delivery capabilities. A short introduction in history of research and development of biomaterials and recently achieved results will be presented.

Research Integration in Teaching

Prof. *Ilze Maldupa*

Rīga Stradiņš University, Department of Conservative Dentistry and Oral Health, Latvia

A university professor usually has 3 main duties – teaching, development of curriculum and research. In this lecture we will see how to combine all of them. Knowledge in the 21st century is constantly growing and developing. Teaching only accepted facts to our undergraduate and postgraduate students will give them 2 important risks: 1) to be reluctant to acquire any new knowledge; 2) to accept any new information without analysing its validity. Furthermore, research requires teamwork, but quite often it is not an easy task to create. Both parties will benefit from introducing research methods in teaching – students will learn methods which will allow them to be up-to-date throughout their professional career, ensuring lifelong learning, but professors will develop their research.

Translational Oral Health Research

Prof. *Jukka Meurman*

University of Helsinki, Finland

“Translational research” is a fashionable term, practically meaning science where basic biomedical findings are implemented in the clinic with, preferably, improvements in the health of populations. Dental and oral health related research has traditionally been focused on specific and narrow discipline areas such as cariology, periodontology, prosthodontics, orthodontics, oral surgery. The drawback in such restrictive thinking has been the lack of a holistic approach. More recently, however, the silo-thinking has been refuted and the patient is regarded comprehensively. A good example here is the current paradigm where oral infections are related to systemic health. Furthermore, a “from the laboratory to the clinic” approach has given us probiotics or health-beneficial bacteria, probably used for thousands of years by man, but only recently applied also in diseases of the mouth thanks to basic laboratory research. In the future, translational research is expected to result in novel diagnostic methods and subsequent breakthroughs in treatments – all for the benefit of the patient.

Facial Genetics: Brief Overview

Ph.D. Stephen Richmond

Cardiff University, United Kingdom

The face develops very early in gestation and face development is closely related to the cranial neural crest cells. Disruption in early embryological development can lead to wide-ranging effects from subtle neurologic and facial features, which includes asymmetry to significant impact on facial shape with CL/P and craniofacial syndromes.

Heritability studies have provided information on possible genetic and environmental contributions to face shape. However, the sample sizes and inconsistencies in research design and particularly statistical management have yielded mixed results.

From birth to adulthood there are significant body and facial changes. Further work is required to explore the importance of the various biomedical markers and medical conditions (e.g. fasting glucose, cholesterol, asthma and neurological disorders etc.) on the growth of the face, for example, remodeling of the facial skeleton, spatial changes of the constituent parts of the facial skeleton through sutures, condylar and nasal cartilages as well as the soft tissues, neural and vascular networks. The Genome-Wide Association Studies (GWAS) have provided insights into the genetic influences on facial shape.

Impressions of an individual's health are integral to social interactions and judgements are made on the visual appearance of skin, degree of roundness of the face and facial expression. There has been significant progress in the first 6 years of GWAS and facial genetics. With increased sample sizes, improved understanding of shared genetic influences on human traits and advancement in techniques there is likely to be significant further progress in the next 6 years. Understanding the face will explain "why we look the way we do" a range of normality and abnormality that will be useful in healthcare applications and forensic science.

Experiences Regarding Orthodontic Treatment in Northern Norway

Ph.D. Anders Sjögren

The Arctic University of Norway, Department of Clinical Dentistry, Norway

The topics are a summary of abstracts presented as a posters at the 94th European Orthodontic Society Congress Edinburgh/ 17-21 June 2018 and a Master thesis presented at the Arctic University of Norway 2018.

- Influence of socio-economic status and ethnicity on orthodontic treatment experience and normative treatment needs of adolescents in Northern Norway. (Anna Kasbekar – Edinburgh)
- Satisfaction with anterior tooth position in relation to orthodontic treatment experience and treatment need in 5-17 year old adolescents in Tromsø, Norway. (Lotte Punsvik & Anette Strindberg – Edinburgh)
- Early extraction of primary molars and caries experience in relation to orthodontic treatment experience in Alta, Norway in a 20 year perspective. (Tage Olsen – Edinburgh)
- Referrals for orthodontic consultation. An overview of referral routines and correspondence in diagnosis between general dental practitioners and orthodontists in Tromsø, Norway. (Ellen Gyllan Hansen – Oslo)

Early Extraction of Primary Molars and Caries Experience in Relation to Orthodontic Treatment Experience in Alta, Norway in a 20-year Perspective

T. Olsen, A. Sjögren (Institute of Clinical Dentistry, Faculty of Health Sciences, UiT, the Arctic University of Norway)

The aim of this study was to investigate if a presumed reduction in caries reflected in reduced primary molar extractions and if there was a relationship between aforementioned and frequency of orthodontic referrals and treatment experience. The sample in this study was collected from all children born in 1980 and 2000 that attended regular oral examinations in Alta, Norway. Data from 585 subjects was collected retrospectively. The rate, number and age of primary molar extractions, referrals for orthodontic treatment and orthodontic treatment experience were recorded.

Despite a significant increase caries prevalence between 1980 and 2000, no significant reduction in early extractions (< 7.6 y) of the first or second primary molars was found and no significant difference in orthodontic treatment experience was found between these cohorts. However, referrals for orthodontic consultation, due to crowding, were significantly more common among subjects with early primary molar extractions than among those with no early primary molar extractions (61.9% and 35.9 % respectively, $p < 0.001$.)

The conclusion drawn from this study was that early extraction of primary molars could affect orthodontic treatment need.

Satisfaction with Anterior Tooth Position in Relation to Orthodontic Treatment Experience and Treatment Need in 15 to 18 Year-Old Adolescents in Tromsø, Norway

A. Strindberg, L. Punsvik, A. Sjögren (Institute of Clinical Dentistry, Faculty of Health Sciences, UiT, the Arctic University of Norway)

The aim of this study was to investigate if satisfaction with anterior tooth position and orthodontic treatment wish is related to orthodontic treatment experience and normative treatment need among adolescents in Tromsø, Norway. The study sample consisted of 490 (15 to 18 year old) out of 1038 first year upper secondary school students participating in a larger health study in Tromsø, Norway in 2010 and 2011. Normative treatment need according to the NOTI, IOTN/DHC and IOTN/AC indexes was graded using plaster models. Satisfaction regarding anterior tooth position, wish for orthodontic treatment and treatment experience was obtained from a questionnaire.

Females with fixed appliance treatment experience were significantly more satisfied with anterior tooth position than untreated females. (81% vs 65%, $p = 0.015$). Males treated with fixed appliances were significantly more satisfied with their anterior tooth position compared to those treated with removable appliance only (79% vs 46%; $p = 0.020$) Males expressing satisfaction with their anterior tooth position were graded significantly lower (more attractive) for normative aesthetic treatment need (IOTN/AC) compared to those who were less satisfied ($p < 0.017$). Males, expressing wish for orthodontic treatment showed significantly higher IOTN/AC (less attractive) grading's compared to those not expressing wish for treatment ($p < 0.01$).

Our results suggest that awareness of anterior tooth position is influenced by gender and that the IOTN/AC index could be helpful for dental professionals in reflecting patient satisfaction related to anterior tooth position and wish for orthodontic treatment.

Referrals for Orthodontic Consultations in Tromsø Country, Norway

E. G. Hanssen, A. Sjögren (Institute of clinical dentistry, UiT Norges Arktiske Universitet, Tromsø), V. Vandevska-Radunovic (Institute of clinical dentistry, UiO Universitetet i Oslo, Oslo)

The aim was to get an overview of referral routines in Tromsø county such as: agreement between referrers and orthodontist regarding diagnosis patients age at referral, consultation and start of treatment

The sample was collected from all 596 subjects referred in 2013 for orthodontic consultations to the Dental Health Service's competence center for Northern Norway. Seventy-four subjects were excluded. Need for Orthodontic Treatment Index (NOTI) was used for evaluating the diagnosis. Dental hygienists referred 63% and dentists 29% of the patients and 1 year younger patients.

An equal amount of boys and girls were referred, but significantly more girls received orthodontic treatment (67% vs 55%; $p < 0.01$). One out of three patients got more than one consultation and three out of five patients received orthodontic treatment. Agreement in diagnosis between referrer and orthodontist was found in 4/5 referrals (dental hygienist 79.5%, dentists 80.4% and students/supervisors 93.5%). Median time between referral and treatment was 19 months with ¼ treated after 36 months.

Our results concludes that the dental hygienists and dentists investigated had a similar ability to record orthodontic diagnosis correctly but not always at the right time.

Development of Biomaterial Research in Institute of Stomatology

Prof. *Andrejs Skaģers*

*Rīga Stradiņš University, Institute of Stomatology, Department of Oral
and Maxillofacial Surgery, Latvia*

The researches on biomaterials for bone replacement in the Institute of Stomatology began more than 20 years ago, when Rudolfs Cimdins and Liga Berzina-Cimdina introduced manufacturing, physical and chemical testing of such materials in Riga Technical University, Laboratory of Biomaterials, now carrying the name Rudolfs Cimdins Centre for Development and Innovations of Biomaterials. First joint publication was in the year 1994.

Within the first stage a biocompatibility on healthy animals was tested, also osteoinduction by activation of endogenous TGF β and BMP4 was obtained. The second stage included an experimental research using animals with experimental pathology of osteoporosis. Positive local response as improvement of mineral density and mechanical strength, activation of endogenous OPG also general improvement of the same parameters were obtained.

The clinical part passed in the Institute of Stomatology at the Department of Oral and Maxillofacial Surgery and in the 2nd Riga Hospital at the Department of Orthopaedic Surgery, where more than 300 patient's implantations of BCP granules were tested with positive results. The following institutions participated in the research: RSU Institute of Stomatology, Departments of Oral and Maxillofacial Surgery and Diagnostic Radiology, RSU Institute of Anatomy and Anthropology, Departments of Pathology, Biology and Microbiology, Laboratories of Experimental animals and Biomechanics. Besides technical staff and supervisors the main part in research was done by doctoral students. Five from them got scientific degree Doctor of Medicine, another five are in the process for now.

Modern Technologies for Orthognatic Surgery

Prof. *Ģirts Šalms*

*Rīga Stradiņš University, Institute of Stomatology, Department of Oral
and Maxillofacial Surgery, Latvia*

Objectives

Treatment of the congenital and acquired facial deformities are a current problem. Accurate planning of orthognatic surgery cases has been a challenge for decades. Emerging new technology makes diagnostics, data recording and virtual surgery possible with the creation of surgical templates and splints. New technology opens new possibilities for more accurate surgery planning, ease surgery to achieve a better surgical outcome and gives us the possibility to shorten the operation time.

Methods

From August 2014, 112 bimaxillary surgeries were planned using 3D Dolphin imaging software 11.8 and 11.9 version with preparation of operative splint. Cone beam Icat scan, 3DMD photo, intraoral and 3D shape model scanner are used for treatment planning. 3D printer is used for printing intraoperative splints.

Results

Treatment planning using modern 3D technology opens great visualisation of planned surgery. Accuracy of fabricated 3D splints are much higher than conventional self or light curing acrylic splints. 3D planning provide the surgeon with a clear picture of planned surgery what makes surgery more predictable and allow to avoid potential complications.

Integrating Research and Clinical Practice in Dentistry

Prof. *Rasa Skudutyte-Rysstad*

University of Oslo, Norway

During the last decades there has been increased focus on evidence-based practice in dentistry. Both clinicians and health authorities are now expected to use the best available evidence when making decisions concerning the most appropriate methods for management of oral diseases and conditions. However, there is a substantial time lag in translation of effective new treatments and approaches to everyday patient care. Increasing involvement of clinicians into all stages of research may be one of the ways to facilitate this translation. The present lecture will focus on practice-based studies in dentistry, with the main emphasis on challenges and possibilities in carrying out such studies.

Osteoporosis and Edentulous Jaws

Ph.D. Anda Slaidiņa

Rīga Stradiņš University, Institute of Stomatology, Latvia

Osteoporosis is a disease of the skeletal system characterised by decreased bone density and microarchitectural deterioration which results in decreased bone strength and an increased risk of fractures. According to World Health Organization data, it is the second most common pathology right after cardiovascular diseases and osteoporosis-related fractures can be seen in every third woman and every fifth man older than 50.

Tooth loss causes residual ridge resorption, which is a chronic progressive and irreversible process, and causes of it are not still fully understood. Residual ridge resorption is a significant factor which affects the prosthetic rehabilitation of edentulous patients and their ability to adapt to their prosthesis as well as the doctor's options to construct an optimal complete denture. Use of dental implants helps to improve the stability and retention of the complete denture, resulting in improved quality of life for patients, but it must be considered that the implantation also requires an adequate amount and quality of alveolar bone. There are several factors which affect the residual ridge resorption – anatomical, metabolic, mechanic, prosthetic. Some scientists believe that in particular, metabolic factors such as osteoporosis are the most significant factors leading to residual ridge resorption. Data from clinical studies regarding osteoporosis and its effect on residual ridge resorption are controversial and the degree of resorption is evaluated using conventional X-ray imaging, which is a less informative method. Nowadays when Cone beam computed tomography is used, it is possible to determine the exact degree of residual ridge resorption and analyse the quality of bone and its relation to osteoporosis.

Acknowledgements

Project: Nr.1.1.1.2/VIAA/1/16/139

Paradigm Shift for Dental Ceramics

Prof. *Per Vult Von Styern*

Malmö University, Department of Odontology, Sweden

Dental ceramics was traditionally used for its tooth-like optical properties and for being highly biocompatible. The strength, however, was not always optimal and consequently, an adhesive cementation technique was considered a prerequisite for gaining sufficient clinical performance. Newly-developed translucent and high translucent zirconium-dioxide have changed our way of considering dental ceramics and today, the clinical landscape of dental ceramics looks quite different compared to previously. The lecture will focus on indications, properties and clinical aspects.

Benefits and Risks of Orthodontic Treatment in Subjects with Periodontal Disease

Dr. Egle Zasciurinskiene

Lithuanian University of Health Sciences, Department of Orthodontics

It is well known that orthodontic movement of teeth with reduced periodontium is possible. However, a low level of evidence exists on the effects, risks and benefits of orthodontic tooth movement on periodontal tissues.

The lecture will focus on the short analysis of the present literature on the effects of periodontal-orthodontic treatment on periodontal tissues. Also the results of a randomised control trial of 50 patients with periodontal disease, who have received periodontal-orthodontic treatment, will be presented. Changes in clinical attachment level, alveolar bone height and risk for root resorption will be analysed.

Towards Understanding Oral Health

Prof. Egija Zaura

Vrije Universiteit Amsterdam, Netherlands

During the last century, dental research has focused on unravelling the mechanisms behind various oral pathologies, while oral health was typically described as the mere absence of oral diseases. The term 'oral microbial homeostasis' is used to describe the capacity of an oral ecosystem to maintain microbial community stability at health. However, the entire oral ecosystem itself is not stable: an individual undergoes multiple physiological changes throughout life when a person progresses through infancy, childhood, adolescence, adulthood and old age. Recent discussions on the definition of general health have led to the proposal that health is the ability of the individual to adapt to physiological changes, a condition described as allostasis.

In the presentation the allostasis principle will be applied to the oral ecosystem and illustrated with clinical examples. The complexity of oral health and the mechanisms that prevent the ecosystem from collapsing during allostatic changes in the entire body are far from being understood. To date, individual components (e.g., hard tissues, microbiome, saliva, host response) have been investigated. By consolidating these and assessing their multidimensional interactions we should be able to reach a comprehensive understanding of the ecosystem. This, in turn, could serve to develop rational schemes for maintaining health.

Impacted Maxillary Canines Three Dimensional Positions Impact on Patients Perception and Treatment Results

*Ph.D. Pēteris Sosārs; Prof. Gundega Jākobsone;
Dr. Madara Štekerhofa*

Rīga Stradiņš University, Institute of Stomatology, Latvia

Objectives

The aim of this study was to evaluate the patient's perception on the treatment outcome based on the measurement describing canines three-dimensional (3D) position, and to find out whether the 3D angle provides additional information about treatments efficacy.

Methods

Cone beam computed tomography scans (CBCT) of 88 patients (27 males and 61 females in the age range between 11 and 44 years) with 107 palatally situated maxillary canines were retrieved from a data base. The DICOM files were imported into OsiriX (v.5.7 32-bit, Pixmeo, Geneva, Switzerland). The three-dimensional (3D) angle of the canine to the occlusal plane was calculated using the coordinates provided by the freeware. A questionnaire was carried out to find out patients perception on the treatment length, changes in shape, color, gingival margin, angulation and inclination of the impacted canine compared to the contralateral canine.

Results

53 canines were moved to the arch by orthodontic traction and were divided into two groups based on percentiles of the impacted canine's 3D angle (low and high angle groups). 25 subjects responded and filled out the questionnaire. 13 out of 25 acknowledged that they notice no differences of the tractioned canine and the contralateral one (regarding canines shape, colour, gingival margin, angulation and inclination). Using Mann-Whitney U test there was no correlations between impacted canines 3D angle and gingival margin, angulation and inclination. Moderate correlation was found between patients thoughts on the treatment length versus the actual treatment's length.

Conclusions

Impacted canine's three-dimensional angle solely is not the only factor responsible for patients perception on the treatment outcome. Patient's perception on the treatment length was in moderate correlation with the actual treatment's length.

Pattern of CD44 Antigen Expression in Mucosal and Submucosal Structures in Case of Oral Leukoplakia

*Ph.D. Madara Dzudzilo*¹; Prof. *Ingrīda Čēma*¹; Prof. *Regīna Kleina*²;
*Dr. med. Ivanda Franckeviča*²; *Dr. Andris Šmits*³

¹*Rīga Stradiņš University, Department of Oral Medicine, Latvia;*

²*Rīga Stradiņš University, Department of Pathology, Latvia;*

³*Rīga East University Hospital, Pathology Center, Latvia*

Objectives

Relatively contradictory information is about the CD44 antigen in oral leukoplakia (OL) but for clinicians these characteristics are still actual in premalignant lesions (Bailiee et al, 2017; Zhuy et al, 2014; Poonja, 2011).

The aim of study was to analyse the expression and role of CD44 in mucosal and submucosal structures of different OL.

Methods

We analysed specimens from 38 patients with OL and 10- normal oral mucosa. CD44 antigen detection was done by EnVision method. Intensity of IHC reaction was classified semiquantitatively as absent (0), weak (1), intermediate (2) and strong (3). Number of macrophages were detected in 3 fields of vision at 400 × magnification. Results were evaluated by SPSS program.

Results

In our research OL involved mainly buccal mucosa (54.5%), tongue (18.1%). Ratio male: female was 11:1, the average age of patients was 52.9 years. We analysed 38 cases with OL. Accordingly WHO classification 34 OL were conventional but 4-of proliferative verrucous type. In normal mucosa CD44 expression is weekly positive in the cytolemma of 2-3 layers of basal epithelium. In the conventional OL where hyperplasia was, membranous expression of glycoprotein was present in 5 till 20 layers of epithelium and was of 1st and 2nd intensity level. But in proliferative verrucous OL immunohistochemical intensity of CD44 was of intermediate level. Parallel to the membranous expression of CD44 we have proved glycoprotein in cytoplasm of parakeratotic cells. The average number of CD44 positive macrophages in submucosa were 12.5 ± 4.3 in 1 field of vision. CD44 was expressed in submucosal salivary gland ducts and acini too.

Conclusions

Our data confirm the involvement of CD44 in cell-cell interaction, its adhesion in hyperplastic areas of OL. CD44 presence in macrophages of oral submucosa proved their participation in long term epithelial-mesenchymal interactions as a hyaluronic receptor protein.

Applications of Average Face in Orthodontic and Genetic Studies

Alexei Zhurov

Cardiff University, School of Dentistry, United Kingdom

The aim was to describe the use of three-dimensional average facial templates in various orthodontic and genetic applications.

The paper applies to quantitative facial studies of any cohort of population with an arbitrary number of subjects, males or females, children or adults, normal or with abnormalities. Three-dimensional surface facial scans can be acquired using laser or optical imaging systems (e.g., Konica Minolta 900/910, 3dMD, Canfield Vectra, etc.). The images are further processed on a computer to stitch together individual portions, remove noise and unwanted data, and improve the mesh quality. This results in 3D facial shells typically accurate to within 0.5–1mm. With the method suggested and reported by the authors previously, average facial shells are constructed for selected groups of images. The algorithm registers images by removing relative translations, rotations, and size differences and performs several iterative averaging steps; three or four steps usually suffice. The algorithm relies on the surface information and may or may not use additional landmark data if available. The average faces of all groups of interest are then used to describe differences between the groups.

This approach has proven its utility in quantifying and visualising various effects in previously reported studies. Some of these include:

- 1) effect of skeletal disproportions and syndromes on face shape, including cleft lip and palate, facial asymmetry, breathing disorders, and atopy;
- 2) effect of principal components of facial variation on face shape;
- 3) effect of variant rs7559271 in gene PAX3 on nasion;
- 4) evaluation of Class III malocclusion in young children, and others.

Related studies that are currently underway include:

- 1) classification of nose shape;
- 2) classification of lip shape;
- 3) effect of genetic variants associated with nose and lip shapes;
- 4) evaluation of a method for treating facial asymmetry;
- 5) evaluation of face variations due to gender, ethnic, and individual differences, and more.

Average facial templates have great potential for orthodontic and genetic studies helping quantify and visualise various effects on the face, assess the effectiveness of treatment methods, describe differences between various groups of population.

Preformulation Studies of Liquisolid Systems: Optimisation of Carrier / Coating Material Ratio

Ph.D. Barbora Vraníková

*Charles University, Faculty of Pharmacy in Hradec Králové,
Department of Pharmaceutical Technology, Czech Republic*

Objectives

Liquisolid systems (LSS) represent novel formulations intended to improve the bioavailability of poorly soluble drugs. Their preparation is based on the sorption of the drug in the liquid state into the porous structure of a carrier which is subsequently coated by very fine particles of a coating material. Nevertheless, powder materials can retain only a limited amount of liquid to still maintain acceptable properties for subsequent processing. This study is focused on the determination of the optimal carrier / coating material ratio (R value) for the preparation of LSS.

Methods

Magnesium aluminometasilicate - Neusilin® US2 (carrier) was loaded with the polyethylene glycol 400 in the ratio of 100:55. Afterwards, the different amounts of colloidal silica - Aerosil® 200 or Aeroperl® 300 Pharma (coating material) were added to obtain mixtures with the R value in the range of 5-100. The properties of mixtures and tablets were evaluated in compliance with Eur. Ph. 9.0.

Results

The obtained results revealed that increasing amount of Aerosil® leads to the worsening of flow properties. Moreover, it was observed that tablets implied an increase in hardness with increasing amount of Aerosil® up to R value of 40. The further increase in the Aerosil® amount caused a decrease in tablet hardness.

The amount of Aeroperl® in liquisolid powder did not affect its flow significantly. Evaluation of tablet hardness revealed that a decrease in R value leads to the increase in hardness up to R value of 25, while a subsequent decrease of this value causes the decrease in tablet hardness.

Conclusions

It can be concluded that the optimal carrier / coating material ratio in the case of Neusilin US2, PEG 400 and Aerosil® or Aeroperl® mixtures is 40 or 25, respectively. With this ratio, the powder mixtures implied suitable flow properties and their compression leads to tablets with the highest hardness.

Use of Innovative Spectroscopy Methods and Chemometrics for Rapid Authentication of Herbals

Dr. Agnese Brangule; Prof. Pēteris Tretjakovs

Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia

Objectives

The aim was to develop quality control methods for herbal medicine (HMs) using innovative, rapid, integratable into production process spectroscopy methods (PAS-FTIR, DRIFT) and multivariate data processing methods.

Methods

For the first time, an innovative cantilever photoacoustic spectroscopy (FTIR PAS) method will be used in spectroscopic studies of herbal medicine. Other FTIR sampling method: Diffuse reflectance (DRIFT). In this study, we evaluated dried herbals and green, and black tee. PAS and DRIFT spectra were taken at 450–4000 cm^{-1} , at a resolution of 4 cm^{-1} , and an average made from 10 scans. For PAS, the homogenized samples were placed in the PAS cell filled with helium gas (flow 0.5 l/min), but for DRIFT homogenized samples were placed on the diamond stick. The advantages of the proposed methods are the rapid acquisition of the result, the possibility of integration into the production process, and low-cost analysis. Up to now, the usage of spectroscopy techniques was limited to the complex interpretation of spectra. This problem will be resolved by using chemometrics and machine learning. The presentation intends to evaluate the advantages of spectroscopic methods compared to the time-consuming chromatography methods used so far, due to the minimal sample preparation.

Results

Comparison between spectra recorded by PAS and DRIFT showed high sensitivity and good resolution. The results obtained provide information about the spectral behavior of homogenized herbal and tee powder can be useful for establishing identification and discrimination criteria. It has been demonstrated that PAS and DRIFT can be a useful experimental tool for the characterization and discrimination of herbals.

Conclusions

FTIR spectroscopy, in conjunction with multidimensional statistical analysis (Chemometrics), offers an extensive scope for herbal medicine studies.

Acknowledgments

The research received funding from the ERAF Post-doctoral Research Support Program project No. 1.1.1.2/16/I/001 Research application "Development of screening methods by innovative spectroscopy techniques and chemometrics in research of herbal medicine", No. 1.1.1.2/VIAA/2/18/273.

Research on Combinations of Substances, Found in Latvia, and their Possible Compatibility in Extemporaneous Dosage Forms for Dermatology

Olga Kiselova; Prof. Baiba Maurina; Prof. Venta Sidlovska

Rīga Stradiņš University, Department of Dosage Form Technology, Latvia

Objectives

The aim was to explore a compatibility of drug substances used in extemporaneous compositions in Latvia, in the extemporaneous dosage forms prescribed by dermatovenerologists.

Methods

Exploring extemporaneous compositions there was created a database with prescriptions, compounded in Latvian pharmacies during 2017. Since the pharmaceutical compatibility or incompatibility of active substances is linked to a particular dosage form, then in the study there were analysed dosage forms which are the most common in dermatovenerologists' prescriptions – suspensions and ointments.

Results

There were identified the most commonly prescribed active substances and excipients, as well as combinations of active substances in suspensions and ointments. Of which we selected 3 combinations of active substances for a pilot study – sulfur with menthol, sulfur with salicylic acid, sulfur with boric acid. Compatibility was analysed guiding by physical properties of active substances and excipients. For analysis of suspensions were used purified water, ethanol (90 per cent), glycerol, vegetable oil and their combinations. For analysis of ointments were used soft paraffin, soft paraffin with wool fat, vegetable oil in a combination with wool fat and purified water. The combination sulfur-menthol is incompatible in the following mediums: purified water; glycerol; purified water with glycerol. The combination sulfur-salicylic acid is incompatible in purified water. The combination sulfur-boric acid is incompatible in purified water and vegetable oil. The combination sulfur-boric acid is incompatible, if as a basis there is used a soft paraffin only. Other combinations are compatible in selected basis.

Conclusions

The compatibility or incompatibility of active substances depends on physical features of the substances, dosage form, excipients. The same combination of active substances may be compatible in one medium and incompatible in another. The cooperation between a physician and pharmacist in the extemporaneous drug compounding procedure is significant for prevention of possible incompatibility and satisfaction of a patient's needs.

Availability of Generic Medicines in Latvia

*Marija Ceha*¹; *Ph.D. Elita Poplavska*²;
*Ph.D. Ieva Salmāne-Kuļikovska*¹

¹ *Rīga Stradiņš University, Department of Dosage Form Technology, Latvia;*

² *Rīga Stradiņš University, Department of Dosage Form Technology, Latvia;*

Rīga Stradiņš University, Institute of Public Health, Latvia

Objectives

The aim was to assess availability, market entry, competition, price and market share development of generic medicines in Latvia.

Methods

To measure off-patent market performance, we used established indicators: proportion of molecules with generic market entry, number of generic competitors per molecule, generic price decline and volume market share 12- and 24-months post-patent-expiry (PPE). We assessed the availability, market entry and number of competitors of all generic medicines authorized through the centralized procedure in the period of 2014–2017. Further, we selected case studies of five different active ingredients to investigate price developments and volume market shares. Data were obtained from the State Agency of Medicine of Latvia and European Medicines Agency.

Results

In the past three years, 35% of centrally authorized generics were available in the market, out of which 26% were available continuously. Majority of generics entered the market two years after patent expiry. An average number of generic competitors was 1–2 after 12 and 3 per molecule after 24 months PPE. Prices of generics were lower than prices of patented medicines. The more generic competitors per molecule were on the market, the lower were prices. Patented medicines maintained rather high market shares and generic competition had little influence on their prices. Maximum generic market share both for reimbursed and non-reimbursed medicines is achieved beginning with the second year PPE. Price reduction and increase in generics volume were more pronounced among reimbursed medicines.

Conclusions

The generic policy should focus on maximizing cost savings PPE by increasing the use of generics. Low availability and relatively slow entrance in the market of generics can influence patients' adherence due to high treatment costs and complicated dosage regimens.

Factors Affecting Hydrolysable Tannin Solvent Extraction

*Renāte Šukele*¹; Prof. *Dace Bandere*¹;
*Ph.D. Rudīte Koka*²; *Ph.D. Pāvēls Sudmalis*¹

¹ *Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;*

² *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia*

Objectives

The aim of the study was to analyze factors effecting hydrolysable tannin solvent extraction.

Methods

Literature review; scientific paper data bases (Pubmed, Science direct, Elsevier).

Results

Tannins are phenolic compounds of high molecular weight (500–3000 g/mol). They are divided into hydrolysable tannins and condensed tannins. Hydrolysable tannins are soluble in water, dilute alkalis, alcohol, glycerol and acetone. Due to presence of the phenolic group tannins are used as antiseptic.

Finer particle size (< 0.5 mm) produce better solvent contact therefor extraction but too small particles uptake more solvent and are harder to filter. Principle – alike solve alike. Water>methanol>ethanol>acetone are polar solvents making it easier to interact with polar functional groups on the tannins. Acetone extracts tannins lower than polar-protic solvent ethanol, hot water shows the least yield due to resulting acidic pH. Solvent concentration effects phytochemicals extracted. Studies suggest that acetone, ethanol concentration 50% is optimal. Higher concentrations of solvent seem to extract more impurities. Higher tannin content can be reached by increasing the solvent-to-solid ratio, ranging from 1:5 to 1:100. If ratio is too high, it requires a long time for concentration and excess solvent use.

Experiments show that increasing soaking time or the heat are crucial but more than 4.5 hours (some cases 1.5 h) or $T > 50\text{ }^{\circ}\text{C}$ noticeably decrease hydrolysable tannin content, increasing other poly-phenols. Solvent evaporation temperature should be considered. Optimized by Box-Behnken Design, highest tannin content was at $35.7\text{ }^{\circ}\text{C}$, 50.71 min, solvent 49.97%. Use of Sokslet apparatus saves solvent amounts and time but increases danger of inflaming. Shaking or stirring does not have much of an influence on tannin yield. Using microwaves, ultrasound or other unconventional methods can improve tannin yield.

Conclusions

Tannin extraction is influenced by various factors – particle size, solvent type, concentration, ratio or technique. Polar solvents are preferable. Temperature higher than $50\text{ }^{\circ}\text{C}$ and longer extraction time than 4.5 h decrease tannin content.

Levofloxacin Assay in Rabbit Plasma: UPLC Method Optimisation and Validation

*Andrejs Sitovs*¹; *Ph.D. Dmitrijs Kustovs*²;
Prof. *Mario Giorgi*³; Prof. *Līga Kovalcuka*⁴; *Laura Voiko*⁴;
Prof. *Santa Purviņa*²; Prof. *Dace Bandere*⁵

¹ *Rīga Stradiņš University, Scientific Laboratory of Biochemistry, Latvia;*

² *Rīga Stradiņš University, Department of Pharmacology, Latvia;*

³ *University of Pisa, Division of Pharmacology and Toxicology, Department of Veterinary Sciences, Italy;*

⁴ *Latvia University of Life Sciences and Technologies, Faculty of Veterinary Medicine;*

⁵ *Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia*

Objectives

Levofloxacin (LVX) is a highly effective third-generation fluorquinolone with great potential in veterinary field. The aims of the present study are to optimize the liquid chromatography (UPLC) bioanalytical assay method for LVX detection in rabbit plasma and to validate it according to the EMA Guideline on bioanalytical method validation.

Methods

Levofloxacin and enrofloxacin (internal standard, IS) pure compounds' solutions in methanol were used as stocks. Pooled drug-free rabbit plasma was used for method validation. The 6-point calibration curve was prepared at LVX concentrations of 0.01, 0.05, 0.1, 0.5, 1 and 5 µg/ml. 100 µl of 10 µg/ml IS methanol solution was added to each sample. LVX and the IS were extracted from plasma via liquid-liquid extraction using 4 ml of 5:1 chloroform:isopropanol (v/v) mixture with consequent organic phase evaporation and reconstituted in 200 µl of mobile phase. The mobile phase consisted of 83% aqueous phase (0.02M KH₂PO₄ and 0.012M tetraethylammonium bromide, pH = 2.5) and 17% acetonitrile (v/v). Flow rate was 0.3 ml/min. Chromatographic separation was performed using Waters Acquity H-class system on Waters Acquity UPLC BEH C18 Column (75 × 2.1 mm, 1.7 µm particle size) and fluorimetric detector (excitation and emission wavelengths 295 and 490 nm, respectively). Injection volume 1 µl, run time 5 minutes. The selectivity, accuracy, precision was established.

Results

The method is rapid, selective and has good peak separation (LVX peak retention time 1.2 min, IS time 1.7 min) with no peaks due to matrix observed. LLOQ is 0.01 µg/ml. The calibration curve is linear in range from 0.01 to 5 µg/ml (R₂ = 0.9978). The recovery of LVX was close to 100%. The method is precise (intraday and interday CV values not exceed 15%) and accurate (bias % not exceed 15%).

Conclusions

This reliable method can be applied in further pharmacokinetic studies of LVX in rabbit.

Use of Ethnomedicinal Plants in Latvian-Populated Territory

*Inga Sīle*¹; *Ph.D. Edita Romane*²; *Sanita Reinsone*³;
*Dace Tirzīte*⁴; Prof. *Maija Dambrova*⁵

¹ *Rīga Stradiņš University, Department of Dosage Form Technology, Latvia;
Latvian Institute of Organic Synthesis, Laboratory of Pharmaceutical Pharmacology;*

² *Rīga Stradiņš University, Department of Dosage Form Technology, Latvia;*

³ *University of Latvia, Institute of Literature, Folklore and Art;*

⁴ *Latvian Institute of Organic Synthesis;*

⁵ *Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;
Latvian Institute of Organic Synthesis, Laboratory of Pharmaceutical Pharmacology*

Objectives

The aim of this study was to collect and analyse the ethnobotanical knowledge found in Latvian folk beliefs.

Methods

Folk beliefs available in the Archives of Latvian Folklore were analysed. The Economic Botany Data Collection Standard is a commonly used standard and provides a unified system to describe the uses of plants. Following the standard, plant uses were grouped based on 21 medicinal use categories. Each plant was identified by scientific name according to the Plant List website. Additionally, the plant parts used, dosage forms of herbal medicines and routes of administration were analysed.

Results

The present study shows 216 genera belonging to 81 families. In total, 2018 cases were reported for disease prevention or health improvement that fit into one of 21 medicinal use categories. The most common health conditions treated with medicinal plants were respiratory system disorders (393 cases), infections / infestations (261 cases), digestive system disorders (250 cases), pain (220 cases), injuries (174 cases) and musculoskeletal system disorders (154 cases). Nineteen plants were described as having activity for more than 8 medicinal use categories. Plants that have the highest medicinal value were: *Betula* sp. L. that was mentioned in 15 use categories, *Matricaria recutita* L. was mentioned in 13 use categories and *Valeriana officinalis* L. was mentioned in 11 use categories. Leaves (16%) and flowers (14%) were the most common plant parts used. The herbal tea (30%) was the most common used dosage form followed by fresh plant material (17%).

Conclusions

A number of plants were mentioned in several medicinal use categories, providing evidence for their efficiency to prevent and treat human diseases.

Anticoagulant Use Patterns in Patients with Pulmonary Embolism in Latvian Hospital

*Agnese Prilina*¹; *Aleksandra Aitullina*¹;
*Dr. med. Larisa Umnova*²

¹*Rīga Stradiņš University, Faculty of Pharmacy, Latvia;*

²*Rīga Stradiņš University, Department of Internal Medicine, Latvia*

Objectives

Several anticoagulants are available for thromboembolism treatment. Choice of agent and dose adjustment depends on patient's renal function, weight and availability of the drugs. Warfarin usually is recommended from the first or second treatment day together with heparin until INR is ≥ 2 at least 24 hours. The aim of this study is to analyse data about anticoagulant use pattern in case of pulmonary embolism in single tertiary hospital.

Methods

Inclusion criteria: adult patients discharged in 2017 from internal medicine departments, diagnose of pulmonary embolism (ICD I26). Information about biochemical blood test results, body weight, anticoagulant choice and doses was collected retrospectively from medical notes.

Results

98 cases have met including criteria. 77 (78.6%) cases were from cardiology and other from pulmonology department. Heparins were started on the first day in both wards. Median duration (Q1-Q3) of heparin use was 5 days (2.5-14.8) in cardiology and 11.5 (5.8-14.8) in pulmonology ward. Only 17 patients total body weight (TBW) was documented, 13 used low-molecular-weight heparin (LMWH). Patient with lower TBW have tendency to receive higher doses of LMWH ($n = 3$), but patient with higher TBW-lower doses of LMWH ($n = 6$) than is recommended by manufacturer. There was only one case of renal impairment (CrCl 21 ml/min), enoxaparin in adjusted dose was used. Warfarin start on median (Q1-Q3) day was 2 (1.0-3.5) in cardiology and 7.5 (5.6-9.3) in pulmonology wards. In 31 cases warfarin was started during hospitalisation and only in 8 cases target INR was achieved before discharge. In 43 cases rivaroxaban, in 22 cases warfarin and in 11 cases dabigatran were recommended on discharge. Patients with GFR 30-49 ml/min often used lower dose of dabigatran - 110 mg twice daily ($n = 4$).

Conclusions

From available data patient renal function state was considered choosing anticoagulants and their doses. Only few patient total body weight was documented. Only one quarter of patients' reached target INR during hospitalisation.

Determination of Cortisol in Human Saliva by Ultra-High Performance Liquid Chromatography Method

Ph.D. Dmitrijs Kustovs; Andrejs Sitovs; Ph.D. Andrejs Skesters

Rīga Stradiņš University, Scientific Laboratory of Biochemistry, Latvia

Objectives

Salivary cortisol level detection is a non-invasive easy test for stress evaluation due to the good correlation with free serum cortisol. As the liquid chromatography is a very precise tool for compound quantification, the aim of this study was to develop the rapid and accurate method for salivary cortisol assessment that could be used routinely in the Rīga Stradiņš University, Laboratory of Biochemistry.

Methods

Hydrocortisone (cortisol, Ph. Eur. purity grade) used as standard, methylprednisolone pure compound used as internal standard (IS). Ultrapure water was obtained by using a Milli-Q system. All other chemicals were of analytical grade. Cortisol and IS 1000 µg/ml stock solutions were prepared in methanol. The phosphate-buffered saline (PBS) used for the preparation of calibration standards, quality control samples and as a blank sample. Saliva extraction was performed using Discovery DSC-18 solid-phase extraction (SPE) cartridges. Cortisol was determined by ultra-high performance liquid chromatograph (UPLC) coupled to UV detector set at 254 nm. An analytical column Cortex C18 100 × 2.1 mm 1.6 µm particle size. Mobile phase consisted of 27% acetonitrile and 73% water, the run time set to 5 minutes. Injection volume 3 µl.

Results

Specificity was determined by comparing chromatograms of samples obtained from blank and samples containing cortisol and IS.

Six-point plasma calibration standard curve was established for cortisol over a concentration range from 0.025 µg/ml to 2.0 µg/ml. Over the tested concentrations range the determination coefficient R² of the calibration curve for extracted samples was greater than 0.99. The accuracy of the method was evaluated by injection of six concentrations of cortisol covering the linearity range.

Conclusions

This simple, rapid and sensitive UPLC method that uses isocratic elution and UV detection provides simultaneously accurate and precise quantification of cortisol in human saliva.

Incidence of Colistin Induced Acute Kidney Injury in Patients with Different Renal Functional States

*Aleksandra Aitullina*¹; Prof. *Angelika Krumina*²;
*Dr. med. Simons Svirskis*³; Prof. *Santa Purvina*¹

¹*Rīga Stradiņš University, Department of Pharmacology, Latvia;*

²*Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;*

³*Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia*

Objectives

Colistin is potentially nephrotoxic antibiotic used for treatment of multi-drug resistant (MDR) Gram-negative bacteria infection in critically ill patients. Nevertheless it is recommended to adjust dose according to renal functional state, renal impairment is not absolute contraindication of colistin use.

Methods

Adult patients admitted to intensive care units of tertiary adult hospital in 2015–2017 years with MDR Gram-negative bacteria infection, at least 72 hours colistin therapy and without renal replacement therapy (RRT) prior colistin use were included in this study. Data was collected retrospectively from medical notes. Colistin acute kidney injury (AKI) was defined as increasing of baseline creatinine level more than 1.5 times over baseline after at least 48 h of colistin therapy.

Results

82 cases have met of including criteria. 18 cases (22%) met colistin AKI criteria and these renal impairment cases mostly were classified as mild or moderate. Colistin AKI were mostly observed in patients with GFR of 50–129 ml/min prior colistin therapy (10 cases of 18) with the median onset (Q1–Q3) of AKI 7.5 (4.5–16) days. The median serum creatinine prior colistin therapy, as well patient age, cumulative colistin dose or overdosing of colistin were not statistically significant risk factors of colistin AKI in this study. On the other hand, higher C-reactive protein (CRP) on the background associated with higher risk of colistin induced AKI. No one patient with colistin AKI needed RRT.

Conclusions

Significant amount of patients experience mild to moderate acute kidney injury during colistin therapy. Patient renal function and overdosing of colistin on background are unclear risk factors of colistin nephrotoxicity. However higher median CRP level prior colistin therapy associated with higher risk of acute kidney injury during therapy.

Extraction of Active Ingredients for Pharmaceutical Use from Freshwater Sapropel in Latvia

*Aneka Kļaviņa; Dr. med. Ivars Vanadzins;
Ph.D. Linda Dobkevica; Agris Auce; Laura Komarovska²*

*Rīga Stradiņš University, Institute for Occupational Safety
and Environmental Health, Latvia*

Objectives

Sapropel has been used for various purposes agriculture, in construction as building material and in cosmetic manufacturing, in balneology and in medicine, and in pharmacy as biological active component. Previously sapropel has been generally used in raw forms and there is no common accepted method or standard method for obtaining of sapropel extracts. However, most extraction methods follow a common path. Currently, there are few extraction methods using variety of extractants for obtaining extracts from raw sapropel.

The most commonly used extractant is alkaline solution. When sapropel is subjected to alkaline environment, the humic and fulvic acids, together with some lipids, vitamins and sugar, present in the raw sapropel become soluble, however other organic matter present in the sapropel remain solid. Alkaline extraction is followed by filtration and water present in the aqueous mixture is evaporated off.

Another type of extractants are organic solvents as hexane, ethanol, propylene glycol, dimethyl sulfoxide and vegetable oils. Organic solvents are able to dissolve some fat-soluble substances as well as water-soluble components. This allows obtaining in the extract a whole range of organic and inorganic substances.

Methods

This study was part of larger study of medical properties of sapropel performed by Rīga Stradiņš University. The sapropel was obtained from 5 lakes in Latgale region of Latvia. 120 different sapropel samples were taken. After testing for pesticides and heavy metal residues, 8 sapropel samples were selected for further tests on cell cultures, to test its regenerative properties and for initial tests for the synthesis of sapropel extract gels. For these samples sapropel extract was obtained - Alkaline extraction method was chosen as the most suitable for cell cultures and pharmacy remedy development.

Results

Sapropel samples were obtained in winter time, from the depth of 3 to 5 metres from sapropel deposits in the bottom of lakes. Samples were subsequently tested for pesticides and heavy metal presence. All sapropel samples were kept in containers without oxygen accessing at temperature of 4 °C, in these conditions samples are stable from 6 to 12 months. To obtain the extract the sapropel samples were processed with 2% NaOH solution and slowly stirred for 24 h, then mixture was centrifugated and filtrated. Filtrate was acidified with 5N H₂SO₄ solution till pH 1-2 and centrifugated and filtrated again. After the extract was produced it is kept at 4 °C. From one kg of dried sapropel 22-28 g of humic acid and approximately 9 g of fulvic acids were extracted. The sapropel extracts were characterised by organic carbon content, Ph level and antioxidant level.

Conclusions

The most important issue for sapropel usage in balneology and medicine is to develop quality criteria for material and its extracts. Latvian freshwater sapropel can be used as raw material for obtaining sapropel extract and use it in the preparation of pharmaceuticals. In this study the antioxidative properties of obtained extracts has been established. In future studies the differences in extract characteristics of the various deposit sites, as well as the stability of the extracts under different storage conditions should be studied.

Therapy Related Adverse Drug Reactions in Patients with Inflammatory Bowel Diseases (IBD)

*Irēna Mirzajanova*¹; Prof. *Juris Pokrotnieks*²; Prof. *Santa Purviņa*³

¹*Rīga Stradiņš University, Department of Pharmacology,
Doctoral study program Pharmacy, Latvia;*

²*Rīga Stradiņš University, Faculty of Medicine, Department of Internal Diseases, Latvia;*

³*Rīga Stradiņš University, Faculty of Pharmacy, Department of Pharmacology, Latvia*

Objectives

The aim of the study to assess the incidence of adverse drug reactions (ADR) in patients with IBD, their effect on therapy continuity and compare it to official State Agency of Medicines of Latvia (SAM) data.

Methods

Data from 84 inflammatory bowel diseases (IBD) related admissions to Pauls Stradiņš Clinical University Hospital Gastroenterology department in 2015 medical case histories were obtained and examined in retrospective cross-sectional study using IBM SPSS Statistics 23.0 and MS Excel 2018.

Results

47 cases of Crohn's disease (CD) and 37 cases of ulcerative colitis (UC) related hospitalisations were registered. 16.7% (n = 14) of patients have never received any IBD therapy, 40.5% (n = 34) had 1 therapy line prior to hospitalisation, 34.5% (n = 29) had 2 therapy lines and 8.3% (n = 7) had 3 or more therapy lines. 29.8% (n = 25) were never prescribed sulfasalazine or 5-ASA therapy. From 56 patients who were prescribed sulfasalazine or 5-ASA therapy, in 37.5% ADR were observed. The most common ADR were: allergic reactions - 3 cases, gastrointestinal symptoms - 5, bitter taste in the mouth - 1, lack of effect - 3. Of 27 patients who were using azathioprine, 3 ADR were observed - 1 case of pancreatitis, 1 case of latent tuberculosis reactivation, and 1 case of constipation. All patients with ADR discontinued the treatment. According to official statistical data from SAM only 1 ADR (for sulfasalazine) was registered for IBD medications in 2015, total number of ADR registered was 314, with 198 unique cases and include all types of reports. In 2015 in EudraVigilance database - 531 side effects reports for sulfasalazine, 275 for mesalazine and 802 for azathioprine for European Economic zone countries were registered.

Conclusions

1. ADR related to IBD therapy are leading to treatment discontinuation.
2. ADR reporting rates in IBD patients from Latvian population seems much lower than in the real clinical practice.
3. Therapy discontinuation rates in Latvia are higher than those reported in literature.

Analysis of Factors Associated with Occurrence of Bias in Studies Assessing Medication Adherence and Health Outcomes: Literature Review

*Ieva Rutkovska*¹; *Ph.D. Elīta Poplavskā*²; *Ph.D. Inga Urtāne*³;
*Dr. med. Dīns Šmits*⁴; *Prof. Dace Bandere*³

¹*Rīga Stradiņš University, Faculty of Pharmacy, Department of Dosage Form Technology, Latvia;*

²*Rīga Stradiņš University, Faculty of Pharmacy, Institute of Public Health, Department of Dosage Form Technology, Latvia;*

³*Rīga Stradiņš University, Faculty of Pharmacy, Department of Pharmaceutical Chemistry, Latvia;*

⁴*Rīga Stradiņš University, Faculty of Public Health and Welfare, Department of Public Health and Epidemiology, Latvia*

Objectives

This literature review aimed to identify possible factors of bias and confounding in studies that assessed associations between health outcomes and medication adherence. Quantifying patients' medication adherence and health outcomes is of little help in understanding motives of patients' behavior. Estimated adherence levels and their associations to health outcomes in published studies may be inaccurate due to various sources of biases and confounding factors hampering comparability and interpretation of results.

Methods

We searched Medline-PubMed, SCOPUS and Web of Science databases to identify peer-reviewed articles written in English on biases and confounding factors in studies assessing associations between health outcomes and medication adherence levels in patients with chronic conditions. We used the following search terms: medication adherence, medication non-adherence, medication compliance, bias, confounding, health outcome. Researchers screened titles and abstracts to identify potentially relevant publications. Full texts of selected articles were further reviewed by researchers to confirm inclusion.

Results

The most frequently identified biases and confounding factors in studies assessing associations between health outcomes and adherence are related to patient behaviors, including healthy-user bias, healthy adherer effect and adherence self-efficacy (confidence in one's ability to adhere). These biases and confounding factors may occur in situations when patients who choose to receive drug therapy as preventive care also choose to receive other preventive services such as immunizations and screening tests. It explains why patients who engage in healthy behaviors also tend to be more adherent medication users. Health outcomes may not be explained by adherence alone but are also associated with other factors such as healthy-user bias, healthy adherer effect and adherence self-efficacy.

Conclusions

Future research studies on associations between health outcomes and medication adherence levels need to consider these biases and confounding factors to improve understanding on medication use behavior.

Analysis of Efficacy of Food Supplements for Maintenance of Normal Blood Glucose Levels in Latvia

*Viktorija Joņina; Ph.D. Edita Romāne;
Ph.D. Ieva Salmane-Kuļikovska*

Rīga Stradiņš University, Department of Dosage Form Technology, Latvia

Objectives

Objective of the study is to analyze the efficacy of food supplements available in Latvia provided for maintenance of normal blood glucose levels.

Methods

Food supplements for maintenance of normal blood glucose levels were detected in the Latvian Food supplement register (December 2018). Health claims and quantity of substances included in labels were analyzed.

Results

98 food supplements were found in the Latvian Food supplement register. These products contain components to lower blood glucose level: chromium (n = 43), milk thistle (*Silybum marianum*; n = 6), gymnema (*Gymnema sylvestre*; n = 5), *Garcinia cambogia* (n = 11), ginger (*Zingiber officinale*; n = 4), common bean (*Phaseolus vulgaris*; n = 4), fenugreek (*Trigonella foenum-graecum*; n = 3), heart-leaved moonseed (*Tinospora cordifolia*; n = 2), cinnamon (*Cinnamomum zeylanicum*; n = 6), mountain knot-grass (*Aerva lanata*; n = 1), garlic (*Allium sativum*; n = 1), bilberry (*Vaccinium myrtillus*; n = 2), chlorella (*Chlorella pyrenoidosa*, n = 1), pectins (n = 1), common dandelion (*Taraxacum officinale*, n = 1), European olive (*Olea europea*, n = 1), common juniper (*Juniperus communis*; n = 2), greater burdock (*Arctium lappa*; n = 2), spirulina (n = 1), prickly pear (*Opuntia ficus-indica*, n = 2), green tea / catechins (n = 2), banaba (*Lagerstroemia speciosa*; n = 1), ginseng (*Panax ginseng*; n = 1), mulberry (*Morus albus*; n = 1), *Phyllanthus niruri* (n = 1), *Cordyceps sinensis* (n = 1), black myrobalan (*Terminalia chebula*; n = 1). Many (n = 43) food supplements contain the component (chromium) in a quantity that can produce positive physiological effect on blood glucose levels. Despite this fact, there are 29 products that include non-authorized health claims; labels of 34 supplements contain health claims that haven't been evaluated yet.

Conclusions

There are products in Latvian Food supplement register that can contribute to maintenance of normal blood glucose levels. Unfortunately, labels of some food supplements contain non-authorized health claims; these products are useless in case of high blood glucose levels.

Excipients in Compounded Paediatric Drug Forms for Internal Use

*Grigorijs Golubs*¹; Prof. *Ilze Barene*¹; Ph.D. *Inese Sviestina*²

¹ *Rīga Stradiņš University, Department of Dosage Form Technology, Latvia;*

² *University of Latvia, Department of Pharmacology*

Objectives

Excipients are an indispensable part of any drug form [1]. Compounding in a pharmacy setting requires use of excipients as well as excipients are broadly represented in all commercially available drugs [2]. The problem arises in case of compounding drugs from commercially available medications [3]. Although profit and shelf life efficient for pharmaceutical business, this practice is highly recognized as bad pharmaceutical practice and potentially harmful for the patient [1, 3, 4]. Aim of the study was to gauge the safety of compounded drug forms for pediatric use.

Methods

A retrospective analysis of compounded drug forms was performed in 3 pharmacies in Riga. Pediatric prescriptions for oral use were cross referenced with EU guidelines for pediatric drug form manufacture as well as relevant scientific literature.

Results

In total 3201 prescriptions were inspected. This amount included 470 drug forms for internal use. In the final analysis 234 compounded drug forms were included, according to criteria of the study (drugs intended for pediatric use). Analyzed drug forms presented as 76 suspensions and 158 powders for internal use. After theoretical evaluation 61 drug forms were considered to provide no additional risk to the active ingredient. Most of the compounded prescriptions (173) were produced from commercially available medications. As a result, 111 analyzed prescriptions contained minor discrepancies and 62 drug forms were considered potentially harmful for children [6, 7]. Gladly no analyzed prescriptions contained excipients that would have known harmful effect in pediatric population.

Conclusions

These findings suggest a broader quantitative study that would have possibility to determine the amount of risk, undertaken by compounding such medicines. Many analyzed cases could have been avoided if stricter compounding guidelines were in place. Drug reimbursement system in Latvia does not include active substances for compounding, which is another inhibitor for compounding safe and effective drug forms.

Full Mitochondrial Genome Sequencing of MDR-TB Patients Using NGS to Clarify Polymorphisms and to Avoid Aminoglycosides Induced Ototoxicity

*Lauma Veidemane*¹; *Viktorija Igumnova*²; *Linda Barkāne*³;
*Ph.D. Egija Zole*¹; *Dr. Anda Viksna*⁴; *Dr. Renāte Ranka*²

¹ Latvian Biomedical Research and Study Centre;

² Latvian Biomedical Research and Study Centre;

Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;

³ Riga East University Hospital, Latvia;

⁴ Riga East University Hospital, Center of Tuberculosis and Lung Diseases, Latvia

Objectives

Aminoglycosides are commonly used to treat multi drug resistant tuberculosis (MDR-TB). Despite their effectiveness there are some negative side effects like ototoxicity. Various mitochondrial DNA (mtDNA) mutations have shown association with aminoglycoside induced ototoxicity but the penetrance usually is incomplete, pointing out that there are other factors such as mitochondrial haplogroups which could affect clinical phenotype manifestation. The main aim of this study is to develop effective method for genetical screening in order to diagnose risks of side effects as soon as possible and to avoid them completely.

Methods

In this study DNA of 52 MDR-TB patients with aminoglycoside treatment were used. The samples were obtained from the Genome Database of the Latvian Population. The study was approved by the Central Medical Committee of Ethics in Latvia. First mtDNA was amplified using PCR. Obtained fragments (> 8000 bp) were cleaved using sonication to 200 bp long fragments. Subsequently samples were prepared to NGS following adapted protocol. DNA was cleaned, and size was selected using NucleoMag® technology. Prepared DNA libraries were analyzed with Agilent technology and sequenced with IonTorrent hardware. The sequencing data were uploaded to the Galaxy web platform and the public server at usegalaxy.org was used to analyze the data.

Results

This study shows effective method to determine all mtDNA SNP of one individual, allowing us to evaluate mtDNA SNP and haplogroup correlation which could induce ototoxicity in MDR-TB patients. In total 52 full mtDNA sequences were gained allowing us to detect polymorphisms, haplogroups and heteroplasmy level.

Conclusions

Full mtDNA genome sequencing using NGS technologies is effective in order to trace various mutations, patients' belonging to the haplogroup and heteroplasmy level. Due to the above method it is possible to prevent aminoglycoside induced ototoxicity and identify risks of other possible disorders associated with mtDNA mutations.

Analysis of Factors Affecting Statin Therapy Undergoing Planned Percutaneous Coronary Intervention

*Kristine Karklina*¹; *Ph.D. Inga Urtāne*¹; Prof. *Aivars Lejnīeks*²

¹ *Rīga Stradiņš University, Faculty of Pharmacy, Latvia;*

² *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

Objectives

The 2016 European Guidelines for the Management of Dyslipidaemias guidelines recommend high-dose statins for patients undergoing percutaneous coronary intervention (PCI), but not always follow up. Research and compare factors affecting the alternative statin therapy used in patient practice in the period of pre and post PCI.

Methods

Retrospective study was conducted between September and December 2018. Data were collected from patient histories in general practices in Riga, Latvia. Based on study inclusion criteria patients with PCI performed in the last year and who received statin therapy were included.

Results

In total 100 patients met the study criteria of whom 65 were men. The mean age of the population was 66.8 ± 7.25 years. More than half of the patients ($n = 59$) non-statin lipid-lowering therapy pre-PCI. Post-PCI 88 patients in hospital received high-dose statins, more likely atorvastatin $n = 85$ while moderate-dose were assigned in 12 cases: atorvastatin ($n = 10$) and rosuvastatin ($n = 2$). In general practise high dose statin therapy was administered only in 69 (atorvastatin $n = 59$; rosuvastatin $n = 10$) and moderate-dose in 28 patients. Three patients did not have any statin therapy post PCI. Statins dose was reduced in large number of cases ($n = 39$), mostly atorvastatin was switched from high-dose to moderate ($n = 15$). In 10% events atorvastatin was switched to rosuvastatin, but in 30% dose was decreased despite analyses of low density lipoproteins (LDL) which were higher than 1.8 mmol/l. The majority of patients ($n = 85$) did not reached the recommended LDL goal. Strong correlation was seen between age and atorvastatin dose ($p = 0.004$).

Conclusions

In the most cases high-dose statin therapy was recommended. More than one quarter high-dose statin therapy unreasonably was lowered to moderate. Only one quarter of patients reached goal LDL.

Potassium Channels and Sodium Hydrogen Sulfide Relaxation of Rat Mesenteric Small Arteries

*Silvijus Abramavicius*¹; *Asbjørn Petersen*²;
*Nirihika Renaltan*²; *Matthew Whiteman*³;
*Edgaras Stankevicius*¹; *Elise Hedegaard*²; *Ulf Simonsen*²

¹ *Lithuanian University of Health Sciences, Institute of Physiology and Pharmacology;*

² *Aarhus University, Department of Biomedicine,
Pulmonary and Cardiovascular Pharmacology, Denmark;*

³ *University of Exeter, Biosciences, College of Life and Environmental Sciences,
and Medical School, St. Luke's Campus, United Kingdom*

Objectives

The objective of the current study was to investigate the K channel subtypes involved in the relaxations.

Methods

Third branch mesenteric arteries were dissected from the mesenteric vascular bed, and mounted on 40- μ m steel wires in microvascular myographs (Danish Myotechnology, Aarhus, Denmark) for isometric tension recording as previously described (Mulvany and Halpern, 1976). Data were presented as mean \pm S.E.M. with a significance level of $p < 0.05$. The two-way analysis of variance (ANOVA) was used to compare the different conditions affecting release of sulfide species from GYY4137 and concentration-response curves obtained in functional studies of isolated mesenteric arteries. The graphs and statistical analyses were performed using GraphPad Prism 7.0 (GraphPad Software, La Jolla, CA).

Results

The preparations were incubated with a blocker of ATP-sensitive K channels, glibenclamide (1 μ M), that decreased Na₂S relaxation, while GYY4137 relaxation was unaltered in U46619-contracted arteries. Blockers of BKCa, iberiotoxin and of KV7 channels, XE991 decreased significantly relaxations induced by both Na₂S and GYY4137.

Conclusions

We have shown that Kv7 and BKCa channels are involved in the mechanism of Na₂S and GYY4137 induced vascular relaxation.

Direct Oral Anticoagulants Concentration Testing in Clinical Practice for High-Risk Patients with Atrial Fibrillation

*Katrina Pukite*¹; *Ilona Laizane*¹;
*Ketija Apsite*²; *Irina Pupkevica*⁵; *Ilze Cernevska*⁵;
*Oksana Boichuk*⁵; *Janis Meisters*⁶; *Dagnija Straupmane*⁶;
*Ph.D. Inga Urtane*³; Prof. *Oskars Kalejs*^{4,5}

¹ Rīga Stradiņš University, Faculty of Pharmacy, Latvia;

² Rīga Stradiņš University, Faculty of Medicine, Latvia;

³ Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;

⁴ Rīga Stradiņš University, Department of Internal Medicine, Latvia;

⁵ Pauls Stradiņš Clinical University Hospital, Center of Cardiology, Latvia;

⁶ Pauls Stradiņš Clinical University Hospital, Department of Laboratory, Latvia

Objectives

The aim of this study was to identify and analyze the need of coagulation tests for AF patients with high cardiovascular risk in clinical practice.

Methods

Quantitative, analytic, cross-sectional clinical trial, during the period from December 2016 to December 2018, was performed at Pauls Stradiņš Clinical University Hospital, Center of Cardiology, Latvia. There were collected data about patients with non-valvular AF, under anticoagulative therapy ≥ 3 months, defined as a high-risk group by CHA2DS2-VASc score – more or equal to 2 or 3, men and women respectively. Data were analyzed using SPSS.

Results

There were collected data about 143 patients of whom 46.2% (n = 66) were male; the mean age was 69.7 (SD \pm 9.9) years. About 2/3 (73.1%) of all patients the AF were longer than 1 year. The mean CHA2DS2-VASc score was 4.2 (SD \pm 1.5). The most common comorbidities were arterial hypertension (65.0%; 93), chronic heart failure (48.3%; 69), coronary artery disease (32.9%; 47), diabetes mellitus (24.5%; 35), and dyslipidemia (25.9%; 37). Almost half of patients (46.2%; 66) used DOACs, 31.5% rivaroxaban and 14.7% dabigatran respectively. 49.7% (71) patients had increased risk of possible drug-drug interactions, most frequently with proton pump inhibitors (16.8%; 24), amiodarone (24.5%; 35), anti-inflammatory drugs (49.0%; 70). The drug concentration in blood was lower than expected, reaching about 75.20% of C_{max}.

Conclusions

DOACs' usage correlated with CHA2D2-VASc score with mean frequent score 4.4 of 86 (60.1%) AF patients respectively. Coagulation tests were applicable more than half of patients (60.1%) to detect DOACs concentration in plasma.

Screening of Mitochondrial DNA Mutations Associated with Antibiotic-Induced and Non-Syndromic Deafness in Ethnic Latvian Population

*Viktorija Igumnova*¹; *Lauma Veidemane*²; *Anda Viksna*³;
Prof. *Dace Bandere*⁴; Dr. *Renāte Ranka*¹

¹ *Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;
Latvian Biomedical Research and Study Centre;*

² *Latvian Biomedical Research and Study Centre;*

³ *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Rīga East University Hospital, Centre of Tuberculosis and Lung Diseases, Latvia;*

⁴ *Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia*

Objectives

Ototoxicity is well-known side effect of aminoglycosides, and a rapid, profound, and irreversible hearing loss can occur. The aim of the study was to cognize the frequency of MT-RNR1 gene mutations, which are related to the aminoglycoside-induced hearing loss (AIHL), in Baltic-speaking ethnic Latvian population, and to estimate the prevalence of such mutations in the population-specific mitochondrial haplogroups (mtDNA hgs).

Methods

DNA samples of 191 ethnic non-related Latvians were used in this study. The samples and information were obtained from the Genome Database of the Latvian Population. An entire mtDNA MT-RNR1 gene was amplified by polymerase chain reaction (PCR) and subsequently sequenced on both strands. The mtDNA hg affiliation was performed by hierarchical PCR-Restriction Fragment length polymorphism analysis.

Results

In total, 7.3% of samples (14/191) had shown MT-RNR1 gene changes. Six different mutations were detected. The most frequently observed mutations were m.961insC (n) and m.961T>G (2.09% each), followed by m.827A>G and m.951G>A (1.05%), Both m.1555A>G and m.961T>A mutations were identified in one carrier each with the frequency of 0.52%. Hg H accounted for 38.74% (74/191) of the samples, while 32.46% (62/191) of mtDNA variants belonged to the hg U. Hgs T and J accounted for 7.33% (14/191) and 9.95% (19/191), respectively.

Within hg H, three different MT-RNR1 mutations were found: m.961T>G, m.951T>A, and m.961T>A. All four m.961insC (n) positive samples belonged to the hg U. The single m.1555A>G mutation positive sample belonged to the hg J, while both samples with m.827A>G mutation belonged to the hg T 14.3% (2/14).

Conclusions

The presence of several AIHL-related MT-RNR1 gene mutations in Baltic-speaking Latvian population indicates the necessity to include ototoxicity-related mutation analysis in the future studies in order to determine the feasibility of DNA screening for patients before administration of aminoglycoside therapy.

Proportion Change of Approved and Off Label Used Oncological Medicinal Products during Clinical Studies

Lasma Kite; Ph.D. Inga Urtane; Ph.D. Pavels Sudmalis

*Rīga Stradiņš University, Faculty of Pharmacy,
Department of Pharmaceutical Chemistry, Latvia*

Objectives

To analyse options of medicinal therapy in oncology depending on type of tumor and genetic predisposition and to find out if personalized medicine has perspective in scope of oncology.

Methods

Researchers via biopsy took samples with tumor affected tissues from respondents included in the study and determined with an accredited in vitro test method in which clinically significant solid tumor genes have occurred mutations that promote tumor growth. Recommendation for the most appropriate medicinal products for the treatment of tumors were based on the test results, approved medications and ongoing clinical trials. In the last step profile of tumor genes for each respondent was made.

Results

In the study there were 41 respondents enrolled among whom 10 were men and 31 were women. Oncology diseases in age group 51–78 years were the most commonly reported (68.3%; $p = 0.021$). From all rare or heavy stage solid tumor types malignant neoplasms in reproductive system were the most common (39.02%) in the study, especially in age group 25–50 years. The most common oncological diseases in women group were tumors of reproductive system (48.4%), in men group – digestive system neoplasms (40%; $p = 0.025$). From all medicinal products suggested in this study medicinal products with mTOR inhibitor activity were the most recommended (34.1%).

Conclusions

The most common level of resistance to the treatment recommended in the guidelines was observed among oncological diseases in the age group from 51 to 78 years. Tumors of reproductive system among all oncologic diseases took a dominant role where the most common mutation have been found in gene PIK3CA. Clinical study data showed positive outcome of off label use of medicinal product thereby it is anticipated that changes in the registration status of the medicinal products could be possible.

Contribution of Molecular Structure to Self-Assembling and Biological Properties of Bifunctional Lipid-Like 4-(N-Alkylpyridinium)-1,4-Dihydropyridines

*Pavels Dimitrijevs*¹; *Dr. Martins Rucins*²; *Dr. Mara Plotniece*¹;
*Dr. Karlis Pajuste*²; *Ludmila Jackevica*²; *Anita Gulbe*²;
*Signe Kibilda*³; *Dr. Arkadijs Sobolevs*²; *Dr. Janis Liepins*⁴;
*Dr. Ilona Domracheva*²; *Prof. Dace Bandere*⁵; *Dr. Aiva Plotniece*¹

¹ Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;

² Latvian Institute of Organic Synthesis;

³ JSC Grindex, Latvia;

⁴ University of Latvia, Institute of Microbiology and Biotechnology;

⁵ Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia

Objectives

Design of nanoparticle delivery materials possessing biological activity is ideal strategy for therapies. Cationic 1,4-dihydropyridines capable of transfecting pDNA into cells were developed by Institute of Organic Synthesis. It was demonstrated that cationic 1,4-DHPs showed high transfection efficiencies (Hyvönen, 2000, Pajuste, 2013). In this work we studied properties of 4-(N-alkylpyridinium)-1,4-dihydropyridine (1,4-DHP), containing propargyl group: evaluated self-assembling properties, nanoparticles size distribution and stability, determined critical micelle formation concentration (CMC). Interaction of 1,4-DHPs with 1,2-dipalmitoyl-sn-glycero-3-phosphocholine (DPPC) model membranes has been demonstrated. Cytotoxicity/toxicity of 4-(N-alkylpyridinium)-1,4-DHPs has been evaluated.

Methods

Cytotoxicity of 1,4-DHPs in vitro was assessed by MTT; toxicity – using prokaryotic and eukaryotic microorganism species (Suppi, 2015), data were analysed by PCA method using online ClustVis tool.

4-(N-Alkylpyridinium)-1,4-DHPs samples for DLS (Zetasizer Nano ZSP) were prepared by injection method.

CMC was determined by DLS (Topel, 2013) or pyrene (Aguiar, 2003) methods.

Phospholipid binding assay was performed with DPPC-1,6-diphenyl-1,3,5-hexatriene (DPH) binary system. DPH was used as probe to determine the hydrophobic interaction (Ma, 1985; Joondan, 2014).

Results

Eleven 4-(N-alkylpyridinium)-1,4-DHPs containing/uncontaining propargyl moiety/ies were synthesised. Increasing of alkyl chain length at N-atom of 4-(N-alkylpyridinium)-1,4-DHP ring or introduction propargyl moiety/moieties in 1,4-DHP molecule influences cytotoxicity. Toxicity toward microorganisms were related with presence of alkyl chains and their characteristics.

Values of Z-average diameter, polydispersity index and stability of nanoparticles of 4-(N-alkylpyridinium)-1,4-DHPs were determined by DLS. The average size of the nanoparticles varied from 30–1000 nm. CMC was established by two different methods and showed comparable tendency of structure-activity relationship.

Conclusions

Variation of propargyl moiety number/position in 1,4-DHP molecule and alkyl moiety length at N-atom at 4-(N-alkylpyridinium)-1,4-DHP molecule affects self-assembling properties and toxicity. Presence of N-dodecylpyridinium moiety is essential for formation of stable nanoparticles; introduction of propargyl moieties decreases stability of nanoparticles. 4-(N-Dodecylpyridinium)-1,4-DHPs quench the fluorescence of DPH-DPPC system confirming their capability to bind with phospholipids through hydrophobic interactions.

Funded by EuroNanoMed2 project INNOCENT.

Search for Novel Treatment for Rare Cancers

*Dr. Reinis Vilskersts*¹; *Melita Videja*²; *Ludmila Jackevica*³;
*Dr. Daina Zicane*⁴; *Andis Melders*⁴; *Rudolfs Belaunieks*⁴;
Prof. *Maija Dambrova*¹; Prof. *Maris Turks*⁴

¹ *Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;*

² *Latvian Institute of Organic Synthesis, Laboratory of Pharmaceutical Pharmacology;*

³ *Latvian Institute of Organic Synthesis, Group of Experimental Chemical Therapy;*

⁴ *Riga Technical University, Faculty of Materials Science and Applied Chemistry, Latvia*

Objectives

Rare cancers are a group of tumours with an incidence of fewer than 6 cases per 100,000 population and with 20% lower 3-year survival rates than for more common cancers. It is considered that poorer overall prognosis and lower survival rates are due to insufficient diagnostic methods and lack of appropriate therapy. Lupane derivatives isolated from birch-bark have shown significant cytotoxic activity against different cancer cells. This study was performed to assess the cytotoxic activity of newly synthesized derivatives of betulinic acid and its reduced form, betulin, against rare cancer cell lines.

Methods

Cytotoxic activity of 70 newly synthesized semi-synthetic C-3 and C-28 derivatives of betulin and betulinic acid was investigated in vitro in 4 rare cancer cell lines: 2 types of neuroblastoma cells, osteosarcoma and glioblastoma cells. To assess cytotoxic effects of the tested substances on normal cells, myoblast and standard fibroblast cell lines were used.

Results

Among C-3 betulinic acid derivatives 4-(3-chlorophenyl)-1H-1,2,3-triazolyl derivative showed the highest cytotoxic activity against all studied cell lines and it was similar to cytotoxic efficacy of betulinic acid. None of the studied betulinic acid derivatives demonstrated higher cytotoxic activity than betulinic acid, while some derivatives exerted higher selectivity against cancer cell lines than betulinic acid. Among betulin derivatives simultaneously modified at C-3 and C-28 positions 4-(methylsulfonamidomethyl)-1H-1,2,3-triazolyl derivative showed the highest cytotoxic activity (IC₅₀ = 6 ± 1 μM) against glioblastoma cells and was non-toxic against myoblasts and fibroblasts (IC₅₀ > 100 μM). Acetylation of C-3 hydroxyl group of betulin fully abolished the cytotoxic effects against cancer as well as normal cells.

Conclusions

Taken together our results demonstrate that semi-synthetic derivatives of betulinic acid and betulin have a significant cytotoxic activity against rare cancer cell lines.

Analysis of Adherence to Statin Therapy in Ambulatory Practice

*Līva Vanaga*¹; *Ph.D. Inga Urtāne*¹;
*Dr. med. Dins Šmits*²; *Aļina Duhanova*³

¹ *Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;*

² *Rīga Stradiņš University, Faculty of Public Health and Social Welfare, Latvia;*

³ *Rīga Stradiņš University, Latvia*

Objectives

Statin therapy is the main cornerstone in preventing morbid cardiovascular outcomes, but often fails due to low adherence level. Our aim was to analyze adherence and its influencing factors during statin therapy in patients with cardiological diseases.

Methods

The retrospective observational study included patients with chronic cardiovascular disease who re-filled their prescriptions for statins (atorvastatin or rosuvastatin) in the pharmacies as well as gave blood sample to assess lipid profile—level of total cholesterol, low density lipoprotein (LDL) cholesterol, high density lipoprotein (HDL) cholesterol. Adherence was measured as proportion of days covered (PDC) – the ratio of the number of tablets available and total day count in study period. If PDC was > 0.8 the adherence level was classified as high, medium if PDC was between < 0.8 and ≥ 0.5 or low if PDC was < 0.5.

Results

Totally 3526 patients divided equally according to statin therapy with an average age of 69.9 years were included. 65.9% participants used high-dose statins. Low level of adherence (70%) dominated at each period of the study, but a positive trend was observed in 2018 with a 3.2% increase. Degree of adherence for patients ≥ 65 years was 6.2% higher than in younger population ($p = 0.023$), which was more common in atorvastatin treatment group (8.1%, $p < 0.001$). Adherence grew proportionally to the size of the drug packing, respectively users of > 30 tablets package were adherent in 9.9% of cases compared to smaller amount (< 30). The LDLH < 3 mmol/L was achieved statistically significantly more often in adherent patients than in others (7.2% vs 2%; $p = 0.001$).

Conclusions

The total level of patient adherence to hypolipidemic therapy was below 50%. Higher proportion of adherence was seen among atorvastatin takers according to package. Focused participation in statin therapy had a positive effect on reaching LDLH < 3 mmol/L.

Conflict Management Skills among Lithuanian Pharmacists

*Ph.D. Aurima Stankuniene; Gintare Macionyte;
Prof. Jurga Bernatoniene*

*Lithuanian University of Health Sciences,
Department of Drug Technology and Social Pharmacy*

Objectives

Managing conflicts among a variety of people and groups is a necessary part of creating a high performance pharmacy practice. Therefore, good skills in conflict management are becoming to be a core competence for every pharmacist in 21st century. Thus, the aim of our research was to evaluate conflict management skills among Lithuanian pharmacists.

Methods

The study was carried out in November 2018. We have interviewed 357 pharmacists, who worked in public chemist shops around Lithuania. An anonymous questionnaire was used for data collection, which included Thomas – Kilmann Conflict Mode Instrument (TKI).

Results

An absolute majority of respondents (95%) has declared that the majority of conflicts arise from communication between pharmacist and client. Only 3% said, that the main source of conflicts is management team, 2% – other colleagues. 45% of respondents had at least 1-2 conflicts every week. Refrain to sell medications without doctor's prescription, price and miscommunication were the main causes of conflicts between pharmacists and clients (26.0%, 21.3% and 17.9%). Our study has revealed that conflicts make a significant impact to interviewed pharmacists: 36% experienced difficulties to work after the conflict, 28% felt an emotional discomfort, and only 7% haven't any consequences. The most popular conflict management styles according to Thomas – Kilmann were the following: compromising 39.8%, avoiding 29.4% and accommodating 17.4%. Almost all interviewed respondents (87.0%) expressed an intention to develop their conflict management skills.

Conclusions

Our study has showed that conflicts are quite common element of pharmacists' daily practice. Majority of conflicts make a significant impact to work and mental wellbeing of pharmacists. Therefore, the continuous improvement of skills in conflict management is critical for every pharmacist's in Lithuania and beyond.

Pharmacy Patients' Knowledge of Safe Use of Dietary Supplements and Medicinal Plants

*Renāte Šukele*¹; *Elīta Ardava*²; *Inga Sīle*³; *Ph.D. Oskars Onževs*⁴

¹ *Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;*

² *Rīga Stradiņš University, Red Cross Medical College, Latvia;*

³ *Rīga Stradiņš University, Department of Dosage Form Technology, Latvia;*

⁴ *Turība University, Latvia*

Objectives

Aim of this research was to analyze the safe use of dietary supplements and medicinal plants of pharmacy patients.

Methods

Quantitative method. Structured interview was conducted in 2018. 300 pharmacy patients over 18 years took participation. Microsoft Excel 2010 was used for statistical analysis.

Results

The respondents of the study most commonly used up to four active substances in dietary supplements and only a few respondents used up to 20 active substances. Respondents showed low interest for side effects or allergic reactions of herbal medicines or dietary supplements. Additionally, 11.67% of respondents very often read about symptoms of an allergic reactions or side effects, 20.00% read often, but the largest part – very rarely (27.67%) or rarely (19.67%) showed concern. The obtained data regarding to interactions showed even lower interest – 38% very rarely ask about it. Information available in drug leaflets about possible interactions between medicine-herbs or medicine- dietary supplements more often (n = 50) were searched by women. Also women more often (50%) used medicinal plants on their own initiative. Only part of respondents (n = 65) read the drug leaflet's relevant chapters very often but 50 and 58 respondents accordingly – rare and very rare.

Conclusions

The knowledge of pharmacy patients' might not be sufficient to assess the safety of dietary supplements and herbal medicine. There is a high degree of self-initiative in the use of dietary supplements and not enough consultation with medical professionals about their safety is performed.

Improving Prescribing and Medicines Use: Approaches from Nova Scotia, Canada related to Antimicrobials

Prof. *Ingrid Sketris*

Dalhousie University, Canada

Nova Scotia is a Canadian province of about 1 million inhabitants. The provincial government is responsible for the delivery of health care. Hospitals and physicians are publically funded. Pharmacies are privately owned and prescriptions are paid for by a mix of public funding, private insurance and out of pocket charges.

The provincial government's Department of Pharmaceutical Services uses a number of approaches to help provide safe, effective, and affordable drugs. Hospital and provincial drug program formularies have been developed. The Drug Evaluation Alliance of Nova Scotia (DEANS) was established to encourage appropriate drug use by analysing population drug use, identifying targets for improvement and developing and evaluating interventions to improve drug use for decision-makers, healthcare practitioners and patients. A key component of DEANS is a province wide academic detailing program which provides visits and educational materials to physicians in their office by health educators on various topics.

To improve antimicrobial use the Province of Nova Scotia, adopted the federal government's framework for action on Antimicrobial Resistance which includes includes 4 key pillars: antimicrobial resistance surveillance, stewardship, infection prevention and control, and research. The Nova Scotia Pharmacare program funded an academic detailing program related to appropriate prescribing of antimicrobials. In addition, it developed pharmacare funding criteria for specific antimicrobials which necessitated adding a criteria code related to indication on the prescription. A 2015 antimicrobial use point prevalence survey in 12 hospitals found a prevalence of 31% and also identified the need for improved documentation of indication and areas where adherence to regional treatment guidelines could be improved. Future research needs to examine the impact of multifaceted interventions and strategies targeting patients.

Fractal Aspects of Pharmaceutical Powder Flow

Ph.D. Zdenka Sklupalova

Charles University, Czech Republic

Particulate materials are fundamental for pharmaceutical manufacturing of dosage forms. As powder flowability and packing properties directly affect the processing, precise characterization of the flow and consolidation behaviour is necessary. Apart from the external conditions as well as given testing conditions, flow is influenced by the properties of the individual particles. However, bulk flow is essentially an emerging property so the influence of individual particles can be less pronounced when more representative particle aggregates exist that dominate overall flow.

In line with the objective, a fractal approach by the particle linear fractal dimension and the bulk fractal dimension of the powder bed surface of dynamically moving particle assemblies will be discussed.

Peculiarities and Advantages of an Interdisciplinary Approach to Science

Nijole Savickiene

Lithuanian University of Health Sciences, Department of Pharmacognosy

Interdisciplinary science is an integrated approach that synthesizes the perspectives of multiple individual disciplines during all phases of the research to investigate and answer a question, or solve a problem. Cooperation among contributors is necessary. The Consortium of the international “Eureka” project E! 3695 (“Creation of the methodology for effects of natural antioxidants on the development of the Diabetes mellitus complications”) was as a model of multi-institutional collaboration in biomedical research. It capitalized on complementary resources and expertise from different disciplines (Pharmacognosy, Endocrinology, Neurology, Biochemistry, Statistics, Psychology) and organizations (different departments of Lithuanian University of Health Sciences, Rīga Stradiņš University and Joint-Stock Company “Sanitas”, Joint-Stock Company “Aconitum”, Lithuania, and Joint-Stock Company “Grindeks”, Latvia) to address scientific problems of phytopreparations investigation in the most impactful way. There was evaluated the effects of Ginkgo biloba L. and Camellia sinensis L. leaves extracts on oxidative damage in type 2 diabetic patients with diabetic complications (neuropathy, nephropathy, retinopathy) in this clinical trial. 88 patients diagnosed with type 2 diabetes mellitus were enrolled into the study. All patients were randomly allocated to receive standardized Ginkgo biloba dry extract (Ex.Gb), Ex.Cs (standardized Camellia sinensis L. leaves extract), compound of both extract – Grinvitals Cereloba plus tablets (GCP) or placebo capsules. The comparisons between three different measurements (at baseline, after 9 and 18 months) were made using Friedman test and Two-way ANOVA. The results were considered statistically significant at $p < 0.05$. The results confirm the beneficial influence of Ex.Gb on reducing amount of MDA and HNE in diabetic patients. Ex.Gb had the most influence on perivascular changes in bulbar conjunctiva vessels. The decrement of VC (Index of the vascular changes) was observed immediately after receiving 160 mg of Ex.Gb per day for nine months.

Proton Pump Inhibitor (PPI) and Non-Steroidal Anti-Inflammatory Drug (NSAID) Intrahospital Use Associated with Longer Hospital Stay in Inflammatory Bowel Disease Patients

*Irēna Mirzajanova*¹; Prof. *Juris Pokrotnieks*²;
Prof. *Santa Purviņa*³

¹ Rīga Stradiņš University, Doctoral study program Pharmacy, Latvia;

² Rīga Stradiņš University, Faculty of Medicine, Department of Internal Diseases, Latvia;

³ Rīga Stradiņš University, Faculty of Pharmacy, Department of Pharmacology, Latvia

Objectives

To investigate concomitantly used medication impact on length of hospital stay in inflammatory bowel disease (IBD) patients.

Methods

Data from 84 IBD related admissions to Pauls Stradiņš Clinical University Hospital (PSCUH) Gastroenterology department in 2015 medical case histories were obtained and examined in retrospective cross-sectional study using IBM SPSS Statistics 23.0. and MS Excel 2018.

Results

47 cases of Crohn's disease (CD) and 33 cases of ulcerative colitis (UC) related hospitalisations were registered in 2015 in PSCUH. In CD, 51% were male and 38% were hospitalised urgently. Duration of hospitalisation was highly dependent on the type of hospital admission; median hospital stay in planned admission was 2.0 (Q1; Q3 2.0–4.5) vs 7.0 days (Q1; Q3 4.8–10.5) in urgent admission. In UC 45% of patients were male, 21% were hospitalised urgently. Intrahospital NSAID use was associated with longer median hospital stay 5.0 days (Q1, Q3; 2.0–9.0) vs 7.5 (Q1, Q3; 6.3–10.3) compared to those who were not using NSAIDs ($p = 0.011$). Similar association was found for methylprednisolone intrahospital use: 4 (Q1, Q3; 2.0–7.5) vs 8 days (Q1, Q3; 3.0–15.0), $p = 0.002$, and for PPI use 4 (Q1, Q3; 2.0–8.0) vs 7 (Q1, Q3; 5.0–12.0), $p < 0.0001$. 56% of patients complaining about pain and 66% of patients with registered fever did not receive any pain relieving therapy and had statistically longer duration of hospitalisation ($p = 0.026$ and $p = 0.002$ respectively).

Conclusions

1. PPI and NSAID intrahospital use was associated with longer hospital stay in IBD patients.
2. Only part of the patients with registered pain and/or fever received analgesic and antipyretic therapy.

Challenges for Commercialisation of Biotechnologies

Diāna Arāja

Rīga Stradiņš University, Department of Dosage Form Technology, Latvia

Objectives

The smart specialisation strategy for Latvia, which was developed to concentrate public the Research and Development (R&D) investment in programs that create future domestic capability and interregional comparative advantage, has defined the bio-pharmacy and biotechnologies as one of the knowledge specialisation areas. Simultaneously, the new Declaration on the Intended Activities of the Cabinet of Ministers of Latvia has emphasized that the cooperation between entrepreneurs and scientific institutions, the commercialisation of research results and their influence on the development of national economy, as well as the strengthening role of universities in this process should be encouraged. In these circumstances the commercialisation of biotechnologies and products of bio-pharmacy become topical. This research is dedicated to identification of the potential challenges for commercialisation of biotechnologies and product of bio-pharmacy.

Methods

To achieve the objectives of this research, the methods of theoretical research (scientific literature review and policy planning documents analysis) and empirical research are used.

Results

The commercialisation of university research has discussed in several scientific papers, and there are some considerations that this approach can provide a negative impact on the research environment, premature implementation of research results, loss of public trust in the university research enterprise, research policy confusion and damage to the long-term contributions of university research. At the same time, it should be considered that the financial contribution to scientific research must be able to provide the return on investment. In field of biotechnology there are some additional challenges, as biotechnology is defined as a technological application that makes use of biological systems, living organisms and its components to create products and other technological systems with the aim of advancing the human condition.

Conclusions

The industrial commercialisation of the biotechnology and products of bio-pharmacy is faced to specific challenges, as these medical technologies and products mostly refer to personalised approach of medicine.

Regulatory Issues and Relative Effectiveness of Borderline Herbal Products

Diāna Arāja

Rīga Stradiņš University, Department of Dosage Form Technology, Latvia

Objectives

Herbal products are widely used in different ways: in medicine (allopathic, traditional and complementary/alternative medicine), as dietary, food supplements, cosmetics and biocides. Each of these categories has the special regulation in European Union. The objectives of this research are to investigate the different approaches and levels of regulation on herbal products and opportunities to assess the relative effectiveness of borderline herbal products.

Methods

To achieve the objectives of this research, the methods of theoretical research (scientific literature review and regulatory documents analysis) and empirical research are used.

Results

Herbal medicinal products are covered by pharmaceutical legislation, which classifies as traditional herbal medicinal products those herbal medicinal products that have been used for at least 30 years, including at least 15 years within the European Union, and the simplified registration procedure is adopted for this group of medicinal products. The simplified procedure allows the registration of traditional herbal medicinal products without requiring some tests and clinical trials, which are mandatory under the full marketing authorisation procedure. However, the access of herbal products used in Eastern Traditional medicines, as the medicinal products in European Union, is limited due to wide variety of components out of scope of the traditional use in Europe. In these circumstances a lot of potential herbal medicinal products are placed on the market as a dietary or food supplements. At the same time, the herbals for external use are covered by cosmetic and biocides regulations, depends on antibacterial activities of ingredients. These categories of products currently are not completely acceptable for treatment process.

Conclusions

The wide dispersion of the borderline herbal products marketing authorisation forms reduces the herbal products role in health promotion. Therefore, the comparative studies of the relative effectiveness of borderline herbal products should be performed to improve the availability of qualitative and safe natural products for human health.

Extreme Hemodilution during Cardiopulmonary Bypass Effect on Neurocognitive Function in Patient after Cardiac Surgery

Dr. Arnija Reihmane¹; Dr. Roberts Leibuss²

¹ *University of Latvia;*

² *Rīga Stradiņš University, Latvia;*

*Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology,
Department of Cardiac Surgery, Anaesthesiology and Intensive Care Unit, Latvia*

Introduction

Despite the development of cardiopulmonary bypass (CPB) technologies, brain damage is still a notable problem after cardiac surgery. Improvements of CPB are studied to prevent neurocognitive dysfunction. We describe a patient undergoing a cardiac surgery where a new filter is used and extreme hemodilution is reduced to prevent the development of neurocognitive dysfunction.

Case description

A 42-year-old female (158 cm, 57 kg) scheduled for mitral valve plasty. Preoperatively, Hb - 103 g/L, other laboratory parameters were normal. Patients neurocognitive function was tested using MOCA and MMSE tests: 24 points and 27 points. Cardiac surgery was under general anaesthesia, pulsatile normothermic CPB included a new dual-chamber oxygenator with lipids and leukocytes reduction. The pump was primed with crystalloid, after cardioplegia same volume was ultrafiltrated. No adverse events were observed during the anaesthesia. Postoperatively Hb - 91 g/L, leukocytes - $13.7 \times 10^9/L$. 28 h postoperatively MOCA test - 22 points; MMSE - 26 points.

Discussion

Pathogenesis of cerebral damage include leukocyte activation, glycocalyx damage, lipid micro-embolization, extreme hemodilution. Neuroprotective methods such as transcranial doppler-ultrasonography; neuromonitoring with INVOS, electroencephalogram are done during surgery to evaluate these risk factors. In order to minimize hemodilution, ultrafiltration and erythrocyte transfusion are done. The cardiotomy reservoir is designed to remove approximately half of the leukocytes from the blood aspirated and the lipid particles by filtering multilayers. Analysing patients neurocognitive status, a slight reduction of her abilities is observed postoperatively, therefore further studies must be done.

Initial Experience of Therapeutical Use of Yellow Pattern Micropulse Laser in Latvia

*Liene Muceniece*¹; *Dr. Dace Markevica*^{1,2}; *Kristine Leimane*²

¹ *Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia;*

³ *Eye Health Centre, Latvia*

Objectives

Sub-threshold micropulse laser is a new treatment option for various macular diseases. It affects deeper retina layers and reduce the retinal scarring. This study aims to estimate the early efficacy of sub-threshold laser therapeutical use for different macular disease patients in Latvia.

Methods

A retrospective study was designed in Eye Health Centre (Riga, Latvia). Treatment with yellow sub-threshold laser (577 nm) was performed for 25 eyes from February 2017 till April 2018. This was used for patients with diabetic macular oedema, retinal oedema after retinal vein thrombosis, central serous chorioretinopathy and age related macular degeneration. For each patient on first, 3rd, 6th and 9th month visit were registered: best corrected visual acuity, intraocular pressure, macular thickness and macular volume (registered with spectral domain-optical coherence tomography). Statistic analysis was performed by IBM SPSS Statistics 22.0.

Results

After 9 months of treatment negative effect have been only to two eyes. There is no significant difference between central macular thickness before and after therapy ($p = 0.16$). It is a noticeable reduce of outer macular thickness, but there is no significant difference ($p = 0.075$). After micropulse therapy intraocular pressure minimally reduces ($p = 0.036$). Therapy have a medium effect on reduce of central macular thickness (Cohen's $d = 0.59$) and a small effect on visual acuity improve ($d = 0.13$).

Conclusions

After 9 months of yellow (577 nm) micropulse laser therapy there is a little effect on macular thickness reduce. As well noticeable minimal eye pressure reduce.

Prevalence and Manifestation of Diabetic Retinopathy in Type 2 Diabetes Patients

Sintija Pilāne

Rīga Stradiņš University, Department of Ophthalmology, Latvia

Keywords: diabetic retinopathy, prevalence, manifestation.

Objectives

The aim of the study was to determine the prevalence and manifestation of diabetic retinopathy in type 2 of diabetes patients.

Methods

A retrospective study by analysis of patient medical histories in MFD Outpatient Hospital "Dziedniecība" in year 2018.

Results

From 50 patients, 32 (64%) were woman and 18 (36%) were men. Median patient age was 65 years. The youngest patient was 43 years old, the older patient was 74 years old. There were 4 (8%) – 2 men and 2 woman insulin-dependant patients and 46 (92%) – 30 woman and 16 men – non insulin-dependant patients. 25 (50%) patients had 1–5 years duration of diabetes, 15 (30%) patients had 5–10 duration of diabetes, 10 (20%) patients had 10–15 duration of diabetes. 27 (54%) patients – 20 woman and 7 men – had the second stage of moderate nonproliferative retinopathy. In fundoscopy they had a few microaneurysms and some hard exudates in 2 quadrants of fundus. 19 patients (38%) – 10 woman and 9 men – had the third stage of severe nonproliferative retinopathy. In fundoscopy they had lot of hard exudates and cotton wool spots in each quadrant of fundus and about 13–19 of microaneurysms in each quadrant and prominent intraretinal microvascularisation abnormalities in 1 quadrant of fundus. There were 8 patients (16%) – 5 woman and 3 men – with focal exudative maculopathy. In fundus there were microaneurysms and well circumscribed macular edema and hard exudates. 4 patients (8%) 2 woman and 2 men – had the fourth stage of proliferative diabetic retinopathy. In fundus there were peripheral new wessels and preretinal hemorrhages.

Conclusions

Diabetic retinopathy the most common is in woman than in men. The most of patients had moderate nonproliferative retinopathy. Regular visits to the ophtalmologist could help to diagnostic diabetic retinopathy in early stages.

Clinical, Dermatoscopic and Histopathological Correlation of Atypical Actinic Keratoses

*Dr. Alise Balcere*¹; *Raimonds Karls*¹; *PhD Māris Sperga*¹;
*PhD Māra Rone-Kupfere*¹; *Prof. Ingrida Čēma*²;
*Prof. Ludmila Vīksna*¹; *Prof. Angelika Krūmiņa*¹

¹ *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;*

² *Rīga Stradiņš University, Department of Oral Medicine, Latvia*

Objectives

We sought to clinically and dermatoscopically examine actinic keratosis (AK) patients to assess the presence of atypical AKs, and to describe their dermatoscopic and histopathological differences.

Methods

Elderly patients with multiple actinic keratoses on facial skin were examined by a board-certified dermatologist. If a clinically or dermatoscopically atypical lesion was diagnosed, a digital dermatoscopy and a 4 mm punch biopsy was performed. Dermatoscopically structures apart from “strawberry pattern”, white scales and superficial keratin were considered atypical. Histologically the severity of AK was classified in three grades as suggested by Rówert-Huber et al., 2007. Statistical analyses were performed using IBM SPSS 20.0. Association between either clinical or dermatoscopic atypia and histological severity was assessed with Mann–Whitney U test.

Results

In total 15 patients were examined. In 10 patients 11 clinically and / or dermatoscopically different lesions were detected. Patients' age ranged from 70 to 87 years and lesion count from 8 to 45 lesions. In clinically atypical lesions (n = 8) main clinical signs that marked the selected lesions were greater size (n = 4), more intense erythema (n = 4) and increased keratosis (n = 4). In half of these lesions additional atypical dermatoscopic features were present. In dermatoscopically selected cases hairpin vessels (n = 2), superficial erosions (n = 2) and white homogenous areas (n = 1) were present. Histopathological examination was consistent with AK in all cases. From clinically atypical lesions 2 were Grade I, 4 were Grade II and 2 were Grade III, while from dermatoscopically atypical lesions 3 were Grade II and 4 were Grade III. This difference of distribution with higher histological grade in dermatoscopically atypical lesions was statistically significant (U = 3.0, p = 0.03, Mann–Whitney U test).

Conclusions

This study shows that often a single clinically and / or dermatoscopically different lesion can be found in a field of actinic keratoses. In addition, dermatoscopically seen structures can aid in identifying morphologically more dysplastic lesions.

Administration of Narrow-Band (311 nm) UVB Phototherapy as Choice Treatment Method for Plaque-Type Psoriasis

Prof. *Iona Hartmane*; Prof. *Ingmārs Mikažāns*;
Dr. med. *Iveta Ivdrā*; Dr. med. *Andra Dērvēnece*

Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia

Objectives

Psoriasis still remain relevant medical and social problem. It is very important to get substantial experience on pathogenically based, safe and effective treatment methods of psoriasis which considerably extent the remission of disease, and improve quality of life for patients having plaque type psoriasis.

Psoriasis is characterized by hyperproliferation of epidermis, disturbances of differentiation of keratinocytes and inflammation in the dermis. UVB phototherapy induces local immunosuppression in psoriatic skin, inhibits mitotic activity of T cells, and promotes production of immunosuppressive and anti-inflammatory cytokines.

Methods

Narrow-band (311 nm) UVB phototherapy (Nb-UVB) has been recommended for treatment of psoriasis in cases when topical (e.g., corticosteroids, tar preparations) and systemic treatments (e.g., methotrexate, cyclosporine, acitretin) don't provide stable clinical efficacy, cause side effects and bad tolerability.

To minimize side effects and improve the clinical outcomes, combined regimens including phototherapy, partculary, Nb-UVB, are administrated.

Results

The most often used combinations with Nb-UVB are:

- 1) topical treatment;
- 2) balneotherapy;
- 3) systemic medications, including biologics.

Nb-UVB as method of choice is used in cases of:

- 1) comorbidities;
- 2) pregnancy and lactation;
- 3) pediatric population.

Conclusions

1. According to literature data, Nb-UVB demonstrates high efficacy, good tolerability, no severe side effects and restrictions for use, in comparison with conventional systemic therapy of plaque-type psoriasis.
2. Combinations with Nb-UVB provide rapid clinical improvement, in comparison with Nb-UVB as monotherapy for plaque-type psoriasis.
3. Combinations with Nb-UVB are especially recommended to avoid loss of efficacy, adverse effects, and cumulative or acute toxicity.

Corneal Thickness and Infiltrate Change for Treated Keratitis

Liene Muceniece¹; Dr. med. Guna Laganovska²

¹*Rīga Stradiņš University, Latvia;*

²*Rīga Stradiņš University, Department of Ophthalmology, Latvia*

Objectives

Patients with keratitis are characterised by corneal stroma infiltration with inflammatory cells and corneal edema. This study aims to evaluate corneal thickness (CT) variation in the central and inflamed areas under active broad spectrum antibiotic therapy.

Methods

A prospective study was designed at Pauls Stradiņš Clinical University Hospital (Riga, Latvia). Patients with clinically suspected bacterial keratitis were examined with Anterior segment Optical Coherence Tomography (AS-OCT) on presentation day (day 0) and days 3, 7 and 14 of treatment. Statistic analysis was performed by IBM SPSS Statistics 22.0.

Results

13 eyes were enrolled in this research. At the presenting day mean [SD] central CT was 745.25 [150] μm which significantly reduced to 663.75 [97] μm at the day 3 ($p = 0.04$). Compared to day 0 CT reduce to 617.0 [87] μm after 14 days ($p = 0.026$). The largest CT in the infiltrated area was on presentation day – 678.0 [146] μm , but decreased to 561.83 [119] μm on day 14. Progressive infiltrated CT reduce is on day 3 to 622.5 [134] μm and day 7 to 576.08 [131] μm , but it is not statistically different ($p > 0.05$). Infiltrate depth is 45 (± 1)% of all CT in infiltrated area all the treatment time.

Conclusions

1. Resolving corneal edema is noticeable not only in the inflamed cornea area but as well in the centre.
2. Corneal edema decrease rapidly during the early phase of treatment.
3. Infiltrate thickness kept the same level of cornea during the 14 days of treatment.
4. AS-OCT is a good objective method to follow how corneal edema resolves.

Comparative Evaluation of Filtering Bleb Ultrastructure Using Anterior Segment Optical Coherence Tomography

Dr. Oskars Gertners; Dr. med. Guna Laganovska

*Rīga Stradiņš University, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia;*

Objectives

The aim was to evaluate filtering bleb ultrastructure using anterior segment optical coherence tomography after two trabeculectomy techniques: traditional trabeculectomy versus trabeculectomy with addition of viscoelastic material.

Methods

A total of 22 patients were included in this study (11 study and 11 control).

Results

Mean ages were 67.5 years (study; SD 8.0) and 71.2 (control; SD 9.7) ($p = 0.12$). Mean preoperative IOP was 32.9 mmHg (study; SD 5.0) and 30.5 mmHg (control; SD 4.7) ($p = 0.125$). Mean topical medication count was 2.8 (study; SD 0.6) and 2.5 (control; SD 0.7) ($p = 0.14$). Mean postoperative IOP was 14.0 mmHg (study; SD 4.1) and 14.6 mmHg (control; SD 4.3) ($p = 0.34$). Mean postoperative topical medication count was 0.6 (study; SD 0.8) and 1.4 (control; SD 1.1) ($p = 0.04$). Mean filtering bleb height was 481 μm (study; SD 334) and 379 μm (control; SD 255) ($p = 0.17$); horizontal width 3820 μm (study; SD 1607) and 3520 (control; SD 1465) ($p = 0.32$); vertical width 3560 μm (study; SD 1341) and 3191 μm (control; SD 1522) ($p = 0.20$). Filtering blebs were classified into four categories from their ultrastructure appearance: diffuse filtering (6 – study; 5 – control), multicyclic (3 – study; 0 – control), flat (2 – study; 3 – control) and encapsulated (0 – study; 3 – control).

Conclusions

Trabeculectomy is an effective surgical treatment method for IOP lowering both in study and control groups. In the study group postoperative use of topical IOP lowering medication was less often necessary compared to control group. There was statistically no significant difference in filtering bleb height and width in both groups. In the study group filtering blebs more commonly had formed into diffuse filtering and multicyclic (9 in total) compared to control group (5 in total) and none of filtering blebs were encapsulated in the study group compared to control group (3 in total).

Dermatoscopic Description of Non-Infectious Balanitis

*Dr. Aleksejs Zavorins*¹; Prof. *Jānis Kīsis*¹;
*Dr. med. Jūlija G. Voicēvska*²

¹ *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;*

² *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

Objectives

Nearly half of all recurrent balanitis are of non-infectious etiology such as psoriasis, lichen sclerosus and lichen planus. Clinical features can be non-specific. Therefore, according to the European guidelines biopsy of glans penis is recommended in unclear cases. Patients are often reluctant to undergo an invasive procedure (Edwards, 2014). Dermatoscopy is a non-invasive, visual diagnostic procedure that is commonly performed by dermatologists to aid in the diagnosis of pigmented and non-pigmented cutaneous lesions, as well as inflammatory skin diseases (Errichetti, 2016, Waskiel, 2018). The objective of this study is to describe dermatoscopic features of several recurrent non-infectious balanitis.

Methods

Approval of Ethics Committee of Rīga Stradiņš University (Nr. 6-3/82 29.11.2018.) was acquired. Five patients with non-specific clinical features of recurrent balanitis (irritation, erythema and papular lesions) have been enrolled in the study. Infectious causes have been excluded in all patients. Dermatoscopy with Dermlite DL4 (10× magnification) equipment has been performed by a certified dermatologist. Dermatoscopic features of each case have been noted. Three mm punch biopsy of the glans penis lesions was performed to obtain a histopathological diagnosis.

Results

According to the histopathological report two patients had been diagnosed with psoriatic balanitis, two patients had lichen sclerosus and one patient had non-specific balanitis. Most characteristic dermatoscopic features of psoriatic balanitis were well-defined margins, regularly distributed dotted and coiled blood vessels and white lines on an erythematous background. Non-specific balanitis was dermatoscopically characterized by linear, slightly branched vessels on an erythematous background. Dermatoscopic features of lichen sclerosus included structureless white areas and grouped dotted vessels.

Conclusions

Dermatoscopy could potentially be used to aid in the diagnostics of non-infectious balanitis. However, larger scale studies are warranted to evaluate the diagnostic precision.

Human-Animal Interaction as Research Subject

Marika Lotko

Rīga Stradiņš University, Department of Welfare and Social Work, Latvia

Objectives

Human-animal interaction (HAI) as research emerged in the 21st century. It focuses on creation of human-animal bond and peculiarities of those relationships. HAI includes various aspects: involvement of animals in the treatment process, issues of animal rights, differences of lifestyle associated with the use of animals as food. In social work and other helping professions it is observed that in social and medical rehabilitation to achieve its goals more often different animal species are involved. This movement developed with the appearance of publications which present positive outcomes from HAI.

In order to understand complex relationships of human-animal, it is necessary to analyze the theoretical concepts that explain and describe HAI and formation of bond.

Methods

Using the hermeneutic method, the aspects of HAI are studied within different disciplines (sociology, philosophy, anthropology, psychology). Each of these disciplines offers different theories and concepts on how to explain HAI.

Results

Literature analysis shows that in sociology one of the most frequently mentioned concepts to explain HAI refers to the social construction of reality, characterized by sociologists P. L. Berger and T. Luckmann. It focuses on raising awareness of how animals are socially constructed by humans, for what purposes animals are used, under what conditions and what kind of relationships humans form with animals.

Such theories as social support theory, role theory, socialization theory, characterize the animal's supportive functions, importance of human interaction with animals.

Conclusions

People and animals have interacted with each other since humanity has existed, but understanding of this interaction has changed and transformed over the centuries. People use animals not only in food and clothing industries, they also integrate animals into their daily activities: animals as work force in agriculture, pets in household who provide moral and social support, animals integration into professional practice to promote social and medical rehabilitation goals.

Testing Efficacy of Phototherapeutic Device FertereX for Improving the Semen Quality

*Baiba Alksere*¹; *Maris Belte*²; *Evija Pimane*¹;
*Dr. Violeta Fodina*¹; *Ph.D. Juris Erenpreiss*²

¹ *Clinic IVF Rīga, Latvia;*

² *SIA FertereX, Latvia;*

³ *Rīga Stradiņš University, Andrology Laboratory, Latvia*

Objectives

Low intensity laser or LED light phototherapy has been widely used in treatment of different diseases. Photo-stimulation has a positive effect on enzymes involved in “breathing chain” of cells, promotes biosynthesis of ATP. A few available studies indicate the positive effect on transcutaneous application of phototherapy on testicles improving semen quality and plasma testosterone levels. The objective of this preliminary prospective study is to evaluate an impact of phototherapy (applied on scrotum) on semen quality, and plasma levels of hormones either produced in testicles (testosterone) or reflecting the quantity and quality of spermatogenesis (FSH).

Methods

8–10 volunteers will be included into this preliminary study, and they will be subjected to 10 sessions of the phototherapy once a week. Phototherapy will be conducted by the SIA FertereX device “FertereX” which contains 6 infrared LED sources designed to be applied on scrotum, and one additional LED source for the projection place of the prostate on perineum. LED wave length is 850 nm, capacity 50 mW, angle of light 50%. A device is programmed for 10 minutes session ensuring 360 J power impact on scrotum with the capacity density of 10–12 J/cm.

Study subjects will deliver a semen sample for semen analysis, and a blood sample for testing the levels of Testosterone and FSH before the initiation of the treatment, and then monthly up to 3 months of the treatment.

Results

This is a prospective preliminary study that has been just commenced. Results will be presented during the conference.

Conclusions

It is anticipated to be able to come to the preliminary conclusion whether LED phototherapy has a positive effect on semen quality, and levels of testosterone and FSH in men. In case of positive impact of the aforementioned therapy a larger study will be planned to confirm the results that could allow to advocate introducing such a therapy in treatment of male infertility. If no positive impact will be observed, it will be considered to change the LED phototherapy for the low intensity laser therapy.

Assessment of Rotational Thromboelastometry and Standard Coagulation Profile in Predicting Thrombosis in Microvascular Flap Surgery

Dr. Karina Drizlionoka^{1,2}; *Dr. Jevgenijs Stepanovs*¹; *Agnese Ozolina*³;
*Dr. med. Liene Nikitina-Zake*⁴; Prof. *Biruta Mamaja*^{1,3}

¹ *Rīga East University Hospital, Department of Anaesthesiology, Latvia;*

² *Rīga Stradiņš University, Division of doctoral studies, Latvia*

³ *Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia;*

⁴ *Latvian Biomedical Research and Study Centre*

Objectives

Thrombosis process a central role in microvascular flap failure advancement. Recent trauma, malignancies, and chronic inflammation possess additional milieu for thrombosis. Identification patients who are at risk to develop flap thrombosis in reconstructive surgery are crucial. We aimed to assess the diagnostic value of standard coagulation profile and thromboelastography in predicting flap thrombosis.

Methods

We collected data of 105 patients underwent microvascular flap surgery in the Latvian Centre of Plastic and Reconstructive Microsurgery, period 2016–2018. We analysed plasma fibrinogen concentration (Clauss, g/L); prothrombin activity (Owren, %); activated partial thromboplastin time (APTT, s); platelet count (Plt 10e9/L). Thromboelastography (ROTEM) was performed for clotting time (CT) (s), clot formation time (CFT) (s) and maximal clot firmness (MCF) (mm) in Intem and Extem; maximal clot firmness (mm) in Fibtem assay.

Results

We found correlation between flap thrombosis and prothrombin activity ($r = 0.218$; $p = 0.032$), mean value for prothrombin activity in thrombosis group was $101.88 (\pm 19.58 \text{ SD}; \text{CI } 95\%, 92.91\text{--}109.70)$ vs. $94.11 (\pm 19.46 \text{ SD}; \text{CI } 95\%, 92.91\text{--}109.70)$ in non-thrombosis group. In thromboelastometry we observed increased MCF Fibtem values in thrombosis group $30.12 (\pm 15.94)$ vs. $23.40 (\pm 10.58)$ in non-thrombosis group, $p = 0.031$. We found no significant difference in plasma fibrinogen concentration in thrombosis and non-thrombosis group $(4.24 (1.66, \pm \text{SD})$ vs. $4.38 (1.08, \pm \text{SD})$, $p = 0.716$) as well as platelet count did not differ in both groups $(322.93 (117.52, \pm \text{SD})$ vs. $349.40 (172.61, \pm \text{SD})$, $p = 0.0401$).

Conclusions

Prothrombin activity and maximum clot firmness in Fibtem assay might be used as a parameter to predict thrombotic complication in microvascular flap surgery.

Visual Acuity Association with Type of Diabetic Retinopathy in Patients with Type 1 Diabetes Mellitus

*Dr. Lelde Ullase*¹; *Dr. med. Kristīne Ducena*²; *Dr. Dace Markevica*¹;
*Dr. med. Guna Laganovska*³; *Kristiāna Čačka*⁴

¹ *Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia;*

² *University of Latvia, Medical Postgraduate Education Institute;*

³ *Pauls Stradiņš Clinical University Hospital, Latvia;*

Rīga Stradiņš University, Department of Ophthalmology, Latvia;

⁴ *Rīga Stradiņš University, Faculty of Medicine, Latvia*

Objectives

Diabetic retinopathy affects about 86% of type 1 diabetes mellitus patients (Ning Cheung et al., 2010). Visual acuity (V) changes are often the first symptom of diabetic retinopathy development. The aim of the study was to find any association of V in patients with proliferative diabetic retinopathy (PDR), non-proliferative diabetic retinopathy (NPDR) and patients without diabetic retinopathy (WDR).

Methods

The retrospective study was held at Pauls Stradiņš Clinical University Hospital (Riga, Latvia) from January 2016 till March 2018. A total of 60 (120 eyes) medical records from patients with type 1 diabetes mellitus were observed. IBM SPSS Statistics version 25.0 was used to process data. The Kruskal-Wallis H test was used to compare groups.

Results

Out of the 60 patients included in this study, 48.3% (n = 29) were with PDR, 26.6% (n = 16) with NPDR and 25% (n = 15) WDR patients. In PDR group mean V was 0.40 ± 0.35 and 0.47 ± 0.37 diopters for right and left eye. While in NPDR group mean V was 0.47 ± 0.36 and 0.59 ± 0.44 diopters for right and left eye. Comparing groups of PDR and NPDR no significant association with V was found (PMV > 0.05). As to WDR group mean V was 0.83 ± 0.27 and 0.83 ± 0.26 dioptres for right and left eye. Comparing three groups: both groups with DR and group without DR V in patients without DR is significantly higher in both eyes: 0.83 ± 0.27 diopters. The difference we got it statistically significant (PKV = 1.65×10^{-3} for right eye and 1.68×10^{-2} left eye).

Conclusions

The findings of the study show that there is no statistically significant difference in visual acuity comparing groups with any kind of diabetic retinopathy – both groups have likewise deteriorated visual acuity. Visual acuity is much higher in group without diabetic retinopathy comparing with both groups of any kind of diabetic retinopathy.

Effects of Pre-Analytical Conditions on Mannan-Binding Lectin Pathway Activity in Healthy Donors

*Dr. Baiba Šlisere*¹; *Jeļena Serova*¹;
*Dr. Dagnija Straupmane*¹; *Dr. med. Aigars Reinis*²

¹ *Pauls Stradiņš Clinical University Hospital, Joint Laboratory, Latvia;*

² *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia*

Objectives

Complement mannan-binding lectin (MBL) pathway is one of three forms of complement activation. Like complement classical and alternative pathways, MBL pathway is prone to spontaneous activation in vitro. Our goal was to evaluate influences of different pre-analytical conditions on MBL pathway functional activity.

Methods

Serum samples from 21 healthy blood donors were analysed. MBL pathway activity was determined with ELISA kit Wieslab Complement system MBL pathway (Eurodiagnostica, Sweden. Reference range $\geq 10\%$). Blood samples after collection were left to clot for 60 minutes, then centrifuged at $1300 \times g$ for 15 minutes. All samples were analysed immediately after collection. Two hours after collection from 11 samples were made 2 aliquotes – one stored at $-20\text{ }^{\circ}\text{C}$ and one – at $-70\text{ }^{\circ}\text{C}$. Five hours after collection third aliquote was made and stored at $-70\text{ }^{\circ}\text{C}$. All three aliquotes were repeated after one day. 10 serum samples were stored at $2-8\text{ }^{\circ}\text{C}$ and repeated after one day. Bias was calculated as a deviation in percentage from the first result.

Results

Average MBL pathway activity was 65%. Of 21 samples 19% ($n = 4$) had results $< 10\%$. Mean bias after storage at $2-8\text{ }^{\circ}\text{C}$ was -20% . One sample became negative – activity decreased from 18.9% to 5.1%. Mean bias for aliquotes made after 2 hours and stored at $-20\text{ }^{\circ}\text{C}$ and $-70\text{ }^{\circ}\text{C}$ was -19% and -24% , respectively. Mean bias for aliquotes made after 5 hours and stored at $-70\text{ }^{\circ}\text{C}$ was -32% .

Conclusions

Mannan-binding lectin pathway activity decreases rapidly in-vitro in the first hours after sample collection. For short-term storage it is acceptable to store samples at $2-8\text{ }^{\circ}\text{C}$ or $-20\text{ }^{\circ}\text{C}$. Negative samples, if not analysed immediately after collection, should be confirmed in a new sample.

Microvascular Reactivity in Psoriatic Plaque and Normal Skin

*Ph.D. Indra Miķelsone*¹; Prof. *Ilona Hartmane*²;
*Ph.D. Artūrs Paparde*¹; *Ph.D. Antra Jurka*¹;
*Dr. Ilze Barone*¹; *Ph.D. Gita Gersona*¹; *Dr. Matīss Mežāls*¹;
*Mārīte Cīrse*¹; Prof. *Pēteris Trejākovs*¹

¹ Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia;

² Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia

Objectives

Plaque psoriasis is a chronic inflammatory, immune-mediated skin disease with a multifactorial etiopathogenesis, which may cause significant deterioration in the quality of life. The aim of this study was to explore local blood flow in psoriatic plaques and normal skin before and after provocations known to alter cutaneous vascular resistance.

Methods

Cutaneous blood flow was recorded in 14 patients over plaque skin and clinically normal skin at least 5 cm away from the nearest plaque on the forearm between the elbow and the palm. 20 healthy subjects were selected as controls. The study groups were matched by age, sex, and body mass index. Blood flow in psoriatic (PS) and normal (NS) skin was measured by single-channel Laser Doppler blood flowmeter (Blood Flowmeter, ADInstruments Ltd., Oxford, UK). Theoretically, the LD flow (LDF) is determined by the product of the number of red blood cells moving in a sample volume of tissue and the average velocity of red blood cells. We used LDF arterial occlusion test: a sphygmomanometer cuff was placed above the elbow and inflated to 40 mmHg above systolic pressure for 2 min, followed by a sudden deflation. Post-occlusive reactive hyperaemia was assessed on the plaque and non-plaque site. We calculated basal (b)-LDF and the maximum of LDF after occlusion. Two independent sample tests (Student's t-test) were used for comparing the groups. Significance level was $p < 0.05$.

Results

In patients, b-LDF was significantly higher in psoriatic skin compared to non-psoriatic skin and significantly higher than in the controls. However, microvascular reactivity was significantly decreased in the plaque sites.

Conclusions

The results suggest that reduced microvascular resistance is associated with a significant increase in the blood flow in the psoriatic plaques and, at the same time, with significantly reduced vasomotor reactivity (including endothelium-dependent vasodilatation).

Results of Kidney Transplantation from Living Donors

Dr. med. Ieva Ziedina^{1,2,4}; *Dr. Klīnta Gritane*¹; *Reinis Lulle*¹; *Evita Skrula*¹;
Dr. med. Aleksandrs Malcevs^{1,3,4}; *Dr. med. Vadims Suhorukovs*^{1,3,4};
Dr. Diana Amerika^{1,4}; *Dr. med. Janis Jusinskis*^{1,3,4}

¹ Rīga Stradiņš University, Scientific Laboratory of Transplantology, Latvia;

² Rīga Stradiņš University, Department of Internal Diseases, Latvia;

³ Rīga Stradiņš University, Department of Surgery, Latvia;

⁴ Pauls Stradiņš Clinical University Hospital, Latvian Transplantation Center, Latvia

Objectives

Kidney transplantation is not only quality of life improving but also life saving procedure. The aim of a study was to review the results of kidney transplantation from living donors in Latvia.

Methods

All consecutive recipients who received kidney transplant from living donor in Latvian Transplantation Centre between 2000–2017 were included in the study. The function of kidney graft was expressed as glomerular filtration rate (GFR) and estimated by MDRD-4 equation. Graft and patient survival was calculated by Kaplan–Meier survival analysis.

Results

In total 65 recipients (38 men and 27 women) received kidney transplants from living donors. The recipients' mean age was 34.3 years (range 8–72). Blood group distribution among them was following: 0 – 52% (n = 34), A – 28% (n = 18), B – 17% (n = 11) and AB – 3% (n = 2). Seven patients received ABO incompatible transplants and all of them have functioning transplants in 2018. 91% (n = 59) of all patients had immediate graft function, 7.5% (n = 5) had delayed graft function and 1.5% (n = 1) had primary nonfunctioning graft due to thrombosis. The acute rejection rate was 29% (n = 18). The GFR 45 ml/min/1.73 m² or more after a year was for 82% of transplants, after 2 years – for 76% of transplants and after 3 years – for 77% of transplants. The graft survival was following: 1-year – 94%, 2-years – 91% and 3-years – 90%, but the patient survival was stable for 1-, 2- and 3-years – 98.5%. Only one patient died during this period due to severe aspegillosis.

Conclusions

A kidney transplantation program from living donors in Latvia was developed in this millenium. The program includes blood group identical, compatible and incompatible transplants. The majority of recipients have good functioning grafts and mortality was very low in this kind of transplantation.

Efficacy of Epidural Injections with or without Platelet Rich Plasma in Treatment of Patients with Lumbal Back Pain

*Agnese Ozoliņa¹; Undīne Zeltiņa²; Dr. Juris Stīpiņš³;
Dr. Kaspars Ruks³; Dr. Artis Gulbis³; Evija Skaba³; Inta Siliņa³*

¹Rīga Stradiņš University, Department of Anesthesiology and Intensive Care, Latvia;

²Rīga Stradiņš University, Latvia;

³ORTO Clinic, Latvia

Objectives

Low back pain is a major health issue limiting of life quality. There has been a widespread use of epidural injections (EI) with steroids. platelet-rich plasma (PRP) is a novel therapeutic tool. The aim of the study was to evaluate efficacy after EI with or without PRP in lumbal back pain patients.

Methods

The prospective study included 17 patients in PRP + EI group and 15 patients in EI group. PRP + EI group received 80 mg of Depomedroli, 5 mg of Bupivacaini in epidural space of lumbal part, and afterwards 8 ml of autologous PRP on facet joints. EI group received only EI. All patients received the second EI in 2 weeks. Evaluation included VAS (Visual Analogue Scale) and overall improvement by Modified Oswestry Disability Questionnaire: before treatment, after 2 weeks, after 3 months.

Results

Overall, 32 patients were analysed. At the baseline in PRP + EI group compared to EI group VAS score was 5 ± 2 vs. 6 ± 2 ; $p = 0.3$, duration of pain 38 vs. 28 months, $p = 0.9$, age 61 ± 15 vs. 48 ± 17 ; $p = 0.03$. In PRP + EI group 7 patients had disc protrusion or herniation, 8 had spinal stenosis. In EI group, 11 patients had disc protrusion or herniation, 4 had spinal stenosis. After 2 weeks in PRP + EI group the clinical improvement was by 52% (VAS from 5 to 2.7; $p = 0.004$) and by 48% (VAS from 6 to 3.4; $p = 0.002$) in EI group. After 3 months in PRP + EI group by 64% (VAS from 5 to 2; $p = 0.006$) vs. 36% (VAS from 6 to 4; $p = 0.03$) in EI group. Stronger correlation was in PRP + EI group between VAS and clinical improvement after 3 months compared to EI group, $r = 0.9$ vs. $r = 0.8$; $p < 0.0001$. Back stiffness decreased 40% vs. 12%, night pain 58% vs. 45%, tingling 42% vs. 37% for patients in PRP + EI vs. EI groups.

Conclusions

Epidural injections combined with platelet-rich plasma injections in facet joints might demonstrate better improvement in longer time periods, in patients with low back pain.

Patients' Profile with Open Globe Injuries: Retrospective Case Study

*Dr. Eva Dručka¹; Dr. Oskars Gertners¹; Dr. Maruta Jurjāne²;
Dr. Ēriks Elksnis¹; Dr. Artūrs Zemītis²; Dr. Inesa Markeviča²;
Dr. Juris Vanags¹; Dr. med. Guna Laganovska¹*

¹ Rīga Stradiņš University, Latvia;

Pauls Stradiņš Clinical University Hospital, Latvia;

² Pauls Stradiņš Clinical University Hospital, Latvia

Objectives

The aim was to describe and evaluate patients with open globe injuries in the tertiary referral eye care center.

Methods

A retrospective study was conducted including patients with open globe injuries from November 2017 till December 2018. A visual acuity was stated as decimal number (0 means no light perception, 1.0 is maximum of vision). The Ocular Trauma Score (OTS) is calculated by assigning certain numerical raw points to six variables: initial visual acuity, globe rupture, endophthalmitis, perforating injury, retinal detachment, and relative afferent papillary defect. The scores are stratified into five categories that give the probabilities of attaining a range of visual acuities post-injury. OTS 1st category shows the worst prognosis, but 5th the best prognosis.

Results

Of the 36 patients, 30 (83.3%) were males and 6 (16.7%) were females. The mean age of patients was 50.6 ± 18.8 years. None of the patient in the series had bilateral eye involvement. The most of cases (58.3%) were secondary to work-related ocular injuries, 33.3% of patients were involved in accidents and 8.3% reflected criminal attacks. According to the data patients arrived in the hospital 1.81 ± 3.67 days after trauma and were treated in the department for 5.28 ± 3.17 days. The average visual acuity on the time of admission was 0.03 ± 0.10 (range from 0 till 0.5) with average loss of function $73.69 \pm 35.20\%$ comparing to the unaffected eye. On the discharge from the hospital visual acuity was 0.05 ± 0.15 (range from 0 till 0.8) reflecting improvement of $2.29 \pm 13.27\%$ ($p = 0.004$). The following incidence of OTS categories was seen: 1st in 16.7%, 2nd in 58.3%, 3rd in 22.2%, 4th in 2.5% and none in 5th category showing that more than half of patients had the second worst prognosis for improvement of visual acuity.

Conclusions

A typical patient with open globe injury is a male in working-age with poor prognosis for improvement of visual acuity.

Appropriate eye protection during work could decrease the incidence of permanent visual impairment and vision loss. Relying on the Ocular Trauma Score category for most of cases the prognosis is cautious while improvement is not always possible because of irreversible tissue damage.

Patch Test Results for Acne Vulgaris Patients in Aesthetic Dermatology Clinic of Prof. J. Kisis from 01.01.2018–01.12.2018

Dr. Dace Buile^{1,3}; *Dr. Gerda Pētersone*^{2,3};
*Dr. Zanda Bogdanova*³; Prof. *Jānis Kisis*^{2,3}

¹*Rīga Stradiņš University, Department of Morphology, Latvia;*

²*Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;*

³*Aesthetic Dermatology Clinic of Prof. J. Kisis, Latvia*

Objectives

Aim of the study was to evaluate patients with diagnosed acne vulgaris and their sensibility based on patch test results indicating allergens which is most seen and correlations between them.

Methods

Study included 55 patients with diagnosed acne vulgaris which were tested for type IV hypersensitivity reaction by doing patch tests in Aesthetic dermatology clinic of prof. J. Kisis in time period from 01.01.2018–01.12.2018. European Standard Patch Test Series for 30 allergens were used. Test substances were applied on the patient's back, where skin was untreated. All patients were not using oral antihistamines and oral or topical steroids for at least 7 days. The patch test was removed and reaction were evaluated after 48 hours.

Results

Of the 55 cases 18 patients were male (33%) and 37 were female (67%). Patients were divided into age categories: < 18 years, 18–30 years and 31–50 years. The commonest age group affected was 18–30 years (67%). Positive patch test results for contact allergens were found in 21 case (38%) – 3 of them were male patients (5.5%) and 18 of them female patients (32.7%) and association between gender and positive test results was significant ($\chi^2 = 5.247$, $p = 0.022$). Positive reactions were observed for: Cobalt (11%), Nickel (20%), Phenilediamine (4%), Benzocaine (2%), Fragrance-mix (4%), Thivriummix (6%), Epoxyrisin (2%) and Colophony (2%). Statistically significant correlations were found between Nickel and Fragrance-mix ($r_s = 0.389$, $p = 0.003$), Quotcinum and Fragrance-mix ($r_s = 0.481$, $p = 0.0001$) and Colophony and Epoxyrisin ($r_s = 1.00$, $p = 0.001$).

Conclusions

Our results indicate that Nickel and Cobalt are the most common allergens for acne vulgaris patients. Female patients with acne vulgaris are more likely to show a positive patch test results. Patients with positive reactions for Fragrance-mix could be more prone to other allergens. More tests should be performed for statistically better results.

Frequency of Contact Allergy in Children with Atopic Dermatitis

Dr. Gerda Pētersone^{1,4}; *Dr. Aleksejs Zavorins*²;
*Dr. Elīza Sālījuma*¹; *Dr. Dace Buile*³; Prof. *Jānis Ķīsis*^{2,4};
Prof. *Ingmārs Mikazāns*²; *Dr. Zanda Bogdanova*⁴

¹ *Rīga Stradiņš University, Faculty of Continuing Education, Latvia;*

² *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;*

³ *Rīga Stradiņš University, Department of Morphology, Latvia;*

⁴ *Aesthetic Dermatology Clinic of Prof. J. Kisis, Latvia*

Objectives

Atopic dermatitis (AD) and allergic contact dermatitis (ACD) have a dynamic relationship not yet fully understood (Jacob et al., 2017). Previously, patients with atopic dermatitis were believed to have a reduced ability to produce a type IV immunological response. However, this belief has been challenged and authors have highlighted the risk of underestimating and overlooking ACD in children with AD (Simonsen et al., 2017). The aim of this study is to analyse the association of contact sensitization and atopic dermatitis in children.

Methods

European Standard Series patch test results of 78 children between the ages of 1 and 18 years that were performed in Aesthetic Dermatology Clinic of Prof. Kisis between January 1, 2015, and November 30, 2018, as well as presence of AD in the personal history of the children was retrieved from the case records. Statistical analysis was performed by applying Chi-square test. p values lower than 0.05 were considered statistically significant.

Results

A total of 78 patch test results were evaluated: 20 in the AD group (10 boys and 10 girls) and 58 in the non-AD group (28 boys and 30 girls). At least one positive patch test reaction was noted in 37.18% (n = 29) of patients, particularly in 80.00% (n = 16) of AD and 22.41% (n = 14) of non-AD group patients ($\chi^2(1) \geq 21.115$, $p < 0.001$). Nickel sensitization was observed most commonly in 19.23% (n = 15) of all patients, particularly, in 55.00% (n = 11) of AD group and 6.90% (n = 4) in non-AD group ($\chi^2(1) \geq 22.155$, $p < 0.001$).

Conclusions

Elevated prevalence of contact allergen sensitization was recorded amongst AD patients, in comparison to patients without AD. Patch testing might be warranted in children with AD, though larger scale studies are required to confirm this association.

European Standard Series Patch Test Results in Dermatology Clinic in 2018

*Dr. Elīza Sālijuma*¹; *Dr. Aleksejs Zavorins*²;
Dr. Gerda Pētersone^{1,3}; *Prof. Jānis Kīsis*^{2,3}; *Dr. Zanda Bogdanova*³

¹ *Rīga Stradiņš University, Faculty of Continuing Education, Latvia;*

² *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;*

³ *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;
Aesthetic Dermatology Clinic of Prof. J. Kisis, Latvia*

Objectives

The prevalence of contact allergy is rising worldwide and becoming an important challenge for public health. Patch testing is the standard procedure to detect contact sensitivity. The aim was to find out the most frequent contact allergens and observe epidemiological variables.

Methods

The retrospective analysis is based on the patch test results collected in a private dermatology clinic in Riga during the year 2018. Patch testing was done with European standard series (30 different allergens). Out of 217 (aged 5 to 87) patient data researched, 106 (48.84%) were positive for at least one contact allergen and were analyzed further. The following variables – gender, age, personal history of atopic dermatitis (AD), positive patch test – was assessed. Independent sample T-test and Chi-square test was used for statistical analysis. p values below 0.05 were considered statistically significant.

Results

Thirty one (34.44%) men and 75 (59.05%) women were sensitized ($\chi^2 (1) \geq 12.768$, $p < 0.001$). From 106 positive patients the majority or 54.71% were positive for one contact allergen, for two – 31.13%, for three – 10.37%. The top contact allergens for women were nickel sulfate (58.60%), cobalt chloride (18.66%), fragrance mix (16%). For men – fragrance mix (25.80%), 4 – phenylenediaminebase, cobalt chloride, nickel sulfate (each 19.35%). The average age for positive test result was 41.68 SD = 15.49 years for women and 41.77 SD = 18.39 for men ($p = 0.980$). Sixteen (15.09%) patients who had positive patch test had AD, while only 6 (5.41%) patients with negative patch test result had AD ($\chi^2 (1) \geq 5.587$, $p = 0.018$).

Conclusions

The most common allergens in our study were nickel sulfate, cobalt chloride and fragrance mix. The majority of patients were positive for one contact allergen. Positive patch test results were more common amongst women and patients with AD. The age difference between genders was not statistically significant.

Ultrasound – Easy and Reliable Tool for Assessment of Airways

*Dr. Zane Glāzniece-Kagane¹; Dr. Aleksandrs Kagans¹;
Jana Kraķe²; Dr. Sergejs Grigorjevs¹; Prof. Biruta Mamaja¹*

¹ *Rīga East University Hospital, Latvia;*

² *Rīga Stradiņš University, Latvia*

Objectives

The management of difficult airway is still a challenge for anesthesiologist. In order to avoid the “can’t ventilate can’t intubate” scenario, it is essential to find a simple and reliable tool to predict difficult airway. There are a lot of airway assessment methods, but the major problem is still low predictability of commonly used airway assessment screening tests and high differences between different observers. That is why more and more data are emerging about US guided airway assessment before general anesthesia to predict difficult intubation. The first data about ultrasound as predictor of difficult intubation are promising. The procedure of sonographic measurement of hyomental distance is easy to learn, perform and takes from two to three minutes with high sensitivity and specificity. The aim of this study is to find whether hyomental distance ratio (HMDR) correlates with Cormack–Lehane grade in direct laryngoscopy.

Methods

Prospective observational cohort study is ongoing in Rīga East University Hospital “Gaiļezers” Department of anesthesiology. The patients scheduled for elective surgery requiring general anesthesia and tracheal intubation are having sonographically measured hyomental distance in neutral and hyperextended positions. Then the hyomental distance ratio is being calculated. The primary outcome is the efficacy of hyomental distance ratio for predicting difficult laryngoscopy (Cormack–Lehane [CL] grade 3, 4). The data are compared to routine preoperative prediction of the difficult intubation. Another aim is to find out, whether US measuring of the hyomental distance ratio in neutral and hyperextension positions is approachable and feasible for anesthesiologist.

Results

At the moment 20 patients are enrolled in the study and the hyomental distance ratio is calculated for them. Acquired results were from 1.06 to 1.52. Three patients had Cormack–Lehane grade 3–4 (HMDR 1.06–1.09). One of these three patients required to perform three intubation attempts (HMDR 1.07). Due to the little amount of cases no correlations are calculated yet.

Conclusions

Ultrasonographically measured hyomental distance ratio is a useful tool for airway evaluation.

Quality of Life and Pain in Patients with Hidradenitis Suppurativa

*Dr. Alise Vigante*¹; *Dr. med. Ilze Upeniece*²; *Zane Činokajeva*³

¹ *Rīga 1st Hospital Clinic for Dermatology and Sexually Transmitted Diseases, Latvia;*

² *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia;*

³ *Rīga Stradiņš University, Faculty of Medicine, Latvia*

Objectives

The aim of our study was to evaluate the quality of life and level of pain in hidradenitis suppurativa patients.

Methods

In total 21 HS patients were included in this prospective study. Disease severity varied from mild, presented with single nodules or abscesses to severe, presented with multiple draining tunnels and scarring. All of the patients were treated in Rīga 1st Hospital Dermatology and Sexually Transmitted Diseases Clinic. The severity of patient's disease was evaluated using Hurley scale and HIS4 scale. Patients filled out the questionnaires for quality of life data using the Dermatology Life Quality Index (DLQI). The level of pain was estimated using Visual Analogue Scale.

Results

According to DLQI four patients had no effect at all on quality of life. Seven patients had small effect, three patients had medium effect, seven patients had very large effect, none of the patients had extremely large effect on quality of life. The mean DLQI score was 7.5, indicating a moderate effect on patient's lives. According to VAS five patients had no pain at all. Twelve patients admitted mild pain, two patients – moderate pain and two patients – severe pain related to HS. The mean level of pain was 2.6, indicating mild pain.

Conclusions

1. According to DLQI, HS is disease with a high negative impact on quality of life.
2. Results according to VAS showed that most of patients reported pain related to HS, indicating that HS is painful disease.
3. Disease severity is not associated with the quality of life or pain intensity. The severe disease did not always result in a high DLQI score as well as patients with severe disease did not always report high pain index.

Relationships between Retinal Nerve Fiber Layer Thickness and Axial Length in Young Adults: Pilot Study

*Marina Strelnikova*¹; *Dr. med. Guna Laganovska*²

¹ *Rīga Stradiņš University, Latvia;*

² *Rīga Stradiņš University, Department of Ophthalmology, Latvia*

Objectives

The aim of the study was to determine the relationships between retinal nerve fiber layer (RNFL) thickness and axial length in young adults with different refraction.

Methods

The study group included 27 volunteers (18 females and 9 males, aged between 20–40 years) without ocular inflammation and retinal pathology. The global average RNFL thickness and RNFL for 4 quadrants (temporal, nasal, inferior, and superior) were measured by spectral-domain OCT (Spectralis). The axial length was measured by IOL Master. All measured were performed by one investigator in Pauls Stradiņš Clinical University Hospital. The relationship between parameters was tested with the Spearman rank correlation coefficient using IBM SPSS Statistics for Windows.

Results

In the study group, the mean axial length was 23.98 ± 0.90 mm, and refractive error was in diapason from -5.75 D to $+1.5$ D. The global RNFL thickness was 97.92 ± 7.98 μm . RNFL thickness in quadrants was the following: 124.54 ± 16.57 μm (inferior quadrant), 122.87 ± 12.18 μm (superior quadrant), 73.53 ± 11.12 μm (temporal quadrant), and 70.76 ± 7.73 μm (nasal quadrant). The axial length showed a negative correlation with RNFL thickness in the inferior ($r = -0.31$, $p < 0.05$) and nasal ($r = -0.30$, $p < 0.05$) quadrants.

Conclusions

The results of the pilot study confirmed relationships between retinal nerve fiber layer thickness and axial length. In young adults without retinal pathology, the RNFL thickness decreases with axial length in inferior and nasal quadrants.

Effect of Perioperative Ketamin Application on Postoperative Pain and Neurocognitive Function

*Dr. Leonīds Solovjovs*¹; *MD PhD Agnese Ozoliņa*²;
*Dr. Artis Gulbis*³; *Dr. Kaspars Ruks*³;
*Prof. Indulis Vanags*²; *Jelena Dukate*³

¹ *University of Latvia;*

² *Rīga Stradiņš University, Latvia;*

³ *ORTO clinic, Latvia*

Objectives

Pain and depressed mood have negative impact on patient recovery. Ketamine (K) has obvious, persistent antidepressant and analgesic, and immunomodulation effects. The key objective was to observe the impact of perioperative application of Ketamin on postoperative pain and neurocognitive function in 2 patients undergoing spine fusion surgery.

Methods

Two patients (ASA grade I-II) were observed. Both had anterior lumbar interbody fusion (ALIF) approach combined with posterior transpedicular fixation (TPF) due to lumbar part spondylarthrosis with spinal stenosis, spondylolisthesis. Ketamin 0.5 mg/kg was given at induction of anaesthesia and 0.25 mg/kg before extubation, followed by 0.15-0.35 mg/kg/h continuous infusion postoperatively up to 32 hours (h). Visual Analogue Scale (VAS) was used for pain, Mini-Mental State Examination (MMSE) for neurocognitive assessment preoperatively, 1, 6, 24 h after surgery and at discharge. Depression level were assessed by Patient Health Questionnaire (PHQ-9) preoperatively, on the first, fifth day after surgery and at discharge.

Results

Both patients (A and B) had similar demographics and were 43 and 55 years old with preoperative pain score 6 and 8 for > 3 months. Patient A received Promedoli 20 mg IM before surgery. MMSE showed score > 24 points reflecting normal cognition. In both PHQ-9 presented moderate level of depression. Postoperative consumption of opioids were reduced significantly with no need in opioids in the day of surgery. Patient A received K for 14 h, B - for 32 h. K presented excellent analgetic effect in low doses, respectively, patient A had 4, 2, 1 VAS score 1, 6, 24 h postoperatively with K dose 0.2 mg/kg/h, while patient B had VAS 6, 1, 1 in a dose 0.1-0.15 mg/kg/h. Both in the operation day evening required Diazepam IV. Both patients received only two injections of Promedol 20 mg in the first two postoperative days. At discharge VAS score was 1 and 2 for A and B patient respectively.

MMSE showed no changes in neurocognitive function. In opposite, PHQ-9 score was reduced significantly 1 (A) and 2 (B) points and showed absence of depression already in the first postoperative day and 0 (A) and 1 (B) at discharge.

Conclusions

Perioperative application of ketamine was associated with improved scores for pain and neurocognitive function in patients undergoing elective spinal fusion surgery.

Evaluation of Nail Dermatoscopic Changes in Patients with Minimal Skin Psoriasis Manifestations

Dr. med. Iveta Ivdra; Prof. Ingmārs Mikazāns; Prof. Ilona Hartmane

¹ *Rīga Stradiņš University, Department of Infectology and Dermatology, Latvia*

Objectives

Psoriasis is the most common skin disease affecting the nails. Nails are damaged in 80–10% of psoriasis patients. Psoriasis-induced nail pathology noticeable by the naked eye is detected for an average of 10 years after the first manifestations in the skin, but subclinical changes of the nails may start earlier. The severity of nail damage, the onset and frequency of involvement increase by psoriatic arthritis.

Methods

Thirty four patients with very mild forms of psoriasis examined and consulted on an outpatient visit of a dermatologist were enrolled into the study. The severity index of the psoriasis (PASI) for the enrolled patients did not exceeded 5 balls. There were patients among the all enrolled subjects, whom psoriasis had not been diagnosed before with due to their mild skin manifestations and diagnosis has been established during the visit by assessing the condition of the skin, the presence of characteristic comorbidities, and history of the disease. The diagnosis of psoriasis was based on clinical data, skin dermatoscopy and on skin biopsy results if it was necessary. For most patients, psoriatic skin plaques are localized only to the elbows, some of the patients had solitar or few papulosquamous elements in the skin of the shins or scalp area. Data about cardiovascular diseases, diabetes mellitus and the presence of joint pain were collected. Objective assessment of changes in facial blood vessels, blood biochemical tests, measured blood pressure, established BMI, assessed fingernail condition. For most patients, the psoriatic skin foci are localized only to the elbows, some of the patients had solitaire or some papulosquamous elements in the shin or scalp.

Evaluation of changes in facial blood vessels, blood biochemical tests, measurement of blood pressure, establishment of BMI, assessment fingernail condition were done. NAPS index was used for clinical evaluation of nail changes, but dermatoscopy of non-polarized and polarized light was done to detect subclinical changes.

Results

Chronic diseases typical comorbidities for psoriasis such as arterial hypertension (TA > 130/90), adiposity (BMI > 30), metabolic syndrome, diabetes of type II, rosacea were established to 28 patients It was significantly more higher than average in the Latvian population in the same age group.

Twenty two patients noted joint pain. Clinically diagnostic nail changes caused by psoriasis were observed in 4 patients, while dermoscopically definable nail pathology signs occurred in 19 patients.

Clinical features of nail psoriasis include the pitting, thickening and crushing of nail plate, leukonychia, transverse grooves, trachyonychia, red spots in the lunula, “oily or salmon spots”, distal onicholysis, subungual hyperkeratosis, splinter haemorrhages. Dermoscopic signs of nail psoriasis are “salmon spot”, splinter haemorrhages, dilated linear capillaries, glomerular blood vessels. Nail pitting were found in 7 patients, onycholysis in 2 patients, “salmon plaque” in 1 patient, bile blood vessels in 5 patients, hemorrhagic hemorrhage in 2 patients, dilated line capillaries in 8 patients.

The higher incidence of nail dermatoscopic changes was observed to patients with joint pains or psoriasis comorbidities. In addition, there were combinations of multiple dermatoscopic features by the arthritis. Among patients with nail changes in dermatoscopy, there were individuals who had not previously been diagnosed with psoriasis before the current visit, but the existing joint pathology was diagnosed in another arthritis group, often with unspecified aetiology.

Conclusions

Dermatoscopy is an effective method for finding subclinical nail damage caused by psoriasis.

Nail dermatoscopy should be used as an relevant additional examination for proving the diagnosis of psoriasis skin forms and psoriatic arthritis.

Postoperative Pain Management after Abdominal Surgery

*Dr. Oļegs Gutņikovs¹; Dr. Maija Rikmane¹;
Dr. Jevgeņijs Stepanovs¹; Jana Kraķe²; Prof. Biruta Mamaja³*

¹ Rīga East University Hospital "Gaiļezers", Latvia;

² Rīga Stradiņš University, Latvia;

³ Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia;
Rīga East University Hospital, Gaiļezers, Latvia

Objectives

Growing popularity of quadratus lumborum block is explained by it's very easy to learn and perform technique as well as the fact that it is very effective in providing pain relief after various abdominal surgery. Quadratus lumborum (QL) block is an abdominal truncal block that provides analgesia to the abdominal wall (Th6-L1). Effective postoperative analgesia after abdominal surgeries is important for early ambulation and patient comfort. The aim of this study was to investigate the effectiveness of QLB on postoperative pain after conventional inguinal hernia repair.

Methods

Lateral QLB block was administered to a total of 20 patients (ASA I-III) who had undergone inguinal hernia repair. Patients were in the supine position under general anesthesia, we injected 30 ml of 0.25% levobupivacaine under US control. Ten patients received QLB 15 minutes before incision; ten patients received QLB after surgery. At the end of surgery all patients received 50 mg dexketoprofene i/v for visceral pain. For all patients the pain level was evaluated using visual analog scale (VAS) at 30 min, 1st, 6th, 12th, 24th hour.

Results

Only 4 patients required additional opioid dosage during first 24 hours. For 16 patients VAS were no higher than three. Six patients needed additional dexketoprofene after 8 h after surgery because of VAS were ≥ 3 . Performance of QLB before surgery required only 0.15 mg of fentanyl, performance after surgery required in average 0.3 mg during anesthesia. Sixteen of 20 patients were satisfied with the quality of pain relief.

Conclusions

Quadratus Lumborum Block is an effective method for pain control after conventional inguinal hernia repair and is easy to perform, no complications were observed. Lateral QLB significantly reduce opioid use, effect lasts at least 24 hours.

Influence of Permanent and Fixed Term Employment on Hypothalamic-Pituitary-Thyroid Axis in Nurses: Cross-Sectional Study

Prof. *Caterina Ledda*¹; Prof. *Rosario Caltabiano*²; Dr. med. *Angelo Montana*³;
Dr. med. *Diana Cina*¹; Dr. med. *Andrea Marconi*⁴; Prof. *Vincenzo Baylon*⁵;
Prof. *Monica Salerno*³; Prof. *Carla Loreto*⁶; Prof. *Venerando Rapisarda*⁴

¹ "Garibaldi Centro" Hospital of Catania, Clinical Pathology and Clinical Molecular Biology Unit, Italy;

² University of Catania, Department G.F. Ingrassia, Section of Anatomic Pathology, Italy;

³ University of Catania - University Hospital "Policlinico - V. Emanuele", Department of Medical, Surgical Sciences and Advanced Technologies "G.F. Ingrassia", Italy;

⁴ Occupational Medicine, Department of Clinical and Experimental Medicine, University of Catania, Catania, Italy;

⁵ Newton Lewis Institute-ISR - Life Science Park, Malta;

⁶ University of Catania, Anatomy and Histology, Department of Biomedical Sciences and Biotechnologies, Italy

Objectives

Temporary employment has increased over the last twenty years in particular for health care workers. Fixed-term employers seem to have unfavorable effects as lack of social security and fewer rights. Evidence on influences on hypothalamic-pituitary-thyroid axis in fixed term employee is limited.

Methods

In this study we investigated the HPT axis function in asymptomatic fixed-term nurses. For this purpose a cross-sectional study was conducted during periodic occupational surveillance among 35 fixed term and 35 permanent nurses. Thyroid-stimulating hormone (TSH), thyroxin (T4), triiodothyronine (T3) and cortisol serum levels were determinate.

Results

Mean concentrations of thyroid hormones show a statistically significant difference ($p < 0.05$) for T3 in the two groups; while no significant differences for the T4 and TSH levels. A difference was, also, observed for cortisol serum levels ($p < 0.05$).

Conclusions

The associations could be correlated with from the insecurity of precarious work perceived by fixed-term nurses.

Families' Perception of Health and Support in Care of Children with Limited Survival

Madara Mikelsons¹; Sofja Tomase²

¹*Rīga Stradiņš University, Statistics Unit, Latvia;*

²*Children's Clinical University Hospital, Department of Palliative Care Service, Latvia*

Objectives

The aim was to assess the health status and support in national level and among families of children, who receive palliative care in Latvia.

Methods

The study involved children within 4 diagnosis categories, based on Clinical guidelines for pediatric palliative care, as well as their relatives. This study was a cross-sectional with self-reported questionnaire, consisting of 3 parts: 1. demographic data of child and relatives (age, education, family monthly income, marriage status, residence location, family structure, power of decision, child's age, gender and diagnosis); 2. instrument adapted from the Duke Health Profile (DUKE); 3. Smilkstein's family APGAR (FAPGAR). To collect information from parents about support they receive in national level, semi-structured interviews were conducted. Data analysis was performed using SPSS version 23. Descriptive statistics were used to examine families' perception of health and family support in children with life limiting diseases. Inferential statistics were used to analyze results between various diseases (Independent sample t-test, Mann-Whitney test, ANOVA). Correlation analysis was used to determine relationship among health and family support and also demographic variables. Predictors were determined with multiple regression analysis. The alpha level was set to 0.05 to be statistically significant.

Results

The results of the study show the main positive and negative functional health measures, as well as families' internal functionality. The correlation exists between demographic data and various health measures.

Conclusions

Results of the study allows to measure the level of support for families of children regarding their physical and mental health etc. Support in national level is crucial.

Low Chronic and High Acute Exposure to Phorate – Death Paradigm: Case Report and Mini Review

*Dr. med. Angelo Montana*¹; Prof. *Alessio Asmundo*²;
*Dr. Vincenzo Bylon*³; *Dr. med. Dario Condorelli*¹;
*Dr. Salvatore Rocuzzo*²; *Dr. med. Massimiliano Esposito*¹;
*Dr. med. Marco Torrisi*¹; *Dr. med. Giuseppe Cocimano*¹;
Prof. *Giulio Di Mizio*⁴; Prof. *Monica Salerno*¹

¹ *University of Catania – University Hospital “Policlinico – V. Emanuele”,
Department of Medical, Surgical Sciences and Advanced Technologies “G.F. Ingrassia”, Italy;*

² *University of Messina, Department of Biomedical Sciences, Dental and of Morphological
and Functional Images, Section of Legal Medicine, Italy;*

³ *Newton Lewis Institute-ISR – Life Science Park, Malta;*

⁴ *University of Catanzaro, Department of Legal, Historical, Economic and Social Sciences, Italy*

Objectives

The goal of this paper is to examine a case of suicide by organophosphates (Phorate) revealed by GC/MS. The analytical method, the post-mortem toxicological concentration of phorate revealed in gastric content and the modality of death are discussed. This presentation will impact the forensic community for the importance of analytical method developed and used to quantify postmortem quantity of phorate and useful information about the pathological pathway leading to the death.

Methods

We describe a case of a 70 year-old gardener, found by her daughter finishing to drink a white granular powder mixed with water. She saw her father disoriented and sweaty, so she alerted the emergency team. The man suddenly collapsed and during the transport to the Emergency Department, despite the first resuscitation maneuvers, died. The external examination of the body was unremarkable. The autopsy revealed hyperinflated, overexpanded and ballooned lungs occupying the whole thoracic cavity. The stomach contained 100 ml of a brown liquid that was sampled. Histological examination of tissues and organs revealed generalized stasis; lungs showed the presence of an eosinophilic proteinaceous material and some hemosiderin-laden macrophages in the alveolar cavities, associated with blood congestion of the interstitial vascularization. Immunohistochemical staining performed on lungs, showed an intense positivity to HIF 1 (hypoxia-inducible factor 1). The etiopathogenetic definition was outlined by a toxicological screening performed on cardiac blood, urine and gastric contents.

Results

Phorate concentration, detected in the gastric content, was 3.29 mcg/ml. No others exogenous substances were found.

Conclusions

According to macroscopic and microscopic findings, the cause of death was most likely respiratory failure and pulmonary dysfunction due to acute cholinergic crisis secondary to the toxic concentration of phorate detected in gastric contents.

Love and Death: Passionate Homicides and Overkilling

*Dr. med. Dario Condorelli*¹; Prof. *Monica Salerno*¹;
*Dr. Davide Giuseppe Albano*¹; *Dr. Francesco Amico*¹;
Prof. *Vincenzo Baylon*²; Prof. *Giulio Di Mizio*³;
*Dr. med. Massimiliano Esposito*¹; *Dr. med. Ilenia Russo*¹;
*Dr. med. Marco Torrisi*¹; *Dr. med. Angelo Montana*¹

¹ *University of Catania - University Hospital "Policlinico - V. Emanuele",
Department of Medical, Surgical Sciences and Advanced Technologies "G.F. Ingrassia", Italy;*

² *Newton Lewis Institute-ISR - Life Science Park, Malta;*

³ *University of Catanzaro, Department of Legal, Historical, Economic and Social Sciences, Italy*

Objectives

Attendees will retain the methodology used in overkill cases, where the crime scene analysis is particularly complex as well as the study of victims' wound and the role of forensic pathologist in sustaining the prosecutor's case. The term "overkill" refers to the infliction of massive injuries by a perpetrator by far exceeding the extent necessary to kill the victim; the offender was in a state of strong excitement. This applies especially to sexually motivated homicides.

Methods

Eighteen of the most violent homicide cases occurred in Rome between 1999 to 2015 are examined. In no one of them firearms were used. In details, 12 victims were men and just 6 were women. The weapon used to commit the crime was found on the crime scene in 8 cases. In the remaining, the identification of the wounds' pattern was crucial to understand the type of weapon. The blunt force injuries included skull fractures, cerebral injuries, facial trauma, neck trauma and chest injuries. Sharp force injuries included lesions on the scalp or face, injuries on the neck, in the chest, in the limb and abdominal injuries. Just in 2 cases the killers used weapon to cause firearm wounds.

Results

39% of the cases presented with less than 10 wounds, 28% between 11 and 20 wounds, 16.5% between 21 and 30 and the 11% had a number of wounds between 31 and 40 and in case 8 (5.5% of the total) was characterized by more than 40 wounds. Autopsy was performed in all 18 cases showing the cause of death.

Conclusions

The police investigations context of crime verification was attributed in the 38.8% to passionate homicides, the 22.2% to neighborhood problems and in the 17% were related to financial pressure. Only the 5.5% was attributed to psychiatric diseases and racial aggressions.

Which Came First, Ischemia or Car Accident? Key to Shed Light on “Road Murder”

Prof. *Monica Salerno*¹; Prof. *Giulio Di Mizio*²; Dr. med. *Marco Torrisi*³;
Prof. *Vincenzo Baylon*⁴; Dr. med. *Giuseppe Cocimano*³;
Dr. med. *Andrea Musumeci*⁵; Dr. med. *Federico Patanè*³;
Dr. med. *Pasquale Malandrino*³; Dr. med. *Aldo Liberto*³;
Dr. med. *Francesca Indorato*³; Dr. med. *Angelo Montana*³

¹ *University of Catania, Italy;*

² *University of Catanzaro, Department of Legal, Historical, Economic and Social Sciences, Italy;*

³ *University of Catania – A.O.U. “Policlinico – V. Emanuele”, Legal Medicine Department
of Medical, Surgical Sciences and Advanced Technologies “G.F. Ingrassia”, Italy;*

⁴ *Newton Lewis Institute-ISR – Life Science Park, Malta;*

⁵ *University Hospital “Policlinico Vittorio-Emanuele”, Radiodiagnostic and Radiotherapy Unit, Italy*

Objectives

This case underlines the discrepancies between ante-mortem and post-mortem instrumental diagnosis, confirming autoptical examination as the gold standard for forensic diagnosis. The forensic pathologist has to know in depth the anatomy and how to study it using the dissection techniques with the help of new pre and post autoptical technologies. Neck strain is often just called whiplash, a traumatic event affecting the cervical spine. In most cases, it arises following a sharp movement of the head that exceeds the physiological limits of joint excursion: the sudden force stretches muscles, tendons and vertebrae of the neck. Many studies document the presence of ischemic accidents following the compression of the vertebro-basal system arteries after whiplash in predisposed patients.

Methods

A 79-year-old man, driving his own car, was involved in a frontal-impact crash with another car. The driver was found comatose (GCS 3) and carried to ED, where he underwent to a brain CT scan and angio-CT scan, directed to epiaortic vessels study. CT scan showed an ischemia of cortical and subcortical areas, affecting parietal and occipital encephalic lobes and cerebellum; angio-CT scan revealed the complete occlusion of the lumen of both vertebral arteries, at the level of the third cervical vertebra. The man died about 4 days after his admittance to the hospital. The external examination of the body was unremarkable.

Results

Thus, the question was: which came first, the ischemia or the car accident? Before performing the autopsy, CT scan of head and neck was conducted. The autopsy was performed 6 days later, with a particular dissection protocol borrowed from the neurosurgery.

Conclusions

The examination, indeed, was focused on the vertebral artery segments between the 3rd and 4th cervical vertebrae. Imaging first, and then autopsy, revealed completely different findings from those shown in ante mortem CT scan, that revealed the true cause of death.

Differential Diagnoses of Chronic Pelvic Pain

*Dr. Alla Haduņkina; Dr. med. Irina Evansa;
Viktorija Džabijeva; Natālija Zlobina; Nikita Ivanovs*

*Rīga 1st Hospital, Department of Anesthesiology,
Intensive Care and Pain Medicine, Latvia*

Objectives

Chronic pelvic pain described as continuous or intermittent pain in pelvis or lower abdomen with pain duration of 3 to 6 months. Pain leads to patients functional disability and long lasting treatment. Even careful examination of the patient sometimes doesn't help to find the cause of pain.

Methods

The retrospective study approved by the Ethics Committee of Rīga 1st Hospital. The patients applied for pain physician with chronic lower abdominal pain.

Results

The study includes 40 patients medical histories, 24 women (60%) and 16 men (40%) respectively, $p = 0.268$. The average age of the patients 38 y.o. (minimum age 24 y.o. and maximum age 75 y.o.). The duration of chronic pelvic pain varies from 3 to 240 months. Somatoform autonomic dysfunction is diagnosed more often in 12 patients (30%). 11 patients (27%) have the diagnose of low back pain, 7 (17.5%) - irritable bowel syndrome, adenomyosis, diverticulosis, hemorrhoidal disease and chronic prostatitis. 6 patients (15%) suffer from depression. Pelvic surgery, endometriosis, unspecified colitis, interstitial cystitis was diagnosed in 5 patients (12.5%). 4 patients (10%) have ovarian dysfunction and adhesion disease, 3 (7.5%) - pilonidal cyst, 2 (5%) - prolapse or tumor of lesser pelvic organs, urogenital infection and chronic appendicitis. 1 (2.5%) patient has kidney leiomioma, Chron's disease and pelvis congestion disease. Most patients 10 (25%) have one diagnose. 9 (22.5%) patients have 3 diagnosis at once. 3 patients (7.5%) have 7 diagnosis that might cause chronic pelvic pain.

Conclusions

This study has shown that chronic pelvic pain is a multidisciplinary problem, only 25% of patients have one disease that causes pain. 75% of patients have diagnosed more than one disease that may cause chronic pelvic pain. To treat and observe this problem pain physicians need to work in multidisciplinary team.

Optimisation of Corrections of Hemostasis Disturbances in Surgical Bleedings on Experience of Anaesthesiologist-Reanimatologist with Hemostasis Laboratory

Irina Surgunte

*Latvia State Blood Donor centre, Department of Transfusion;
Pauls Stradiņš Clinical University Hospital, Department of Anesthesiology, Latvia*

Objectives

Massive surgical bleeding remains one of the main causes of patient mortality. This fact, especially against the background of reduced adaptability of an acute surgery patient's constitution in the presence of somatic diseases to a great change in all limbs of the hemostatic system. The purpose of this study is to improve the results of treatment of surgical patients with massive blood loss by selective recruiting of hemomedicine in terms of quality of donor's blood components and patients (recipient) bleeding.

Methods

The study included two phases. The first phase was the study of the results of hemostasis of different categories of donors, their distribution in groups by age, donations and the other factors. The coagulation test results of 200 donors (150 men and 50 women) aged from 18 to 65 years old, weigh more than 55 kg, blood donation with a frequency of 3-4 times a year (from 5 to 15 donations for the entire duration of the donation) are analyzed. The following parameters were identified: number of erythrocytes, hemoglobin, APTL-activated partial thromboplastin time, platelet aggregation, fibrinogen, prothrombin, INR and total serum protein. The second phase of the study contained the use of blood components during transfusion therapy based on selective selection taking into account the quality of hemostasis of donor's blood and patients (recipient).

Results

In total 38 patients were examined of which 18 patients at the age 19-82 were a part of a study group underwent hospital time massive blood loss. Selective component transfusion therapy was carried out, taking into account the quality of the donor's hemostasis for the correction of hemostasis disturbance. The control group consisted of 20 patients who had suffered massive blood, had a plasma transfusion without hemostasis donor plasma ingestion, that is, without a selective selection of components for transfusion. Selective component transfusion therapy allowed to reach normalization of hemostatic results of a dose of transfusion medium in the study group in comparison with control ($p < 0.044$).

Conclusions

Our studies have shown that the purposed optimization associated with the selection of donor plasma, depending on the type of hemostasis disorders of the recipient with blood loss in surgery has a number of advantages: it reduces the amount of transfusion plasma, normalizes parameters of hemostasis target, thereby improving the results of the treatment of surgery patients with acute blood loss.

At the posters, there is a clinical case demonstration, where the patient had an acute bleeding and lost more than 6 liters of blood during 24 hours, on the background of strong transfusion and had got hemotransfusion more than 7 liters of components of transfusion (they included 5 liters of plasma and 2 liters of erythrocyte mass).

Effect of Donor Kidney Preceding Sclerosis on Early and Late Post-Transplant Results: 10-Year Observational Study

*Dr. Jurijs Bormotovs; Dr. med. Aleksandrs Malcevs;
Dr. med. Janis Jusinskis; Dr. med. Ieva Ziedina;
Dr. med. Vadims Suhorukovs*

Rīga Stradiņš University, Scientific Laboratory of Transplantation, Latvia

Objectives

This study is devoted to the analysis of donor kidney biopsy and transplant results. The objectives were to find and analyze the effect of donor kidney preceding sclerotic injury on early and late post-transplant results, as well as patient survival.

Methods

The study included all cases of kidney transplantation (KT) between 01.01.2004 and 31.12.2007, where the results of pre-transplant kidney biopsy and 10-year follow-up were available (n = 101, 54 males, 47 females, mean age 46.6 + 14.0 years). The effects of donor kidney preceding interstitial sclerosis (IS) and glomerular sclerosis (GS) on post-transplant surgical and immunological complications and on transplant and patient survival were analyzed.

Results

IS and GS showed high interconnection ($p < 0.05$). IS was diagnosed in 73%, and in 12% of cases it was $> 20\%$. IS was associated with increased donor age and body mass index ($p < 0.05$), recipient age ($p < 0.05$), postoperative period with increased acute rejection ($p < 0.05$). Higher IS $> 20\%$ was associated with the incidence of mortality in patients ($p < 0.05$), possibly related to the allocation of such organs to older recipients, but it did not affect the frequency of graft loss. At the end of the observation period, the function of functioning transplants did not differ between patients with diagnosed IS or GS and without sclerosis.

Conclusions

The donor kidney pre-transplant biopsy provides important information on the previous state of the organ and predicts post-transplant complications. IS and GS had a negative effect on early and late post-transplantation results, but the effect on the duration of transplant function was not proven due to the insufficient number of observations. Continuation of the study with a higher number of observation cases is required.

Evaluation of Central Macular Thickness after Pars Plana Vitrectomy for Replacement of Dislocated IOL to Iris-Clips

Dr. Dairis Meiers¹; Dr. med. Guna Laganovska²

¹ *Pauls Stradiņš Clinical University Hospital, Latvia;
Rīga Stradiņš University, Latvia;*

² *Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Cataract surgery is the most common eye surgery practised in ophthalmology department with valuable outcome. Although cataract surgery is considered as very effective and safe, there is still a possibility of rare complications, for instance, IOL dislocation. The frequency of dislocated IOL ranges from 0.2–1.8% of all surgically treated cataract patients. For patients without capsular support one of the first-choice treatment is the iris-clip IOL implantation in an anterior chamber with predictable refractive outcome compared to the angle supported IOL and the sclera sutured IOL.

The aim of the study was to evaluate the outcome of pars plana vitrectomy for replacement of dislocated IOL to iris-clip IOL in an anterior chamber by measuring the changes of central macular thickness one month after surgery.

Methods

Retrospective study included 28 eyes of 27 patients (mean age: 74.32 ± 10.42 years; range: 31–88 years), who underwent pars plana vitrectomy surgery for replacement of dislocated IOL to iris-clip IOL in an anterior chamber in Pauls Stradiņš Clinical University Hospital. Data are collected at the preoperative examination by measuring central macular thickness using optical coherence tomography and at the postoperative follow-up by measuring central macular thickness one month after surgery. As a clinically significant macular oedema was classified central macular thickness more than 500 micrometres. Descriptive statistics were used for analysing data.

Results

The central macular thickness before surgery for all cases was 228.46 ± 27.32 (SD) micrometres, but after surgery – 307.28 ± 162.74 (SD) micrometres. There was clinically significant macular oedema in 5 cases (17.85%). In 23 cases (82.15%) there was no significant changes in central macular thickness.

Conclusions

1. Surgery outcome revealed a significant possibility of macular oedema.
2. Patients who underwent replacement of dislocated IOL to iris-clip IOL should have the follow-up OCT examination to diagnose macular oedema at early stage and receive appropriate treatment.

Importance of Ionized Calcium Level in Serum in Ethylene Glycol Poisoning

Dr. Roberts Stašinskis

*Rīga Stradiņš University, Department of Anaesthesiology
and Intensive Care, Latvia*

Objectives

It is not possible to perform quantitative ethylene glycol assays in Latvia. As a result, treatment decisions are based on history, clinical signs, and laboratory tests. Hypocalcaemia is one of the most significant biochemical abnormalities. Ethylene glycol is metabolized to oxalic acid which binds to calcium to produce calcium oxalate and hypocalcaemia can worsen.

Methods

This retrospective study included patients with confirmed ethylene glycol poisoning who were admitted in Riga East University Hospital (RAKUS) Toxicology and sepsis clinic from 2012 to 2017. Blood gas analysis was performed on admission, and at 12, 24, 48, 72, 96 hours. Electrolytes (ionized calcium) were also performed at the same time. Total and calculated calcium were not measured in this study. Ionized calcium concentration, and its relationship to blood pH, serum bicarbonate, lactate concentrations, and anion gap were analysed. A separate patient group that received haemodialysis was also included. Admitted patients were divided into two groups - 1) patients with serum pH below 7.3 and 2) patients with serum pH above 7.3. Data were analysed using linear regression method and one-way analysis of variance. Analysis was performed using IBM SPSS Statistics version 22.

Results

Fourty-seven poisoning cases were included; 9 females (average age - 61 yrs) and 38 males (average age - 58 yrs). From all included patients 79% (n = 37) were discharged from hospital, 21% (n = 10) died in hospital. Hemodialysis was performed in 62% cases (n = 29), ethanol therapy - 96% cases (n = 45). Linear regression analysis did not reveal any statistically significant difference in ionized serum calcium concentration in comparison with blood pH. In patients with a pH below 7.3, ionized calcium concentration was higher than those with serum pH above 7.3 (p = 0.026). Serum calcium concentration was significantly lower in those who died compared with those who (p = 0.001).

Conclusions

Although hypocalcaemia was present in ethylene glycol poisoned patients with severe metabolic acidosis, this was not consistently present and may not be an accurate marker of poisoning.

Incidence Rate of Acute Appendicitis in Elderly Population in Latvia

*Sintija Lapsa*¹; *Dr. med. Artūrs Ozoliņš*¹;
*Prof. Ilze Štrumfa*²; *Prof. Jānis Gardovskis*¹

¹ *Pauls Stradiņš Clinical University Hospital, Department of Surgery, Latvia;*

² *Rīga Stradiņš University, Department of Pathology, Latvia*

Objectives

Acute appendicitis in elderly population older than 65 years has become more common in last years based on clinical practice. The objective of this study was to estimate the rates of acute appendicitis in elderly population between 2006 and 2017 and the correlation coefficient with the total elderly population in Latvia.

Methods

People with diagnosis of acute appendicitis who have had surgical treatment – appendectomy between January 2006 and December 2017 were identified using data from the National Health Service (NVD) and Central Statistical Bureau of Latvia (CSP). Statistical analysis was performed using descriptive statistics and Pearson correlation coefficient. A value of $p < 0.05$ was considered statistically significant.

Results

In Latvia, the proportion of elderly patients among all cases of appendicitis has increased from 9.8% to 11.2% between 2006 and 2017. There are on average 491.01 new cases every year (95% confidence interval 468.1–514.05) between 2006 and 2017. There is moderate positive correlation – correlation coefficient 0.526, with no statistical significance ($p = 0.079$) between incidence of acute appendicitis and the increase in elderly population in Latvia.

Conclusions

Proportion of acute appendicitis in elderly population in Latvia between 2006 and 2017 correspond overall world data of 10% acute appendicitis in elderly population out of all cases of acute appendicitis. Overall increase of acute appendicitis in elderly population doesn't correlate ($p > 0.079$) with increase in overall increase of elderly population.

Innovative Knowledge Creation of Health Issues in Level of Holistic Community

Brigita Maženytė; Prof. Monika Petraite

Kaunas University of Technology, Lithuania

Objectives

1. To indicate different groups as trustworthy informational sources for women during pregnancy.
2. To indicate specific steps for knowledge creation in a level of holistic communities for the seeking solutions of specific health issues.
3. To propose an innovative OpenLab model how the solutions could be made in a level of a holistic health community.

Methods

The research participants were asked to tell whether there is a need for knowledge during pregnancy and through which channels they obtain the information needed.

Qualitative research was done for this analysis. This analysis draws on semi-structured interviews with 10 pregnant women from the Hospital of Lithuanian University of Health Sciences. Interviews were recorded, transcribed, and coded and working inductively to trace themes arising from the data. Participants were recruited through pregnancy and prenatal courses support groups and social media through snowball sampling.

Results

5 different groups as trustworthy informational sources found out for women during pregnancy:

- 1) medical professionals;
- 2) information sources;
- 3) social environments;
- 4) patients environments;
- 5) close environments.

Knowledge creation in a level of holistic communities for the seeking solutions of specific health issues are developed by following steps: problem framing, shaping, drafting, reviewing, finalizing, implementation, control. An innovative OpenLab model were proposed: how the solutions could be made in a level of a holistic health community.

Conclusions

1. The research results indicate different groups as trustworthy informational sources for women during pregnancy (medical professionals, information sources, social environments, patients environments; close environments).
2. Indicated specific steps for knowledge creation in a level of holistic communities for the seeking solutions of specific health issues: problem framing, shaping, drafting, reviewing, finalizing, implementation, control.
3. An innovative OpenLab model were proposed: how the solutions could be made in a level of a holistic health community.

Functional Capacity and Limitations Determination Assessment of Patients with Respiratory System Diseases

Inga Dirveika

*State Medical Commission for the Assessment of Health Condition
and Working Ability, Latvia*

Objectives

Compliance with current guidelines for assessing the functional conditions and impairments of the respiratory system.

Methods

Most frequently assessed respiratory system diseases.

Methods for assessing the functional disorders of the respiratory system:

- Determination of respiratory failure.
- Examinations (investigations) that justify diagnosis and impairment.

Results

The role of cooperation between medical practitioners and officials determining disability.

The role of prevention, early diagnosis and treatment, and active rehabilitation in reducing functional disorders.

Conclusions

The need to include up-to-date evaluation criteria in the setting of work capacity and functional limitations.

Antioxidant Properties of Five Varieties of Bread-Wheat (*Triticum Aestivum* L.) Grains: Latvian Selection

Ph.D. Alina Kulbacna; Assoc. Prof. Andrejs Skesters

Rīga Stradiņš University, Scientific Laboratory of Biochemistry, Latvia

Objectives

Wheat is one of the most popular crops and major grains in the human diet. Whole grain consumption has been associated with reduced risk of chronic diseases such as asthma, cancer, cardiovascular diseases and diabetes. The importance of antioxidants dietary consist in the decreasing of negative consequences of oxidative stress and balancing interplay between reactive oxygen species productivity and scavenging.

Methods

The present study was designed to evaluate the antioxidant properties of five varieties of bread-wheat grains original Latvian selection. Aquatic, ethanol and methanol extracts of wheat grains were used to determine total phenolic content, 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity and ferric reducing antioxidant power ability (FRAP).

Results

The results of our investigations showed, that the total content of phenolic compounds in aquatic extracts did not vary greatly among the four wheat cultivars – about 67.26–68.17 mg gallic acid equiv/100 g of wheat. But the cultivar Talsi showed the smallest polyphenolic compounds comparing with another cultivars (for 14%), and was 58.91 mg gallic acid equiv/100 g of wheat grain. The best results in DPPH free radical scavenging activity were determined for cultivar Edvins and it was 12% of inhibition DPPH in ethanol extract and 19.37% of inhibition DPPH in methanol extract, while the smallest result was for Talsi cultivar (6.4% and 10.85% respectively). Investigations determine, that the ferric reducing antioxidant capacity of five Latvian cultivars vary from 0.1 mmol Fe²⁺+Equiv/100 g of wheat to 0.53 mmol Fe²⁺+Equiv/100 g of wheat.

Conclusions

The present investigations concludes, that the antioxidant activity of five cultivars of bread-wheat grains original Latvian selection vary in different extracts, depended from genetic properties and from the preparing conditions. It is suggested that dietary consumption of whole wheat grains will be helpful to reduce the risk of chronic diseases and aging processes.

Does Birmingham Vasculitis Activity Score (BVAS) Influence Treatment Decisions of ANCA Associated Glomerulonephritis?

*Dr. Zane Munkena*¹; *Dr. med. Viktorija Kuzema*²;
*Daniela Sila*¹; Prof. *Aivars Pētersons*²

¹ *Pauls Stradiņš Clinical University Hospital, Department of Internal Diseases, Latvia; University of Latvia;*

² *Rīga Stradiņš University, Department of Internal Diseases, Latvia; Pauls Stradiņš Clinical University Hospital, Latvia*

Keywords: ANCA associated glomerulonephritis, Birmingham Vasculitis Activity Score, treatment evaluation.

Objectives

Antineutrophil cytoplasmic antibody associated vasculitis is a group of autoimmune diseases, characterized by inflammation and destruction of small and medium blood vessels. It is often hard to determine disease onset and treatment for a flare up. The purpose of this study was to determine whether assessing disease severity according to BVAS would help clinicians to optimize the immunosuppressive therapy.

Methods

Retrospectively 34 patients with biopsy proved pauci-immune crescentic glomerulonephritis were included – 25 analyzed, 7 discontinued due to a fatal outcome, 2 lost from observation. Treatment response after 6 months was analyzed and baseline BVAS was computed for disease activity at the time of diagnosis, using patient medical history charts.

Results

6 patients (24%) with BVAS below 20 received glucocorticoids and cyclophosphamide less than 3 months, 6 (24%) – for more than 4 months, and in three patients (12%) remission was achieved using only glucocorticoids. 4 patients (16%) with higher disease activity (BVAS > 21) received glucocorticoids with cyclophosphamide for more than 4 months, three patients (12%) – less than 3 months, two of them (4%) received rituximab, and another one (4%) received only glucocorticoids. Most of the patients with BVAS below 20 had an improvement in renal function (n = 11, 50%), in 2 patients (9.09%) a decline in GFR was observed and 4 patients (18.18%) had no changes in renal function. Two patients' (9.09%) with BVAS between 21 and 40 renal function improved, 2 (9.09%) – declined and 1 (4.55%) showed no change.

Conclusions

Treatment with cyclophosphamide and glucocorticoids was assessed as effective in achieving improvement in renal function. Immunosuppressive therapy in patients with higher disease activity according to BVAS was relatively less effective than in patients with lower disease activity status.

Relationship between 4-Hydroxynonenal and Clinical Course in Community-Acquired Pneumonia Patients

*Dr. med. Julija G. Voicehovska*¹; *Dr. Natalja Voskresenska*²;
*Aleksandra Voicehovska*³; *Dr. med. Alise Silova*⁴;
*Prof. Andrejs Skesters*⁴; *Prof. Aivars Lejnieks*¹

¹ *Rīga Stradiņš University, Department of Internal Diseases, Latvia;*

² *Rīga Stradiņš University, Latvia;*

Pauls Stradiņš Clinical University Hospital, Latvia;

³ *University of Latvia;*

⁴ *Rīga Stradiņš University, Scientific Laboratory of Biochemistry, Latvia*

Objectives

Community-acquired pneumonia (CAP) severity assessment is still challenging. Some laboratory biomarkers are in use, but its specificity and sensitivity remain insecure. 4-Hydroxynonenal, HNE, considered as a oxidative stress marker being implicated in the tissue damage, dysfunction, injury associated with aging and other pathological states cardiovascular and inflammatory complications. In order to avoid unnecessary clinical variation in CAP care and management, we studied a supplementary approach (by HNE monitoring) to guide CAP diagnosis and its management.

Methods

A case-control study took place at P. Stradins Clinical University hospital, Latvia. CAP patients (n = 32), males and females of average age 69.0±8, and healthy control patients matched for age (n = 16) were recruited. Comorbidities, laboratory variables (4-HNE, CRP, WBC, NEU), chest x-ray findings, CURB65 and PSI score as well as disease outcomes were analyzed.

4-HNE level was measured by manual spectrometry at Rīga Stradiņš University Laboratory of Biochemistry. Differences in means between groups were analysed by the independent-sample t-test. Spearman's correlation coefficient was used to investigate association between parameters. A p-value of 0.05 or less was considered statistically significant.

Results

Mean HNE on admission in CAP patients was 5.29 µmol/L (3.21 µmol/L in a control group); HNE in CAP patients in 7 days was 3.49 µmol/L. There was positive correlation between HNE and Leu, HNE and CRP. There was also positive correlation between HNE and CURB65 (n = 13). Besides, these 13 CAP patients demonstrated prolonged clinical course, antibacterial treatment was to be elongated. No link between presence of comorbidities and past history of smoking was revealed.

Conclusions

Results of our study suggest that HNE might be used as an additional biomarker of CAP severity. There is a need for further studies to evaluate HNE diagnostic and/or prognostic value.

Mode of Initial Dialysis Therapy for Chronic Kidney Disease Patients: Prospective Study

*Dr. Baiba Vernere*¹; *Dr. med. Viktorija Kuzema*²;
*Dr. Maija Motivāne*²; *Dr. Anna Popova*³; *Veronika Mešečko*²;
*Dr. med. Ināra Ādamsons*²; *Dr. Ilze Puide*²; *Prof. Aivars Pētersons*²

¹ *Rīga Stradiņš University, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvia;
University of Latvia;

² *Rīga Stradiņš University, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvia;
³ *Pauls Stradiņš Clinical University Hospital, Latvia;*
University of Latvia

Objectives

Dialysis initiation (DI) performed in an unplanned urgent way is associated with increased morbidity and mortality, due to increased use of temporary vascular access, and less frequently offered other choice of dialysis modality such as peritoneal dialysis. Therefore, we investigated the routine praxis of initiation of dialysis in one center.

Methods

We prospectively obtained and analyzed clinical and laboratory data of all patients who had started chronic renal replacement therapy (RRT) from 1JAN2015 to 31DEC2017 at P. Stradins Clinical University Hospital.

Results

During a three-year period, chronic RRT started 163 patients, of those 63% (n = 103) were men. 58% (n = 95) patients started unplanned dialysis: 80% (n = 76) unplanned hemodialysis, 20% (n = 19) unplanned peritoneal dialysis. 72% (n = 49) patients started planned peritoneal dialysis. Only 15% (n = 14) of patients who started dialysis urgently had regular predialysis ambulatory monitoring. Major indications for dialysis in both groups (unplanned RRT, planned dialysis) was low glomerular filtration rate in 19% (n = 31) of cases. Second indication for DI were clinical symptoms like a vomiting, nausea (15%, n = 25). Common causes of unplanned dialysis were acute progression of uremia (40%, n = 38), late referral to a nephrologist (31%, n = 29) and 11% (n = 10) patient noncompliance.

Conclusions

We found unplanned DI (58%) more common in our study cohort, than expected. That in 80% was hemodialysis, which might influence the outcome. Prescription of RRT is a complex problem – combination of clinical and laboratory findings is important for DI. Further controlled studies are needed to clarify planning and management of this clinical problem.

Design Construction and Calibration of Self Recording Precipitation, Temperature and Relative Humidity Measurement Equipment

Awoniyi Titilayo Olayinka

The Polytechnic of Ibadan, Department of Banking and Finance, Nigeria

Objectives

The design, construction and calibration of precipitation, temperature and relative humidity measurement device were carried out in this paper. The design instrument consists of six electronics block stages: Power stage which supplies power through a direct current (DC), input (sensor) stage which senses the number of count per tip (count/tip), the clock/triggering stage which was designed to monitor the time interval between the break and makeup of the counting, and the output stage using micro-controller and digital display. Each block was designed in stages and constructed to give the required output, utilizing various low-power integrated circuits (ICs).

Methods

Design processes of the tipping bucket

The flowchart of the design of the digital electronic system for the tipping bucket is shown in figure 1 with each block unit making specific output.

Figure 1: Design flowchart of the digital electronic system.

Figure 2: Schematic diagram of the input device.

Figure 3: (a) Pin connection of a stable clock and monostable 555 timer. (b) D-type transparent latch based on an SE NAND latch.

Results

Figure 6 show the field performance of the constructed precipitation sensor against the standards in WASCAL Meteorology observatory. observed that the error margins between the constructed and the standard sensors were relatively small indicating good performance of the sensor. However, the MBE for the wind speed is negative indicating slight underestimation of the results of the standard. A precipitation sensor has been designed, constructed and calibrated.

References

- Allerup P. and Madsen H. (1980): Accuracy of point precipitation measurements. *Nordic Hydrology* 11: pp (57-70).
- Anil K. M. (2007): *Digital Electronics: Principles, Devices and Applications*, Defence Research and Development Organization (DRDO), India. John Wiley & Sons, Ltd. ISBN: 978-0-470-03214-5: 357-404.
- Alter J.C. (1937): Shielded storage precipitation gauges. *Monthly Weather Review* 65: pp (262-265).

Basic Issues in Primary Education Delivery in Nigeria and West Africa

Okeke-Rain Christabel Omon

Federal Polytechnic Auchi, Department of Marketing, Nigeria

Objectives

Education is widely regarded as the route to economic prosperity, the key to scientific and technological advancement, the means to combat unemployment, and the foundation of social equity. Based on this fact, the Federal Government of Nigeria like other developing countries has at different times made frantic efforts in increasing the number of children enrolled in primary schools though there are still many more who are not enrolled and who do not complete the programme.

Methods

Following the directives by the Federal Government that the minimum teaching qualification shall be the National Certificate in Education (FRN, 2004), teachers have seized the opportunities of part time programmes offered by National Teachers' Institute (NTI), and sandwich or long vacation programmes organized by different Faculties of Education in tertiary institutions to improve on their academic qualifications.

Results

Physical facilities play important role in teaching and learning especially at the primary school age when the sense of imagination is still premature. The availability of adequate school building, classrooms, chairs and other facilities are necessary to the attainment of objectives of an educational system. However the increase in primary school enrollment does not have corresponding increase in infrastructural development in the primary schools.

Conclusions

Education reforms all over the world is increasingly curriculum based, as mounting pressures for education to meet the demands of the society tend to target and focus on content of school curriculum (Moreno, 2006). The objectives of changes are to ensure all round education for learners. The curriculum provisions are immense and profound for school teaching and learning. At primary level ten subjects are taken.

Power and Sample Size Calculation for Mixed Models

Eva Šauriņa

Rīga Stradiņš University, Statistics Unit, Latvia

Objectives

Sample size determination is one of the first steps to do in a research. Inappropriate sample size, too big or too small can lead to different problems later. That is why sample size determination should be done with care. In the simplest cases sample size determination is straightforward and formulas are easy to obtain. In any study, sample size depends on acceptable level of significance, power of the study, expected effect size, underlying event rate in the population, standard deviation in the population. Some practical issues, for example, costs or administration, might influence sometimes sample size as well. In a typical clinical trial when two groups are compared, sample size formula is known and calculations are straightforward. Complex situations do not have explicit formulas and usually are obtained based on some assumptions (usually normality). This paper deals with power and sample size calculations for mixed models where fixed and random effects are considered.

Methods

A simulation study for mixed models with balanced design is done in programme RStudio. Normal, log-normal, exponential distributions are compared. Different alpha (Type I error) and beta (1-Power) values are used.

Results

Simulation studies showed different results for all distributions. If normality is not met, power is lower than expected. In addition, if normal assumption is violated it is influencing errors less for larger sample sizes than for smaller sample sizes.

Conclusions

Formulas should be obtained for specific distributions to gain required alpha and beta confidence levels.

Expected Duration of Macular Surgery Depending on Best-Corrected Visual Acuity

*Dr. Aija Balode; Dr. Dāvis Raščeviskis;
Dr. Juris Vanags; Dr. med. Guna Laganovska*

*Rīga Stradiņš University, Faculty of Continuing Education, Latvia;
Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia*

Objectives

The time it takes to conclude the same surgery for the same surgeon can differ in every case. Acknowledgement of the factors that could possibly affect the surgical time could help in patient management and estimate cost-effectiveness. Aim of the study was to measure macular surgery time and analyse it in correlation with preoperative best-corrected visual acuity.

Methods

Prospective study included 14 eyes of 14 patients who underwent macular surgery at PSCUH Department of Ophthalmology between June 15, 2018 and September 5, 2018. All patients underwent routine examination before the surgery, which included measurements of the best-corrected visual acuity (BCVA). The duration of the surgery was recorded as well.

Results

A total of 11 female and 3 male patients (14 eyes) aged 64.57 ± 5.40 [95% confidence interval (CI) = 61.45–67.69] years were included in the study. The average preoperative best-corrected visual acuity was 0.10 ± 0.08 . [0.06–0.15] The average duration of the surgery was 35.07 ± 5.76 [31.74–38.39] minutes. Statistically significant negative correlation between the BCVA and the duration of the surgery was found ($r = -0.54$; $p = 0.04$).

Conclusions

The study results demonstrate that it takes longer time to complete the surgery for the patients who had lower BCVA values before the surgery, allowing anticipating more complex cases. BCVA can be used as one of the predicting factors when managing the time in the operating theatre.

IOL Dislocation after Vitreoretinal Plus Phaco Surgery Depending on Capsulorhexis Size and Overlap

*Dr. Dāvis Raščevskis; Dr. Aija Balode;
Dr. Juris Vanags; Dr. med. Guna Laganovska*

*Rīga Stradiņš University, Faculty of Continuing Education, Latvia;
Pauls Stradiņš Clinical University Hospital, Department of Ophthalmology, Latvia*

Objectives

Intraocular gas – perflouropropane (C3F8), is frequently used for vitreoretinal surgery due to its innate properties – expansile and has a long resorption time. However, gas maximal volume expansion might lead to IOL misplacement. An appropriately sized, well-centered capsulorhexis as well that it overlaps the edge of the IOL's optic is important and helps to avoid the postoperative decentration of the IOL. Doing so prevents an unintended myopic result due to anterior movement of the IOL [Agarwal et al., 2017].

The aim of this study was to measure and evaluate capsulorhexis area, capsulorhexis highest cross dimension and overlap area among patients with partially dislocated IOL and non-dislocated IOL.

Methods

Prospective study included 14 eyes of 14 patients who underwent vitreoretinal surgery with intravitreal gas injection plus phacoemulsification with IOL implantation at PSCUH Department of Ophthalmology between June 15, 2018 and September 5, 2018. Preoperative IOL power calculations were made using Carl Zeiss IOL Master v5 optical biometer. Postoperative actual capsulorhexis size and overlap was measured and analyzed.

Results

Postoperatively, among 14 patients, 3 or 21.4% were with partially dislocated IOL and 11 or 78.6% with correctly positioned IOL. The age of patients ranged from 55 to 77 years. The mean age of patients standard deviation (SD) was 64.6 ± 5.4 [95% confidence interval (CI) = 61.5–67.7] years. The mean capsulorhexis area was 16.2 ± 2.6 [14.7–17.7] mm². The mean capsulorhexis highest cross dimension was 4.8 ± 0.42 [4.5–5.0] mm. The mean overlap area was 12.0 ± 2.6 [10.5–13.5] mm². There was significant correlation between IOL dislocation and all three measurements ($P = 0.002$); ($P = 0.0006$); ($P = 0.002$).

Conclusions

Smaller capsulorhexis area and bigger overlap area helps to prevent partial IOL dislocation, as well as shorter capsulorhexis highest cross dimension.

New Horizons for Social Work Profession in Contemporary Socio-Environmental Dynamics: Challenges to Social Workers in Latvia

Prof. *Lolita Vilka; Marika Lotko*

Rīga Stradiņš University, Department of Welfare and Social Work, Latvia

Objectives

During the last ten years the professional capacity of social workers is strongly criticized. In Ex-Ante research (Evaluation results and analysis of municipal social services and social work specialist activities (2017)) it is noted that social work professionals need to develop assessment skills, communication and skills in case work. Year by year in the professional qualification improvement courses the social workers ask for 'repeating' these basic professional skills. The assessment of the preparedness of social work study program graduates from the perspective of the managers of social services departments, is rather bad or bad (53% (n = 105)). Ex-ante research stated the range of recommendations: understanding the social work in the society and the necessity for clearer vision of the development of social work in Latvia.

Methods

Goal: to analyze the impact of the trans-formative processes to social work profession as academic discipline and practice. Methods: historical comparative analysis, secondary analysis of data, interviews.

Results

The critical assessment of social workers competences are mentioned already in Ex-ante research 2012: social workers has too narrow view on things, do not see correlations"; "lack of flexible thinking". Trans-formative processes in socio-environmental space create the new contexts to social work practice. Social workers face these changes in every day practice at the same time face also their own professional capacity limits to respond to these changes effectively.

Conclusions

The vision of the development of social work in Latvia in many depends on intellectual capability of social work professionals and educators to look into the dynamics of societal changes deeply and critically to avoid of simplification in the understanding of social problems in nowadays life. To find the development trajectory for the social work profession in the context of complexity of modern life is challenging but also the task and duty with high importance in Latvia case.

Mitochondrial DNA Haplogroups and Telomere Length in Exudative Age-Related Macular Degeneration Patients in Latvian Population

*Beate Baumann*¹; *Laura Grava*²; *Līva Strucinska*³;
*Ph.D. Egija Zole*⁴; *Dr. Renāte Ranka*⁵

¹ *Rīga Stradiņš University, Faculty of Medicine, Latvia;
Latvian Biomedical Research and Study Centre;*

² *University of Latvia, Faculty of Medicine;*

³ *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

⁴ *Latvian Biomedical Research and Study Centre;*

⁵ *Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;
Latvian Biomedical Research and Study Centre*

Objectives

Age-related macular degeneration (AMD) is a complex eye disease of public health significance that causes severe vision loss. AMD has been associated with a number of genetic and environmental factors including mitochondrial damage and specific mitochondrial DNA haplogroups (mtDNA hgs). Also, changes in another cell structure – telomeres – are associated with age-related diseases. The aim of the study was to identify mtDNA hgs and to measure leukocyte telomere length (TL) in exudative AMD patients in comparison to healthy individuals in Latvian population.

Methods

DNA was extracted from peripheral blood leukocytes of 59 AMD patients (age: 77.23 ± 8.52; female percentage: 64.40%), and 56 age and sex-matched (age: 77.66; female percentage: 65.57%) healthy individuals as a control group. MtDNA hgs were characterized by PCR RFLP. qPCR was used to measure TL. Statistical analysis was performed using GraphPad Prism version 5 for Windows.

Results

mtDNA hgs were identified for 55 out of 59 patients (93.22%). 19 patients had hgH (32.2% [in a general Latvian population – 44.6%]), and 20 patients had hgU (33.9% [25.7%]). Hgs T, J and W were identified in 4 patients each (6.8% [in a general Latvian population – 8.7%, 5.9% and 4.0%, respectively]). HgV was detected in 1 patient (1.7% [4.4%]), and hgI – in 2 patients (3.4% [3.3%]). The relative TL was measured in all DNA samples, and it was significantly longer in exudative AMD patient group in comparison to the control group ($p < 0.0001$).

Conclusions

The results have shown that AMD patients had longer telomeres than the control subjects. Previously, shorter TL was associated with geographic atrophy, but not with choroidal neovascularization. HgH was observed less often, and hgU more often in AMD patients compared to a Latvian population, indicating possible protection or predisposition to the disease. Further studies are needed to confirm these results.

Chronic Obstructive Pulmonary Disease (COPD) Patient Treatment Tactics and Its Results at Emergency Medical Center (NMC) Stage

Milana Karpova¹; Romans Uljanovs¹; Dr. Dace Zentina²

*¹Pauls Stradiņš Clinical University Hospital, Department of
Emergency Medical Center, Latvia;*

*²Rīga Stradiņš University, Department of Internal Diseases, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Evaluate whether existing treatment tactics at PSKUS NMC stage meet the Global Initiative for Chronic Obstructive Lung Disease (GOLD) recommendations.

Methods

The study was conducted at PSKUS, analyzing case records of patients hospitalized with a referral from the Emergency Medical Service, family doctor or arrived themselves with acute shortness of breath. For 16 weeks, all hospitalization cases in NMC were examined, and case records that were encoded by the physician with (SSK-10) J44 – COPD. Obtained data were processed with Microsoft Excel and SPCC Statistics. Results were compared with GOLD recommendations.

Results

A total of 49 patients were involved in the study. Of these, 46.9% were hospitalized in therapeutic departments, 4.1% in intensive care units and 49% discharged for outpatient treatment. Overall 32.7% patients had first time COPD diagnosis, 22.4% patients had recurrent exacerbations in the last month and 26.5% patients had not been hospitalized for a time period greater than 12 months. Over the last year 18.4% patients were hospitalized with COPD exacerbation more than 5 times and 59% not once. There were 46.9% patients that used medications on a regular basis and 32.7% patients that were not taking any medications regularly. Most drugs used to treat COPD exacerbations at the NMC stage were: 59.2% – Salbutamol, 53.1% – Berodual, 46.9% – Dexamethasone, 26.5% – Solumedrol, 10.2% – Magnesium sulfate, 12.2% cases – Ambroxol, 32.7% cases – Sophafyllin, 51% cases – others.

Conclusions

PSKUS NMC patients with COPD exacerbations received treatment according to GOLD recommendations, but a tendency to use additional agents such as Magnesium Sulphate, Ambroxol, Sophafyllin exists, which have not have proven their effectiveness in other studies on COPD exacerbations.

According to literature data, up to 80% of patients with COPD can continue outpatient treatment, in our study it reached only 49%, which can be explained by poor patient compliance.

Provision of Emergency Medical Assistance for Patients with Narcotics, Hallucinogenic and Psychotropic Substances Poisoning in Prehospitality: 3-Year Experience in Latvia

*Rafaels Ciekurs*¹; Prof. *Dainis Krievins*²; *Dzintra Jakubaneča*³

¹ *Rīga Stradiņš University, Faculty of Public Health and Social Welfare, Latvia;*

² *Pauls Stradiņš Clinical University Hospital, Latvia;*

³ *State Emergency Medical Service, Latvia*

Objectives

Analyze provision of Emergency Medical Assistance for patients with narcotics, hallucinogenic and psychotropic substances poisoning in prehospitality – three years experience in Latvia.

Methods

Qualitative research method, based on Latvia State Emergency Medical Service outbound crews notes in call cards from 2016 to 2018 for 8925 patients with narcotic, hallucinogenic and psychotropic substances poisoning.

Data Processing Methods – Microsoft Excel 2010 and IBM SPSS v23 Programs.

Results

Emergency medical Assistance for narcotic, hallucinogenic and psychotropic poisoning in pre-hospital phase from 2016 until 2018 was provided to 8925 patients: 1301 women and 7618 men (in 6 medical cards gender was not defined). Age of patients – 1–90 years, average age – 33 years (± 8.1 (SD)).

The result of the outbound calls – 1446 patients were taken to the medical institution, in 4777 cases the medical assistance was rejected, in 11 cases resulted in death.

Conclusions

1. In 2017 there was the highest number of emergency medical assistance cases with narcotics, hallucinogenic and psychotropic substances poisoning in the pre-hospital phase over three years.
2. Emergency medical assistance with narcotic, hallucinogenic and psychotropic substances poisoning in prehospitality is increasing over the years for female patients.
3. The largest number of outbound calls for overdoses of narcotic, hallucinogenic and psychotropic substances was observed in Riga and Riga region.
4. There is a need for broader public education events on the risk factors for the use of narcotic and psychotropic substances.

Polytrauma Mechanism has Impact on Outcome and Reflects Environmental and Social Hazards in Latvia

*Dr. Leila Geibijeva*¹; *Dr. Andris Caplinskis*²;
*Dr. Mihails Dolgusevs*³; *Dr. Alvis Melderis*⁴;
Prof. *Haralds Plaudis*⁴; Prof. *Guntars Pupelis*⁴

¹ *University of Latvia;*
Riga East University Hospital, Latvia;

² *University of Latvia;*
Traumatology and Orthopaedics Hospital, Latvia;

³ *Rīga Stradiņš University, Latvia;*
Liepāja Regional Hospital, Latvia;

⁴ *Rīga Stradiņš University, Latvia;*
Riga East University Hospital, Latvia

Objectives

The aim was to compare the demographics, injury mechanisms and outcomes in polytrauma patients admitted to Riga East University Hospital “Gailezers”.

Methods

A cross-sectional analysis of the data collected prospectively from January 2017 to October 2018 was performed. The variables included the mechanism, diagnosis of polytrauma, patient demographics and the main outcomes.

Results

In total, 579 patients were admitted during the study period and assessed according to the polytrauma protocol. The median age of the cohort was 41 years (IQR 30–55), with a predominance of male patients, 71.2 % vs. 28.8%, $p = 0.045$. The most frequent mechanism was a pedestrian stricken by a vehicle in 29.7% cases, and falling from a height of over 2 m in 27.3%. The isolated musculoskeletal injuries were associated with fall from a height in 31.1% and pedestrians were stricken by a vehicle in 28.2%. Falling from a height caused visceral injuries in 34.1% of patients and in 28.2% they were stricken by a vehicle. The most common cause of neurotrauma was a fall from a height in 34%, and pedestrians involved in car accidents in 27.7%. From the whole cohort, 19 patients were not saved, resulting in a 3.3% mortality rate. Most patients (17) who died had ISS > 50, however one died with ISS > 15 and one > 50. Among pedestrians stricken by a vehicle mortality reached 2.3%, and patients who fell from a height of over 2 m died in 5.1% cases.

Conclusions

The most common mechanism in the cohort was a pedestrian stricken by a vehicle, followed by falling from a height, with a predominant involvement of male patients. Similar mechanisms were involved in musculoskeletal and visceral injuries, demonstrating an important direction for polytrauma prevention.

Headache in Emergency Medicine Department Workers Compared to Medical Students

*Dārta Renāte Vītola*¹; *Dr. Ieva Kalve*²

¹ *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

² *Rīga Stradiņš University, Department of Occupational and Environmental Medicine, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia*

Keywords: headache, emergency medicine, students.

Objectives

Headaches are one of the most common health problems to face. They can have very variable characteristics and each individual can tolerate them differently. Often, they may significantly impede communication, capacity of performing, concentration, and may even lead to a complete inability to perform duties.

The aim of this study was to evaluate headache frequency, characteristics, relieving factors, used therapy, impact on ability to work, study, communicate in emergency medicine department workers and compare the same headache criteria with medical students.

Methods

Anonymous questionnaire with multiple questions were created. Total there were 133 participants in the study. Data from students were obtained electronically, while data from emergency medicine workers were obtained by paper surveys. Data were analyzed using IBM SPSS Pearson's chi square test and Microsoft Excel.

Results

Participated 63 emergency medicine department workers and 70 medical students. Age median in emergency medicine department workers were 26 years and in student group – 21 year (interquartile range 4). Statistically significant difference were in headache localization – emergency medicine workers had one (unilateral or bilateral) headache, but students had combination of both (Pearson's chi square < 0.003). From relieving factors students had more benefit from sleep, rest and fresh air ($p < 0.05$). Together, students had more factors (4–6 factors) that relieved headache than emergency medicine workers. ($p < 0.05$). No statistical significance were found between ability to concentrate, communicate, making decisions or being late for school / work during headaches ($p > 0.05$), but student group showed that headaches interferes with the performance of duties ($p < 0.001$). No statistical significances were found between headache duration, day time, frequency, characteristics, used medication.

Conclusions

Headaches more interferes with the performance of duties in student group, but in the same time students have more headache relieving factors than emergency medicine workers.

Evaluation of Anterior Gastropexy as Treatment Option for Large Hiatal Hernias (Type III, IV) in Elderly Patients with Comorbidities

Dr. Kristīne Žarkova; Dr. med. Igors Ivanovs

¹ *Rīga East University Hospital, Latvia;
University of Latvia*

Keywords: Large esophageal hiatal hernia, anterior gastropexy, elderly patients, small case series.

Objectives

The aim of the study is to present the less traumatic surgical method – anterior gastropexy (AG)- which can be successfully used in case of large complicated diaphragmatic hernia (type III-IV) treatment in elderly people with comorbidities and evaluate its' safety and effectiveness.

Methods

Laparotomic AG was performed on three patients with large hiatal hernia (type III or IV). Patient characteristics: 80-year-old man with abdominal adhesions, umbilical hernia, pseudocyst of pancreas, gallstone disease, kidney cysts, osteoporosis, diverticulosis of small intestine, colon, 80-year-old woman with gastrostasis, hypokalemia, 91-year-old man with coronary artery disease, stable angina class II, old myocardial infarction, primary arterial hypertension, chronic heart failure class II, general atherosclerosis, all patients with major preoperative complaint about obstruction (pain in the upper abdomen, nausea, vomiting). The abdominal CT scan and chest X-ray was performed to all patients to evaluate the characteristics of hernia. Laparotomy, abdominal organ reposition and AG was performed. No perioperative complications or postoperative morbidity occurred. 5 days after the surgery patients were discharged from the hospital.

Results

AG is a safe and effective treatment option for large hiatal hernias in elderly patients, whom surgical intervention should be minimized due to their comorbidities.

Conclusions

Three elderly patients with multiple comorbidities and large hiatal hernias (type III, IV) who underwent laparotomy and AG- fixation to the abdominal wall- were evaluated retrospectively. One month after the surgical treatment patients were telephoned and asked about the current health complaints regarding the disease- no patient had recurring complaints related to the disease. All the patients remained asymptomatic on follow-up and did not have recurrent hospitalisation due to the same disease.

Association between Diabetes Mellitus and Overall Survival of Cancer Patients in Latvia: Register-Based Study

*Dr. med. Ieva Strēle*¹; *Santa Pildava*²; *Ilze Repša*²; *Una Kojalo*²;
*Dr. Jānis Vilmanis*²; Prof. *Ģirts Briģis*²

¹*Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia;*

²*Rīga Stradiņš University, Latvia*

Objectives

Most studies from high-income countries agree that overall survival of cancer patients with diabetes is lower compared to non-diabetic cancer patients. The aim of our study was to assess the association between pre-existing diabetes and overall survival of cancer patients in Latvia.

Methods

Two population-based data sets were used to perform two independent retrospective cohort analyses. The first data set (disease registers) consisted of 22 936 men and 25 338 women with cancers diagnosed from 2009 to 2013 and followed-up until February 28, 2015; the linkage between the Cancer Register, the Diabetes Register and the Causes of Death Database provided data on diseases and vital status. The second data set (health care service data) included 10 130 men and 13 236 women who were discharged from oncology hospitals with cancer diagnosis from 2009 to 2012 and followed-up until December 31, 2013; their diabetes status was indicated by antidiabetic prescriptions. Cox regression was used to estimate age-adjusted hazard ratios (aHR) with 95% confidence intervals (CI).

Results

Among female cancer patients, prior diabetes was associated with worse survival during the entire follow-up period: aHR was 1.17 (1.10–1.24) using the disease register data and 1.11 (1.02–1.21) using the health service data. However, among male cancer patients, those with diabetes had an even better short-term survival: aHR was 0.86 (0.79–0.93) for the first year and 0.89 (0.80–0.98) for the first two years after cancer diagnosis according to the disease register and health service data, respectively. Further, after three full years of follow up, men with prior diabetes had a higher mortality: aHR was 1.60 (1.28–1.99).

Conclusions

The better short-term overall survival in Latvian male cancer patients with prior diabetes contradicts existing evidence. Regular contacts with health professionals and familiarity with the health-care system might lead to earlier cancer detection and better disease management.

Action of Different Types of Aspen Bark Extracts on Digestion Enzymes

Prof. *Jelena Krasilnikova*¹; Prof. *Galina Telysheva*²;
Prof. *Elena Kistanova*³; *Kirils Jursevics*⁴; Dr. *Sarmite Janceva*²;
Ph.D. *Liga Lauberte*²; Dr. *Oskars Bikovens*²

¹ Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia;

² Latvian State Institute of Wood Chemistry;

³ Institute of Biology and Immunology of Reproduction, BAS, Bulgaria;

⁴ Rīga Stradiņš University, Latvia

Objectives

Dysfunction on digestion enzymes can lead to dyspepsia and malnutrition, which can cause imbalance in cell metabolism of lipids, proteins and carbohydrates. It is important to discover new nontoxic and economically efficient forms for overall metabolic correction, which is included in European COST CA 15135 MuTaLig programme. The aim is to study different extracts obtained from Aspen (*Populus Tremula*) bark growing in Latvia and their influence on digestion enzyme activity.

Methods

Two types of aspen bark extracts were tested: mechanochemically pre-treated bark extract (46% polyphenols with salicinoids as active compounds, and 30.2% monosaccharides), and untreated aspen bark (21% and 30.6% respectively) in doses from 0.5 ml to 3 ml. Extracts were obtained from Latvian State Institute of Wood Chemistry. The influence of the extracts on salivary amylase was measured by the breakdown of polysaccharides containing linear α -1, 4 glucose bonds in starch; of pepsin (substrate: milk protein – casein); of pancreatic lipase (substrate: milk triglycerides). The experiment was conducted on standard European digestion models.

Results

In doses 0.5 ml and 1.0 ml amylase activity in both cases increased 8 times. Peptidase efficacy using pre-treated bark extract in doses 1.0 ml and 2.0 ml was much higher, than in the same quantities of untreated aspen bark extract, which was shown by better hydrolysis of casein polypeptides. The effect on pancreatic lipase was inhibitory in both tests in doses 2.0 ml and 4.0 ml.

In non-physiological models of duodenal phase (without bile) untreated aspen bark extract activates lipase in all tested doses.

Conclusions

The received data show that both extracts obtained from domestic raw materials, possibly can be used for physiological correction of digestion enzymes. Inhibition of pancreatic lipase can be used for reducing lipid absorption in obese and people with hyperlipidaemia, but it is necessary to conduct further researches.

Patient's Body Weight Changes and Food Intake in Hospital: Nutrition Day 2018 Audit

*Dr. Jevgenija Arensburga*¹;
*Dr. Justīne Rudzīte-Rjabceva*¹; *Dr. med. Laila Meija*²

¹ *Rīga Stradiņš University, Medical residency program, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia;*
² *Rīga Stradiņš University, Academic staff, Latvia;
Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Disease related malnutrition is serious problem in hospitals leading to increase rate of complications and costs respectively.

The aim of nutritionDay (nDay) is to improve awareness of malnutrition in health care institutions. Specific task of this study was to identify food intake and body weight changes in hospital using nDay audit results.

Methods

nDay worldwide is a one-day cross-sectional audit conducted in hospital wards around the world. This study reports preliminary analysis of nDay 2018 data of Clinical University Hospital. 125 newly admitted patients participated in the study. The official nDay Patient Questionnaire and patient medical records were used. Data were analyzed using Excel.

Results

Only 34.9% of patients with planned hospital admission and 19% of emergency patients had their weight measured. The body weight data of the rest of patients were either self-reported or estimated. 31.8% of patients reported reduced food intake prior to hospitalization, 75.6% of them ate less than half portion. 58.5% of patients who reported reduced food intake prior to hospitalization also reported weight loss. Nevertheless, 34.1% of patients who ate “normal” and better during the previous three months reported weight loss. 62.0% of patients reported reduced food intake during hospitalization, 38.0% of them ate less than half portion. Organoleptic qualities of hospital meals are the main reasons for reduced food intake in hospital setting: 35% of the study patients did not like the taste / smell of the food offered. However, comparison with previous years' data suggests that quality / presentation of food in hospital has been improving.

Conclusions

Reduced food intake and weight loss leading to malnutrition is a serious problem in hospitals. More attention should be paid to patient food intake and body weight dynamic of patients in primary care and during hospital stay, since disease related malnutrition can be reduced by nutritional therapy.

Design of FRET-Based Assay for Detection of Intracellular pH

*Laura Hippe*¹; Prof. *Modra Murovska*¹;
*Dr. med. Linda Gailite*²; Ph.D. *Mārtiņš Kālis*²

¹ Rīga Stradiņš University, Institute of Microbiology and Virology, Latvia;

² Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia

Objectives

Intracellular pH is a significant marker of cellular processes. Fluorescent proteins and dyes have been used to assess intracellular pH in previous studies. Since fluorescent proteins demonstrate low toxicity, they are suitable for live cell experiments. However, usage of fluorescent proteins for pH detection has their limits, as each protein is sensitive only at certain pH range. Therefore we have designed a new approach for pH assessment, using several fluorescent protein pairs in FRET system.

Methods

Our pH sensor system design includes three FRET constructs, each consisting of a fluorescent protein pair. Fluorescent proteins of different pH sensitivity were combined in pairs, using Aquamarine, Citrine, ECFP and EYFP fluorescent proteins. Corresponding DNA constructs were designed and produced using DNA synthesis and cloned into expression vector under CMV promoter.

Results

DNA constructs coding for FRET fluorescent protein fusion proteins have been obtained and sequenced. Testing of the construct expression, FRET and dependence of fluorescence and FRET values on pH in live cells is ongoing.

Conclusions

A new concept of FRET-based intracellular pH assessment system has been created. More experimental work is necessary to approve the system.

Trimethylamine-N-Oxide – Microbiota-Derived Cardiometabolic Risk Marker

Prof. *Maija Dambrova*¹; Ph.D. *Janis Kuka*²; *Melita Videja*²;
Prof. *Ilze Konrade*³; Dr. *Edgars Liepins*²

¹ *Rīga Stradiņš University, Faculty of Pharmacy, Latvia;*

² *Latvian Institute of Organic Synthesis;*

³ *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

Trimethylamine-N-oxide (TMAO) is a product of the intestinal microbiota-dependent metabolism of dietary L-carnitine, choline and phosphatidylcholine. Despite that TMAO may protect cells by acting as osmolyte and protein folding stabilizer and TMAO-containing marine product consumption is inversely associated with fatal coronary heart disease, growing evidence suggests that increased TMAO plasma concentration is a marker of cardiometabolic risks and a link between ingestion of unhealthy foods, such as beef (containing carnitine) and eggs (containing choline) and the development of atherosclerosis. The independent association of TMAO with the incidence of major adverse cardiovascular events, angiographic measures of coronary artery atherosclerosis, cardiometabolic risk, impaired renal function and all-cause mortality have been published. TMAO has been shown to suppress reverse cholesterol transport, deteriorate endothelial cell senescence and vascular aging, and to reduce the mitochondrial efficiency of energy production in the cardiac tissues. Statins, meldonium and 3,3-dimethyl-1-butanol intake is associated with lower TMAO plasma concentrations. Studies of TMAO as an emerging diagnostic marker in lifestyle diseases add to the growing understanding of the interactions between food intake and cardiometabolic risks and drive innovative approaches to treat cardiovascular diseases and diabetes.

Glucose Metabolism Disorders in Kidney Transplant Recipients

*Dr. Klinta Gritane*¹; *Dr. med. Ieva Ziedina*²; *Dr. med. Janis Jusinskis*²;
*Dr. med. Aleksandrs Malcevs*²; *Dr. med. Vadims Suhorukovs*²;
*Dr. Diana Amerika*³; *Prof. Aivars Lejnies*¹

¹ *Rīga East University Hospital, Latvia;*

Rīga Stradiņš University, Latvia;

² *Pauls Stradiņš Clinical University Hospital, Latvia;*

Rīga Stradiņš University, Latvia;

³ *Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

The aim was to evaluate the incidence of glucose metabolism disorders in kidney transplant recipients and determine its' influence on transplantation outcomes.

Methods

In single centre, retrospective study were included patients who underwent kidney transplantation in 2015. and 2016. Patients were divided into three groups according to the glucose state post-transplant: no glucose metabolism disorders, diabetes mellitus (DM) known before transplantation and post-transplant diabetes mellitus (PTDM). Graft function was evaluated by eGFR, assessed by CKD-EPI equation. One- and two-years graft and patient survivals were assessed by Kaplan–Meier analysis. For statistical analysis IBM SPSS Statistics 21.0 was used.

Results

A total of 112 patients received kidney transplant in 2015. and 2016. For 81.3% (n = 91) of recipients there were no glucose metabolism disorders, 10.7% (n = 12) had known DM before kidney transplantation and 8% (n = 9) of patients developed PTDM. Mean glycaemia after one and two years was the lowest in the group of no glucose metabolism disorders (5.44 mmol/l; 5.61 mmol/l), but the highest in PTDM group (8.68 mmol/l; 7.36 mmol/l), for DM group it was accordingly 6.27 mmol/l; 6.33 mmol/l.

Graft function did not differ significantly after one and two years follow-up, however, there was a tendency for GFR to be higher in the PTDM group. All the grafts were functioning in DM and PTDM groups and there was no significant difference in graft survival between all the study groups (p = 0.26). Three patients died during two year follow-up. The reasons for patient loss were – cardiovascular complications, infectious complications and bleeding from the gastrointestinal tract.

Conclusions

Our findings report that glucose metabolism disorders are present in the population of kidney transplant recipients but does not influence results of kidney transplantation in short term. Further studies should be conducted to determine factors associated with development of post-transplant diabetes mellitus and its' impact on transplantation outcomes in long term.

Nutritional Risk Screening and Prevalence of Malnutrition in Hospitalized Patients

*Kristīne Klaramunta-Antila*¹; *Dr. Justīne Rudzīte-Rjabceva*²;
*Nora Aleksīna*³; *Dr. med. Laila Meija*⁴

¹ *Rīga Stradiņš University, Latvia;*

² *Rīga Stradiņš University, Medical residency program, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvia;

³ *Pauls Stradiņš Clinical University Hospital, residency of gastroenterology, Latvia;*
University of Latvia;

⁴ *Pauls Stradiņš Clinical University Hospital, Latvia;*
Rīga Stradiņš University, Latvia

Objectives

There is a high prevalence of malnutrition among hospitalized patients. Malnutrition is associated with increased risk of complications and higher treatment costs. Currently, malnutrition screening is not practiced in hospitals in Latvia. The aim of the study was to assess the risk of malnutrition and its prevalence in hospitalized patients.

Methods

The cross-sectional study was carried out within the framework of the scientific project “Nutrition Day Worldwide” on November 15, 2018 at the Pauls Stradiņš Clinical University Hospital. The study included 125 hospital patients from the departments of neurology, pulmonology, gastroenterology, cardio surgery and general surgery. The validated “Nutrition Day Worldwide” questionnaire was used to collect patient data. Statistical processing of data was performed in Microsoft Excel and SPSS Statistics.

Results

Data were available for 116 patients, of whom 43.1% (n = 50) were men and 56.9% (n = 66) women. The mean age was: 64 years (SD = 14.7), 63 (SD = 16.4) years for men and 65 (SD = 13.5) years for female.

The mild malnutrition risk was diagnosed 13.8% (n = 16), moderate malnutrition risk 21.6% (n = 25), and severe malnutrition risk 20.7% (n = 24) of hospitalized patients.

The average length of hospital stay was 11.6 (SD = 9) days. Patients with normal nutritional status had an average of 10.8 (SD = 8.4) days in the hospital, and patients with severe malnutrition risk 13.3 (SD = 10.5) days.

Conclusions

The risk of malnutrition was observed in the majority of hospitalized patients, while severe malnutrition risk was diagnosed in fifth of the patients. The results indicate longer hospital stay of malnourished patients. A regular nutritional risk screening should be implemented in hospitals of Latvia.

Activated and Non-Activated Wheat Flakes Glycaemic and Insulin Response

*Dr. Guna Havensone*¹; *Dr. med. Laila Meija*²;
*Dr. med. Vinita Cauce*³; *Prof. Aivars Lejnīeks*⁴

¹ *Rīga Stradiņš University, Latvia;*

² *Rīga Stradiņš University, Department of Sports and Nutrition, Latvia;*

³ *Rīga Stradiņš University, Department of Physics, Latvia;*

⁴ *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

Objectives

The prevalence of metabolic diseases worldwide has increased dramatically. High daily intake of whole grain reduces incidence and progression of metabolic disorders. There is an increasing need for alternative foods e.g. whole grain based functional foods such as activated or germinated grain. The aim of study was to assess changes in carbohydrate content in flakes after activation of grains and investigate glycaemic and insulin response after consumption flakes made from non-activated and activated wheat flakes.

Methods

A group of nine healthy, young people, aged from 18 to 30 years with normal body mass index (BMI) 22.3 ± 2.9 kg/m² participated in the test. The participants in fasted state were given equivalent carbohydrate amount non-activated or activated wheat cereal meal and reference food (glucose solution). Post-prandial blood glucose and plasma insulin concentrations were measured according to Brouns et al. (2005).

Results

Chemical changes in activated wheat grain flakes showed increased concentration of resistant starch, increased soluble fibre and decreased insoluble fiber. The highest concentration of plasma glucose was at 30 min: 8.77 ± 0.47 mmol for glucose reference solution, 6.89 ± 0.89 mmol for activated flakes and 8.08 ± 1.06 mmol/l for non-activated wheat flakes. Both – activated and non-activated cereal flakes gave significant differences ($p \leq 0.05$) in lower glucose response than the glucose reference solution.

There was no significant difference in glycaemic and insulin response after consumption non-activated and activated wheat flakes.

Conclusions

Results indicated that activation of grains is not a crucial factor for reduction of glycaemic and insulin response reduction. It could be suggested that the main role could be contribution of components of carbohydrates such as soluble, insoluble fiber, starch, sugars, and their changes during production of flakes.

Factors Associated with Glycemic Control in Hospitalised Diabetes Mellitus Patients: Preliminary Report

*Artūrs Pētersons*¹; *Dr. med. Larisa Umnova*²

¹ *Rīga Stradiņš University, Latvia;*

² *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

Objectives

The objective of this study is to assess associations between glycemic control (GC) and factors involving Diabetes self management (DSM), patient demographic data, disease status and laboratory data.

Methods

Our study design was cross-sectional. Diabetes mellitus (DM) patients from Pauls Stradiņš Clinical University Hospital and Riga East University Hospitals Endocrinology ward completed a DSM questionnaire (DSMQ—a DM self-care assessment questionnaire containing questions about Glucose control (medication use and blood glucose level monitoring), Dietary Control, Physical Activity and Health-care Use) and a questionnaire for demographic data and disease status assessment. The study participants laboratory data were obtained from their hospital charts. Regression analysis and Pearson correlation coefficient was calculated to assess correlations between HbA1c levels and different numerical patient data.

Results

49 patients completed the questionnaire. 39% (n = 19) were male and 61% (n = 30) were female, mean age was 57 years (range 18–87 years; SD = 19 years). HbA1c was measured in 34 research participants and the mean HbA1c level was 9.50% (range 4.5% to 16.2%; SD = 2.9%). A statistically significant negative correlation was found between the total DSMQ score and HbA1c ($r = -0.43$, $n = 34$, $p = 0.006$) as well as between the Glucose Management subscale of DSMQ and HbA1c ($r = -0.50$, $n = 34$, $p = 0.003$) and between the Dietary Control subscale of DSMQ and HbA1c ($r = -0.37$, $n = 34$, $p = 0.03$).

Conclusions

According to our preliminary data patients self assessment of DSM correlates with GC. Self assessment of Glucose Management (medication use and glucose monitoring) as well as Dietary Control show the strongest correlation with HbA1c. Further research is needed to assess the validity of DSMQ for assessment of self-care habits associated with GC in DM patients.

Increased Tissue Expression of Th17-Related Cytokines in Hashimoto's Thyroiditis: Shift in Traditional Th1/Th2 Paradigm

*Dr. Tatjana Zaķe*¹; *Dr. med. Sandra Skuja*¹; *Dr. Ieva Kalere*²;
*Prof. Ilze Konrāde*³; *Prof., Dr. habil. med. Valērija Groma*¹

¹Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;

²Rīga Stradiņš University, Department of Human

Physiology and Biochemistry, Latvia;

³Rīga Stradiņš University, Latvia;

Rīga East University Hospital, Latvia

Objectives

Hashimoto's thyroiditis (HT) has long been considered as a Th1-mediated disease, while a Th2-driven autoimmune response is dominant for Graves' disease (GD) development. The discovery of Th17 cells has changed the traditional paradigm of Th1/Th2 dichotomy. Furthermore, Th cells upon exposure to IL-23, IL-1 β , and IL-6 can generate highly pathogenic Th17 lymphocytes. We aimed to investigate the association between IL-17 and cytokines promoting differentiation of pathogenic Th17 cells by studying immunoeexpression patterns of IL-17, IL-23, and IL-1 β in AITD.

Methods

Twenty-one adult patients with HT and 8 patients with GD who underwent thyroidectomy at Riga East University Hospital between January 2014 and December 2016 were enrolled in this study. Eighteen age and gender-matched patients with colloid goiter without autoimmune component served as a control group. Immunohistochemical staining was performed in each case using polyclonal rabbit anti-IL-17A, anti-IL-23, and anti-IL-1 β antibodies. Additionally, thyroid tissue specimens obtained from 5 HT patients during thyroidectomy were fixed in aldehyde and further processed for immunofluorescent labeling and confocal microscopy.

Results

The expression level of IL-17 in the thyrocytes was significantly higher in HT and GD patients than that in colloid goiter patients. Immunopositivity of both IL-23 and IL-1 β was significantly increased in HT patients when compared to GD and colloid goiter. However, no difference was found between IL-23 or IL-1 β expression in patients with GD and colloid goiter. A positive correlation between IL-17 and IL-23 as well as IL-17 and IL-1 β expression was observed in HT patients ($r = 0.574$, $p = 0.007$ and $r = 0.461$, $p = 0.036$, respectively). In GD patients, IL-17 was positively correlated with IL-1 β ($r = 0.817$, $p = 0.013$) but not with IL-23 expression.

Conclusions

We found increased expression of proinflammatory IL-23 and IL-1 β which correlated with IL-17 in HT but not in GD patients, suggesting that both interleukins through promoting the differentiation of pathogenic Th17 may have a role in HT pathogenesis.

Consistency of ADC-DWI and ADC-DWIBS in Bowel Walls Depending on Measurement Area in Active Chron's Disease

Prof. *Ilze Apine*¹; *Reinis Pitura*²; *Dr. Digna Bērziņa*²

¹ *Children's Clinical University Hospital,
Department of Radiology, Latvia;*

² *Latvia*

Objectives

To assess consistency between apparent diffusion coefficients (ADC) in diffusion-weighted imaging (DWI) and diffusion-weighted imaging with background body signal suppression (DWIBS) depending on area of selected region of interest (ROI) in inflamed ileal wall in adult and paediatric patients with proven Crohn's disease.

Methods

15 patients – 9 children, 11–17 y.o., and 6 adults, 25–57 y.o., with proven active Crohn's disease in the terminal ileum loop underwent MR enterography examination including DWI and DWIBS sequences. ADC-DWI and ADC-DWIBS values were measured in 31 diseased bowel segment of paediatric patients and 25 diseased bowel segments in adult patients using 2–3 mm² ROI and 10–20 mm² ROI. Both ADC-DWI and ADC-DWIBS values were mutually compared using t-test in each ROI. P value of < 0.05 was chosen as a level of statistical significance.

Results

No statistically significant difference was found between ADC-DWI and ADC-DWIBS choosing 2–3 mm² ROI being $1.23 (SD = 0.29) \times 10^{-3} \text{ mm}^2/\text{s}$ and $1.14 (SD 0.43) \times 10^{-3} \text{ mm}^2/\text{s}$, respectively ($p = 0.08$), and difference neither in children nor in adults was found. There was statistically significant difference between ADC-DWI and ADC-DWIBS choosing 10–20 mm² ROI, in whole study population being $1.24 (SD = 0.32) \times 10^{-3} \text{ mm}^2/\text{s}$ and $1.16 (SD 0.50) \times 10^{-3} \text{ mm}^2/\text{s}$, respectively ($p = 0.03$). Among them, there was statistically significant difference between ADC-DWI and ADC-DWIBS in adults being $1.20 (SD = 0.31)$ and $1.12 (SD = 0.48)$ ($P = 0.04$), respectively, whereas in children there was no statistically significant difference between ADC-DWI and ADC-DWIBS being $1.37 (SD = 0.31) \times 10^{-3} \text{ mm}^2/\text{s}$ and $1.31 (SD = 0.49) \times 10^{-3} \text{ mm}^2/\text{s}$, respectively ($p = 0.26$).

Conclusions

ADC-DWI and ADC-DWIBS values measured with smaller ROI are more precise in both pediatric and adult patients since such small ROI does not contain signal contamination from juxtaintestinal tissues. Larger ROI, in turn, includes signal contamination from surrounding tissue which, due to morphological features of adult tissues and different fat suppression properties of DWI and DWIBS results to difference between ADC-DWI and ADC-DWIBS values.

Pain Management in Intensive Care Unit Patients after Cardiac Surgery with Sternotomy Approach

*Baiba Vilīte; Ph.D. Eva Striķe;
Dr. Roberts Leibuss; Dr. Katrīna Rutka*

*Pauls Stradiņš Clinical University Hospital, Department of
Cardioanesthesiology and Intensive Care, Latvia;*

Keywords: pain management, intensive care, cardiac surgery, patient satisfaction.

Objectives

Postoperative pain is a persistent problem among intensive care patients. Pain management includes pain assessment and documentation, patient care and pharmacological treatment, but it is impacted by several factors. Pain in intensive care patients after cardiac surgery continues to be undermanaged. The aim of the study is to find out the pain management practices and describe patient satisfaction measurements for intensive care patients after cardiac surgery with sternotomy approach at a university hospital in Riga, Latvia.

Methods

A prospective, cross-sectional design was used. 19 intensive care nurses and their knowledge regarding pain management was assessed with Toronto Pain Management Inventory and 72 intensive care patients were assessed with a research protocol containing pain level and pharmacological treatment data and 2010 Revised American Pain Society Patient Outcome Questionnaire for patient satisfaction measurements.

Results

Postoperative pain for intensive care patients after cardiac surgery is mostly mild (68.66%, n = 46). Pain intensity has a tendency to lower over time, from 4.66 mean VAS score 2 hours after extubation to 3.12 mean VAS score 12 hours after extubation. Pain mostly negatively impacts the patients' ability to carry out activities in bed ($X = 4.69$, scale range - 0-10) and sleeping ($X = 2.02$, scale range - 0-10). Mostly opioids (100%, n = 72) and NSAIDs (77.8%, n = 56) are used for pharmacological treatment, and treatment is adjusted according to pain levels and patient needs. Patient satisfaction regarding pain management in the 24 hours after surgery is high (94.2%, n = 49), even though nurses' knowledge is average ($X = 60.6 \pm 7.3\%$).

Conclusions

Individualized pain management plan based on patient pain levels and needs requires pain documentation and ensures a high patient satisfaction. Pain levels after cardiac surgery with sternotomy approach is mostly mild and patient satisfaction is high.

Increased Load of Somatic Mutation in Association with More Aggressive Growth and Recurrence of Pituitary Adenoma

*Dr. Inga Balcere*¹; *Raitis Peculis*²; *Ilze Radovica-Spalvina*²;
*Prof. Ilze Konrade*¹; *Dr. Mihails Romanovs*³;
*Dr. Aigars Kiecis*⁴; *Kaspars Megnis*²; *Vita Rovite*⁵;
*Prof. Aivars Lejnieks*¹; *Prof. Janis Klovinš*²

¹ *Rīga East University Hospital, Latvia;*
Rīga Stradiņš University, Latvia;

² *Latvian Biomedical Research and Study Centre;*

³ *Rīga East University Hospital, Latvia;*
University of Latvia;

⁴ *Rīga East University Hospital, Diagnostic Radiology Centre, Latvia;*

⁵ *Latvian Biomedical Research and Study Center; University of Latvia*

Objectives

In this study, we investigated genetic differences between genomic DNA of primary and rapidly recurrent tumour in the same patient, to understand the tumorigenesis mechanisms of PA recurrence.

Results

We observed an increased load of missense mutations in the recurrent pituitary adenoma when compared to a first tumour. Amount of detected mutations increased from 10 to 26 and potential clonal expansion of four mutations can be observed. Additionally, targeted SNP (single-nucleotide polymorphism) analysis revealed five rare missense SNPs with potential impact on the function of their proteins.

Conclusions

Investigation of our case showed, that relapsed pituitary adenoma had a higher mutational load and faster recurrence of a tumor and in this patient it could be caused by clonal expansion of the tumour leftover tissue.

Different Growth Factors and Proliferation Markers in Middle Ear Cholesteatoma: Literature Review

Dr. Kristaps Dambergs¹; Ph.D. Gunta Sumeraga²

¹*Rīga Stradiņš University, Latvia;*

Children's Clinical University Hospital, Latvia;

²*Rīga Stradiņš University, Department of Otorhinolaryngology, Latvia*

Objectives

Cholesteatoma is a benign epidermally derived lesion in the middle ear. It is characterized by migration of keratinized squamous epithelium. There are several growth factors that can induce proliferation of cholesteatoma epithelium. The aim of the review is to find out the different types of growth factors in the cholesteatoma tissue.

Methods

PubMed database was used to search for articles. Two search domains “cholesteatoma” and “growth factors” which were combined by “AND” were used to find relevant articles, also “similar articles” section was used.

Results

After searching and excluding a total of 14 articles published from 1993. until 2017., were included in review. Growth factors and ligands from Epidermal growth factor family was researched – total 6 different studies. Six different studies used Ki-67, which is epithelial proliferation marker, to prove cell proliferation in cholesteatoma tissue.

There is contrariety in two studies that wrote about proliferating cell nuclear antigen (PCNA), Raynov et al, states that PCNA is not specific and not reliable marker and often leads to false positive or negative results. However, Olszewska et al, declares PCNA-positive cells show active proliferation and is useful in estimating the aggressiveness of the cholesteatoma.

Only three studies write about possibility to develop intra tympanic drug for cholesteatoma treatment. Two studies researched mRNA which is believed to regulate protein coding genes involved in the regulation of cell proliferation. Shumin et al, currently uses HaCat cell culture model to further investigate the effect of Heparin binding EGF like growth factor in order to confirm HB-EGF as a potential target for intra-tympanic drug.

Conclusions

Various number of growth factors are involved in cholesteatoma development. It is not yet clear which of these growth factors are responsible only for cholesteatoma and further research should be done. The obtained information is going to be used for a following pilot study.

Using a Multi-Omics Approach to Understand Complexity of Metformin Action in Humans with Respect to Variability of Response to the Treatment

Prof. *Ilze Konrade*¹; Prof. *Janis Klovins*²; *Ilze Elbere*²;
*Monta Ustinova*²; *Vita Rovite*²; Prof. *Valdis Pirags*³

¹ Riga East University Hospital, Latvia;

² Latvian Biomedical Research and Study Centre;

³ University of Latvia

Objectives

Metformin is a commonly used antihyperglycemic agent for the treatment of type 2 diabetes. Nevertheless, the exact mechanisms of action underlying the various therapeutic effects and their variability in metformin treatment remain elusive.

Methods

Some of the cohorts included in the Genome Database of Latvian Population have provided a unique opportunity to study the complexity of antidiabetic drug responses in healthy people and patients of type 2 diabetes. This study goes beyond the pharmacogenomics and demonstrates the system based approach involving investigation of microbiome and epigenetic factors determining the response of metformin, a widely used antihyperglycemic agent in terms of efficacy and intolerance.

Results

Using a multi-omics approach that includes analysis of genetics, microbiome composition, epigenetic alterations and RNA expression we demonstrate for the first time the immediate effect of short-term metformin administration at therapeutic doses on all above-mentioned aspects included in analysis. We show the metformin-associated increase in abundance of opportunistic pathogens triggering the occurrence of side effects associated with the observed dysbiosis of the gut microbiome. These results also suggest the DNA methylation process as one of the mechanisms involved in the action of metformin, thereby revealing novel targets and directions of the molecular mechanisms underlying the various beneficial effects of metformin.

Conclusions

The results of the study reveal for the first time a strong inter-individual variation of the metformin effect on the transcriptional regulation that goes in line with well-known variability of the therapeutic response to the drug.

Milk as Most Important Source for Optimal Iodine Supply

*Dr. Lolita Vija Neimane*¹; *Dr. med. Ieva Strēle*²;
*Prof. Ilze Konrāde*³; *Prof. Aivars Lejnieks*³

¹ *Rīga Stradiņš University, Department of Sports and Nutrition, Latvia;*

² *Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia;*

³ *Rīga Stradiņš University, Department of Internal Diseases, Latvia;*

Objectives

Objectives. Milk and dairy products are studied as alternative iodine sources, because salt iodization is controversial due to high salt consumption leading to cardiovascular diseases. In a natural way, the concentration of iodine in milk is low, but it is strongly increased due to iodine-rich cattle feed and the presence of disinfectants in milk. In milk samples determined in Latvia (2017), the average iodine quantity was 457.6 µg/L.

The aim of this study was to assess the use of iodine in animal farms in disinfectants and food supplements.

Methods

An original questionnaire was developed to perform a survey among selected 35 cow farms. The size of farms ranged from 10 to 900 cows; the median size was 100 cows. The iodine use between large farms (more than 100 cows, n 18) and small farms (less than 100 cows, n 17) was compared using Fisher's Exact test.

Results

Overall, 80% of farms used iodine containing feed additives, but only 30.3% of farms used iodine containing disinfectants in teat dipping. Although a higher proportion of larger farms than smaller farms used iodine containing feed additives (94.1% vs 66.7%) and iodine containing disinfectants in teat dipping (37.5% vs 23.5%) these differences were not statistically significant.

Conclusions

Iodine in disinfectants on large farms is slightly less than half the farm, in the small case of only one-fifth. Iodine food supplements are used in virtually all large farms and slightly more than half the small farms.

Milk and dairy products can be considered as one of the main sources of iodine.

Changes in Body Mass Index, Ratio of Waist and Hip Circumference Related to Use of Plate Principle for Overweight Women

*Dr. Lolita Vija Neimane*¹; *Anita Baumane*²; *Silva Seņkāne*³

¹ *Rīga Stradiņš University, Department of Sports and Nutrition, Latvia;*

² *Rehabilitation Center Krimulda, Latvia;*

³ *Rīga Stradiņš University, Latvia*

Objectives

Large portions of food and sedentary lifestyle inevitably increase body weight.

The aim of the work is to investigate how the use of the plate principle changes the anthropometric indicators – body mass index (hereinafter – BMI) and the ratio of waist and hip circumference – of participants during one month.

Methods

The research involved women (n = 13) with BMI greater than 24.9 and the ratio of waist and hip circumference more than 0.8. Medical scales, tape measure, height meter were used to achieve the goal of the research. Research data was processed and analyzed by IBM SPSS Statistics 22. The arithmetic mean and standard deviation were calculated. Changes in anthropometric indicators at the beginning and end of the study with Wilcoxon test. Theoretical value $p = 0.05$.

Results

The average age of the participants of the study was 40 years (SD = 8.7), height 1.70 cm. The average BMI at the start of the study was 30.3 (SD = 3.3), while at the end of the study the average BMI was 29.4 (SD = 3.0). Analyzing data of BMI changes at the end of the study, it was found that BMI changes are statistically significant as $p = 0.002$. At the start of the study the average ratio of waist and hip circumference was 0.9 (SD = 0.1), while it was 0.87 (SD = 0.1) at the end of the study.

Conclusions

A statistically significant change in BMI can be achieved, following the plate principle within a month. The ratio of waist and hip circumference declined, following the plate principle within a month, but statistically insignificant, because more time is required to achieve significant changes.

Selenium-Rich Food Consumption in Latvia from 2000 to 2016

*Ieva Kalere*¹; Prof. *Ilze Konrāde*²;
*Dr. Tatjana Zaķe*³; *Dr. med. Ieva Strēle*⁴

¹ Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia;

² Rīga Stradiņš University, Department of Internal Diseases, Latvia;

³ Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;

⁴ Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia

Objectives

Dietary selenium is available for the synthesis of selenoproteins, which have variable functions, including antioxidant effects, T cell immunity and thyroid hormone metabolism. The main food groups contributing to selenium intake are milk and dairy products, meat, grains, fish, and related products. The aim of the study was to evaluate the selenium-rich food consumption in Latvia.

Methods

The study used data from the Health Behaviour among Latvian Adult Population survey (aged 15 to 64 years) for the period 2000–2016. Consumption prevalence, % and 95% confidence interval are shown in the results.

Results

The percentage of participants usually eating at least one slice of rye bread per day decreased from 80.6% (78.9, 82.1) to 70.1% (68.5, 71.5), $p = 0.016$, while that of white bread decreased from 75.5% (73.7, 77.1) to 57.5% (55.8, 59.0), $p = 0.001$.

The percentage of participants drinking at least 1 glass of milk daily decreased from 61.2% (59.1, 63.1) to 47.3% (45.6, 48.9), $p = 0.001$.

The percentage of participants consuming chicken at least once weekly increased from 68.8% (66.7, 70.8) to 86.0% (84.8, 87.0), $p < 0.001$, while fish consumption decreased from 69.6% (67.5, 71.5) to 58.7% (57.0, 60.2), $p = 0.003$.

The percentage of participants consuming meat at least once within last week decreased from 90.1% (88.3, 91.5) in 2006 to 85.0% (83.7, 86.1) in 2016, $p = 0.007$. Similar trend was observed regarding the proportion of participants consuming meat products: decrease from 86.0% (84.3, 87.4) in 2000 to 79.8% (78.4, 81.0) in 2016, $p = 0.015$.

Conclusions

The current results reveal a shift in selenium-rich food consumption. The consumption of selenium rich products, with the exception of poultry, has decreased significantly during that period. The obtained data will be used when analyzing selenium status in Latvian population. The trends in dietary habits should be considered when recommending a selenium sufficient diet.

Have the Consumption Habits of Easily Identifiable Dietary Iodine Sources Changed?

Dr. *Vija Veisa*¹; Prof. *Ilze Konrāde*²; Dr. *Ieva Kalere*³;
Dr. med. *Ieva Strēle*⁴; Dr. med. *Marina Makrečka-Kūka*⁵;
Prof. *Dace Rezeberga*¹; Prof. *Aivars Lejnīeks*²; Prof. *Maija Dambrova*⁶

¹ Rīga Stradiņš University, Department of Obstetrics and Gynaecology, Latvia;

² Rīga Stradiņš University, Department of Internal Diseases, Latvia;
Rīga East University Hospital, Latvia;

³ Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia;

⁴ Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia;

⁵ Rīga Stradiņš University, Department of Pharmaceutical Chemistry, Latvia;

⁶ Rīga Stradiņš University, Latvian Institute of Organic Synthesis, Latvia

Objectives

To evaluate, whether the consumption of easily identifiable dietary iodine sources has changed over the past two decades.

Methods

We analyzed data from the Health Behaviour among Latvian Adult Population survey 1998–2014, Latvian pregnant women survey in 2013 and a similar survey among pregnant women conducted in 2018. The results are presented as proportion (95% CI).

Results

The percentage of iodized salt consumers increased from 1998 to 2004: 2.9% (2.2–3.6) to 15.3% (13.6–17.0), later decreased to 8.2% (7.2–9.2) in 2014 ($p < 0.001$). In 1998 at least one glass of milk per day was consumed by 60% (58–62) of respondents, which then decreased to 42.8% (41–44.6) in 2014, $p < 0.001$. In 1998, 69.5% (67.5–7.5) had consumed fish during the previous week, which dropped to 61.3% (59.6–63.0) in 2014, $p < 0.001$.

The percentage of pregnant women taking iodine supplements in 2013 was 17.2% (14.64–20.07), but in 2018: 14.7 (9.64–21.86), $p = 0.470$. Iodized salt was consumed by 8.9% (7.08–11.21) of pregnant women and 8.5% (4.83–14.62) in 2018, $p = 0.222$. One glass of milk per day was consumed by 87.82% (85.27–89.99) of pregnant women and 83.72% (76.39–89.10) in 2018, $p = 0.137$. Seafood was consumed by 50.87% (47.28–54.47) of pregnant women and 48.06% (39.62–56.61) in 2018, $p = 0.547$.

Conclusions

In the absence of mandatory salt iodization program dietary iodine intake is essential, however, our results suggest the consumption of iodine containing products has not changed significantly during the past two decades. Therefore, nation-wide recommendations would be relevant to reach adequate iodine intake in Latvian population.

Changes in Iron Absorption in Patients with Proven Enteropathy: Single Centre Analysis

*Dr. Olesja Basina*¹; *Dr. Jelena Derova*²;
Prof. *Aleksejs Derovs*³; *Dr. med. Sandra Lejniece*¹

¹ *Riga East University Hospital, Latvia;*

² *Latvian Maritime Medical Centre, Latvia;*

³ *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

Objectives

To evaluate the potential correlation between enteropathy detected by capsule endoscopy (CE) and iron absorption disturbances.

Methods

The study included all patients without exclusion criteria who had a CE performed at Latvian Maritime Medical centre “Gastroklinika” from November 2014 to November 2018. Patient’s related data, CE procedure related factors and iron absorption test related factors were collected in originally designed study protocol. All the data were entered in a database for further processing and analysis. Iron absorption test was performed in classical way, i.e. patient was received a 50 mg of oral iron gluconate: at 10:00 h on an empty stomach. S-iron was measured just before iron consumption, and after 1, 2 and 3 h consequently. Chi-square was used to measure association between anaemia and enteropathy. The data was statistically processed with the IBM SPSS 25.0 program.

Results

Overall, 47 patients participated in our study. Out of these 39 were females and 8 – males. The patient’s mean age was 42 (\pm 20) years. Out of these, enteropathy was found in 35 cases (72.9%), anemia was found in 24 (50.0%) cases. Latent iron deficiency with decreased ferritin level, was diagnosed in 17 patients (35.4%). After assessing the association between enteropathy presence and anemia, the tendency was found, that anemia is more common among patients with endoscopically diagnosed enteropathy ($p = 0.097$). However, the association between enteropathy and ferritin level was not found.

Conclusions

1. Anemia is associated with enteropathy, which can be explained by decreased absorption capability of intestinal surface, and substitution methods need to be appropriate.
2. Iron malabsorption was mostly found in patients with detected enteropathy.
3. Based on our findings, oral iron absorption test should be performed before starting treatment with oral iron preparations. Patients with proven enteropathy should have parenteral iron treatment as a first choice.

Changes in Haematological, Biochemical and Inflammatory Markers after Long Distance Running

Dace Sūna^{1,2}; *Sandra Rozenštoka*^{1,2}; *Simona Upīte*^{1,2}

¹ *Sports laboratory – sports medicine, sports traumatology and rehabilitation centre, Latvia;*

² *Rīga Stradiņš University, Latvia*

Objectives

Long distance running events are becoming more popular among recreational, amateur athletes. The effects of endurance exercise on athlete's health and situations when we should raise concern are not well understood. The aim of the study was to evaluate the acute effects of long distance running on haematological, biochemical and inflammatory markers in healthy male athletes.

Methods

Six amateur male endurance athletes (28–41 y.o.) participated in half marathon (n = 4) and marathon (n = 2). A written informed consent was obtained before the blood samples were collected. Blood samples were collected at baseline (0 to 5 days before the race) and immediately after the race (30 minutes to 1.5 hours after the finish). Statistical analysis was conducted using SPSS version 21.0.

Results

There were no statistically significant changes in red blood cell count, haemoglobin, haematocrit, C reactive protein, alanine aminotransferase and lactate levels. There was statistically significant increase in leucocyte count (p = 0.000), mainly due to increase in neutrophil count (p = 0.000). There was statistically significant increase in trombocyte count (p = 0.014), creatinine level (p = 0.001), decrease in glomerular filtration rate (p = 0.001), increase in lactate dehydrogenase (LDH) level (p = 0.021), aspartate aminotransferase (AST) level (p = 0.010), creatinine kinase level (p = 0.006), myoglobin level (p = 0.037), increase in creatinine kinase MB isoenzyme (CK-MB) level (p = 0.033), increase in cortisol level (p = 0.000). Trombocyte count increase was within reference range limits. AST level increase above the upper reference range limit was in two athletes, in one of these athletes also before the race. Creatinine was within reference range limits in two athletes, LDH in two athletes, CK-MB level in two athletes.

Conclusions

Endurance exercise can induce changes in blood laboratory markers that indicate muscle damage, renal impairment and inflammatory reaction. Physicians should know about these changes and be able to differentiate between pathological conditions and physiological response to exercise in each individual case.

Hight Frequency Ultrasound: Evaluation of B-Mode, Strain and Share Wave Elastography, Doppler Microcirculation Mode in Rotator Cuff Tendinopathy

Dr. Ingus Supe; Prof. Ardis Platkājis

Rīga Stradiņš University, Department of Radiology, Latvia

Objectives

Tendinopathy is one of the most common musculoskeletal injuries cause for shoulder pain. This condition comprises most upper-limb musculoskeletal disorders in the workplace, resulting in high economic costs.

Ultrasound (US) is a recent technology that has experienced major developments in the past two decades. In nowadays newest US modes allows a radiologist to evaluate changes in musculoskeletal structures not just in a qualitative manner like simply report on tendon echogenicity changes on grey-scale (B-mode), but also to estimate tendon fiber integrity and microcirculation while measuring tendon elasticity.

These modes of US potentially increase the sensitivity and diagnostic accuracy in tendinopathy compared to conventional US imaging. Still, these modes are a promising technique under development and may be used also to identify the risk of injury and to support the evaluation of rehabilitation interventions.

Methods

The aim of this research is to collect, analyze and compare US findings using high-frequency B-mode, Strain un Shear wave elastography and specialized Doppler microcirculation mode in order to asses changes in rotator cuff tendons for patients with acute shoulder pain.

A number of planned patients: 30 patients with shoulder pain and 15 patients without complaints about shoulder pain will be evaluated in this research.

Quantitative data: sex, age, BMI, thickness (mm) of subscapularis, supraspinatus and infraspinatus tendons on longitudinal plane (3 positions: enthesis, midportion and miotendinal junction), Shear wave elastography (kPa) of subscapularis, supraspinatus and infraspinatus tendons on longitudinal plane (3 positions: enthesis, midportion and miotendinal junction).

Philips Epiq7 ultrasound machine will be used; rotator cuff tendons will be examined with Linear probe eL18-4, that will provide an operational frequency in 18-4 Mhz. Ultrasound regimes: B-mode, Strain Elastography, Share Wave Elastography, Specialized Doppler Micro Flow.

Results

Research is being carried out now; results will be gathered, processed and explained after reaching the necessary number of patients in both groups. Estimated time March 2019.

Conclusions

Expected conclusion:

- For patients with complaints about shoulder pain in B-mode, it is expected to find changed-thickened tendon values (in the longitudinal plane) and III or IV type tendon fiber changes.
- Strain un Shear wave elastography measurements will show increase elasticity in rotator cuff tendons.
- It is expected for patients with shoulder pain to see changes in elastography data the earliest.
- In Doppler microcirculation mode one can anticipate different grades of micro-neovascularization in the altered rotator cuff tendons.

Effectiveness of a Multidisciplinary Approach in Total Knee Replacement

Prof. *Murod Karimov*; Dr. *Sarvar Madrakhimov*

Tashkent Medical Academy, Uzbekistan

Objectives

The aim of the study was to determine the effectiveness of a multidisciplinary approach in total knee arthroplasty (TKA).

Methods

Under our supervision there were 21 patients, osteoarthritis of the knee joint III-IV level (Kellgren-Lawrence, 1978). The Average age was 61 years. From them men - 1, women - 20. All patients underwent total knee arthroplasty. There were used several types of implants (Zimmer, De Puy, GRUPPO BIOIMPIANTI). In the preoperative period, on the basis of the developed algorithm, potential risk factors were studied: age, detailed history of the disease, life, concomitant diseases such as metabolic syndrome (diabetes mellitus, coronary artery disease, hypertension, obesity, cholesterol), the presence of chronic infection (ENT organs, dental, respiratory, gynecological, parenchymal organs, urinary system, skin condition). Also we examined blood tests (total blood count, ESR, coagulogram, biochemistry and blood sugar, CRP, RW, hepatitis - HBsAg, HCV, HDV, HEV. HIV infection), a swab from the throat, pharynx, duplex scanning of the lower extremities.

Results

Multidisciplinary examination of patients reduces risk factors such as deep vein thrombosis, pulmonary embolism, surgical and hospital-acquired infections. Postoperative management included planned anesthesia, prophylactic antibiotic therapy with Vancomycin 15 mg/kg ("International consensus on periprosthetic joint infection 2012"), anticoagulant therapy (rivaroxaban 15 mg, switching to aspirin 75 mg) and early rehabilitation. The latter begins 1 day after the operation, which includes an increase in the range of movements in the joints, using mobilization techniques, muscle strengthening, therapeutic exercises, improving the quality of life of the patient.

Conclusions

TKA is a challenge for orthopaedic surgeons. However, careful preoperative selection of patients, aimed at minimizing potential risks, is the key to achieving better results. There is no conflict of interest.

Treatment Apparatus for External Fixation of Fractures of Femoral Neck

*Ph.D. Fahriddin Salokhiddinov; Dr. Ravshan Jakubjanov;
Prof. Murodulla Karimov; Dr. Holbek Aliyev*

Tashkent Medical Academy, Uzbekistan

Objectives

The aim of the study was to study the efficacy of the treatment of femoral neck fractures using the rod apparatus developed by us.

Methods

Under our supervision there were 15 patients with fractures of the proximal end of the femur from July 2016 to May 2018. Of these, 4 women and 11 men. The age of patients ranged from 22 to 92 years, the average age was 56.1 ± 1.2 years. Among them 6 (40%) patients had metabolic syndrome.

Results

We have developed a rod external fixation device (patent FAP 01180). The advantages of the operative technique with the use of the rod apparatus proposed by us are minimization of the surgical trauma, creation of optimal conditions for reparative regeneration, the need for special tools and the possibility of early activation of patients.

Osteosynthesis of fractures of the femoral neck was carried out under spinal anesthesia with the use of EOC. On 2–3 days after the operation, patients started active movements in adjacent joints and walked with crutches with a dosed load and full load after 2 months. Control and dynamic radiography was carried out in 3 and 7 months. The average fixation period was 150 ± 6 days. Fracture fusion was observed in 14 patients, including: good results – in 13 (87.6%) patients, satisfactorily – in 1 (6.7%), unsatisfactory – in 1 (6.7%) patient.

Conclusions

The rod apparatus has the following advantages: early activation of patients, development of movements in adjacent joints and prevention of secondary complications. Although, this fixator is domestically produced, at a reasonable price and it has all the advantages, like other analogues.

Evaluation of Local and Systemic Analgesic Effects of Dexamethasone in Upper Arm Bone Fracture and Shoulder Joint Surgery

Dr. Jeļena Kucina; Ph.D. Iveta Golubovska

Traumatology and Orthopaedics Hospital, Latvia

Objectives

Shoulder surgery is associated with severe post-operative pain. Pain delays early rehabilitation, increases morbidity and lowers quality of life.

Aim of the work was to investigate which of administration methods: dexamethasone perineurally or intravenously prevents pain more effectively and improves patient quality of life.

Methods

Prospective, randomized study conducted at Traumatology and Orthopaedics Hospital after Ethics committee approval. Study involved 75 patients with upper limb fracture or shoulder joint surgery in combined regional and and general anesthesia.

Group I: Bupivacaine 0.25% - 70 mg + Dexamethasone 8 mg perineurally.

Group II: Bupivacaine 0.25% - 70 mg perineurally + Dexamethasone 8 mg i/v.

Group 0 (control): Bupivacaine 0.25% - 70 mg perineurally.

Stimulator and ultrasonography were used for nerve identification. Following indicators were fixed: pain intensity, morphine consumption, patient satisfaction. Statistical analysis was performed using SPSS software.

Results

Pain reliably ($p < 0.05$) differed on D0 at all standardized times. Pain was significantly lower in I and II groups comparing to the control group. There was significant difference in pain intensity between groups I and II in favor of the intravenous group ($p < 0.05$).

The mean morphine consumption for the control group on D0 was significantly higher for Group 0: 26.4 mg, I - 15.6 mg and 13.2 mg for group II ($p < 0.05$).

Satisfaction with analgesic method was 3.6 ± 0.5 in group I, 3.3 ± 1.5 in group II and 2.9 ± 0.7 in group 0 on D0.

In the control group, at first night, sleep disorders were more frequent (72.0%), but in group I only 12.0% and 4% in group II ($p < 0.05$).

Conclusions

The pain intensity is significantly lower in the dexamethasone groups, especially if systemically given. Opioid consumption is significantly lower in dexamethasone groups and patient postoperative period quality is significantly higher in dexamethasone groups.

Chronic Pain Syndrome Manifestation before and after Total Hip Arthroplasty for Patients with Primary Hip Osteoarthritis

*Agnese Studere*¹; *Dr. med. Daina Šmite*²

¹ *Traumatology and Orthopaedics Hospital, Latvia;*

² *Rīga Stradiņš University, Department of Rehabilitation, Latvia*

Objectives

Link between the osteoarthritis as a chronic pain syndrome and the central sensitization mechanisms is being proven more frequently as these are also named as one of the main reasons for development of chronic pain. The aim of the study was to analyze chronic pain syndrome and functional limitations caused by it for patients with primary hip osteoarthritis.

Methods

The prospective observatory cohort study included patients diagnosed with primary hip joint osteoarthritis. Patients were evaluated preoperatively and 4 to 6 months postoperatively. Patients filled HOOS, HADS, SF-36 surveys and pain manifestation assessment protocol.

Results

HOOS, HADS and SF-36 significantly improved ($p < 0.001$) postoperatively. 41 (51.9%) patients reported low-intensity pain (2.6 ± 1.5 points) remained in the replaced joint. The proportion of prevalence of pain did not change reliably postoperatively. Patients with clinically significant symptoms of preoperative anxiety had higher intensity of pain both in hip joint ($p = 0.001$) and lower back ($p = 0.026$) as well as lower HOOS subscales ($p < 0.05$), but with postoperative anxiety they had higher prevalence of generalised pain ($p = 0.002$) and lower HOOS subscales ($p < 0.05$).

Conclusions

Clinical characteristics of chronic pain syndrome, namely, generalisation of pain and psychological distress which interacted with the manifestation of pain and functional limitations, were observed for patients before arthroplasty. After the surgery its intensity is decreased but stays present which can be explained by central sensitization and the preservation of complex musculoskeletal dysfunction. Participating at work, leisure and social activities was largely affected by several factors such as pain in the hip, limitations caused by functional impairments, psychological distress as well as level of pain generalisation, therefore justifying the necessity to pay reasonable attention to complex evaluation of chronic pain syndrome and multi-disciplinary rehabilitation approach already in the stage of conservative treatment in order to improve patient function after total hip arthroplasty.

Medium-Term Outcome of Patients with Surgically Treated Tibiofibular Syndesmosis Injury

Dr. *Toms Arcimovičs*¹; Prof. *Ruta Jakušonoka*²; Prof. *Andris Jumiņš*²;
*Gunita Vinčela*³; Prof. *Zane Pavāre*⁴; Prof. *Alexander Lerner*⁵

¹ Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

² Rīga Stradiņš University, Department of Orthopaedics, Latvia;

³ Rīga Stradiņš University, Faculty of Medicine, Latvia;

⁴ Rīga Stradiņš University, Department of Orthopaedics, Latvia;
Traumatology and Orthopaedics Hospital, Emergency Department, Latvia;

⁵ Bar-Ilan University, Israel;

Ziv Medical Center, Israel

Objectives

Surgical treatment is essential in patients who have ankle fractures with accompanying tibiofibular syndesmosis (TFS) injuries. Outcome measure in the medium-term after trauma evaluates aspects of patients abilities to return to the everyday activities as well as allows to plan rehabilitation measures. The aim of the study is to evaluate outcome of patients with TFS injury following syndesmotic screw fixation.

Methods

Retrospective study of 182 patients with ankle injuries, admitted in the Traumatology and Orthopaedics Hospital from December to February 2014, 2015, 2016 and from June to August 2014, 2015, 2016 was conducted. In the study were included 123 patients (67.6%) with supination-external rotation injury according Lauge-Hansen classification. In the group A were included patients who had TFS rupture and who underwent surgery with syndesmotic screw fixation, in the group B – patients without syndesmosis rupture and who underwent surgery without syndesmotic screw fixation. For patients outcome evaluation we used the Foot and Ankle Disability Index (FADI) score and compared results between two groups.

Results

In the group A were 44 patients (35.77%), in the group B were 79 patients (64.23%). Functional outcome was evaluated in 49 patients 16–42 months after trauma. According exclusion criteria in the group A 22 patients (50%; 14 females, 8 males; mean age 51.37 years) had mean FADI score 91.48 (range 65.38–100); in the group B 27 patients (34.2%; 21 females, 6 males; mean age 48.97 years) had mean FADI score 95.87 (range 68.27–100). No significant differences were noted between A and B groups ($p > 0.05$) in FADI mean scores.

Conclusions

Our results suggest that outcome in patients who undergo tibiofibular syndesmotic screw fixation surgery are similar to the outcome of patients without syndesmosis rupture.

Medium-Term Outcomes of Polytrauma Patients with Pelvic Ring and Acetabular Fractures Treated by Modified Stoppa or Combined Approach

*Dr. med. Andris Vikmanis*¹; Prof. *Andris Jumiņš*¹;
Prof. *Ruta Jakušonoka*²; Dr. *Jevgenijs Movčāns*²

¹*Rīga Stradiņš University, Department of Orthopaedics, Latvia;*

²*Rīga Stradiņš University, Faculty of Medicine, Latvia*

Objectives

The anterior retroperitoneal lower laparotomy (modified Stoppa) approach and combined approach can be used to expose pelvic and acetabular fractures. These approaches applied as an alternative to well established ilioinguinal approach. We described our experience with these approaches in polytrauma patients with pelvic ring and acetabular fractures. The aim of study was to evaluate the medium-term outcomes possibilities and impossibilities of internal fixation of pelvic ring and acetabular fractures using the modified Stoppa or combined approach.

Methods

This retrospective study describes a series of 60 consecutive patients where a modified Stoppa or combined approach were used for pelvic or acetabular fracture fixation.

Results

30 patients with acetabular fractures, 18 patients with a pelvic ring injury not involving the acetabular joint and 12 patients with a combined fracture were operated through a modified Stoppa or combined approach. Anatomic or satisfactory reduction was achieved in 92% of the acetabular fractures, but the medium-term outcomes (follow up 1-2 years) showed 10 patients went under hip replacement due to posttraumatic arthritis. Pelvic ring fractures had an anatomic (displacement up to 1 cm) postoperative result in 100%. The same follow up showed 4 patients had a pain and hobbling due to nonunion of fracture.

Conclusions

Despite medium-term outcomes, these approaches may have good the postoperative radiological, surgical results and are a method of choice for patients with combined trauma with internal organ damage and patients with both side pelvic bone fracture.

Main Microvascular Thrombosis Risk Factors: Early Posttraumatic vs. Elective Reconstructive Surgery

*Dr. Jevgenijs Stepanovs*¹; *Agnese Ozoliņa*²;
*Dr. med. Liene Nikitina-Zake*³; *Dr. Maksims Mukans*⁴;
*Prof. Indulis Vanags*³; *Prof. Biruta Mamaja*^{1,2}

¹ Rīga East University Hospital, Department of Anesthesiology, Latvia;

² Rīga Stradiņš University, Department of Anesthesiology and Intensive Care, Latvia;

³ Latvian Biomedical Research and Study Centre, Latvia;

⁴ Rīga Stradiņš University, Statistical Unit, Latvia

Objectives

Numerous factors were previously demonstrated to have an influence on free flap thrombosis rate. However, for separate patient groups the risk factors might be different, accordingly requiring different management strategies. We aimed to characterize the main thrombogenic risks for patients undergoing free flap transfer with or without history of recent trauma.

Methods

Patient demographical characteristics, including main risk factors for microvascular thrombosis (recent trauma, smoking, thrombogenic comorbidities) were collected. Standard coagulation tests and rotational thromboelastometry (RTE) were performed on the preoperative day; functional fibrinogen to platelet ratio (FPR) ≥ 42 in addition to main RTE parameters was set as the indicator of hypercoagulation. Incidence of flap thrombosis was defined as primary outcome, secondary main risk factors were evaluated for two patients groups: presented for surgery early after trauma or on an elective basis.

Results

Totally, 103 patients were included in the prospective observational study. Recent trauma (< 1 month) was detected for 36/103 patients, and it was revealed to be one of the main factors for hypercoagulability: 16 of all 24 patients with FPR ≥ 42 had recent trauma history, $p < 0.001$. Free flap thrombosis developed in 21, free flap necrosis – in 17 patients on average the 1st postoperative day. For all included patients, correlation was found between FPR ≥ 42 detected by RTE and free flap necrosis: AUC 0.665, $p = 0.033$, sensitivity – 41.2%, specificity – 79.8%. Prognostic value of RTE parameters was confirmed assessing the risk factors individually, MCFextem ($r = 0.236$, $p = 0.017$) and MCFfibtem demonstrated correlation with increased rate of flap thrombosis. Interestingly, that presence of hypercoagulability per se demonstrated stronger association than specific numbers. Regarding our hypothesis, for patients with recent trauma only prolonged surgery time correlated with higher thrombosis risk ($r = 0.338$, $p = 0.044$), while for elective patients the common predictive value of FPR ≥ 42 was confirmed ($r = 0.285$, $p = 0.019$). Association with thrombotic events was not found for other factors such as smoking, advanced age, comorbidities, thrombocytosis or higher fibrinogen level.

Conclusions

RTE hypercoagulative data might indicate predisposition to develop microvascular thrombosis. Patients in early posttraumatic period have to be considered at higher flap thrombosis risk during prolonged operations.

Patient Safe Education in Orthopaedics

Prof. *Andris Jumiņš*¹; Prof. *Ruta Jakušonoka*¹;
Dr. med. Andris Vikmanis^{1,2}

¹ *Rīga Stradiņš University, Department of Orthopaedics, Latvia;*
² *Riga East University Hospital, Clinical Centre "Gailezers", Latvia*

Objectives

The study course "Orthopaedics", included in the Rīga Stradiņš University (RSU) study programme "Medicine", is significant subject to prepare academically educated and professionally qualified physicians.

Methods

Study course "Orthopaedics" is included in the study programme "Medicine" as well as "Physiotherapy", "Occupational therapy" and in the "Residency in medicine" study course "Traumatology and Orthopaedics" in the speciality traumatology and orthopaedics, and is carried on in the four clinical bases. For more than 10 years Department of Orthopaedics provides the Objective Structured Clinical Examination (OSCE) for students knowledge and practical skill assessment.

Results

During study course "Orthopaedics" in the 16 practical lessons and eight lectures cycle approximately 500 fourth year medical students annually get competences in the orthopaedics. In the educational process the balance between duration of theoretical and practical training is important. Practical lessons start with theoretical part in the classroom and continue in the hospital wards to improve the practical skills. Before clinical training in the hospital wards acquisition of the theoretical knowledge and practical skills are relevant. The practical skills before entering of hospital wards are acquired in the classroom using the mannequins, mullases or students-volunteers. The residents training in the speciality traumatology and orthopaedics is carried on mainly in the hospital wards, operating theatre, emergency department and outpatient clinic. Before practical training residents acquire theoretical knowledge as well as participate in the medical education including two credits per year. Using medical simulations in the residents training is paramount. In the RSU Medical Education Technology Centre diagnostic and treatment methods are acquired in the simulated environment. External fixation mastering takes place in the classroom, using artificial bones, as well as in the foundation "Doctors Safe Train".

Conclusions

Patient safe education has significant and increasing part in the undergraduate and graduate education, develops knowledge and skills of students and residents before treatment of patients.

Analysis of Revision Operations after Total Hip Replacement in Dysplastic Hip Patients

*Dr. med. Silvestris Zebolds; Prof. Andris Jumiņš;
Dr. Kristaps Knohenfelds*

Traumatology and Orthopaedics Hospital, Latvia

Objectives

Due to severe anatomical changes total hip replacement (THR) in patients (pts) with dysplastic hip joint osteoarthritis (OA) is a challenge for orthopaedic surgeons.

The aim of our study was to analyse the causes which lead to revision operations after THR in dysplastic hip patients in 7 to 10 years follow-up period (operated in Riga HTO in 2008–2011).

Methods

We included in our study 88 pts with dysplastic hip OA, who underwent 106 THR. The Crowe classification was used to assess the severity of dysplasia before operation. There were 47 pts with Crowe type I dysplasia, 38 – Crowe type II, 17 – Crowe type III and 4 – Crowe type IV. X-rays and medical documentation from the HTO was used for analysis of the causes of revision operations.

Results

In 7 to 10 years period after THR were done 6 (5.7% from all) revision operations. The reason for revision operation was: infection – 2 cases, aseptic loosening of the femoral component of endoprosthesis – 2 cases, aseptic loosening of acetabular component – 2 cases. All revision cases were done for patients with acetabular component placement in primary socket. Patients with aseptic loosening were treated by one stage operation: re-replacement surgery, patients with infection – with two stage operation (temporary endoprosthesis, than permanent EP).

Conclusions

Radical treatment: placement of acetabular component in primary (anatomical) socket causes higher complication rate, that leads to revision operations.

Patient Experience after Receiving Lower Extremity Amputation Due to Diabetes and/or Peripheral Artery Disease

Viesturs Drunks

*National Rehabilitation Centre "Vaivari", Vaivari Orthotic
and prosthetic center, Latvia*

Objectives

The aim was to study the experience of patients with unilateral amputation of lower extremity (above knee).

Methods

Participants: six patients with unilateral above knee lower extremity amputation due to diabetes and / or peripheral artery disease, in which every two persons are currently in separate post-amputation stages designated by the author: persons are waiting to receive a prosthesis (inhabit a familiar environment); persons have begun to use the prosthesis and are undergoing a rehabilitation course at Vaivari National Rehabilitation Centre; persons are using the prosthesis on a daily basis in a familiar environment (no longer than one year).

Tools: semi structured interview.

Results

Five main topics were framed: the experience of having agreed to amputation; the experience of having a new identity; the experience of information availability; the experience of the new attitude from the public; the experience of environmental accessibility.

Conclusions

In Latvia, people aged 50–65 with unilateral above knee amputation due to diabetes and / or a peripheral artery disease experience restrictions in mobility in their familiar environment. After the amputation they perceive their bodies as socially unacceptable (defective). A motivating role is played by the family and healthcare professionals; in general, they play an important role in meeting the goals of rehabilitation. Patients face environmental obstacles; their residential area is also adjusted. The information on post-amputation possibilities is received from healthcare professionals at inpatient facilities as well as by further investigation by the patients themselves in social media.

V-Shape Double Vascularised Fibula Growth Plate Transplantation – New Method for Long Segment Tibial Reconstruction

Dr. Dzintars Ozols¹; Uldis Bergmanis²; Dr. Vadims Neffodovs³

¹ Children's Clinical University Hospital, Department of Pediatric Surgery, Latvia;

² Children's Clinical University Hospital, Latvia;

³ Rīga Stradiņš University, Latvia

Objectives

Ewing sarcoma is rare malignant bone cancer. Goals of treatment are radical resection of primary tumor, preventing metastatic spread, provide best possible functionality and quality of life. Pediatric bone cancers localized in proximal metaepiphysis have to be treated with radical resection including tibial growth plate. There is possibility to reconstruct tibia using long segmental prosthesis which could not provide adequate elongation for small children other option is amputation. We present the new surgical technique, which provides possibility for limb growth for pediatric patients.

Methods

Two patients with Ewing sarcoma in tibial bone were treated using new V-shape double fibula growth plate reconstruction method. Patients received chemotherapy according Ewing sarcoma treatment protocol and radical removal of tumor including tibial growth plate, proximal metaepiphysis, half of diaphysis. Two vascularized (contralateral as microvascular flap and ipsilateral as pedicle flap) fibular growth plate flaps were used forming V-shape to reconstruct tibial segment. Fibula growth plate vascularization were based on anterior tibial artery for ipsilateral fibula as pedicle flap. Contralateral fibula growth plate and fibula diaphysis had dual vascularization. Long term follow up study to evaluate functional outcomes was done.

Results

No recurrent or metastasis were found in follow up period for 3 years. First patient was treated at age of 12, second – at age of 4. Follow-up was performed 3 years after reconstruction. Patients scored 65.4 in The Foot & Ankle Disability Index and 45 in Lower Extremity Functional Scale. 80° active flexion and full extension in the knee is achieved with no joint instability. Radiography in first patient showed open growth plate in medial fibular flap, 15° varum deformity and 18° posterior recurvation.

Conclusions

Tibial reconstruction with double V-shape fibular vascularized growth plate flaps is the only option to provide satisfactory functionality and preserve limb growth for pediatric patients.

Long-Term Evaluation of Functional and Esthetical Outcomes for the New Method of Toe-To Hand Transfer for Full-Length Thumb Reconstruction in Congenital Thumb's Hypoplasia

Dr. Dzintars Ozols¹; Prof. Aigars Pētersons²

¹ *Children's Clinical University Hospital, Department of Pediatric Surgery, Latvia;*

² *Rīga Stradiņš University, Latvia;*

Children's Clinical University Hospital, Latvia

Objectives

Congenital thumb hypoplasia is rear deformity of upper extremity. Incidence for the thumb hypoplasia grade IIIb-V is 1:40 000 newborns per year in Latvia. The base of metacarpal bone is absent for hypoplasia type IIIb-V, therefore, toe-to hand transplantation is not recommended. Tan and Tu 2013 described a technique for toe-to hand transplantation for thumb hypoplasia patients IIIb-V but overall results were not better than pollicization.

Methods

The aim of this study is to describe a new technique for thumb reconstruction with a second toe transfer with metatarsophalangeal joint arthrodesis, which can provide a 5-digit hand and restore the functionality of the thumb for thumb hypoplasia IIIb-V. Long-term follow up was done to evaluate the functions and aesthetics of the hands and results were compared to results for pollicization method. The survey to evaluate aesthetical outcome for transplantation method and pollicization method was completed by 290 respondents.

Results

Combined VAS score for aesthetic and functionality answered by families of the both patients reconstructed with the new toe-to hand transplantation method were rated in average for 8.55 (5-10) points. Patients scored 8.0 and 10.7 points in the DASH survey what gives an average for DASH as 9.35 points. Patients and their families who had underwent pollicization procedure gave average VAS of 6.7 (5-8) points and DASH score were 19.8 (6-26.7). Overall population rates new transplantation method's aesthetic outcomes higher than pollicization's (the scores is statistically significant $p < 0.0001$).

Conclusions

The new toe-to hand transplantation procedure in public survey was evaluated higher. The aesthetical results and functional results as DASH score for new method 9.35 (8-10.7) points and for pollicization method 19.8 (6-26.7) shows that we have reached our goals with toe-to hand transplantation using new method and creating five digit hands.

Fascia Iliaca Block vs. Local Infiltration Analgesia for Postoperative Pain Control after Hip Replacement Surgery

Dr. *Arturs Bogdanovs*¹; Prof. *Aleksejs Miščuks*²;
Ph.D. *Iveta Golubovska*¹

¹ *Traumatology and Orthopaedics Hospital, Department of Anaesthesiology
and Intensive Care, Latvia;*

² *Latvian University, Faculty of Medicine*

Objectives

Fascia iliaca block (FIB) provides N. femoralis, N. cutaneous femoris lateralis and hypothetically N. obturatorius analgesia.

We suggest that FIB is applicable in acute postoperative pain management for patients undergoing total hip arthroplasty under spinal anesthesia and its analgesic effect is comparable with local infiltrational analgesia (LIA).

Aims of study were to compare mean pain scores during rest and mobilization, to determine if FIB or LIA shorten hospitalization time and have morphine sparing effect.

Methods

Prospective observational study was conducted after Ethics committee approval at Traumatology and Orthopaedics Hospital, Riga, Latvia. Patients were divided in 3 groups according to regional anaesthesia provided – FIB, LIA and control group. FIB was conducted under ultrasound control by the anesthesiologist, LIA intraoperative by surgeon; the control group received spinal anesthesia only. All patients received similar multimodal analgesia in postoperative period. Pain intensity according to VAS, morphine consumption and side effects were registered. Statistical analysis was performed using SPSS software.

Results

In total 56 patients were randomized, 5 were excluded from study due to protocol break. Demographics were similar in all groups. LIA was significantly better according to analgesia in postoperative period ($p < 0.05$). Both LIA and FIB provided morphine sparing effect ($p < 0.05$). There wasn't significant difference in hospitalization time ($p < 0.1$). Sleep quality and overall satisfaction was better in LIA group ($p < 0.05$).

Conclusions

FIB does not provide statistically significant difference in VAS pain scores comparing to control group. LIA provides better pain management profile in comparison to FIB. Both groups provided morphine sparing effect.

Femoral Geometry and Bone Quality Influence on Fracture Patterns of Proximal Femur

*Dr. Andris Džeriņš*¹; Prof. *Pēteris Studers*¹;
*Dr. Valts Boginskis*²; *Dr. Matīss Zolmanis*¹

¹ Rīga Stradiņš University, Latvia;

² University of Latvia

Objectives

To determine, can femoral geometry and the degree of osteoporosis affect the probability of sustaining a pertrochanteric or femoral neck fracture.

Methods

Pelvic radiographs and medical records of 154 patients who had injured their hip and were admitted to the Hospital of Traumatology and Orthopedics during year 2017 were included in this study. They were divided into 3 groups based on the radiographic injury pattern - no fracture (Group 1) (n = 34), pertrochanteric fracture (Group 2) (n = 52) and femoral neck fracture (Group 3) (n = 68) groups.

Patient age, gender, injury mechanism and radiological measurements including hip axis length, femoral neck axis length, femoral head diameter, femoral neck width, neck shaft angle, femoral shaft width, cortical thickness index (CTI) and Singh index (SI) were acquired using the Impax-Orthopaedic-Tools 3.0.2.3 program.

Results

The most common injury mechanism in all groups was falling on one side (97.4%). Women more commonly injured their hips than men (72.7% vs 27.3%) but this predominance was not statistically significant when compared between the 3 groups (p = 0.64). Comparing fracture group patients (Group 2 and 3) and patients with no fracture after trauma (Group 1), femoral shaft width (29.92 ± 3.15 vs 30.70 ± 1.83) and CTI was significantly lower (p = 0.04; p = 0.01) in Group 1, and there were no patients with SI less than 4 (indicating osteoporosis) 0.0% vs. 38.3% (p = 0.001). Group 3 had significantly narrower femoral necks than Group 2 (p = 0.001), but Group 3 had significantly less patients with SI less than 4 (p = 0.001). All other quantitative and qualitative parameters did not differ between groups.

Conclusions

Proximal femoral geometry such as femoral shaft width, femoral neck width and specific signs of osteoporosis (SI, CTI) which are detectable in plain radiographs can be used to identify patients who are at the risk of fracture in the future. Decreased femoral neck width is a risk factor for femoral neck fractures.

Calcium Phosphate Bioceramic Materials General Influence on Osteoporotic Bone: Experimental Research

*Dr. Vladislavs Ananjevs*¹; *Dr. Aleksandra Ananjeva*²;
Prof. *Jānis Vētra*³; Prof. *Andrejs Skaģers*¹;
Prof. *Vladimirs Kasjanovs*⁴

¹*Rīga Stradiņš University, Department of Oral and Maxillofacial Surgery, Latvia;*

²*Rīga Stradiņš University, Faculty of Continuing Education,
study programme residency in medicine in the speciality General practitioner, Latvia;*

³*Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;*

⁴*Rīga Stradiņš University, Laboratory of Biomechanics, Latvia*

Objectives

The aim of the study was to find out how local enhancement with biphasic calcium phosphate bioceramic materials in the femur greater trochanter region generally influences on bone biomechanical parameters of rabbits with experimental osteoporosis.

Methods

Experimental osteoporosis was induced in 19 eight month old female rabbits after ovariectomy followed by 1 mg/kg daily methylprednisolone injection. The duration of the treatment was six weeks. On 15 rabbits defects were created in the right femur greater trochanter region. Seven defects were filled with biphasic ceramics (HAP/TCP 70/30), the remaining eight defects were filled with 5% Sr modified biphasic ceramics. The sham surgery group consisted of 4 female rabbits with identical bone defect. After three months the animals were euthanised. Squared samples (10 mm length at least) were cut out from the femur's body. Test of samples on a bend has been carried out at the Zwick / Roell stand.

Results

The test samples were divided into three groups: sham surgery group, HAP/TCP group (the second group) and HAP/TCP with 5% Sr group (the third group). The results of the study showed that in the sham surgery group the flexure modulus of elasticity in the right and in the left body of the femur was less than in the other two groups. The flexure modulus in the right body of the femur in the sham surgery group was 16.31 (18.66-12.15) GPa, which is statistically significantly lower than in the second group (Md = 19.87 (21.10-17.94)) GPa and in the third group (Md = 21.88 (27.53-21.09)) GPa. The flexure modulus value in the left body of the femur in the sham surgery group was 14.91 (17.36-13.6) GPa, which is statistically reliable less than in the second group (Md = 21.86 (25.81-19.6)) GPa and in the third group (Md = 22.11 (23.41-20.29)) GPa.

Conclusions

The study found that the right femur of the rabbit, where the biomaterial is implanted, and the left femur, where no biomaterial implantation was performed, becomes more rigid after filling the defects with biphasic calcium phosphate bioceramic materials. Thus, local use of calcium phosphatic bioceramic materials in the greater trochanter region has a general influence on animals bone tissue.

Challenges in Orthopaedics and Trauma in Regional Hospital

Dr. Igors Kolosovs¹; Dr. Rudolfs Preiss²

¹ *Ziemeļkurzemes reģionālā slimnīca, Latvia;*

² *Madonas slimnīca, Latvia*

Objectives

The aim was to demonstrate difficulties and specifics in trauma patients in regional hospital.

Methods

Patients with different trauma sequelae, which were treated in “Ziemeļkurzemes reģionālā slimnīca” hospital and “Madonas slimnīca” hospital from August, 2017 till January, 2019.

Results

Treatment tactics, process and results will be shown on presentation.

Conclusions

Good treatment results in patients with severe trauma could be achieved not only in university hospitals, but also in regional hospital.

Revision Total Hip Arthroplasty

*Dr. med. Pēteris Studers; Dr. Andris Džeriņš;
Dr. Matīss Zolmanis; Dr. Una Bladiko*

Rīga Stradiņš University, Department of Orthopaedics, Latvia

Objectives

The overall rate of primary total hip arthroplasties done each year is increasing worldwide. The main reason of primary surgery is osteoarthritis – it was the diagnosis at the time of surgery for approximately 79% of the patients undergoing primary hip arthroplasty (AAOS Annual Report 2017). Annual numbers in USA in 2017 was 277 200, in Latvia – 1082. Number of surgeries is growing according to joint replacement registry data. As a result increases numbers of revision arthroplasties between 2012 and 2016, data were collected on N = 36 091 revision hip arthroplasties as compared with data from Latvia 2012–2017 was N = 948.

To determine the rates of total hip arthroplasties comparing data from most popular joint registries (AJRR 2017, Swedish JR 2016, NZ and Australian JR 2018). To analyze the data of revision hip arthroplasties performed in Traumatology and Orthopaedics Hospital, Riga since 1993. Define the best treatment algorithms for the management of aseptic and septic total hip arthroplasties complications.

Methods

Search of publications published as Annual Reports from respected joint registries, selection data from reports for most common revision hip arthroplasties reasons. To acquire equal data from Department of statistics in Traumatology and Orthopaedics Hospital.

Results

The most common indications for revision hip arthroplasties are aseptic loosening, instability / dislocation infection, and wear and osteolysis (the last two which often co-exist and are inter-related) accounting together for 54% of revisions recorded (AJRR 2017). These data are common with Latvian registry data, from 2010–2014 overall revision count N = 631, 91.2% was aseptic related complications, and only 8.87% was septic meanwhile in USA septic complications 7.7%. Time till primary total hip arthroplasty failure by the literature is from 1.8–20% in 10 year period of time (AJRR 2017, Swedish JR 2016, NZ and Australian JR 2018). In Traumatology and Orthopaedics Hospital registry data shows 15.08% in 10 years.

Conclusions

Most recent data from joint registries suggested that in near future revision hip arthroplasties increases up to 219% (AAOS Annual Report 2017).

Last decade in Latvia shows slower increase of revision hip arthroplasty surgeries. It's important to respect treatment algorithms for revision hip arthroplasty complication treatment.

Syndesmotic Screw Fixation in Treatment of Trimalleolar Fractures

*Dmitrijs Grigorjevs¹; Dr. Igors Terjajevs²;
Dr. Mārtiņš Malzubris²*

¹ Rīga Stradiņš University, Faculty of Medicine, Latvia;

² Rīga Stradiņš University, Latvia;

Traumatology and Orthopaedics Hospital, Latvia

Keywords: malleolar fractures, tibiofibular syndesmosis, syndesmotic screw.

Objectives

Trimalleolar fractures are fractures with distal tibiofibular syndesmosis (TFS) injury. The aim is to compare functional midterm patients outcomes in the cases with tibiofibular screw fixation versus without, when fracture of posterior edge of the tibia is not fixed.

Methods

From January 2016 to December 2016, patients with trimalleolar fractures, which were treated in Traumatology and Orthopaedics Hospital were identified. TFS screw was inserted only if intraoperative stress examination of the syndesmosis injury were positive. Patients were followed up in 2018: examination consisted of goniometric motion assessment, self-administered Short Musculoskeletal Function Assessment (SMFA), X-ray views were the group. We divided patients into two groups – 16 patients with TFS screw and 14 patients without TFS screw.

Results

The mean age of patients in the group with TFS screw was 53.31 (SD 14.84) and in the group without TFS screw – 55.5 (SD 12.64) years, $p = 0.67$. Patients were similar with regard to the median of the follow-up and the median percentage of the tibial plafond involvement. The mean loss of range of motion for ankle extension were 51.01% (SD 28.35) in the group with TFS screw and 44.65% (SD 21.68) in the group without TFS screw, $p = 0.29$. The median loss of range of motion for ankle flexion were 16.67% (IQR 4.82–37.95) in the group with TFS screw and 5.84% (IQR 3.2–17) in the group without TFS screw, $p = 0.113$. There were no significant differences in the SMFA scores.

Conclusions

The functional postoperative results are similar in both groups. The decision to fixate syndesmosis should not be based only on fracture type. The intraoperative stress examination of the syndesmosis is currently the best way for determining the need for syndesmotic screw fixation.

Postgraduate (Residency) Training of Orthopaedic Surgeons in Hospital of Traumatology and Orthopaedics in Cooperation with Universities

*Dr. Modris Ciems*¹; *Dr. Rota Vēciņa*²;
*Dr. Uģis Zariņš*³; *Marika Ziediņa*⁴

¹ *Traumatology and Orthopaedics Hospital, Latvia;*

² *Traumatology and Orthopaedics Hospital, Department of Traumatology, Latvia;*

³ *Traumatology and Orthopaedics Hospital, Latvia;*

Rīga Stradiņš University, Orthopaedic Department, Latvia;

⁴ *Traumatology and Orthopaedics Hospital, Group of Education and Research, Latvia*

Objectives

The aim of the presentation is to show the training process of residents in orthopaedic surgery and analyze situations based on the experience of the Hospital of Traumatology and Orthopaedics. Residency programs are implemented by Rīga Stradiņš University and University of Latvia. A resident is an employee and is bound by all the conditions governing the employment relationship.

Methods

The research materials are all residency-related documents, university programs and reports. The experience of the Traumatology and Orthopaedics Hospital in contracting with residents, universities, other medical institutions and doctors has been analyzed. Financing process has been studied according to the requirements of normative documents. University education programs and organization of various practical training cycles has been analyzed.

Results

Organization of postgraduate education process is a teamwork. Some situations are not precisely defined in normative documents and require a creative approach. The situation is different in the organization of labor relations and financing process for the state budget and fee residents.

Conclusions

Postgraduate training process is influenced by normative documents, financing, planning and availability of intellectual and technological resources.

The role of the Ministry of Health is related to its analytic function and to the regulatory documents.

To increase the effectiveness and efficiency of the process an annual conference on residency with participation of all stakeholders is necessary.

Using of Conservative Therapies to Prevent Formation of Hypertrophic Scars after Thermal Burns

Guntis Raipalis; Kārlis Lācis; Tīna Krūmiņa

*“DDA Orthopaedics” SIA, Latvia;
Rīga Stradiņš University, Latvia*

Objectives

According to the data of the Centre for Disease Prevention and Control, during the period from 2012 to 2016 there were 296.2 cases of skin burns / scalds a year on average in all age and gender groups. As compared to other age groups, most of the burns and scalds were suffered by children aged 0 to 4 years.

Hypertrophic scars form during the burn wound healing process by causing discomfort and visual and functional changes to the body. These can be minimised by applying creams that soften the skin and facilitate the healing process, plasters containing silicone gel, as well as by using the scar tissue massage therapy. An important role is played by an early compression garment therapy which reduces the blood supply and collagen synthesis of the scar tissue thereby slowing down the scar formation process (Argirova, 2006).

Methods

Purpose of the work was to determine the effectiveness of using complex conservative therapies in treatment of hypertrophic scars after burns (case analyses).

There are several known conservative therapies for treatment of hypertrophic scars; however, no optimal method has yet been established (Rabello, Souza, & Júnior). Hypertrophic scars after burns can be minimised by applying creams that soften the skin and facilitate the healing process, plasters containing silicone gel, as well as by using the scar tissue massage therapy. The work looks at the effect of compression garment and silicone gel plasters on the hypertrophic scar tissue in 8 patients, and observations were made from the start of the therapy up to the stage of complete formation of the scar tissue.

Results

In 6 cases the results which were obtained by using a complex compression garment and silicone gel therapy in accordance with instructions for 23 hours a day affected and considerably improved the visual appearance of the scars while reducing the size of the scar tissue and its pigmentation.

In one case where the patient was only using compression garment due to allergic reaction to gel plasters considerable scar improvements were also observed.

In one case the therapy was not used in accordance with instructions, therefore substantial thickening of the scar tissue and its spreading to the surrounding tissue was observed.

In 3 cases the compression garment of the patients was changed two times during period of use (2 sets each time), in 4 cases one set of compression garment was used, and in one case the compression garment was not used in accordance with instructions.

Conclusions

A complex therapy by using gel plasters in combination with compression garment is an effective way of reducing the thickness and size of the scars and improving their visual appearance.

Prevention of formation of large hypertrophic scar tissue is essential in limiting the spread of the scar tissue.

The average duration of using the compression therapy is 6–12 months.

Psoriatic Arthritis Symptoms in Patients with Psoriasis without Concomitant Diagnosis Psoriatic Arthritis

Dr. *Kristina Tolocko*¹; *Anna Mihailova*^{2,3};
Prof. *Ingmārs Mikažāns*^{4,5}

¹ Rīga Stradiņš University, Department of FCI, Latvia;

² Rīga Stradiņš University, Department of Internal Diseases, Latvia;

³ Orto Clinic, Latvia;

⁴ Rīga Stradiņš University, Faculty of Medicine, Department of Infectology and Dermatology, Latvia;

⁵ Rīga 1st hospital, Clinic for Dermatology and Sexually Transmitted Diseases, Latvia

Objectives

The aim of the research was to identify and analyse symptoms of psoriatic arthritis in patients with psoriasis without concomitant diagnosis PsA.

Methods

A prospective study included 32 patients with psoriasis no prior rheumatologist-confirmed PsA diagnosis. Patients underwent questionnaire about morning stiffness duration, ASAS inflammatory back pain assessment, nonsteroidal anti-inflammatory (NSAID) drugs use, psoriasis duration, type, distribution, tender 68 (T68) and swollen 68 (S68) joint count assessment, enthesitis assessment Spondyloarthritis Research Consortium of Canada (SPARCC), dactylitis assessment, Schober's test.

Results

Data from 32 patients, 14 men (43.8%), 18 women (56.3%) with median age 45 years (range 19–70 years) were collected and analysed. Skin psoriasis in 29 patients. Nail psoriasis in 11 patients. Scalp psoriasis in 17 patients. Psoriasis vulgaris in 26, pustular psoriasis in 1, palmoplantar psoriasis in 4, intertriginous psoriasis in 1. Mean psoriasis duration 12.73 years (SD – 12.56). NSAID for joint pain used 8 patients, 2 men, 6 women. Morning stiffness had 18 patients, ≥ 60 min 4 patients. Morning stiffness duration was more in patients with nail psoriasis (M = 33.63 min vs. M = 13.57 min); (p = 0.04). Inflammatory back pain had 6 patients. Median Schober's test was 4.75 cm (SD – 1.03). Mean SPARCC was 1.2 (SD – 1.78), SPARCC > 1 (n = 9). SPARCC was significantly higher in NSAID users (p = 0.33). Dactylitis was in 3 patients. Mean T68 joint count was 2.46 (SD – 2.92). Mean S68 joint count was 2.15 (SD – 2.70). S68 joint count was significantly higher in women than in men (p = 0.41). There was no significant difference in T68, S68, SPARCC, Schober's test, inflammatory back pain between patients with different psoriasis type and psoriasis distribution. At least 6 patients meet CASPAR criteria for psoriatic arthritis.

Conclusions

Patients with psoriasis have large proportion of undiagnosed psoriatic arthritis.

Deformation in Elastic Panels of Smart Garment when Imitating Self-Corrective Movements of Patients with Idiopathic Scoliosis

*Agate Leimane*¹; *Gundars Rusovs*²; *Dr. Aleksejs Kataševs*³;
Prof. *Aivars Vētra*¹; *Dr. Aleksandrs Okss*³

¹ Rīga Stradiņš University, Latvia;

² SIA REHAD, Latvia;

³ Rīga Technical University, Latvia

Keywords: scoliosis, smart garment, sensors.

Objectives

The aim of the study is to examine the range of deformation in panels of smart garment with different elastic properties when imitating the Self-Corrective movements of patients with idiopathic scoliosis (IS) to fit the deformation distance in the range of linear activity of stretch sensors.

Methods

The study included the 3D scanning of the body shape of the volunteer able to repeatedly take the position of the body to reliably mimic the deviation in distances between anatomical markers characteristic to IS patients in self-corrective movements. The methodology of scanning was adopted from the previous research with the 5 repetitions of new position after second 10 rest between. The changes of the distance in the range of linear activity of sensors where isolated. At the second stage the panels from the materials of different elastic fabric equipped with stretch sensors where attached to the garment at the positions of markers demonstrating deviation in the range of linear activity of sensors. The measurements of stretch sensor and deviation recorded by repeated scanning of the body where compared.

Results

By the measuring the deviation between anatomical points / markers on the body of volunteer it was possible to achieve pattern of the position changes to demonstrate consecutive deviations in distances. The range of deviation in several distances reliably repeated the patterns of deviation in patients with scoliosis while performing self-corrective movements. It was possible to find the correlation between the readings of sensors and changes of distances.

Conclusions

The positioning of the sensors at the anatomical points where deviation of distance are within the range of linear sensor deformation provides the correspondence between the readouts of the sensors and changes of distances.

Extended Flexor Carpi Radialis Approach: Treatment of Complex Distal Radius Fractures

Dr. Inese Breide

Hospital of Traumatology and Orthopaedics, Latvia

Objectives

The purpose of the study is to evaluate the safety and utility of the extended flexor carpi radialis (EFCR) approach and volar locking plate fixation for complex, intraarticular distal radius fractures.

Methods

A consecutive series of patients treated with EFCR approach and volar plate fixation for fractures of the distal radius between 1 August and 31 October 2018 at Hospital of Traumatology and Orthopaedics were selected and controlled prospectively for this study. Indication for EFCR approach was complex, intraarticular distal radius fracture in cases of difficult repositioning (e.g. fracture of volar margin of the lunate fossa) and if satisfactory reduction was not achieved otherwise. The decision was therefore taken intraoperatively. Patients requiring supplementary fixation (dorsal plating or a supplementary approach such as a dorsal approach) were excluded.

Preoperatively, plain radiographs and CT were taken. Clinical and radiographic outcome evaluations were done at 5 and 10 weeks after surgery. Grip strength was measured, and pain was evaluated with the visual analog scale. Range of motion was noted.

Radiological analysis included fracture AO-classification. Preoperatively and postoperatively, radial and dorsal inclination, loss of radial length and intra-articular steps were evaluated. Time until consolidation was determined evaluating callus formation, gap-filling and restoration of bone architecture.

Results

Eleven patients with complicated distal radius fractures were treated. This resulted in good clinical outcome (mean visual analog scale 1, almost symmetric range of motion). Radiologic evaluation revealed anatomic reduction without secondary dislocation during the follow-up and uneventful consolidation.

Conclusions

The presented EFCR approach for multifragmentary distal radius fractures is prior because it facilitates anatomic repositioning and stable fixation in difficult cases. It provides improved access and facilitates reduction and hardware application. Mainly indicated for patients with complex distal radius fractures in which displacement of the fragments is difficult to manage and leads to good clinical and radiological outcomes.

Can Holes in the New Implant for Osteosynthesis of Femoral Neck Contribute to Improvement of Its Mechanical Properties?

*Afgan Jafarov¹; Çingiz Alizadeh²; Zafer Ozer³;
Fatma Kübra Erbay⁴; Amirullah M. Mamedov⁵; Teyfik Demir⁶*

¹ *Modern Hospital, Department of Orthopedics and Traumatology Surgery, Azerbaijan;*

² *Scientific Research Traumatology and Orthopedic Institute, Azerbaijan;*

³ *Mersin University, Mersin Vocational High School, Turkey;*

⁴ *TOBB University of Economics and Technology, Micro and Nanotechnology, Turkey;*

⁵ *Bilkent University, Nanotechnology Research Center (NANOTAM), Turkey;*

⁶ *TOBB University of Economics and Technology, Department of Mechanical Engineering, Turkey*

Objectives

Despite the use of modern implants complications such as non-union and femoral head avascular necrosis can be seen in femoral neck fractures (FNF).

The purpose of our study was to study the distribution of stress on a computer model of a FNF after its osteosynthesis with a new implant (NI) using the finite element method (FEM) and biomechanical studies by pulling out test between NI with and without holes.

Methods

3D femur models are prepared according to femoral geometry. According to Pauwels classification 3 types FNF is done in 30, 50 and 70 degrees (respectively type 1, type 2 and type 3). Mechanical behaviours (strain and deformation) of the perforated and nonperforated NI models investigated separately for 3 types of fracture under the 4000 N vertical force. The calculated strain and deformation values were evaluated by ANSYS software program which included FEA. Pull out tests were conducted models of NI pulled from the polyurethane blocks which were used as a bone model. Tests were performed with 6 perforated and 6 non perforated NI with 5 mm/min according to ASTM F543 standard.

Results

The max. Von Mises stress values occurred in the same place where implant areas close to the fracture side in all models and types. In this case, the difference in the stress indices between the cortical and spongy parts of the bone in the perforated model was 2 times less.

The pull-out tests showed that mean maximum load was 3775.02 ± 346.98 for perforated NI. The pull-out tests performance of the perforated NI was 20% higher than nonperforated NI.

Conclusions

Thus, as per our studies the presence of holes in the implant will help to reduce the stress in the bone implant system and increase the stability of the osteosynthesis.

Antibacterial Prophylaxis in Hand Trauma

*Vadims NeĶodovs*²; *Dzintars Ozols*¹;
*Janis Zarins*¹; *Olga Rimdenoka*²

¹ *The Centre of Plastic and Reconstructive Microsurgery of Latvia;*

² *Rīga Stradiņš University, Latvia*

Objectives

Plastic surgeons must deal with hand trauma on day-to-day basis. One of the concerns is wound infection. Antibiotics in various forms and conditions are prescribed in order to avoid this complication, but the effectiveness is unclear. Most commonly used forms are intra-venous solutions, topical ointments and per-oral tablets.

Methods

Prospective randomized trial was conducted in The Centre of Plastic and Reconstructive Microsurgery of Latvia. Healthy adult patients with simple, non-bite, surgically treated hand trauma were included. During the surgery a proper debridement and irrigation with simple saline was always done. Randomly patients were assigned to one of the 8 groups. Every group received different antibacterial prophylaxis including none. Post-operative follow-up was done 2 weeks after the surgery. Presence of wound infection was documented. Patients were excluded from the trial if they did not follow recommendations, i.e., started using antibiotics, applied solutions or ointments on the wound.

Results

Overall 240 patients (80.2% male, mean age 38.7 years), 30 in each study group were included. 226 patients returned for a follow-up, 7 patients were excluded from the trial. Wound infection was observed in 5 patients from different groups. Thus, rate of wound infection is 2.28%. Chi-square revealed no difference in infections' incidence between groups ($p > 0.05$).

Conclusions

In this study antibiotics did not affect incidence of wound infection after hand trauma. Attention should be paid to proper debridement and irrigation of the wound. This helps to reduce wound infection risk and avoid unnecessary usage of antibiotics.

Ankle-Joint Arthrodesis in Patients with Chronic Suppurative Osteoarthritis

Prof. *Chingiz Alizade; Huseyn Aliev; Shahin Agaev*

Baku Health Center, Department of Traumatology and Orthopedics, Azerbaijan

Objectives

The purpose of this research is to study the effectiveness of application of wire-rod external fixator (WREF) at ankle-joint arthrodesis in patients with chronic non-specific suppurative osteoarthritis.

Methods

20 patients were examined and surgically treated during the period from 2008 to 2017. 13 (65%) of the patients were male, 7 (35%) were female. The average age of patients was 45.5 years (min. – 18, max. – 72). In 9 (45%) patients osteoarthritis developed after injury; in 1 (5%) after a gunshot wound of the ankle-joint; 4 (20%) patients had postinjection osteoarthritis (steroid osteoarthritis) and in 6 (30%) patients osteoarthritis developed after a surgery.

Results

Surgical technique: The ankle joint was opened either with the front incision or lateral incision. Resection of the articular ends up to healthy tissues has been performed – usually 0.5–1.0 cm from each end was resected after which nectroectomy was performed. Resected areas were compared at the angle of 90–100 degrees and temporarily fixed with two 2 mm cross wires. Osteosynthesis has been carried out by (WREF), consisting of one rings and two half rings. Once the wound was healed all patients were allowed to walk with measured loading on their leg.

Results: In 14 (70%) patients wounds were healed by first intention, in 6 (30%) patients – by secondary intention. The average duration of fixation with WREF was between 4.5 ± 1 months. Septic-inflammatory process was eliminated in all patients; no complaints of pain were registered. Union was achieved in all patients. The average limb shortening in patients after arthrodesis was 1.5 ± 0.5 cm. Stable fixation using WREF allows active walking from the first days.

Conclusions

Our experience shows that the use of WREF for ankle arthrodesis in patients with NSOA gives good results and allows good arthrodesis and walking without any support after removal of the fixator.

Reconstruction of Osteomyelitis Defects

Dr. Martins Malzubris¹; Dr. Luīze Raga²; Dr. Igors Terjajevs²

¹ *Traumatology and Orthopaedics Hospital, Latvia;*

² *Rīga Stradiņš University, Department of Orthopaedics, Latvia*

Objectives

The most important step in successful treatment of osteomyelitis is adequate debridement. But often it leaves large bone and soft tissue defects which are challenge for surgeon for further reconstruction. Aim of the study is to analyse factors that affect osteomyelitis and its related bone defect treatment. In order to improve results in osteomyelitis treatment we aim to create indicative clinical algorithm including treatment affecting factors and possible treatment methods.

Methods

We performed literature review about the specific topic and included all local patient studies concerning osteomyelitis for last 5 years performed in Hospital of Traumatology and Orthopaedics in Riga, Latvia. We analysed all patients' with diagnosis "osteomyelitis" medical histories from June 2013 till December 2018. This period was chosen, because starting from 2013 in our hospital patients were treated with all major complex bone reconstruction methods, including distraction osteogenesis, microvascular reconstructions and induced membrane (Masquelet) technique.

Results

We identified variety of different factors influencing approach to osteomyelitis treatment and bone defect reconstruction, emphasising following:

- Duration of infection.
- Relation with fracture, in past or recent (new term "fracture related infection").
- Infection causing microorganism, with much worse prognosis for patients with Gr-germs.
- Soft tissue status, including defect localisation and dimensions.
- Age of the patients and their comorbidities.

Soft tissue reconstruction methods varied from primary closure and secondary healing to complex free flaps. Bone reconstruction depended whether it was non-segmental or segmental defect, with all major reconstructive techniques available in our institution.

Conclusions

Although already more than 30 years ago Chierny and Mader described nearly perfect classification system for adult osteomyelitis, including different treatment options, still decision making in osteomyelitis treatment is not easy and needs open mind. Evaluating all treatment affecting factors helps to choose the most appropriate treatment method for specific patient.

Comparison of Volar Locking Plates vs. External Fixation and K Wires in Arthroscopically Assisted Intraarticular Distal Radius Fracture Fixation

*Dr. Uldis Krustins*¹; *Dr. Janis Krustins*²; *Dr. Diana Bringina*²;
*Dr. Kristine Laurane*³; *Prof. Andris Juntins*⁴

¹ Rīga Stradiņš University, Latvia;

Rīga East University Hospital, Microsurgery Centre of Latvia;

² Rīga East University Hospital, Microsurgery Centre of Latvia;

³ Rīga Stradiņš University, Latvia;

⁴ Rīga Stradiņš University, Department of Orthopaedics, Latvia

Objectives

The number of pathologies treated using wrist arthroscopy technique has been growing rapidly over the last decades. We want to present the results of the prospective cohort study which includes 63 patients with articular (AO C-Type) distal radius fractures that have been treated in an arthroscopically assisted manner with volar locking plates or external fixator and K-wires.

Methods

A total of 63 patients – 23 males (mean age 43.4 ± 14.7) and 39 females (mean age 55.6 ± 11.4) were included in this particular trial. The recruitment of patients took place between May 2015 and May 2017. Patients were divided into two groups using the alternative allocation method – the first surgery was performed with VLP, the second with an external fixator and K-wires, the third one with VLP and so on. Postoperative analysis was carried out using X-rays, clinical data, Patient-rated wrist evaluation (PRWE), Gartland & Werley, Modern Activity Subjective Survey of 2007 (MASS07) scores, range of motion (ROM), grip, pinch, and tripod pinch were assessed at 1, 3, 6 and 12 months intervals postoperatively.

Results

Postoperative follow-ups demonstrated a statistically significant difference in some goniometric and some dynamometric measurements (ROM, grip and pinch). The PRWE pain and function score showed a statistical difference between two groups only in the 1st month. The MASS07 score and the Gartland & Werley score did not differ significantly between the groups.

Conclusions

If there is no statistically significant difference between the two different arthroscopically assisted methods over a long period, it means that minimally invasive surgery with K-wires and external fixator in some cases could be more beneficial due to the absence of extra traumatization as well as virtually no scaring of the soft tissues, but there is heightened possibility for iatrogenic nerve injuries using a large number of K-wires without the elongation of portals.

Arthroscopic Treatment and Bone Grafting of Scaphoid Nonunions

Dr. Uldis Krustins

*Rīga East University Hospital, Microsurgery Centre of Latvia;
Rīga Stradiņš University, Latvia*

Objectives

The number of carpal pathologies treated using wrist arthroscopy instead of conventional methods has been growing rapidly during last decades. The arthroscopic bone grafting of the scaphoid nonunion was introduced by the prof. Pak Cheong Ho in Hong-Kong in 1997. 125 surgeries were performed within 20 years and the results were presented in 2017. The modification of the arthroscopic scaphoid surgery later was described by the prof. Christophe Mathoulin. I want to present first 10 cases of the arthroscopic treatment of the scaphoid nonunions in the Centre of Microsurgery of Latvia.

Methods

Eight men and two women with age distribution from 18 till 56 y.o. were treated between May 2017 and October 2018 by the same surgeon. All surgeries were performed under the axillary block anaesthesia and fixation of the scaphoid nonunion was achieved using 1.2 mm K-wires and using the dry arthroscopy technique. The same postoperative protocol was used for all patients.

Results

All nonunions showed radiological signs of bone healing within 8 to 10 weeks after surgery and later patients were pain free in the site of nonunion. Despite the standardized postoperative protocol not all the patients followed the recommendations and the final subjective and objective measurements are very different.

Conclusions

This particular method of the treatment requires specific surgical skills and training. The technique of the arthroscopic scaphoid nonunion bone grafting preserves the disturbed blood supply of the proximal pole of the scaphoid. The anatomical localization of the wrist portals makes surgeries for distal nonunions more difficult. The arthroscopic bone grafting is an outstanding alternative to more complicated other methods of the treatment of the scaphoid nonunions even due to the almost absence of the scars.

Challenges in Arthroscopic Knee Surgery – Medial Meniscus Posterior Root Tear

Dr. Eriks Ozols

Rīga Stradiņš University, Department of Orthopaedics, Latvia

Objectives

Meniscus plays a crucial role for maintaining homeostasis of the knee joint. In addition to lubricating properties and providing secondary stability, the meniscus distributes significant load across the tibiofemoral joint. Current evidence suggests that tears of the meniscus disrupt normal homeostasis and increase contact force which can lead to premature arthritis.

Methods

Injury to the root of the medial meniscus is a subtype of tear that may have profound impact on the health of the knee. Tears of the meniscus root insertion lead to meniscal extrusion, and subsequent loss of hoop stresses- an inherently critical structural property of the meniscus. Meniscus root tears creates profound changes in load transmission, and is biomechanical similar that of total meniscectomy.

Results

Although there are several treatment options and controversies, the current trend is to repair the medial meniscus root tear using various techniques including suture anchors and pullout sutures if the patient meets the indications. However, there are still debates on the restoration of hoop tension and prevention of arthritis after repair and further biomechanical and clinical studies should be conducted in the future.

Conclusions

Surgical techniques for root tears have evolved in recent times, with most techniques aimed at arthroscopic anatomic restoration of the root avulsion. Diagnostics, recognition of the tear, and understanding of the implications and coexisting joint pathology can help guide the treating physician in providing appropriate treatment and recommendations to patients.

Quality of Life and Other Characteristics of Elderly Patients Six Months after Hip Fracture

Dr. Gunta Kristapone¹; Dr. med. Signe Tomson²

¹Rīga Stradiņš University, Department of Doctoral Studies, Latvia;

²Rīga Stradiņš University, Faculty of Rehabilitation, Latvia

Objectives

The aim of this study is to evaluate the quality of life and other characteristics in patients older than 65 years after hip fracture.

Methods

Participants with a traumatic hip fracture and data were collected at the hospital stage and six months after fracture. The Quality of Life was assessed by the general quality of life scale World Health Organization Quality of Life Questionnaire (WHOQoL-BREF) and health-related quality of life was assessed by Hip dysfunction and Osteoarthritis Outcome Score (HOOS).

Results

40 patients with hip fracture at the hospital stage participated in the initial stage of the study. Mean age was 80.08 years (SD-7.8 years, min 65 years and max 93 years). 30 participants (75%) were women and 10 participants (25%) were men. Six months after hip fracture only 13 patients (32.5%) remained in the study from them 11 were woman and 2 were man. From the initial group of patients 3 persons (7.5%) died in this period. But 24 persons were excluded (67.5%) to participate for various reasons. Mean age of survivors was 80.7 years, min 66 years and max 90 years. 50% of patients used an assistive technology device before the trauma. 1% of patients had gainful employment before the trauma. In comparison mean age of excluded was 79.96 years, min 65 years and max 93 years.

Conclusions

In the longitudinal studies involving very old and fragile participants there is very big probability of participant loss because of different reasons (age, cognitive function a. e). To proceed with further data collection, revision of inclusion criteria would be needed in order to minimize participants drop-out in the study.

Experience of Minimally Invasive Spine Surgery in Hospital of Traumatology and Orthopaedics

*Aleksejs Repnikovs; Kalvis Briuks; Rolands Gibners;
Edgars Svolaks; Olegs Suhorukovs; Andris Puce*

Traumatology and Orthopaedics Hospital, Spine surgery unit, Latvia

Objectives

Traditionally, the goal of spinal surgery is to improve quality of life for the patient. Yet, open intervention is associated with major interference with soft tissue, which results in long recovery period and relatively high complication rate. Minimally invasive spine surgery (MISS) decreases surgical injury to soft tissues and morbidity associated with it, but allows to achieve the same results as conventional surgery. The aim of the study is review of the MISS experience in Hospital of Traumatology and Orthopaedics (HTO).

Methods

This is a retrospective study based on HTO experience in development of MISS from 1995 till 2018. We collected and analyzed data of the surgical technique and procedure count, evolving indications for MISS and postoperative complication rate.

Results

The proportion of MISS operations has increased from 0.5% in 1995 to 64% in 2018. The range of procedures has evolved from the first microdiscectomy in 1995 to microdiscectomy, minimally invasive spinal canal decompression, percutaneous transpedicular fusion, percutaneous transforaminal lumbar interbody fusion in 2018. Number of percutaneous thoracolumbar spine fusion has increased from 4 in 2011 to 30 in 2018. Indication for MISS include working age patients to facilitate return to employment and co-morbid patients when open surgery risks outweigh benefits. Postoperative complication rate and intraoperative blood loss has substantially decreased.

Conclusions

In last decades MISS has evolved as the technique of choice in major spinal surgery. This surgery provides good and safe results for patient, but its more demanding for the surgeon skill level and specific instruments.

Orthopaedic Oncology – Challenge for Orthopaedic Surgeon

Dr. Lauris Repsa

Rīga Stradiņš University, Department of Orthopaedics, Latvia

Objectives

To show diversity of orthopaedic oncological diseases.

To show treatment results from oncological, orthopaedic and functional point of view.

Methods

Review of literature and clinical data in Hospital of Traumatology and Orthopaedics during last 5 years.

Results

Orthopaedic oncology demands high level of knowledge in oncological diseases, anatomy, as well as in orthopaedics, excellent surgical skills as orthopaedic surgeon, general surgeon, vascular surgeon and microsurgeon, bravery to make decisions. Benign bone lesions are mostly presented in childhood and young adults. In majority of cases, these lesions are not life-treating. Primary malignant bone lesions are not common. Sarcoma treatment is multimodal. In 90% of all bone sarcomas, as reconstruction method, endoprosthetic replacement is used. In all cases in average, 5 year survival is approximately 60%, implant survival for 5 years are 50% in average with following orthopaedic reconstruction. Biological reconstruction or no-reconstruction are used in particular cases.

Soft tissue tumors in 90% are benign. In our hands, patients with soft tissue tumors disease-free 5 year survival is approximately 50%. Often soft tissue tumors include underlying bones, and bone reconstruction is necessary.

Metastatic lesions are often seen in daily orthopaedic praxis. Challenge is in fact, that often primary bone tumors are mistaken as metastatic, and treatment and prognosis are different. Palliative fixation of fracture as decades ago, now with multimodal treatment and much better life-expectancy, is replaced with more radical and aggressive treatment, that includes radical resection and reconstruction of bone and soft tissue.

Conclusions

Orthopaedic oncology is highly demanding- bravery from surgeon, medical oncologist, radiologist and of course patient.

Radical resection and reconstruction is mandatory in majority of cases to achieve successful result.

Endoprosthetic replacement is used in majority of tumor cases with biological reconstruction or no-reconstruction in selected cases.

Results in Hospital of traumatology and orthopaedics are similar as in literature described.

Choice of Implants in Shoulder Replacement Surgery Depending on Rotator Muscle Function

Dr. Aigars Vugulis

Rīga Stradiņš University, Department of Orthopaedics, Latvia

Shoulder joint endoprosthesis along with hip joint and knee joint endoprosthesis is a modern treatment method for patients with many shoulder joint pathologies.

Main indications are primary and secondary shoulder joint osteoarthritis, rotator cuff arthropathy, avascular necrosis of the humeral head, complicated fractures of the humeral head, tumors, and the consequences of posttraumatic and previous surgical interventions.

The choice of implants is, to prevent the pathology of the shoulder joint, mainly established by the quality of the rotator cuff and its wholeness. The function of the rotator cuff is to center the humeral head against the glenoid, to provide rotating motions and the strength of the arm within the shoulder.

Total endoprosthesis of the shoulder joint anticipates that the damaged armouring surface of the humeral head and the glenoid can be replaced, on condition that the rotator cuff is healthy.

For patients with a damaged armouring surface and a healthy rotator cuff, there is also a possibility for a resurfacing for the humeral head, if the proximal part of the humeral head bone remains.

Reverse endoprosthesis design anticipates that the motions of upper arm are being compensated by a deltoid muscle without the involvement of the rotator cuff. The main indication is an unreparable damage of the rotator cuff, rotator arthropathy. Keeping in mind the degenerative changes of the rotator cuff with age, patients over 75 years of age are recommended to have an endoprosthesis with a reverse type prosthesis. The guidelines allow complete or partial resection of the rotators in the process of the surgery.

For patients with a rotator cuff healthy and of quality, total replacing endoprosthesis of the shoulder joint and its surface is being indicated, with sparing and refixing the rotator cuff to keep the rotation's motion and strength.

Association of Interleukin-10 Gene Promoter Allelic Variants with Rheumatoid Arthritis in a Sample of Residents in Latvia

*Anna Dorondo*¹; *Dr. Erika Nagle*²; *Dr. med. Linda Gailīte*³

¹*Rīga Stradiņš University, Latvia;*

²*Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;*

³*Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia*

Objectives

Allelic variants located in IL-10 positions c.-592 (rs1800872), c.-657 (rs1800895), c.-849 (rs1800871), c.-851 (rs1800894) and c-1082 (rs1800896) IL-10 gene have been associated with regulating IL-10 promoter activity. Aim of our study was to identify IL-10 gene promoter allelic variant frequencies in RA group and to evaluate their role in aetiology of rheumatoid arthritis.

Methods

In cross-sectional study, 171 patients with diagnosis RA (ICD-10 code M05 and M06) were included. DNA samples were obtained from Genome Database of the Latvian Population (LGDB). All study subjects were Latvian residents. The study was approved by the Central Ethics Committee. Genotyping for the presence of specific alleles was performed using Sanger sequencing. Minor allelic frequencies (MAF) in RA group were compared with European (non = Finnish) frequency (MAF EU) in GnomAD database.

Results

The median age was 58 ± 13 (20–85) years for patients. Females 74% and 26% males. Identified allelic variant frequency in RA group were for c.-592 - 0.231 (MAF EU = 0.235), c.-657 - 0.019 (MAF EU = 0.012), c.-819 - 0.209 (MAF EU = 0.236), c.-851 - 0.024 (MAF EU = 0.031), c.-1082 - 0.262 (MAF EU = 0.474).

Conclusions

Observed differences in promoter allelic variants in RA group of Latvian residents in comparison with European general population, indicates the need for further investigation of allelic frequencies in Latvian residents. Certain allelic variant association in an IL-10 promoter and RA could help to understand pathogenesis and genetic aetiology of rheumatoid arthritis.

Correction of Immunosuppressive Therapy in Rheumatologic Patients during Perioperative Period

Anda Kadiša

Rīga Stradiņš University, Department of Internal Diseases, Latvia

Objectives

For the treatment of rheumatologic diseases, synthetic and biological disease modifying drugs (DMARDs) are used. Almost all of them belong to immunosuppressants, which are characterized by immune suppressive activity. Often rheumatologic patients, especially arthritis patients, need arthroplasty. In order to reduce the development of complications during the perioperative period, it is necessary to properly stop or reduce the treatment with immunosuppressive drugs.

Treatment with DMARDs prior to scheduled surgery should not be interrupted too early to avoid exacerbation of the disease. It is not always possible to stop all used medications. Not only changes in medication used, but also surgery can lead to exacerbation of the disease. Autoimmune diseases, especially rheumatoid arthritis, can contribute to the development of infection in the prosthetic joint. It could be caused by disease activity, functional disability, used treatment and joint prosthesis.

Results

In rheumatologic patients, the DMARDs are often withdrawn during the preoperative period and replaced with glucocorticoids. It effectively reduces disease activity and risk of outbreak, but increases the risk of postoperative infection. The commonly used drug methotrexate, as well as hydroxychloroquine and sulfasalazine, do not significantly affect the perioperative period. Leflunomide worsens wound healing. TNF- α inhibitors are more commonly used bDMARDs. They can contribute to the development of persistent skin infection, especially colonization of *S. aureus*, as well as rapid biofilm formation in the prosthetic joint. Rituximab and tocilizumab have no significant effect on the perioperative period.

Conclusions

During the perioperative period it is necessary to continue to control the activity of the disease, to optimize the healing of wounds, as well as to reduce the risk of postoperative infections and the deterioration of co-morbidities. Conducting an optimal perioperative period requires close cooperation between traumatologist, rheumatologist, anesthesiologist and radiologist.

Perioperative Nutrient Role after Hip and Knee Arthroplasty

Ansis Zauers

Rīga Stradiņš University, Department of Doctoral Studies, Latvia

Objectives

Introduction. In Latvia, orthopedic surgeries, including knee and hip arthroplasty, are among the most common surgeries. In Western Europe and the US, various perioperative nutrition intervention strategies have gained popularity and are commonly practiced to mitigate the negative effect of metabolism by preventing catabolic response after surgery, improve the patient's overall state of health, reduce the period of rehabilitation, including the risks of post-operative complications and the need of revision surgery.

Methods

Analyze the existing literature data of the last ten years on the effects of perioperative nutrients on the postoperative results of hip and knee orthopedic surgery.

Results

The effect of nutrients on the patient condition after hip and knee surgery was analyzed in six randomized clinical trials. The benefits of preoperative carbohydrate loading are thoroughly researched and widely accepted. The European Society for Clinical Nutrition and Metabolism (ESPEN) guidelines indicate that preoperative carbohydrate intake may reduce insulin sensitivity, prevent hypoglycemia and reduce overall stress. ESPEN guidelines recommend taking 800 ml of a carbohydrate drink one night before surgery and 400 ml in the day of surgery. In four intervention studies using carbohydrate drinks before surgery, the patients were found to experience less nausea and hunger, while the blood tests showed lower insulin resistance, lower endogenous glucose release, and elevated insulin-like growth factor I (IGF-I) bioavailability. The two studies with administering perioperative essential amino acids reported a reduction of muscle loss and a faster return to functional mobility. In the ESPEN guidelines one of the goals is to integrate nutrition into the overall treatment of patients in order to minimize catabolism and support anabolism. The recommended amount of preoperative protein is 1.5 g/kg.

Conclusions

In order to strengthen the role of perioperative nutrients in hip and knee arthroplasty, a more in-depth research on a wider range of random indicators is needed.

Options for Lower Limb Length Discrepancy Correction in Children

*Dr. Janis Upenieks¹; Dr. Uldis Bergmanis²;
Dr. Agnese Rekevica²*

¹ Rīga Stradiņš University, Latvia;

Children's Clinical University Hospital, Department of Pediatric Surgery, Latvia;

² *Children's Clinical University Hospital, Department of Pediatric Surgery, Latvia*

Objectives

To perform comparative treatment outcome analysis in pediatric lower limb length discrepancy (LLLD) patients.

Methods

Records of 133 patients with operative LLLD correction from 2001 to 2017 were analyzed. Treatment options included Blount staple epiphysiodesis, shortening of the long leg combined with ESIN or locking nail, and lengthening of the short leg using Ilizarov, Wagner or Kalnberzs devices.

Results

84 patients (63%) had congenital shortening of lower limb, while 49 patients (37%) underwent treatment due to acquired LLLD. 76 patients (57%) complained of femoral shortening, 45 patients (34%) suffered from tibial shortening and 12 patients (9%) had both segment shortening. Age at operation was 4 to 18 (mean 14.7) years. 23 epiphyseodeses, 12 shortening and 98 lengthening procedures were performed. We applied a circular fixator in 12 cases and a monolateral fixator in 56 cases for femur lengthening. 37 lengthenings of tibia were performed by circular fixator, but 5 lengthening procedures were done by monolateral fixator. Achieved correction was 2 to 10 (mean 4.9) cm. 145 complications, including 82 pin tract infections, 4 problems with bone formation, 22 axial deviations, 28 joint problems and 9 fractures of bone regenerate were documented. Duration of hospital admittance varied from 6 to 24 (mean 9) days.

Conclusions

Complication rate correlates with correction amount. High complication rate in lengthening procedures makes epiphysiodesis and shortening procedures more attractive options for small discrepancies. The locking nail is better both for femoral shortening and lengthening with monolateral fixator.

Can Myotonometry Aid Goniometry in Estimation of Treatment Efficiency of Paediatric Midshaft Forearm Fractures?

*Dr. Janis Upenieks*¹; *Dr. Agnese Rekevica*²;
*Prof. Aigars Petersons*³; *Prof. Anita Villerusa*⁴

¹ *Rīga Stradiņš University, Latvia;*

Children's Clinical University Hospital, Department of Pediatric Surgery, Latvia;

² *Children's Clinical University Hospital, Department of Pediatric Surgery, Latvia;*

³ *Rīga Stradiņš University, Latvia;*

Children's Clinical University Hospital, Latvia;

⁴ *Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia*

Objectives

To estimate treatment efficiency of pediatric forearm midshaft fractures using myotonometry and goniometry.

Methods

A prospective, stratified, randomized, controlled clinical trial, including 180 boys and girls (age 7–15 years) from 2014 to 2016, comparing conservatively and surgically treated children with healthy controls. Duration of plaster for treated children was 1 month, none of the respondents underwent rehabilitation. ROM of wrist and elbow joints and viscoelastic parameters of 6 arm muscles were assessed.

Results

All fractures consolidated. Both conservatively and surgically treated patients had higher ROM limitation rate and muscle stiffness, than controls. Surgical treatment predicts significantly lower ROM limitation rate (30%), compared to conservatively treated patients (75%). Limitations were mostly asymptomatic – only 11.7% of operated children and 16.7% of conservatively treated patients had subjective complaints. Conservatively treated children complained of limited elbow flexion (n = 1), extension (n = 2) and pronation (n = 4) as well as wrist extension (n = 3). Surgically treated children complained of limitations in elbow flexion (n = 1) and pronation (n = 3) as well as wrist extension (n = 3). No gender differences were found among treated patients, boys had 51.7% compared to girls having 53.3% limitation rate. Dominant hand was injured more often (ratio 1.2:1). Comparing age subgroups (7–9 years, 10–12 years and 13–15 years) of the same gender, no significant differences were seen in limitation rate for both genders. Muscle stiffness in operated children was lower than in conservatively treated children, but higher than in controls.

Conclusions

Surgical treatment (ESIN) has lower ROM limitation rate compared to conservative approach. Mild limitations (< 10 degrees) do not cause subjective complaints due to compensatory capacities of a growing child. Age and gender of the child do not correlate with frequency and severity of ROM limitations. Myotonometry and goniometry are complementary and equally useful tools for estimation of treatment efficiency in pediatric forearm midshaft fractures.

Long-Term Follow-up for Calcaneal Bone Reconstruction Using Vascularised Composite Fibula Growth Plate Transplantation for 5 Years Old Boy

Dr. Maris Krumins¹; Dr. Dzintars Ozols²; Dr. Kristaps Blums²

¹ *Microsurgery Centre, Latvia;*

² *Rīga Stradiņš University, Latvia*

Keywords: fibula, growth plate, flap, transplantation, calcaneal reconstruction, foot.

Objectives

Traumatic calcaneotomy is rare and complicated condition which results in loss of limb function and chronic pain, as calcaneus is crucial for weight bearing.

In adult reconstruction options are limited to bone grafts, 3D prosthesis. Data is very scarce in paediatric population. Vascularized bone grafts or prosthesis require additional surgeries due to inability to grow with the rest of the foot bones.

Methods

Five years old patient was presented after his trauma while slipping under lawnmower which resulted in calcaneal amputation, large bone and plantar soft tissue defect from medial to lateral malleoli.

During emergency surgery debridement and external fixation was performed preserving innervation and blood supply. Wound closure was possible with remaining soft tissue due to volume loss of calcaneal bone. Four days later reconstruction surgery was performed using composite vascularized pedicle growth plate flap. Flap was based on anterior tibial artery, peroneus longus muscle and skin perforator flap was included to maintain soft tissue coverage.

Calcaneus was reconstructed by double barrel fibula transplant localizing growth plate in distal part of neocalcaneus. Fixation was done with K-wires and foot joint ex-fix.

Results

Flaps survived with primary healing. Growth plate is open at 7 years follow-up. Patient can walk and run without any functional problems. Lower extremity functional scale (LEFS) is 78 of 80. Full consolidation of both fibula barrels with open growth plate was achieved.

Fibular transplant has acquired similar shape to calcaneus with symmetric flattening, angulation as in opposite side. Podometry- patient is bearing more weight on lateral aspect of plantar side of foot when compared to standard.

Conclusions

Reconstruction of amputated calcaneal bone is rare and complicated, more so for paediatric patients. It's possible by complex vascularized flap with sustained growth and good functional outcome in long term.

Mixed-Mode Instruction Using Flipped Classroom and Active Learning Techniques Leads to Improved Generic Problem-Solving Skills of Undergraduate Students

Prof. *Andis Klegeris*

*University of British Columbia Okanagan Campus,
Department of Biology, Canada*

Objectives

In a recent survey of employers, 60% of respondents identified problem solving and critical thinking as an essential set of soft skills that is lacking in recent university graduates. These data are supported by academic studies arguing that contemporary university education should equip students with not only subject domain-specific knowledge, but also with generic, domain-general, problem-solving skills (PSS). Development of this skill set is challenging due to the shortage of widely available tools for measuring PSS of students, as well our limited understanding of the pedagogical strategies effectively advancing student problem solving. We hypothesized that the PSS and critical thinking of students can be improved through flipped classroom strategy where class time is mainly used for active learning instead of didactic lecturing.

Methods

A final-year Biochemical Basis of Disease course was re-designed to include three different clinical cases, which students explored through in-class problem-based learning in small groups; reading of assigned research articles; and listening to pre-recorded audio lectures, which enabled course content delivery. In addition, classroom time was used for workshops focused on professional skills such as critical thinking, metacognition and working with reliable, evidence-based sources of information. As part of this research study, students were offered to write problem-solving and critical-thinking tests at the beginning and the end of the term.

Results

46 students participated in the study. A statistically significant, 12% improvement in PSS test scores was observed, while the critical-thinking test scores did not improve.

Conclusions

Flipped classroom approach allowed students to use in-class time to work on ill-defined clinical problems in a small-group setting, which most likely led to significant improvement of their generic PSS. Since there was no improvement in critical thinking skills, alternative instructional strategies should be introduced to advance this important component of the soft skills of students.

Reflection on Research Integration in Study Process: Case of Psychology Branch at Rīga Stradiņš University, Latvia

*Kristīne Šneidere*¹; Prof. *Kristīne Mārtinsonē*²;
Prof. *Tatjana Koķe*²

¹ Rīga Stradiņš University, Doctoral study program Psychology, Latvia;

² Rīga Stradiņš University, Latvia

Objectives

The transformation from student into researcher has become increasingly relevant even in professional study programmes, as the ability to use research skills can no longer be considered necessary only in academic achievements (Brew, 2006). This study is based on framework by Griffiths (2004) and Healey (2005), suggesting four approaches of research-teaching linkages in curriculum – research-led, research-oriented, research-based and research-tutored. The aim of the present study was to investigate research integration in study process based on reflection of three data sources: mapping results of course descriptions focusing on learning outcomes, academic staffs' reflections and students' reflections.

Methods

Mapping (n = 40) was conducted on learning outcomes in course descriptions from Department of Health Psychology and Pedagogy. The questionnaire contained questions regarding research integration (n = 8). In the focus group, psychology branch students were included (n = 8). Data were analysed with deductive content analysis.

Results

Results indicated discrepancy between data from document analysis and reflections from academic staff. Considering data from document analysis, it was found that mainly research-based approach is used, while reflections from academic staff indicated research-led approach. Students' views on research integration in study process complied with academic staffs' views, mostly stressing great gap between course implementation in practice and research. Students acknowledge their research experience through research-led approach dominated by faculty.

Conclusions

Discrepancy between the officially stated learning outcomes and methods used to achieve these results in the classroom indicates a clear mismatch, namely, lack of space for even initial research experience does not promote students thinking based on interest and their responsibility for study results. More so, rather narrow comprehension of research can be found from students' reflections. Thus, possible benefits could be gained by enriching academic staffs' metacognition through regular supervisions and increasing the collaboration between students and academic staff.

3D Printed Anatomical Models – New Visualisation Platform for Teaching and Education in Basic Study Course

Prof. *Dzintra Kažoka*; Prof. *Māra Pilmane*

Rīga Stradiņš University, Department of Morphology, Latvia;
Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia

Objectives

Today 3D printing technology is a special way of creating almost any object we can imagine out of different materials. In Human anatomy course some students have trouble understanding and visualizing some of the structures but the using of 3D printed models may help tutors to better explain difficult topics and enhance the students' education. The aims of this study were:

- 1) to develop different 3D printed models for educational use and integrate these models in various topics in regular curriculum of study course;
- 2) to enhance the knowledge about students' views and attitudes concerning the educational value of 3D printed models.

Methods

In this study different 3D models of the bones or organs were created by tutors and the 1st study year medical students at the Department of Morphology in 2018. Several steps included: preparation of different 3D human anatomical models and their post-processing. Different shapes, sizes and formats of all 3D printed models were prepared by free slicing softwares, after saved in a 3D printer-readable file format and printed using an FDM 3D printer, a Prusa i3 MK2 (Prusa Research). Polylactic acid (PLA) and acrylonitrile butadiene styrene (ABS) were used as the print materials. At the end of classes the tutor performed a discussion session with students about 3D printed models.

Results

3D printing was integrated into active teaching, learning and group work. Students developed their own models and different skills while working on 3D printing, including 3D modeling, creativity, technology literacy, problem-solving, self-directed learning and observed special structures on 3D objects that were more difficult to visualize on paper or other formats. Classes were also more interesting for medical students, allowed them to broaden their knowledge not only in theory but also in practice.

Conclusions

3D printing of the anatomical models is undoubtedly new chapter in teaching and education in Human anatomy.

Lecturer’s Reflection on Feedback Provided in Study Course “Pharmaceutical Dosage Form Technologies”

Olga Kiselova; Prof. Venta Sidlovska

Rīga Stradiņš University, Department of Dosage Form Technology, Latvia

Objectives

The aim was to assess feedback provided by lecturer in a study course “Pharmaceutical Dosage Form Technologies” in order to develop students research skills during the course.

Methods

To analyse feedback provided by the lecturer in each stage of acquiring the medicinal products preparation process.

Results

As a result of acquisition of the study course the students must not only be able to prepare different dosage forms quickly and in a good quality, but also to know theoretical justification of preparation of extemporal dosage forms. The study course includes lectures and practises. Practises include seminars, during which the students, guided by the lecturer, bond theory with practice. After seminars each student receives a list of individual prescriptions and performs necessary calculations, describes preparation. If there are any mistakes, the lecturer immediately discusses them with a student. Only after the lecturer’s corrections the student receives a permit to prepare the medications. The lecturer supervises the medicine preparation process. In order to strengthen theoretical knowledge, the student writes a protocol, in which reflects on the preparation of prescriptions, compounded during practise. Regardless the close cooperation between the lecturer and the student during the practise, students still make mistakes in protocols. Analysing mistakes, the student is not always able to justify his opinion.

Conclusions

The most productive feedback will be achieved, if a student, during preparation of a medication, will have the opportunity reflect on his / her experience, asking him / herself “Why did I do it?” To develop students’ ability to reflect, lecturer’s task is to encourage students to muse as often as possible, why each operation is performed. It is necessary to make changes for protocol form, encouraging a student to show the way how he / she achieved each of the operation, thus developing inquiry, engagement and responsibility which is necessary prerequisites for research skills.

Implementation of Research Experience in Study Courses at Rīga Stradiņš University, Latvia

Prof. *Inese Čakstiņa*

Rīga Stradiņš University, Institute of Oncology, Latvia

Objectives

Researcher obligations besides to perform scientific research, includes work with students, both on individual level (in the laboratory teaching the applied methods) and in academic environment (giving the lectures and classes). During and after PhD studies, one has to improve teaching skills and participate in academic tasks of the host institution. Having the biology background, it was somewhat challenging to shape obtained knowledge in the fields of molecular and cellular biology towards specific medical approaches. Here, an insight of the previous research experience and it's integration in the B course “Horizontal Gene Transfer”, taught to students of Faculty of Medicine will be given.

Methods

Starting the course of “Horizontal Gene Transfer” four years ago the topics of classes and lectures were analysed. All lectures and classes were developed based on topics covering the basic applications of gene engineering. Every year lectures are improved with newest discoveries in the specific fields.

Results

Based on experience with recombinant DNA technologies, two practical classes (molecular construct design using modelling program and bacterial transformation with plasmid DNA) were developed and introduced in this course.

Conclusions

The course “Horizontal Gene Transfer” receives an excellent feedback from students. They are looking forward to more practical works. However, it is hard if not impossible to plan more practical actions due to given time for the classes, since most of the protocols in gene engineering takes longer time periods.

DeDiWe Case Study

Sanita Litiņa

Rīga Stradiņš University, Red Cross Medical College, Latvia

Objectives

EHealth has been a priority for the World Health Organization (WHO) since 2005, with an aim at cost-effective and secure use of information communication technologies (ICT) in support of health and health related fields.

E-health development in the last decade has significantly developed and affected mutual interaction of such fields as information science, public health and business, developing fast introduction of e-solutions in health care institutions. In order for students to successfully integrate in the labour market and in the future to work with e-health or other digital systems and instruments in health care field, it is necessary to provide a possibility to develop and improve digital skills and competences in the study process. The EU Central Baltic funded Developer of Digital Health and Welfare Services (DeDiWe) project aimed to enhance future health care professionals' abilities to develop digital health care and welfare services. The project was a multi-cultural and multi-professional project, combining students from health and welfare with students from the IT sector. The main objective of the project was to create a new curriculum.

From February 2016 until February of 2018 The Red Cross Medical College of Rīga Stradiņš University (further in text – RSURCMC) in cooperation with Laurea University (Finland), Arcada University (Finland) and Tartu Health Care College (Estonia) implemented a project “Development of Digital Health and Well-being Services” (further in text – Dediwe). In the framework of the Dediwe project has been developed study course “Digital Skills in Health Care”, in the framework of which students could get basic knowledge about working with health information in the digital environment, got to know and understood digital service focused on the user, including e-Health service design and activity process and understood a structure of different types of the health information data sources. Study course has been used in the team chat app Slack.

Methods

45 RSU RCMC students took part in the survey, 26 of them were students of the study programme “Medicine”, 15 students of the study programme “Nursing” and one student was representing study programme “Therapeutic Massage”. Data of the partly structured survey was analysed quantitatively.

Results

Research showed that e-study course “Digital Skills In The Health Care” is important and improves students' skills in the processing of health information data in the digital environment, contributes to the understanding of data safety and approach focused on the patient. 72% (n = 32) of the respondents rated acquisition of the study course with 4 (good) based on the scale of 5 points. On a question, which skills students could improve in the framework of the study programme best of all, such answers have been given: 23% (n = 10) intercultural communication skills, 45% (n = 20) – skills to use new applications and platforms, 19% (n = 9) – critical thinking, 13% (n = 6) – problem solving skills. 81% (n = 36) of the respondents indicated that in the frameworks of the course they improved their own skills about patient's and client's role in the context of e-health, 96% (n = 42) answered that have learned safe and effective basic principles of the virtual communication, 95% (n = 43) indicated that after the study course understand development of the health information data structure. In the DeDiWe studies the combination of multi-professional teachers, that's is, teachers from different disciplines, also led to positive attitudes towards multi-professionalism in students.

Conclusions

Data of the research made shows that the study course “Digital Skills in the Health Care” is supported and should be implemented in the process of health care studies. In the framework of the study course students have improved digital skills, intercultural communication and have been encouraged to acquire new e-study platforms. The learning by Developing process has also been visible during study course. Representation of working life representatives has been an active partner during the process, enabling connection to digital health service development in working life.

When a Teacher Is a Researcher Simultaneously – What Types of Benefits are There for Students?

Inese Stars

Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia

Objectives

Teaching and research are closely linked in a university setting. The goal of this article is to encourage discussions about the teaching and research nexus as well as to identify a range of benefits that undergraduate students can derive from being taught by research-active staff.

Methods

Theoretical method – scientific literature analysis about teaching and research nexus in a university setting.

Results

Scientific literature indicates on multiple benefits that undergraduate students can gain from being taught by academic staff who is involved in an active research process at once: 1) it can increase students' understanding of the subject; 2) it can stimulate students' interest toward a particular subject matter; 3) it can enhance students' enthusiasm to engage in a research; 4) it can increase students' understanding of the research process; deepen their awareness of the methodological issues regarding research process and contribute to the development of research-related skills; 5) it can motivate students to consider to do research in the same area; 6) it can develop understanding of how scientists work on problems and how scientific knowledge is constructed; 7) it can enable students to see how theory and practice are integrated in research and as well in teaching process; 8) it can empower students to be more critical consumers of scientific literature, to have more tolerance for obstacles, to work more independently and to gain more self-confidence; 9) promote up-to-date knowledge.

Conclusions

Linkage – teaching and research – is a significant topic in education science. It is motivated by the need to teach undergraduate students in a research-informed teaching environment that facilitate a "students as researchers" pedagogy. Studies that examine teaching-research nexus in academic setting should be promoted including both perspectives: teachers' perspective and students themselves.

Most Common Ways of Learning for Students

Prof. *Irena Upeniece*; Prof. *Voldemars Arnis*; *Anna Aboliņa*

Rīga Stradiņš University, Department of Sports and Nutrition, Latvia

Objectives

The aim of the study was to identify the dominant ways of sensory perception in the acquisition of knowledge of students, future physiotherapists, and nutritionists.

Methods

242 students were participated in the research. The study was conducted in five study years from 2013/2014. to 2017/2018. Scientific research method – Survey with Testological Knowledge. The survey was conducted within the framework of a pedagogical course with two practical objectives: to identify the most characteristic and appropriate way for students to learn more easily; and help lecturers to include the content of knowledge: didactic principles, methods, tools. Today’s students are learning different. New technologies have a very strong impact on student education.

Results

The results show that the dominant form of perception is visual (78% confirmed it with the testological findings in the survey).

This means that most of the students in the survey understand the content of their knowledge better by looking at what they are learning, trying to visualize ideas and not expressing them in words. The best way to learn is through imaginative scenes: using charts and images, observing subjects, preparations, people, viewing handouts, watching videos. The results strongly confirms the necessity of using the didactic principle of visibility and the related didactic means in the study process by studying independently and in cooperation with the lecturer.

Conclusions

The most characteristic way of perception of knowledge for students is visual, followed by tactical, audible and last imaginary. The results of the research show tandems of dominant knowledge acquisition: visual + tactical, visual + auditory, visual + imaginary.

Comparing the data obtained with previous studies, we can assure that among the young people visuals are growing rapidly.

Exploring Satisfaction Attributes of E-learning among Students of Medical Terminology Study Courses

*Miervaldis Karulis; Ināra Ābelīte; Vita Viksne;
Aija Zilvestre; Ēina Zazerska; Ieva Fībiga*

Rīga Stradiņš University, Language Centre, Latvia

Objectives

Higher education policy makers worldwide focus on integrating e-learning systems into all study programs, while fully respecting student's interests and satisfaction. One of the solutions is blended learning, which includes both face-to-face and online learning, extending opportunities of exploiting various methods of learning / teaching, scheduling, modes of delivering and guidance. In this respect, student satisfaction is of crucial importance, which can be defined as a measure of interaction between users and the e-learning system in order to achieve success. DeLone and Mclean have developed the e-learning model involving 6 domains: information quality, system quality, service quality, use, user satisfaction and net benefits. According to Kano, satisfaction attributes comprise objective (fulfillment) and subjective (perception) aspects. In recent years, taking into account these factors, the teaching staff of Language Centre (Rīga Stradiņš University) have been implementing interactive e-tests in several courses of Medical Terminology in the e-learning environment (E-LE) (MOODLE).

Aim: to evaluate student satisfaction attributes (objective and subjective) in the blended learning setting of the study courses: Medical Terminology in Latin and English and to reveal homogenous groups of students of different study programmes and courses.

Methods

To evaluate student satisfaction attributes of e-learning, a cross-sectional study was carried out in December, 2018, when 256 students of the first and second study year of the study programmes of Medicine, Dentistry, Public Health and Occupational Therapy (Rīga Stradiņš University) were interviewed using the questionnaire, comprising a list of 10 statements with 5 multiple categorical answers (Kano one-way model questionnaire). 324 (93 males, 231 females) completed questionnaires were fully valid. To find out homogeneity of student groups, a cluster analysis was performed. In order to evaluate a level of student satisfaction of e-learning, the standardized coefficient of satisfaction ranging from +2 to -2 was introduced. The descriptive and inferential assessment of students' responses and two-step cluster procedure were processed using IBM SPSS Statistics 20 (a significance level of 95%).

Results

The questionnaire contained the following statements (attributes): technical stability and reliability in the E-LE (Q1), easy to use and user-friendly interface of the E-LE (Q2), lecturer's instructions how to use the E-LE (Q3), availability of audio / video resources in the E-LE (Q4), a variety of communication options (on-site: in pairs, groups - and on-line: internet) (Q5), possibilities of knowledge self-assessment in the E-LE (Q6), use of mandatory (graded) exercises and tests in the E-LE (Q7), blended learning (combination of traditional learning with an interactive E-LE) (Q8), availability of instructions how to perform e-tests with examples in the E-LE (Q9), availability of interactive E-LE at any time and place (Q10); and the answers: I am satisfied, I consider important, I do not care, I can accept, I am dissatisfied. The Kruskal-Wallis test revealed that there was no statistically significant difference among students of study programmes ($\chi^2 = 7.780$, $df = 3$, $p = 0.051$ (2-sided)) and genders ($\chi^2 = 3.179$, $df = 1$, $p = 0.075$) on coefficients of satisfaction, but it was between students of study courses ($\chi^2 = 7.205$, $df = 1$, $p = 0.007$) in Q1, Q2, Q3, Q4, Q5, Q10. Generally, the level of satisfaction attributes of the whole study sample decreased in the following order: Q10-Q1-Q3-Q8-Q2-Q6-Q9-Q7-Q5-Q4. The coefficient of satisfaction varied from -1.30 to +1.90 (median 1.0448). Two clusters were segregated: 1 (56.1% cases), 2 (43.9% cases). In cluster 1, the answer "I consider important"

with importance 1 of Q3 was the most important feature for its formation and more students of “Medical Terminology in Latin” were represented there, but in cluster 2 – it was the answer “I am satisfied” with importance 1 of Q3. All the study programmes and genders were represented in both of the clusters.

Conclusions

1. Students considered the following attributes as the most satisfying: availability of the E-LE at any time and place, its technical stability and reliability and instructions of its usage, but as the least satisfying – a variety of communication options and availability of audio / video resources since they are available in internet applications and forums.
2. Most of the students of the study course “Medical Terminology in Latin” (cluster 1) considered the attributes in the following decreasing order: Q3-Q9-Q6-Q5-Q7-Q1-Q2-Q4-Q8-Q10, which indicates their greater demand (must-be) for these attributes of this order.
3. Most of the students of cluster 2 considered the attributes in the same order, which indicates their greater satisfaction (attraction) with these attributes.
4. The study had some limitations: the Kano two-way model was not used due to a complex understanding to provide answers and the number of satisfaction attributes was reduced to 10 for the same reason. Hence, some attractive satisfaction attributes were lost.
5. It is necessary to explore continuously student satisfaction attributes of e-learning for they have an increasing impact on competitiveness in higher education.

Worksheets as Example of Information Structuring in Chemistry Studies

Irina Kazuša

Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia

Objectives

The aim of the research is to improve students' ability to understand the basic idea of the text by improving the skills of writing conscripts as one of the methods of developing critical thinking.

Methods

Individual work with worksheets is an integral component of a lesson since it creates the need to repeat the study material and strengthen knowledge. Worksheets are an example of selection and analysis of factual material while reshaping and adapting it based on each student's study experience, peculiarities and study context. By using assignments of varying complexity and different visualization techniques (formulas, graphs, schemes), students that aren't sufficiently prepared for lessons can also be involved. The main emphasis isn't placed on mastering a comprehensive theoretical basis in chemistry but rather on an effective application of universal critical thinking methods by justifying fundamental regularities with examples understandable to medics. By adding comments to specific examples and displaying them as essential parts of homeostasis, the main principles of information analysis are accentuated. During studies in natural science, it is important to motivate students to rely on a scientific and interdisciplinary approach that is characterized by inquisitiveness, skepticism, and search for logical justification and proof.

Results

Basic student knowledge, experience, and cognitive factors influence their ability to understand the main idea of a text. Identification of main ideas while reading and writing is an analytic basis for information structuring. Summarization not only allows gaining a better understanding of text but is also useful when recalling one's track of thought. Worksheets aid in understanding such main ideas when students write their notes in chemistry. The advantage of worksheets is the ability to use them during different stages of a lesson. They help to activate students during the initiation phase, to organize productive and independent operation during comprehension and synthesis phase, as well as to analyze one's mistakes and personal contribution during reflection phase while receiving feedback.

Conclusions

Questionnaires at the end of the semester allow concluding that worksheets in chemistry complement other organizational study forms (lectures, laboratory work, seminars) and provide an equal opportunity to students with different levels of knowledge and motivation. Students in their comments especially highlight their importance in:

- building skills necessary to apply different methods of information analysis;
- ability to understand and analyses the meaning of texts in order to clearly present and argue their position in writing or verbally;
- building skills necessary for problem-solving;
- evaluating the problem-solving process and results.

Analysis and Evaluation of Topics of Research Papers in the Context of Health Consciousness Presented in Latvian High School Learner Scientific Research Conferences on Health Science in Period of 2012–2018

*Anita Pastare*¹; *Ph.D. Aira Aija Krūmiņa*²; *Miervaldis Karulis*³

¹ *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

² *Rīga Stradiņš University, Department of Health Psychology and Paedagogy, Latvia;*

³ *Rīga Stradiņš University, Language Centre, Latvia*

Objectives

The Health Science Section in the Latvian High School Learner Scientific Research Conference has been organized since the 1990s onwards. Since 2012, the teaching staff of Rīga Stradiņš University have set up the Commission for the evaluation of high school learners' research papers in the healthcare field at national level. In 2016 and 2017, the work of the Health Science Section was conducted in Medical Education Technology Centre (METC) of RSU. Developing scientific research skills to guide a young person to study at a university and to work in science while helping to choose a future profession is one of the options for securing succession in secondary and higher education. Research activity develops the learner's health consciousness, that is, the cognitive and social skills that determine his / her motivation and ability to acquire, understand and use the information in a way that promotes and maintains good health for oneself (his / her family members) to be able to integrate into the labor market and be competitive.

The aim was to analyse and evaluate the high school learners' research papers in order to give recommendations to supervisors to improve the quality of research work.

Methods

Quantitative and qualitative analysis of topics of high school learners' research papers.

Results

In the period from 2012 to 2018, 149 learners' papers featuring 8–9 thematic circles were evaluated at national level in the Health Science Section; five of which were more widely represented (I. Health risk factors. II. Lifestyle, preventive measures for health preservation, lifestyle and quality, day health regime. III. Care for outer appearance – skin, hair, oral hygiene; cosmetics, UV radiation. IV. Nutritional effects on health, basic principles of healthy nutrition, body weight, food supplements, nutritional supplements), which in principle coincides with the information published by WHO on the fact that health of the people in economically developed countries is determined by a healthy lifestyle (50%), environment (20%), heredity (20%), health care (10%). This indicates that the healthy lifestyle and environment (school and family, society, friends) are the primary factors that motivate a young person to expand his / her health consciousness and to choose the topic of a research paper.

The qualitative assessment of papers results in the received points, which, according to the methodology developed by National Centre for Education of the Republic of Latvia and Rīga Stradiņš University, consists of 2 competent reviewers' evaluations on the written paper and the author's skill to present and defend it to the expert commission. 21 papers received high scores (80% and more out of the maximum), good / sufficient – 115, but 13 papers were subject to serious compliance, despite the pre-selection in the first two (regional) rounds. The most common "stumbling blocks": a wrongly chosen research methodology, incorrect data processing, scientific errors, topics and the outline of a content that did not follow ethical considerations. Unfortunately, the identified weaknesses can be positioned more than the responsibility of the supervisor rather than the author of the paper, which in turn indicates the need for the development and implementation of courses of relevant content for the improvement of professional competence of teachers.

Conclusions

The integrative nature of the subject Health Education in general secondary education undoubtedly influences the scientific validity of the results (both contributing and, in some cases, hindering).

The personal contribution of the author (learner) and a practical applicability of the research should be considered as a priority criterion for the evaluation of the paper. Of the papers analyzed during the study period, the highest score in this criterion was given to 21 authors – I, II and III degree diplomas of the Ministry of Education and Science, which can be used as an opportunity to join higher education institutions of Latvia.

Measuring of Gain for Evaluating Individual Student Growth at Science Courses of the University of Latvia, Faculty of Physics, Mathematics and Optometry

Ilva Cinite

University of Latvia, Faculty of Physics, Mathematics and Optometry

Objectives

Science faculties, by introducing a student-centered learning approach, encounter stereotypes about teaching methods, as well as skepticism about the lecturer, lack of student motivation and other barriers. The best way to refute that is with research-based results.

The Gain of each student and student group shows results of the students and Lecturer mutual and individual involvement.

Methods

One of the research-based methods for evaluating individual student growth are the before and after tests and Gain calculating.

Said research was launched in the autumn semester of 2018 for students of the University of Latvia's and Ventspils University physics courses. Namely, students performed before and after-course tests. The purpose was to identify each student's and study group's growth in the understanding of physics concepts.

Professor's D. Heston's Force Concept Inventory (FCI) materials about 62 student groups in the U.S. were used as base for one of the tests. By testing students at the University of Latvia, it allowed to measure and compare the results of students of University of Latvia with the results of many other university science students.

How was the procedure of before and after-testing done? In the first physics lesson initial tests were done. The test format, test conditions and time limit was set and strictly observed.

After the test, the lecturers were able to get acquainted with the information about which students have a better or weaker understanding. So the initial test was a starting diagnostic too.

At the end of the course, the students did the after-test. The same conditions and time limit were met, and students answer the same questions that they did in the pre-test.

Results

The result is a number called the Gain. That means that overall effectiveness of each student and group is calculated. This figure shows how much of the potential growth has been achieved. In other words, how effectively each student has worked relative to the maximum possible outcome.

Results were distributed in wide range. For most of students improvement was as expected – about 0.2–0.4. But surprising was that the Gain of some students was negative.

Here are a number of things worth the study. For example, a student who has already shown a good understanding at the beginning of the course has less growth opportunities. Therefore, the question is whether the faculty and the university will be able to provide such students with effective and relatively useful opportunities?

Conclusions

In general, students from the University of Latvia physics course showed results that present challenges for the lecturer staff. In particular, the results demonstrate the need for student engagement in the process of learning and student-centred methods in basic physics courses.

Need of Blended Learning / Teaching in Medical Chemistry Course

Karina Kostrjukova; Dr. Agnese Brangule

*Rīga Stradiņš University, Department of Human Physiology
and Biochemistry, Latvia*

Objectives

1. What are the components of effective blended learning / teaching in higher education?
2. How can be blended learning / teaching implemented in the Medical Chemistry course?
3. How does blended learning / teaching affect student motivation and outcomes in the Medical Chemistry course?

Methods

This study was conducted in the Rīga Stradiņš University Medical Chemistry course for international students (2015–2018). The effectiveness of blended learning / teaching was evaluated through the integration of study materials in a Modular Object-Oriented Dynamic Learning Environment (MOODLE) platform. All study materials were divided into pre-class, in-class, after-class and self-study activities.

Methods:

1. Students and teachers who utilized blended learning / teaching were surveyed to establish primary research on the use of study materials.
2. Students and teachers MOODLE statistics and log activities were analyzed and compared with a Medical Chemistry course without blended learning.

Results

Based on the analysis in literature we found that, when implemented effectively, the blended learning / teaching model can benefit student motivation and outcomes.

This study demonstrated that a transition to blended learning / teaching model improved aspects of student academic performance, satisfaction, and engagement in a Medical Chemistry course. However, challenges were also experienced by both students and educators in adapting to this new learning / teaching approach.

Conclusions

Further studies are required to understand better the role of educators in the teaching process and behavior of students interacting with online resources and the behavior associated with engagement and academic performance.

Teaching Approach and Methods for Development of Consultation Competency in Pharmacy Studies

*Ph.D. Elīta Poplavska*¹; *Ph.D. Nora Jansone-Ratinika*²;
*Lāsma Medjānova*³; *Ph.D. Rudīte Koka*⁴

¹ *Rīga Stradiņš University, Faculty of Pharmacy, Latvia;*

Rīga Stradiņš University, Institute of Public Health, Latvia;

² *Rīga Stradiņš University, Centre for Educational Growth, Latvia;*

³ *SIA "Medlex Baltics", Latvia;*

⁴ *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia*

Objectives

To assess the effectiveness of the pedagogical approaches applied to develop consultation competency in 4th-year pharmacy students in a newly redesigned course with an OSCE as a final assessment method.

Methods

First, we measured suitability of the pedagogical approaches to meet the class objectives using the following methods: 1) direct observations in four classes by two independent observers; 2) structured reflections of lecturers throughout the semester and 3) a focus group with lecturers after completion of the course.

Second, we measured students' progress of consultation competency through the semester using a standardized grading rubric.

Finally, we measured students' satisfaction with the pedagogical approaches and their own progress using 1) short written feedbacks at the end of each class and 2) a focus group discussion after completion of the course.

Results

Students and lecturers shared a similar understanding of the course objectives. Overall, it was assessed that chosen pedagogical approaches were satisfactory to meet the objectives. This was confirmed by students' progress in developing consultation skills. Clearly defined the course and individual class objectives, detailed assessment criteria, patient-actor involvement, role plays, and analysis of videos were mentioned as the most helpful approaches. Several issues were identified for improvement. First, students expressed a need for more patient-actor involvement in the study process and improved standardization of patient-actors in OSCE. Second, students and lecturers felt that the 3-credit point course should be extended to 4-credit points for proper skill development. Third, there was tension among students and lectures regarding the fact that in class the current best practices of consultation were taught which always did not reflect the realities of an everyday job at a community pharmacy.

Conclusions

Although some organizational and content-related improvements are required, the pedagogical framework and concurrent evaluation methods can be further applied in courses aimed at developing consultation competency.

Changing Concepts of Teaching and Literacy in Age of New Media: Practice and Research: MIL&LAB project at Rīga Stradiņš University, Latvia

Ph.D. Ilva Skulte

*Rīga Stradiņš University, Department of
Communication Studies, Latvia*

Objectives

The objectives of this paper is to reflect on the role of media and information literacy in the process of teaching and learning today as well as research conducted and needed in this field. This is done in the context of the development of ERASMUS+ strategic partnership program for MIL teaching at the Department of Communication Studies at Rīga Stradiņš University and the platform for reserach of MIL and MIL teaching methods that is developed as a virtual laboratory.

Methods

The materials of the research include diaries of students and teachers and observation materials as well as interview materials.

The methodological approach proposed is mainly ethnographic including observation and in-depth interviews, but also experiments are suggested. However, as a special interest in the framework of “Student as Researcher” section the autoethnography is discussed.

Results

The results show that participants of authoethnographic studies and observations, even if actively use media and are aware of some of their impacts and aspects that determine changes in communication have no idea of media specificity and complexity of communication. Thus, they are tended to make conclusions about their respective field (including studies) based on cultural biases and existing professional routines. Interviews show that teachers are enjoying and creative about using existing platforms, but the lack of understanding of goals of media usage in the teaching process is in part connected with the missing of understanding of the very concept of new, old and chaning media in the centre of contemporary communication.

Conclusions

- 1) that the theoretical reflection on the role of media in the everyday life including teaching, learning and research itself is currently needed where changing media and their effective, purposefull usage stand in the centre;
- 2) more research on the role of cultural biases and routines in teaching process is needed;
- 3) more particular aspects of new media including multimodality and virtual spaces must be regarded;
- 4) that in particular interest is the development of research on media used in diverse sphares and study process itself.

Multidisciplinary Learning Approach Delivering Study Courses English for Dentistry and Medical Terminology in English

Tatjana Zakutajeva

Rīga Stradiņš University, Language Centre, Latvia

Objectives

To study:

- 1) if applying multidisciplinary approach delivering study courses English for Dentistry and Medical Terminology in English it is possible to meet student needs and increase student satisfaction level with study course topicality, originality and practicality;
- 2) whether undergraduate, resident and doctoral students find it valuable to contribute to study courses English for Dentistry and Medical Terminology in English, considering this challenge as a further step in their career development.

Methods

Data were collected during academic years 2016/17 and 2017/18 from Rīga Stradiņš University (RSU) Faculty of Dentistry 1st year students and Faculty of Medicine 2nd year students taking part in a cross-sectional study.

Results

Dental Faculty students were introduced to the topic of "Evidence-based medicine versus personalized medicine" by Anna Ribakova RN, Mg. Sc. Sal. RSU, Nursing and midwifery department assistant of Pauls Stradiņš Clinical University Hospital, Center of Dentistry and Facial Surgery, operating room nurse-manager. Students were demonstrated 3-D printed skull being used for adjusting bone plates in facial surgery. Medical Faculty students were introduced to two clinical cases by Natālija Bērziņa-Novikova, a resident in Psychiatry. This provides students hands-on experience enabling them to develop more profound knowledge in medicine-related area with their English language proficiency enhancement. Dental Faculty students designed questionnaires and collected data on dentistry-related topics with further presentation, this way displaying their research skills and ability to present research data. 2nd year medical student Kitija Lūcija Gristiņa delivered presentation on Herbology and demonstrated herbs growing in Latvia to secondary school No. 41 senior pupils in the framework of the project attracting secondary school students to choose medicine as their future career. In July 2018 Kitija Lūcija Gristiņa took part in the 1st International Multidisciplinary Academic Conference in Jūrmala as a co-author and presenter on the topic of "Transverse Skills Development Delivering Study Course Medical Terminology in English at RSU".

Conclusions

Multidisciplinary learning approach being practiced in delivering study courses English for Dentistry and Medical Terminology in English brings a tangible value-added both to students and academic staff. This gives the opportunity to involve undergraduate, resident and doctoral students in the teaching process discussing clinical cases and breakthroughs in medical science. Multidisciplinary approach in language teaching provides synergetic effect enabling students to use the language in settings that are very close to their real work environment, i.e. simulations with patient care manikins involvement, conducting research, educating the patient on healthy lifestyle, promoting medical studies to secondary school graduates. The feedback demonstrates student increased satisfaction level with study course topicality, originality and practicality. Moreover, it is beneficial for undergraduate, resident and doctoral students who apply their knowledge to practical use.

Using Moodle as Formative and Summative Assessment Tool in Medical Chemistry Course: Case Study

Mihails Halitovs; Dr. Agnese Brangule

Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia

Objectives

The main objective of this research is to explore the suitability of Moodle platform for formative and summative assessment in RSU Medical Chemistry course. The platform is well established in the educational process, while testing via the system was widely implemented to broaden learning, performance assessment and feedback process.

Methods

Medical Chemistry is a 1st semester mandatory course for all Medicine program students. Over the period of two semesters more than 300 students have actively participated in various forms of evaluation via Moodle.

Activity logs were analysed to assess the usage of Moodle tools by students. Extended answer questions were studied to correlate between teaching process and student testing performance. A voluntary and anonymous survey was carried out to obtain student opinion on electronic testing.

Results

Application of Moodle has already brought several benefits. Advanced statistical analysis allows to evaluate student performance and identify critical questions more efficiently.

Academic fairness is greatly improved as students were tested using a wider variety of tasks to evaluate similar skills. A notable resource reduction was achieved. Electronic testing has reduced the amount of printed material by more than 80% while reducing student-used paper by more than 30%. Students evaluate electronic testing as more efficient and faster to do.

Conclusions

Overall, Moodle provides an opportunity to give students a fast and detailed feedback on their performance. As a formative assessment tool it allows students to learn from their mistakes as tests can be analysed with additional detail provided. As a summative assessment tool, Moodle provides an easy opportunity to give extended feedback along with links to extra materials, figures etc., if needed. Additionally, Moodle is a source of vital advanced statistical information that can be used to assess the effectiveness of teaching techniques implemented, student studying patterns and problem-solving skills.

Making Sense of Things Together: Application of Phenomenology in University Teaching

Ph.D. Uldis Vēgners

Rīga Stradiņš University, Department of Humanities, Latvia

Objectives

Phenomenology is a philosophical tradition that primarily focuses on experience and sense or meaning. Focusing on the essential structures of how an experiencing subject relates to the world and makes sense out of it, phenomenology has a great application potential in many fields. Phenomenological insights and methods have been applied and appropriated in a vast number of research fields, including pedagogy. The objective of this paper is, based on my own experience as a university lecturer, to find how insights and methods of phenomenology could be used and adapted to improve my teaching.

Methods

Application of a number of phenomenological insights and adapted methods to the specificity of university teaching. Insights about intersubjectivity, empathy and second-person perspective, as well as meaning horizon, thing, question, dialogue, and prejudice were applied. From the phenomenological methods phenomenological reduction, reflection, and imagination were adapted and implemented to teaching process.

Results

During the years of teaching a number of phenomenological insights and methods were applied and adapted to the teaching process to a varied degree, providing results that could be subjected to the reflection on the impact of phenomenology on my teaching.

Conclusions

Application of phenomenological insights and adapted methods the university teaching show that phenomenologically informed teaching focusing on both the second-person perspective in relationship with students and the understanding of the issue at hand on its own terms can in principle be successfully used as one of the approaches to student-centred and research-based education.

Virtual Reality as Innovation in Healthcare Education

Prof. *Marjoke Vervoorn*

ACTA, Netherlands

The ongoing developments in Information and Computer Technology create exciting new opportunities for learning and training.

One of the applications of these developments is the creation of Virtual Reality (VR). Learning and training environments for healthcare and specifically dental education. Especially in this field of expertise it is extremely valuable to enable students to train clinical invasive procedures in an almost real but safe environment, allowing them to make mistakes and perform procedures over and over again before performing them in the real world.

Though the opportunities are increasing and the added value is clear, implementation is slow because because of human and culture.

Various technologies and their knowledge base as well as challenges implementing these technologies will be discussed.

Researchers' Careers and Inclusion in Scientific Communities

Grit Laudel

Department of Sociology of the Technical University Berlin, Germany

Knowledge production in the sciences, social sciences and humanities is a communal enterprise rather than an activity of isolated individuals. However, although researchers produce knowledge as members of scientific communities, they are included in their communities' knowledge production in different ways and to different degrees. Community members produce different types of contributions, use contributions by fellow community members in specific ways and differ in their inclusion in the community's decision processes. These differences manifest themselves in specific roles and statuses of researchers and in various national-level and international-level centre-periphery structures of scientific communities.

In our lecture, we discuss the ways in which researchers' careers position them in these centre-periphery relationships. Using evidence from projects on early career researchers and research in the GDR and the US, we discuss the impact of national and organisational conditions on the inclusion of researchers in their international scientific communities, including

- the inescapable tension between researchers' need to be active members of their international scientific community, on the one hand, and their own or others' expectations to contribute to national development;
- the impact of national and organisational constraints such as insufficient resources, institutional restrictions of communication or travel or political priorities for research on the positioning of researchers;
- the opportunities for researchers to overcome 'cumulative disadvantages' resulting from prolonged limited inclusion.

Our theoretical conclusion from this discussion is that the positions of researchers in their scientific communities are far more varied than previously considered, and that researchers' careers must be re-thought with regard to their function of positioning of researchers in various centre-periphery structures. A political conclusion is that science policy and management measures must be assessed according to the opportunities they provide for researchers to participate in the knowledge production of their scientific communities.

Characterisation of Cytokines in Cleft Lip Palate Affected Lip Tissue

Prof. *Māra Pilmane*¹; Dr. med. *Elga Sidhoma*¹; Prof. *Ilze Akota*²

¹ *Rīga Stradiņš University, Department of Morphology, Latvia;*

Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia

² *Rīga Stradiņš University, Department of Maxillofacial Surgery, Latvia*

Objectives

Cleft lip palate (CLP) takes the stable second place among all anomalies. From all factors studied into the CLP affected tissues the appearance of cytokines is still not clarified despite their possible crucial role in tissue. So, IL1 is main mediator of interaction between the inflammation and proliferation, IL8 is responsible for neutrophil or lymphocyte recruitment, IL6 induces the other cytokines, IL4 is main pro-inflammatory agent for vascular network, but IL10 – the main anti-inflammatory factor. Thus, the aim of work was the detection of appearance in pro- and anti-inflammatory cytokines and their inter-correlations in lip of CLP affected children.

Methods

The lip material was obtained from 16 children (10 boys, 6 girls) aged before primary dentition during plastic surgery of bilateral (2) and unilateral cases (14). Control was obtained from 7 non-CLP oral tissue. Tissues were stained for IL1, IL4, IL6, IL8, IL10 and Ki67 immunohistochemically. Non-parametric statistic, Mann-Whitney and Spearman coefficient were used to evaluate results.

Results

All cytokines positive cells were observed more into the epithelium. However, statistically significant difference was seen between epithelial IL1, IL10, IL8 and Ki67 containing cells and IL10, IL4 positive connective tissue cells in comparison to the control. Strong positive correlation was detected in CLP epithelium between IL10 and IL8, IL10 and IL4, IL10 and IL1, IL1 and IL8, IL1 and 4, IL4 and IL8, IL8 and Ki67, IL10 and Ki67, but moderate – in connective tissue between IL1 and IL10, IL1 and IL4.

Conclusions

Rich by IL1, IL10, and IL8 lip epithelium proves the balance between pro-and anti-inflammatory tissue response. Common increase of cytokines in the epithelium and factors correlations suggest the specific mutual increase of local inflammatory-immune response, while correlations of Ki67 and cytokines indicates the involvement of IL8 and IL10 in proliferation of cells.

Evaluation of Tumour Necrosis Factor-Alpha, Matrix Metalloproteinase-2 and Human Beta-Defensin 2 in Hidradenitis Suppurativa

Dr. med. Elga Sidhoma; Prof. Māra Pilmane

*Rīga Stradiņš University, Department of Morphology, Latvia
Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia*

Objectives

Hidradenitis suppurativa (HS) is a chronic skin condition, characterized clinically by painful, recurrent, deep-seated nodules and suppuration, and histologically by hypertrophic scarring of apocrine gland bearing skin and sinus tracts. The overall clinical and histological consequence of the disease is considerable tissue remodelling. Various theories about the pathogenesis of HS have been proposed, but despite reports of successful therapies with immunomodulators, the underlying alterations in innate immunity are poorly understood. The aim of this study was therefore to evaluate the expression of human beta-defensin 2, tumour necrosis factor- α (TNF- α) and matrix metalloproteinase-2 (MMP-2) in skin lesions of patients with HS.

Methods

A total of 14 skin samples from patients with HS, obtained during excisions, and 2 skin samples from healthy volunteers were evaluated. All tissue specimens were stained by immunohistochemistry for human beta-defensin 2 (cat no. AF 2758, LOT VJU015051, obtained from goat, 1:100 dilution, R&D Systems, Germany), TNF- α (code ab 6671, obtained from rabbit, 1:100 dilution, Abcam, Cambridge, UK) and MMP-2 (cat no. AF902, LOT DUB034081, obtained from goat, 1:100 dilution, R&D Systems, Germany). The intensity of staining was graded semiquantitatively.

Results

We observed sinus tracts and cysts, large intradermal inflammatory infiltrates with plasma cells and lymphocytes, epithelioid cells, arteriole sclerosis, and destruction of hair follicle structures, atrophy and proliferation of apocrine sweat glands. Human beta-defensin 2 was negative in 12/14 specimens. MMP-2 and TNF- α positive structures were found in all skin samples. Elevated expression of MMP-2 was observed in keratinocytes, fibroblasts and inflammatory cells in dermis, sweat glands, outer epithelial sheath of hair follicles and sinus tracts. Cytokine-positive inflammatory cells in the dermis correlated with the level of inflammation in the tissue.

Conclusions

MMP-2 plays a key role in HS pathogenesis. Decreased human beta-defensin 2 in the presence of inflammatory (TNF- α -containing) cells suggests a decreased innate immunity in HS-affected skin.

Significance of Growth Factors, Degenerating Enzymes, Inflammatory and Antimicrobial Factors in Morpho-Pathogenesis of Intraabdominal Adhesions in Infants

*Dr. Anna Junga*¹; Prof. *Māra Pīlmane*¹;
Prof. *Zane Ābola*²; Dr. med. *Olafs Volrāts*²

¹ Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;

² Rīga Stradiņš University, Department of Paediatric Surgery, Latvia

Objectives

To explore the appearance of transforming growth factor β (TGF β), hepatocyte growth factor (HGF), basic fibroblast growth factor (FGF-2), fibroblast growth factor receptor-1 (FGFR1), vascular endothelial growth factor (VEGF), protein gene product 9.5 (PGP 9.5), chromogranin A (CgA), interleukin (IL) -1, 4, 6, 7, 8, 10, tumor necrosis factor alpha (TNF- α), human beta defensin-2 (HBD-2), matrix metalloproteinase-2 (MMP-2) and tissue inhibitor of metalloproteinase-2 (TIMP-2) in intra-abdominal adhesions.

Methods

The study material was obtained from 50 patients who underwent abdominal surgery due to bowel obstruction. All factors were detected using immunohistochemistry and were assessed according to semiquantitative counting method.

Results

Significantly higher number of TGF- β positive connective tissue cells was found in adhesions. A positive reaction for MMP-2 and TIMP-2 was seen, but the number of TIMP-2 positive cells was significantly higher in the controls. Most specimens showed occasional HGF positive structures. Significantly less FGF-2 positive fibroblasts and macrophages were found in adhesions. Also FGFR1 and VEGF positive structures were observed, significantly more in patients. Adhesions contained few PGP 9.5 positive nerve fibers. Number of IL-1, IL-4 and IL-8 positive inflammatory cells was significantly lower in patients. Adhesions demonstrate moderate number of IL-6, IL-7, IL-10, TNF α and HBD-2 positive structures.

Conclusions

Persisting appearance of TGF- β indicates the growth / regeneration potential of loose connective tissue. The lack of HGF and the imbalance between MMP-2/TIMP-2 might support formation of adhesions. The correlation between the less distinct FGF-2 and more prominent FGFR1 proves a compensatory stimulation of receptors. The less IL-1 and more IL-10 finding points out a strong local defense response. The comparably low findings for IL-4 and IL-8 indicate that neutrophil chemotaxis could be impaired, which prolongs inflammation. Persisting appearance of HBD-2, the down-regulation of PGP 9.5 and increase VEGF might be a result of the inflammation and hypoxia.

Strontium Enriched Calcium Phosphate Ceramics Improve Bone Regenerative Properties in Constant Osteoporotic Femoral Neck Bone

*Dr. Jānis Zariņš*¹; Prof. *Māra Pilmane*²; Dr. med. *Elga Sidhoma*²;
Dr. med. *Ilze Šalma*³; *Jānis Ločs*⁴

¹ *Microsurgery Centre of Latvia, Department of Hand and Plastic Surgery;*

² *Rīga Stradiņš University, Department of Morphology, Latvia*

Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;

³ *Rīga Stradiņš University, Department of Oral and Maxillofacial Surgery, Latvia;*

⁴ *Rudolfs Cimdins Riga Biomaterials Innovations and Development Centre
of Riga Technical University, Latvia*

Objectives

The aim of the study was to analyze distribution of osteoprotegerin (OPG), nuclear factor kappa beta 105 (NFκB-105), osteocalcin (OC), bone morphogenic protein 2/4 (BMP-2/4), collagen I (Col-1α), matrix metalloproteinase 2 (MMP-2), tissue inhibitor of matrix metalloproteinase 2 (TIMP-2), interleukin 1 (Il-1) and interleukin 10 (Il-10) after implantation of hydroxyapatite (HA) and tricalcium phosphate (TCP) granules with or without 5% strontium (Sr).

Methods

Group A consisted of 10 healthy female rabbits. Osteoporosis (ovarectomy and 6-week methylprednisolone) was induced in 34 animals – in group B bone defect of femoral neck was filled with Sr-HA30/TCP70 (n = 7) and HA30/TCP70 (n = 7), group C with Sr-HA70/TCP30 (n = 6) and HA70/TCP30 (n = 8), but in group D (n = 6) defect was left unfilled. Tissue from non-operated leg were assessed for systemic reactions. Bone samples were analyzed immunohistochemically and evaluated semi-quantitatively 12 weeks after surgery.

Results

Group A showed smaller amount of immunopositive osteocytes compared to group B (OC, NFκB-105, BMP-2/4, Il-1 and Col-1α) and group C (OC, NFκB-105, BMP-2/4, TIMP-2, Il-1, Col-1α) after Sr-enriched granule implantation. In group B Sr-HA30/TCP70 showed most noticeable increase of OC, OPG, NFκB-105, BMP-2/4, Il-1 and Col-1α positive osteocytes compared to non-operated leg, while HA30/TCP70 showed only increase of NFκB-105 and MMP-2 immunopositive cells. In group C all factors were significantly higher compared to non-operated leg. Whereas in group D only Col-1α was higher in operated leg. Both Sr-enriched biomaterials showed numerous OPG positive osteocytes compared to moderate after HA/TCP implantation.

Conclusions

Sr-enriched biomaterials improve only local bone regeneration, increasing expression of markers responsible for bone mineralization, new bone formation, extracellular matrix proteins and cellular activity indicators in constant osteoporosis. Moreover, Sr promotes inhibition of bone resorption by up-regulation of OPG immunopositive bone cells. Implantation of biomaterials induce higher expression of OC, NFκB-105, BMP-2/4, Il-1 and Col-1α compared to healthy rabbits bone in physiological conditions.

Y Chromosome: Tool in Estimation of Genetic Origin of the Balts

*Agrita Puzuka*¹; Prof. *Astrida Krumina*²;
Prof. *Svetlana Limborska*³; Prof. *Andrei Khrunin*³;
*Dr. Zane Dobeļe*²; *Dr. Inga Nartisa*²; *Dr. med. Linda Gailīte*²

¹ *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;*

² *Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia;*

³ *Institute of Molecular Genetics of the Russian Academy of Sciences,
Laboratory of Molecular Human Genetics*

Objectives

The aim of the study was to define more precisely genetic origin of Balts performing Y chromosome haplogroup (Y-hg) analysis of Russian individuals that inhabit historical regions of Baltic tribes and to compare Y-hg frequencies with incidence of Y-hg in Latvian population.

Methods

Subjects analysed in this study were 183 unrelated healthy men representing four anthropologically, archaeologically and ethno-linguistically different regions of Russia (Mezen, Ustyuzhna, Staritsa, Sychevka). DNA samples were typed with 18 Y chromosomal binary markers to establish their haplogroup. Differences in Y chromosome haplogroup frequencies between groups were compared by the Chi-square statistic.

Results

Three main haplogroups R1a1, N1c, and I comprise ~90% of all analysed Y chromosome genofund, and are the dominating haplogroups in north-east part of Europe. This division of haplogroups in different European populations as well as in analysed group suggests their common pre-history and origin. The prevalent haplogroup in analysed four Russian subgroups is R1a1, which represents 44% of all analysed samples. Whereas, frequency of it in Latvian population is 35%. Other most common Y haplogroup represented in analysed samples is N1c representing 24% of all haplogroups, however it is less frequent in comparison to Latvians where its frequency is 42%. That explains also, why this haplogroup is highly found in Finno-Ugric populations. In addition, one of the analysed Russian subpopulations – Mezen shows the highest incidence of N1c resulting in almost 49%, that is even more than in Latvian population. However Y chromosome haplogroup I occurred in 14% of analysed samples, but in Latvians – 6.5%.

Conclusions

Three major haplogroups that are predominant in Europe were rediscovered in the study, suggesting their reproductive success in Baltic region. No significant differences in common Y-hg distribution among analysed Russian and Latvian populations were found.

The analysis of Y-hg genofund in Mezen indicates possible Finno-Ugric or Baltic ancestry.

Variability of Morphometric Parameters of Posterior Border of Hip Bone

Prof. *Dzintra Kažoka*

Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia

Objectives

Parameters of the hip bone are important for the anatomists as well as for the anthropologists for different population investigations and comparisons. Several authors had paid an attention to features related to the sizes of these components. Only some studies established the morphological pattern of the posterior border of human hip bone.

The aims of this study were to determine the morphometric parameters of posterior border of dry hip bones and to assess differences, relationships in these parameters and to find out any differences in values between the right and left.

Methods

The total number of the dry human bones was 41 of which, 22 were left and 19 were right. They were obtained from the skeletal collection of the Anatomy Laboratory of the Department of Morphology, Rīga Stradiņš University. Parameters were based on following bony landmarks on the hip bone: posterior superior and inferior iliac spines (PSIS, PIIS), ischial spine and tuberosity (IS, IT). After for each bone between landmarks 5 distances (PSIS-IT, PSIS-IS, PSIS-PIIS, PIIS-IS, PIIS-IT) and 3 lengths (arch PIN, arch PIIS-IS, arch PB) were determined and analyzed. Measurements were done using sliding vernier caliper and inextensible thread. Parameters were expressed as mean, standard deviation, maximal, minimal and significance of difference was assessed using Student's t-test but correlation at value $p < 0.01$.

Results

On right side and on left side mean values of parameters (mm) were: 112.88 and 115.11 (PSIS-IT), 83.00 and 82.75 (PSIS-IS), 16.76 and 14.73 (PSIS-PIIS), 63.22 and 66.76 (PIIS-IS), 92.56 and 95.57 (PIIS-IT), 17.42 and 20.41 (arch PIN), 112.88 and 110.84 (arch PIIS-IS), 157.53 and 150.95 (arch PB). On both sides PSIS-IT significantly correlated with PSIS-IS, PIIS-IT, arch PIIS-IS, and there existed correlations between PIIS-IT and arch PIIS-IS.

Conclusions

Differences between parameters and shapes of posterior border of hip bones were very variable. Measured values can be used to determine the sides of bones and gender.

Insight into COPD Morphopathogenesis: Chronic Inflammation, Tissue Remodeling, and Antimicrobial Defense

*Dr. Zane Vitenberga; Prof. Māra Pilmane;
Dr. med. Aurika Babjoniševa*

Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia

Objectives

Chronic obstructive pulmonary disease (COPD) is a progressive disease leading to airway obstruction. Intercellular signaling network with high complexity, interrelations and overall wide distribution of various mediators cause a spectrum of mechanisms achieving COPD.

Methods

In the COPD group, lung tissue specimens were obtained during flexible bronchoscopy from 40 patients. In the control group, lung tissue material was obtained during an autopsy from 49 healthy control subjects. Immunoreactive cells positive for the following markers in bronchial tissue were detected by biotin-streptavidin immunohistochemistry method: interleukins (IL) IL-1 α , IL-4, IL-6, IL-7, IL-8, IL-10, IL-12, tumour necrosis factor- α (TNF- α), matrix metalloproteinase-2 (MMP-2), tissue inhibitor of metalloproteinase-2 (TIMP-2), transforming growth factor- β 1 (TGF- β 1), heat shock protein-70 (Hsp-70), human β -defensin (hBD) 2, 3, 4.

Results

In relatively healthy lung tissue, the number of IL-10 immunoreactive cells was found to be evaluated higher than other local factors. Overall the highest numbers (from mostly numerous (+++) to abundance (++++) of IL-7, IL-8, IL-10, MMP-2, TIMP-2, TGF- β 1 immunoreactive cells were marked in airway bronchial epithelium and mucosal connective tissue of COPD affected lung. In comparison with the control group, we found statistically significant ($p < 0.05$) higher numbers of immunoreactive cells positive for all examined interleukins, TNF- α , MMP-2, TIMP-2, TGF- β 1, hBD-2, and hBD-3 in the COPD affected lung but not for Hsp-70 and hBD-4.

Conclusions

Relatively healthy lung tissue exhibits mostly anti-inflammatory response patterns with the background balance of inflammatory and regulatory cytokines. The dominance of immunoreactive cells in the COPD affected airway epithelium over other tissue compartments is highlighting the essentials of epithelium in inflammatory and defense signaling with more pronounced findings of IL-7, IL-8, IL-10, hBD-2, hBD-3. Wide distribution and extensive appearance of increased MMP-2 and TGF- β 1 but decreased Hsp-70 proposes pronounced tissue damage and remodeling in COPD, particularly being suppressed by TIMP-2.

Embryonic Development of Haematopoietic Stem Cells in Human and Other Vertebrates: Lessons Learned from Animal Models and Xenotransplantations

*Ph.D. Andrejs Ivanovs*¹; *Ph.D. Stanislav Rybtsov*²;
*Prof. Alexander Medvinsky*²

¹*Beatson West of Scotland Cancer Centre, United Kingdom;*

²*MRC Centre for Regenerative Medicine, United Kingdom*

Objectives

Haematopoietic stem cells (HSCs) emerge during embryogenesis and maintain haematopoiesis in the adult organism. Qualitative and quantitative assessment of HSCs can only be performed functionally using the *in vivo* long-term repopulation assay. Due to the lack of such data, little is known about the development of HSCs in the human embryo, which is a prerequisite for the development of new therapeutic strategies.

Methods

The research project employed all main experimental haematology techniques (including human and mouse haematopoietic stem cell transplantation into mice), manipulations with human and mouse embryos, cell culture (including the culture of human embryonic and induced pluripotent stem cells), advanced flow cytometry, cytogenetic analysis and imaging techniques (including confocal microscopy).

Results

We have performed the spatio-temporal mapping of HSC activity within the human embryo and have shown that human HSCs emerge first in the aorta-gonad-mesonephros (AGM) region, specifically in the ventral wall of the dorsal aorta, and only later appear in the yolk sac, liver and placenta. Human AGM region HSCs transplanted into immunodeficient mice provide long-term high-level multilineage haematopoietic repopulation. These cells, although present in the AGM region in low numbers, exhibit a very high self-renewal potential. A single HSC derived from the AGM region generates around 600 daughter HSCs in primary recipient mice, which disseminate throughout the entire recipient bone marrow and are retransplantable. These findings highlight the vast regenerative potential of the earliest human HSCs and set a new standard for *in vitro* generation of HSCs from pluripotent stem cells for the purpose of regenerative medicine. We have also established a preliminary immunophenotype of the earliest human HSC. These data will be useful for my future studies on the mechanisms underlying the high potency of human embryonic HSCs and on the characterisation of embryonic HSC niche.

Conclusions

During my presentation, I will discuss what is known of human haematopoietic development: the anatomical sites at which it occurs, the different temporal waves of haematopoiesis, the emergence of the first HSCs, the signalling landscape of the haematopoietic niche and possible translational applications. To fill in the gaps of our knowledge of human embryonic haematopoiesis, I will complement the presentation by the data on HSC development obtained in the mouse, birds and lower vertebrates.

Characterisation of OPG, TGF- β , Runx2 and Wnt3a in Cleft Lip Palate (CLP) Hard Tissue from First Surgical Intervention

Dr. *Dace Buile*¹; Prof. *Māra Pilmane*¹; Prof. *Ilze Akota*²

¹ *Rīga Stradiņš University, Department of Morphology, Latvia;*

² *Rīga Stradiņš University, Department of Maxillofacial Surgery, Latvia*

Objectives

Aim of the study was to evaluate relative number of the genes Runx2, Wnt3a; growth factor TGF- β and protein OPG in CLP hard tissue of the first surgical intervention.

Methods

Materials included patient 36 cartilage and 24 bone, and 6 bone samples from the controls. Immunohistochemistry was used for detection of OPG, TGF- β , Runx2, Wnt3a. A semi-quantitative method for quantifying of the positive structures was used.

Results

Mean value of both OPG and TGF- β positive structures in bone was few and in cartilage – moderate to numerous for patients while controls demonstrated few OPG and numerous TGF- β positive structures. Mean value of positive Runx2 structures in bone was occasional to few in both – patients and controls, while the cartilage demonstrated moderate positive cells in patients. Mean value of positive Wnt3a cells for patients in bone was few, but in cartilage – numerous and for controls – occasional to few. There was no statistically significant difference found between all factors of bone between patients and controls. Statistically significant differences were found in cartilage of patients and bone of controls between: OPG ($U = 26.5$; $p = 0.002$); Runx2 ($U = 19.0$; $p = 0.001$) and Wnt3a ($U = 6.5$; $p = 0.0001$). Statistically significant correlations were found between OPG and TGF- β ($r_s = 0.738$; $p = 0.001$); OPG and Wnt3a ($r_s = 0.535$; $p = 0.001$); Wnt3a and TGF- β ($r_s = 0.654$; $p = 0.001$) in cartilage of patients. In bone of patients statistically significant correlations were found between OPG and TGF- β ($r_s = 0.578$; $p = 0.005$), OPG and Wnt3a ($r_s = 0.516$; $p = 0.01$); Runx2 and Wnt3a ($r_s = 0.625$; $p = 0.001$).

Conclusions

Cartilage shows more factors (OPG, TGF- β , Runx2 and Wnt3a) in comparison to the bone indicating the increased process of metabolism, growth and resorption suppression. Correlations between OPG, TGF- β and Wnt3 in hard tissue connect the resorption suppression, growth and proliferation in both – CLP and controls.

Characteristics of Neuropeptide-Containing Innervation, Tissue Remodelling, Growth and Vascularity in Nasal Tissue of Cleft Lip Patients

Evija Balode; Prof. Māra Pilmane

Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia

Objectives

The pathogenesis of cleft lip and palate (CLP) is a complex, yet not fully understood. There have been few studies looking at the nasal tissue of CLP, however, none have researched the innervation, tissue remodelling, growth, and vascularity altogether. Our aim was to detect the appearance and distribution of factors regulating remodelling, innervation, growth, and vascularity of the nasal tissue affected by CLP.

Methods

The study included 17 surgery materials from 15 patients and 7 control tissue samples. Biotin-streptavidin immunohistochemistry was performed for PGP 9.5, TGFβ1, VEGF, CD34, MMP2, MMP9 and TIMP2. The results were evaluated semiquantitatively. For statistical analysis, we used Mann-Whitney U test in SPSS software, version 22.0 (IBM Company, Chicago, USA).

Results

CLP affected tissue revealed dense and loose connective tissue, adipose cells and hyaline cartilage, along with numerous CD34 positive endotheliocytes and VEGF positive neoangiogenesis regions. We observed moderate to numerous PGP 9.5 positive nerves. TGFβ1, MMP2, MMP9, and TIMP2 were all found in hyaline cartilage and connective tissue, and the number of positive cells was moderate to numerous for TGFβ1, MMP9 and TIMP2 and few to moderate for MMP2. CLP affected tissue compared to control samples, showed a statistically significant difference in PGP 9.5 ($p = 0.006$), VEGF ($p = 0.001$), MMP2 ($p = 0.002$), MMP9 ($p = 0.013$) and TIMP2 ($p = 0.0001$) expression.

Conclusions

The moderate expression of TGFβ1 demonstrates an active ECM remodeling, carried out by proteinases. An increased number of VEGF, MMP2, MMP9, and TIMP2 demonstrates balanced tissue remodeling and neoangiogenesis of the CLP nasal tissue. Hyaline cartilage of intranasal septum is an example of balance between tissue degradation and its suppression, demonstrated by a relationship between MMPs and TIMPs and by the presence of VEGF. Increased innervation combined with persistent TGFβ expression and tissue ischemia, might be a sign of previous inflammation.

Association of Risk Factors with Posture Type and Symmetry for Children of Preschool Age in Riga Region, Latvia

Dr. Liene Martinsone-Bērzkalne;
Prof. *Silvija Umbraško; Ph.D. Ilva Duļevska*

Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia

Objectives

The aim of the study was to clarify the impact of watching television and using computer on postural disturbances among pre-school aged children in Riga region.

Methods

In the research 959 children were included from 22 pre-school institutions of Riga region. Parents completed agreement and questionnaire after which anthropometric measurements were performed by employees of Rīga Stradiņš University, Institute of Anatomy and Anthropology, Anthropology office.

Results

53.3% (n = 511) girls and 46.7% (n = 448) boys took a part in the research. Standard posture was found in 36.5% (n = 172) for children using computer opposite to children not using computer - 46.2% (n = 224). Symmetrical posture was found in 21.4% (n = 101) for children using computer opposite to children not using computer - 26.4% (n = 128). Standard posture was found in 40.4% (n = 180) for children watching TV over 1 hour a day opposite to children watching TV less than 1 hour a day - 42.3% (n = 216). Symmetrical posture was found in 22.9% (n = 102) for children watching TV over 1 hour a day opposite to children watching TV less than 1 hour a day - 24.9% (n = 127).

Conclusions

1. Standard posture is more common in children not using a computer (46.2%) compared to children using a computer (36.5%).
2. Symmetrical posture is more common in children not using a computer (26.4%) compared to children using a computer (21.4%).
3. Standard posture is more common in children watching television for less than one hour a day (42.3%) compared to children watching television for more than one hour a day (40.4%).
4. Symmetrical posture is more common in children watching television for less than one hour a day (24.9%) compared to children watching television for more than one hour a day (22.9%).
5. Symmetrical posture for children watching TV more than one hour a day and using a computer is uncommon (15.8%) than for children watching TV less than one hour a day and not using computer (24.7%).

Evaluation of Waist, Hip and Upper Arm Measurements in Preschool Children with Bronchial Asthma

*Dr. Gundega Skruze-Janava*¹; Prof. *Dzintra Kažoka*²

¹*Rīga Stradiņš University, Institute of Anatomy and Anthropology,
Doctoral study program Medicine, Ph.D. candidate, Latvia;*

²*Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia*

Objectives

World Health Organization recommends using body mass index to evaluate nutrition in patients of all ages. However, there are more factors, like waist, hip and arm circumferences, that help determine the body composition and nutrition.

The aim of the study was to evaluate the differences in waist circumference, hip circumference and upper arm measurements in preschool children with bronchial asthma.

Methods

The study group consists of 42 children (23 boys and 19 girls), age 5 to 7 years, with bronchial asthma, but no other chronic conditions. The control group includes 85 children (44 boys and 41 girls), age 5 to 7 years, without any chronic conditions. Waist circumference (WC), hip circumference (HC), upper arm circumference (UAC) and triceps skinfold (TS) were measured. Waist-to-hip ratio (WHR) was determined.

Results

The mean age of the girls was 6.03 ± 0.82 years; in boys 6.13 ± 0.69 years. The mean measurements were determined in both genders of the study and the control group. According to Mann-Whitney U test, the mean WC and HC were significantly larger in girls of the study group, compared to the control group ($p < 0.05$). In boys of the study group, the mean WC was significantly larger ($p < 0.05$); questionable statistically significant differences were found of HC in boys of the study and control groups ($p = 0.09$).

There was no statistically significant difference in UAC, TS and WHR ($p > 0.05$) between study and control groups of both genders.

Conclusions

In preschool girls with bronchial asthma, the waist and hip circumferences are larger than in healthy preschool girls. In preschool boys with bronchial asthma, only the waist circumference is larger. There are no differences between preschool children with bronchial asthma and healthy children in upper arm measurements and waist-to-hip ratio.

Children and Teenagers' Development in Longitudinal Research

Prof. *Silvija Umbrasko*; *Viktorija Cirule*; *Ph.D. Ilva Dulevska*;
Dr. Liene Martinsone-Berzkalne; *Edgars Cudars*;
Dr. med. Anita Oginska; *Jekaterina Stankevica*

Rīga Stradiņš University, Department of Morphology, Latvia

Objectives

The aim was to observe, measure and analyze children growth and health condition in a longitudinal study.

Methods

Research consisted of children observation: from birth till age of one measurements were made once in three months; starting from one year till age of 12 – once a year. The same parameters were measured during the whole study period. 246 newborn boys and 253 newborn girls were observed. At age of one year 183 boys and 198 girls were observed. At age of 12 – 80 boys and 96 girls. Measurements were made according to worldwide gold standards of anthropological methodology. Currently the research is in an active phase and data collection continues. Data were analyzed with Microsoft Excel 2013 and IBM SPSS Statistics 23.0 programs.

Results

In the period of time starting from birth till the age of 12 mean value of height increased by 103.66 cm for the boys and by 105.47 cm for the girls. Mean height for the newborn boys is 51.24 ± 2.01 cm, with minimum value 45.80 cm, maximum value 56.30 cm. Mean height for the boys by the age of 12 is 154.9 ± 7.65 cm with minimum value 133.70 cm, maximum value 171.70 cm. Mean height for the newborn girls is 50.47 ± 1.74 cm with minimum value 44.90 cm, maximum value 54.50 cm. Mean height for the girls by the age of 12 is 155.94 ± 7.36 cm with minimum value 139.0 cm, maximum value 176.40 cm.

Conclusions

The most active growth process can be observed during the first year. Boys have increased in height by 26.39 cm, and girls by 25.53 cm. However, by the end of the second year boys have increased by 11.4 cm, and girls by 11.94 cm. Until the age of 11 no differences in height increase were observed between boys and girls. Girls had the second increase in mean height between the age of 11 and 12 by 7.09 cm.

Anatomically-Clinical Characteristics of Glandula Suprarenalis

Dr. med. Zeltīte Cederstrema

Rīga Stradiņš University, Department of Morphology, Latvia

Objectives

The aim was to dissect the abdominal cavity, to clarify topography of adrenal glands and to describe them from anatomically-clinical aspect.

Methods

Dissected cadaver samples of AAI anatomy laboratory. To do research the dissection method is applied.

Results

Adrenal glands are a pair of endocrine glands located in regio epigastrica and regio hypochondriaca at the levels of XI–XII thoracic vertebrae and are situated on the superior renal pole. The right adrenal gland is commonly of a triangular form, the left one – a crescent shape. They are 4–6 cm long, 2–3 cm wide, thickness 3–6 cm, weight 10–15 grams. In adrenal gland we distinguish facies anterior, facies posterior and facies renalis. In the anterior surface there are ports through which arteries and nerves enter, but veins and lymphatic ducts come out. Adrenal glands are enclosed in fascia prerenalis duplicate. They are separated from the kidney by a loose connective tissue layer.

The human adrenal gland has the core and cortex which are made by three layers. The outer layer is made by zona glomerulosa, which produces steroid hormones mineral corticosteroids – aldosterone and deoxycorticosterone, which participate in blood pressure and electrolyte control; middle – zona fasciculata which produces glycocorticosteroids – cortisol and corticosterone, which are responsible for metabolism and immune system control; internal – zona reticularis which produces sex hormones. In the core of adrenal glands there are formed catecholamines (adrenalin and noradrenalin), which are intensively excreted in stress situations and are needed for the body's adaptation due to changes of external conditions. During the work the abdominal cavity of cadaver was dissected. Incision into anterior abdominal and lateral wall was done along the lower groin line, laterally along linea axillaris media and superior border along the rib circle till processus xiphoideus. By opening the anterior abdominal wall one can see omentum majus, large and small intestinal loops which visually correspond to the literature description. On the right side, by sliding back the intestinal loops, by separating peritoneum parietale along colon ascendens, we can find the right adrenal gland at the inferior surface, whose medial side is reaching up to v. cava inferior. Visually it is of a common shape without pathological changes. On the left side, by separating peritoneum parietale along colon descendens, by sliding down the intestinal loops and the stomach, we can see the left adrenal gland, which at its inferior side is reaching up to cauda pancreatis and vasa splenica. Visually it is of a common shape without pathological changes.

Conclusions

1. Glandula suprarenalis dextra et sinistra corresponds to the theoretical description given in the literature and textbooks.
2. The developed preparations can be used as a study material in practical classes of anatomy.

Characterisation of Morphology in Healthy, Traumatized and Aged Knee Meniscus of Different Species: Pilot Study

*Marija Podlesnaja*¹; Prof. *Mara Pilmane*¹; Dr. *Modris Ciems*²

¹ Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;

² Traumatology and Orthopaedics Hospital, Latvia

Objectives

Meniscus is a fibrocartilaginous anatomical structure, that realizes complicated biomechanics functions in knee joint. However, there are no comparative morphology studies done on the different species and conditions regarding the meniscus. Thus, the aim of our pilot study was to compare the morphology of traumatized and aged human and healthy deer meniscus to reveal the tissue ground, growth, degeneration, cell death and inflammation factors.

Methods

The study included surgery materials from one deer and two humans. Biotin-streptavidin immunohistochemistry was performed for detection of tissue TGFβ1, MMP2, MMP9, Collagen I, caspase, IL-1, IL-6, IL-10. The results were evaluated semiquantitatively.

Results

Abundant number of Collagen I positive cells was detected in human disordered meniscus, but not in the deer one. TGFβ1 was seen in numerous to abundant number of cells of all three cases. MMPs and Caspase was distributed with numerous to abundant cells in both human and deer meniscus. Numerous to abundant cells of human traumatized and aged menisci showed IL-1 and IL-6, while deer demonstrated the cytokine expression in moderate cells only in limited zones of meniscus. Traumatized human meniscus possessed abundant number of IL-10 positive cells, while deer and aged human meniscus showed mainly moderate number of IL-10 cells with some elevation of cytokine in superficial and deepest layer of meniscus.

Conclusions

Deer meniscus with relatively limited Collagen I expression proves probably the limitation in hard tissue metabolism due to the wild life, but might serve also as a key comparative point for detection of compensatory increase of protein in human traumatized and aged meniscus. Disordered human meniscus are characterized by rich pro- and anti-inflammatory cytokine expression with some signs of decompensation in IL-10 appearance during aging, while deer meniscus shows correct balance in cytokine expression (with less pro-, but more anti-inflammatory cytokine secretion in meniscus).

Assessment of Obesity Using Anthropometric Indexes

*Jekaterina Stankeviča*¹; Prof. *Liāna Pļaviņa*¹;
Prof. *Guntis Bahs*²; Prof. *Silvija Umbraško*¹

¹ Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;

² Rīga Stradiņš University, Department of Internal Diseases, Latvia

Objectives

Data from the National Health and Nutrition Examination Survey 2009–2010 reported that 69% of all adults age 20 and older are overweight. Older adults have an increased prevalence of being overweight. Obesity is associated with increased health care cost, placing a large financial burden. Body mass index (BMI) is the method most commonly used to classify individuals into specific weight categories. A waist circumference (WC) and a waist hip ratio (WHR) are also used as a measurement of obesity, which is a possible indicator of other more serious health disorders.

Methods

BMI, WC, WHR and the index of Kettle were calculated for 321 women in various institutions of Riga of age between 40–65 years. The participant women were divided in five subgroups according to the age: the first – 40–44 years (n = 72); the second – 45–49 years (n = 45); the third – 50–54 years (n = 46); the fourth – 55–59 years (n = 63); the fifth – 60–65 years (n = 95).

Results

For the first subgroup: BMI – $25,24 \pm 0,53$, WC – $78,15 \pm 1,32$ cm, WHR – $0,78 \pm 0,01$, index of Kettle – $415,48 \pm 8,79$ g/cm. For the second subgroup: BMI – $27,1 \pm 0,93$, WC – $87,79 \pm 2,45$ cm, WHR – $0,82 \pm 0,01$, index of Kettle – $455,61 \pm 15,66$ g/cm. For the third subgroup: BMI – $29,41 \pm 0,69$, WC – $91,63 \pm 1,94$ cm, WHR – $0,84 \pm 0,01$, index of Kettle – $483,22$ g/cm. For the fourth and for the fifth subgroups results of the average values were similar.

Conclusions

Body mass index, waist circumference, waist hip ratio and the index of Kettle may be useful tools to screen for adiposity using their optimum values for sex and ethnicity.

Evaluation of Chest-Growth Indexes for Women of Age Greater than 40

*Jekaterina Stankeviča*¹; Prof. *Liāna Pļaviņa*¹;
Prof. *Guntis Bahs*²; Prof. *Silvija Umbraško*¹

¹ *Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;*

² *Rīga Stradiņš University, Department of Internal Diseases, Latvia*

Objectives

The body indexes are the most popular and simplified indicators that gives opportunity to assess the condition of the somatic health. Different body indexes are calculated by applying mathematical formulas. The Errismann index represents the proportional development of the chest and the average values for the women equals 3.8 cm. In the event of index being considered less than the specified values, then the chest would be considered as a narrow and in the event of index being considered greater, then the chest would be considered as a wide. The Livi index determines the ratio of the chest circumference to the body height. The average values of the Livi index are 50–55%.

Methods

The study group was randomized. It includes 321 women of Riga and Riga region in aged between 40–65 years. The participants women were divided in five subgroups according to the age: the first – 40–44 years (n = 72); the second – 45–49 years (n = 45); the third – 50–54 years (n = 46); the fourth – 55–59 years (n = 63); the fifth – 60–65 years (n = 95). We analyzed body height, chest circumference and indexes.

Results

The Errismann index was: for the first subgroup – $9,95 \pm 1$ cm, for the second subgroup – $14,61 \pm 1,62$ cm, for the third – $17,97 \pm 1,64$ cm, for the fourth – $17,73 \pm 1,97$ cm, for the fifth – $19,29 \pm 1,02$ cm. The Livi index was: for the first subgroup – 56,06%, for the second subgroup – 58,84%, for the third – 61%, for the fourth – 60,92%, for the fifth – 61,99%.

Conclusions

Determining the values of the Errismann and the Livi indexes for the women involved in the study, has been found that a wide and well-developed chest is more common in all age subgroups.

Histopathology of Rabbits Jaws with Experimental Osteoporosis and Implantation of Biphasic Calcium Phosphates (BCP) in Trochanter Major

*Dr. Vladislavs Ananjevs*¹; *Dr. Aleksandrs Grisulonoks*¹;
*Dr. Aleksandra Ananjeva*²; Prof. *Arnīs Aboliņš*³;
*Dr. med. Ilze Salma*¹; Prof. *Girts Salms*¹; Prof. *Janis Vetra*³;
Prof. *Vladimirs Kasjanovs*⁴; Prof. *Andrejs Skagers*¹

¹ Rīga Stradiņš University, Department of Oral and Maxillofacial Surgery, Latvia;

² Rīga Stradiņš University, Faculty of Continuing Education,
Study Programme Residency in Medicine, speciality: General Practitioner, Latvia;

³ Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;

⁴ Rīga Stradiņš University, Laboratory of Biomechanics, Latvia

Objectives

Synthetic biphasic calcium phosphate biomaterials with effective implementation in reparative regeneration and increase of mineral density are used to prevent and treat fractures of osteoporotic vertebral column and in some cases of long bones. Osteoporosis of jaws are infrequently investigated on experimental animals never with local application and the response of whole body. To be more close to human clinical situation – postmenopausal osteoporosis – we set up the pronounced mode of experimental osteoporosis on rabbits by ovariectomy and long-term use of glucocorticoids.

Methods

Twenty two California female rabbits (eight months old) were included in this study. Experimental osteoporosis was induced by bilateral ovariectomy in eighteen animals. Two weeks after surgery intramuscular injection of methylprednisolone (1 mg/kg/day) for six weeks was done. Bone defects were created in femur trochanter major region. In first group (7 rabbits) created defects were filled with granules of hydroxyapatite and tricalcium phosphate (HAP/TCP 30/70); in second group (7 rabbits) defects were filled with same granules (HAP/TCP 30/70) together with strontium (5% by mass). Sham surgery group consisted of 4 female rabbits with osteoporosis and identical bone defect, but no biomaterials were implanted. Control group consisted of 4 healthy rabbits. 3 months later animals were euthanized.

Twenty two bone samples were taken from lower jaw premolar region. The material was subjected for two weeks in a 10% formalin. Bone fragments were processed according to classical histological technique: dehydration, clarification, paraffin coating, inclusion, section of the block, adhesion of the sections to the lamellae, drying and staining with the Hematoxylin and Eosin. Mean trabecular bone thickness was measured using Image Pro Plus 7 program, where equal fields of view (50 × zoom) were at random chosen in all bone samples.

Results

Healthy and osteoporotic bone tissues were compared. Results have shown that thickness of trabecular bone in osteoporotic groups was almost twice less, than in control group. Thickness of trabecular bone in healthy rabbit was 19.85 μm (17.42–22.64), in first group 11.91 μm (9.42–13.62), in second group 12.1 μm (10.21–13.87) and in sham surgery group 10.54 μm (8.42–11.23). Thickness of trabecular bone in first, second and sham surgery group did not statistically reliable differ.

Conclusions

Significant reduction of trabecular bone thickness in premolar region proves induction of generalized osteoporosis.

Implantation (in trochanter major) of BCP granules with or without strontium ions remote from the analyzed region (lower jaw premolar region) did not show statistically significant changes in trabecular bone thickness.

Spatium Retroperitoneale – Anatomical and Clinical Aspects

*Ilva Dulevska; Prof. Silvija Umbrasko; Dr. Liene Martinsone-Berzkalne;
Jekaterina Stankevica; Ludmila Gavricenkova*

Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia

Objectives

Spatium retroperitoneale on the backside defines fascia endoabdominalis, but on the frontside peritoneum parietale. Upper part is located behind lower ribs, but bottom goes to linea terminalis. In spatium retroperitoneale locate organs, blood vessel, nerves, lymph will die. Fossa iliaca is also a part of spatium retroperitoneale. In front of the fascia endoabdominalis is retroperitoneal fiber layers: loose connective tissue, fascia subperitonealis, retroperitoneal connective tissue. It is a continuation of the preperitoneal connective tissue of the abdominal front wall and the side wall: above, it will continue subdiaphragmal connective tissue, and downwards into the connective tissue of the small pelvis. The front of the loose connective tissue is located in the fascia subperitonealis, which begins at the point where the parietal peritoneum moves from the side wall of the abdomen to the posterior wall, i.e. linea axillaris media.

Methods

To familiarize themselves with the topographical location of organs, blood vessels, nerves, lymphocytes and observations of the retroperitoneal room, compare with the data available in literature.

The study used preparations of the Anatomy Laboratory (Institute of Anatomy and Anthropology) and used a preparation method, as well as analysis of data available in literature.

Results

The front wall of cadaver's abdominal cavity was opened during the course of the study. The inner surface of the front wall was covered by greater omentum (omentum majus). As the work progressed, the peritoneum parietale was opened to access the contents of the retro-peritoneal room. Access to retro-peritoneal organs was hampered by a 1–1.5 cm thick layer of fat. Kidneys (ren), adrenal glands (glandula suprarenalis), ureters (ureter), duodenum (duodenum), pancreas (pancreas), blood vessels (aorta abdominalis, v. cava inferior), nervs (truncus sympathicus, plexus coeliacus s. Solaris, plexus lumbalis) and lymph nodes. A pronounced capsula adiposa consisting of a thick layer of fat was observed in the kidneys.

Conclusions

1. During research there was investigated the topography of the organs of the retroperitoneal area, the gait of blood vessels and nerves, as well as access to those particularly required in clinical practice in the case of operative manipulation.
2. Cadaver anatomical deposit will help students to familiarize themselves and understand the contents of the room and the topography of organs in the learning process.

Th17 Cells and Impairment of Thyroid Follicle Integrity in Pathogenesis of Thyroid Autoimmunity: Morphological Assessment

*Dr. Tatjana Zaķe*¹; *Dr. med. Sandra Skuja*¹; *Dr. Ieva Kalere*²;
*Prof. Ilze Konrāde*³; *Prof., Dr. habil. med. Valērija Groma*¹

¹Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;

²Rīga Stradiņš University, Faculty of Medicine, Department of
Human Physiology and Biochemistry, Latvia;

³Rīga Stradiņš University, Latvia;
Rīga East University Hospital, Latvia

Objectives

Recent studies have highlighted a proinflammatory role of Th17 cells in the pathogenesis of autoimmune thyroid diseases (AITD), thus changing the traditional paradigm of Th1/Th2 dichotomy. The cytokine-regulated tight junction (Tj) disruption might be essential in the initiation of several diseases, including AITD. We aimed to investigate integrity of the thyroid follicle by studying immun-expression of cellular Tj – zonula occludens (ZO)-1 and claudin-1 proteins coupled to CD68 detection as well as expression of Th17-related cytokines in AITD.

Methods

Following thyroidectomy, 21 patients with Hashimoto's thyroiditis (HT), 8 patients with Graves' disease (GD) as well as 18 subjects of colloid goiter served as controls were enrolled in this study. An immunohistochemical analysis including IL-17, IL-23, IL-1 β , ZO-1, claudin-1, and CD68 detection was performed in each case. Additionally, 5 thyroid tissue specimens obtained during thyroidectomy were processed for immunofluorescent and immunogold labeling.

Results

A stronger expression level of IL-17 was found in the thyrocytes of HT and GD patients compared to colloid goiter. Immunoreactivity of IL-23 and IL-1 β was significantly increased in HT patients compared to GD and colloid goiter patients. In HT patients, IL-17 was positively correlated with IL-23 and IL-1 β immunoreactivity. A significant reduction of ZO-1 expression was observed in HT patients, whereas no differences were found in claudin-1 expression in HT and GD compared to colloid goiter patients. In HT patients, the expression of IL-17 in the follicular cells was positively correlated with CD68 immunopositivity, whereas no association with claudin-1 or ZO-1 expression was found. GD patients did not reveal any significant correlation of IL-17 with Tj and CD68.

Conclusions

We evidenced the changes in Tj, highlighting impairment of the thyroid follicle integrity in HT, but no association with IL-17 was found. Overexpression of Th17-related cytokines was found in HT patients, suggesting that Th17 cells might play a role in AITD pathogenesis.

Common and Different Homeostasis Regulating Factors, Innervation, Ischemia and Inflammatory Markers in Right Atrial Tissue from Patients with Degenerative Aortic Valve Stenosis and Coronary Heart Disease

*Dr. Edīte Vārtiņa*¹; Prof. *Māra Pilmane*²; Prof. *Romans Lācis*³

¹ *Pauls Stradiņš Clinical University Hospital, Department of Cardiac Surgery, Latvia;*

² *Rīga Stradiņš University, Department of Morphology, Latvia*

Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia;

³ *Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology*

Rīga Stradiņš University, Department of Surgery, Latvia

Objectives

Both coronary heart disease (CHD) and degenerative aortic valve (AoV) stenosis have common risk factors such as age, high blood cholesterol, diabetes, smoking, high blood pressure, inflammation, and metabolic syndrome. However, these diseases are not always observed together, confirming the existence of risk and pathogenesis factors specific to each disease. The aim of this study was to identify appearance and distribution of common and different homeostasis regulating factors, innervation, ischemia and inflammatory markers in the right atrial tissue from patients with degenerative AoV stenosis and CHD.

Methods

During elective cardiac surgery, right atrial tissue fragments were taken from 20 patients with CHD and 9 patients with degenerative AoV stenosis. All tissue fragments were stained for immunohistochemical detection of protein-gene peptide 9.5 (PGP 9.5), atrial natriuretic peptide (ANUP), vascular endothelial growth factor (VEGF), chromogranin A, endothelin, interleukin 1 and 10 (Il-1 and Il-10) and β defensins 2, and 3 (β D2 and β D3). For the quantification of structures, a semi-quantitative counting method was used.

Results

There were more endothelin positive epi-/endocardial cells in CHD group than in degenerative AoV group and the difference was statistically significant ($p = 0.018$). However, we didn't find a significant difference between endothelin positive endothelial cell count in right atrial vessels between the two groups. Mostly numerous Il-10 positive cardiomyocytes and epi-/endocardial endothelial cells were detected in all specimens taken from patients with CHD and it was statistically more than in specimens taken from patients with degenerative AoV disease ($p = 0.007$ and $p = 0.016$). Also, the number of β D3 positive cardiomyocytes was higher in coronary heart disease group ($p = 0.026$). All other tested markers such as PGP 9.5, ANUP, VEGF, chromogranin A, Il-1 and β D2 showed similar expression in both groups.

Conclusions

In our study common right atrial tissue markers for CHD and degenerative AoV stenosis were neuroendocrine hormone chromogranin A, vasodilator ANUP, ischemia marker VEGF, neuronal marker PGP 9.5 and inflammatory cytokine Il-1 and antimicrobial peptide β D2. Right atrial tissue fragments from patients with CHD showed higher expression of endothelin, Il-10 and β D3.

Keeping Genome in Order: Role of Nuclear Lamina in Somatic Mutations and Progression of B Cell Malignancies

Dr. Andrejs Braun

*Queen Mary University of London,
Barts Cancer Institute, United Kingdom*

Objectives

The nuclear periphery is a unique compartment comprised of inner nuclear membrane proteins and nuclear lamina. Previously, genome-wide and cytological studies revealed the regulatory role for some of these nuclear proteins in higher level genome organisation and gene regulation. In particular, Lamina Associated Domains (LADs) were identified at the nuclear periphery having an important role in the regulation of gene expression. Moreover, developmentally regulated genes were found to be specifically enriched in these domains, leading to the theory that LADs are regulated as facultative heterochromatin compartments during development.

Methods

We have performed functional in vitro, in vivo and patient sample analysis of functional genome-lamina interactions using ChIP-Seq, RNA-Seq and Whole Exome Sequencing analysis. These data, in combination with advanced microscopy and molecular biology techniques, were aligned to clinical profiles of CLL and DLBCL patients.

Results

We have recently demonstrated that Lamin B1, a component of the nuclear envelope and a key regulator of LAD dynamics, is a suppressor of somatic hypermutation in B cells. In particular, we found that the genome binding of Lamin B1 is reduced during B cell activation and formation of lymphoid germinal centres in vivo. ChIP-Seq analysis showed that kappa, lambda and heavy variable immunoglobulin domains were released from the Lamin B1 suppressive environment when SHM was induced in B cells. RNAi-mediated reduction of Lamin B1 resulted in enhanced SHM as well in aberrant surface expression of the kappa-light chain. Moreover, Lamin B1 expression level was directly proportional to the 5-year survival rate in chronic lymphocytic leukaemia and was strongly associated with the transformation of Follicular Lymphoma. Finally, nuclear Lamin B1 was found to be decreased in the majority of GC-derived lymphomas, and low LMNB1 expression being associated with multiple cytogenetic abnormalities, was a strong negative prognostic factor for both PFS and OS in CLL.

Conclusions

In summary, here we discuss that Lamin B1 is a negative epigenetic regulator of SHM in normal B cells and a “mutational gatekeeper”, suppressing the aberrant somatic mutations that drives lymphoid malignancies. Potential functional mechanisms of the impaired Lamin B1 assembly in activated B cells is also suggested.

Variation in Facial Morphology and Biopsychosocial Factors of Facial Attractiveness

Prof. *Janina Tutkuvienė*

*Vilnius University, Faculty of Medicine,
Institute of Biomedical sciences, Lithuania*

Objectives

Facial symmetry, averageness and sex-related peculiarities are crucial biological features for facial attractiveness, and “average” faces reflect genetic diversity, phenotypic fitness and immunocompetence. Besides, it is assumed that individuals are more attracted to the self’s features and tend to have partners who are similar to themselves. On the other hand, dissimilar facial features might increase variability and provide higher biological quality of the offspring. However, there is a lack of studies on relationship between facial morphology, facial attractiveness and personality traits.

Methods

In total, data of 290 persons were included into present analysis. Craniofacial features were investigated according standard anthropometric methods (Knussman, 1988; Greil, 2003), persons were photographed in frontal and sagittal planes. Standardized pictures from special atlases (Assman et al., 2008; Ohlrogge et al., 2009) were used to somatoscopically evaluate size and shape of facial features. Total facial attractiveness and personality traits (friendliness, social activity, reliability, professional success, etc.) were rated using 7 points Likert scale.

Results

1. Marginal in size and shape facial features were attractive for the individuals with dissimilar corresponding facial features.
2. Contemporary young women no longer gave so much priority to the extremely androgenized male faces, but men still favoured especially expressed female facial features.
3. Correlations between facial attractiveness and different personality traits were average or weak, besides, attractiveness and personality traits were often interrelated with nasal size and facial width.

Conclusions

The classic theory of facial attractiveness has been confirmed only partially, and might be questioned:

1. The hypothesis that beauty is rooted on an image of self might have exceptions.
2. Female interest in masculinity is overestimated.
3. Social, cultural and even fashion-related factors often affect cues for attractiveness, but there is no evident relationship between normal variability of facial features, personality traits or intellectual abilities of the individual.

Interleukins (IL) and Antimicrobial Proteins in Healthy Nasal Mucosa Biopsies

*Mārtiņš Vaivads*¹; *Ph.D. Gunta Sumeraga*²;
Prof. *Māra Pilmane*³

¹ *Rīga Stradiņš University, Latvia;*

² *Rīga Stradiņš University, Department of Otorhinolaryngology, Latvia;*

³ *Rīga Stradiņš University, Department of Morphology, Latvia*
Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia

Objectives

The balance between the inflammatory and anti-inflammatory factors always has been the matter of interest in the border zones of tissue and environment. The objectives of this research was to evaluate appearance and distribution of pro-inflammatory factor IL-6, and anti-inflammatory factors IL-10 and human beta defensin (hBD-2) in nasal mucosa and to compare the data between different mucosal structures (surface epithelium, glands, cellular infiltration).

Methods

Nasal mucosa biopsies were taken from 17 patients (aged from 18 to 51 years) from the middle part of right-side inferior turbinate during the planned nasal septum surgery. Expression of IL-6, IL-10 and hBD-2 was proceeded by immunohistochemistry. Statistical analysis was evaluated semi-quantitatively with following use of Student t-test.

Results

IL-6, IL-10 and hBD-2 were found in all samples. Mean number of IL-6 in was 2.1 ± 1.2 for epithelium, 1.5 ± 0.7 for glands, 1.5 ± 0.6 for lymphocytes, and 1.9 ± 0.7 for macrophages. IL-10 showed mean value of positive structures as following: 1.9 ± 0.9 for epithelium, 1.4 ± 0.8 for glands, 1.4 ± 0.8 for lymphocytes, and 2.1 ± 1.0 for macrophages. Mean number of hBD-2 positive structures was: 1.6 ± 0.6 for epithelium, 0.7 ± 0.6 for glands, 0.3 ± 0.4 for lymphocytes, and 0.5 ± 0.7 for macrophages.

For hBD-2 there was a significant difference in number of epithelial cells and glands ($p = 0.005$), between epitheliocytes and lymphocytes ($p = 0.00001$), between epitheliocytes and macrophages ($p = 0.001$). There was a statistically significant difference between expression of IL-6 and hBD-2 in number of nasal glands ($p = 0.014$), in number of lymphocytes ($p = 0.00001$) and in macrophages ($p = 0.0003$).

Conclusions

The main source for interleukins and antimicrobial protein secretion is nasal epithelium. From intraepithelial and connective tissue cells macrophages are the most active producer of interleukins and defensins. Dominance of IL-6 appearance in healthy nasal mucosa suggests the slight tendency for pro-inflammation process probably due to the regular stimulation of the environmental factors and antigens.

Clinical Aspects of Arteria Vertebralis and Anatomic Variations

Andrejs Lacbergs

Pauls Stradiņš Clinical University Hospital, Latvia

Objectives

To dissect two cadaver's a. vertebralis (ventral and dorsal) and compare the data obtained.

Methods

In the study were used two cadaver of AAI's Anatomy Labs. A. vertebralis was exposed by dissection method and the results obtained were compared with the data in the literature.

Results

We dissected the skin in regio colli posterior, corresponding to the back of the neck, the upper limit was linea nuchae superior and protuberantia occipitalis externa, while the lower was an imaginary horizontal line passing through the processus spinosus of the C7 vertebra. Under the skin was a layer of subcutaneous tissue associated with the superficial fascia of the neck. Superficial blood vessels and nerves were found under the skin. The upper part consisted of a. occipitalis branches, but the lower part of superficial branches of a. transversa colli.

Cadaver No. 1 a. vertebralis were found in the front of the fourth layer of muscle. An artery was entering here through foramen transversarium axis. Both arteries are equal, ~ 3 mm in diameter. The right-hand artery was more twisted and perforated in several places as possible consequences of balsaming. Cadaver No. 2 a. vertebralis passing through C6 foramen transversarium and the arterial diameters of both sides were different: right-hand a. vertebralis was ~ 3 mm in diameter, left-hand a. vertebralis was ~ 5 mm in diameter.

Conclusions

1. Cadaver No. 1 a. vertebralis, the right and left sides are similar, about 3 mm in diameter.
2. Cadaver No. 2 a. vertebralis of each side was different: the right was 3 mm in diameter, the left was 5 mm in diameter.
3. The topography and way of a. vertebralis clearly show differences in the cadaver No. 2.

Testicular Injection of Autologous Stem Cells: Case Report

*Ph.D. Juris Erenpreiss¹; Elina Zandberga²; Jelena Sorokina²;
Dr. Natalija Bozotova³; Dr. Violeta Fodina²*

¹ Rīga Stradiņš University, Laboratory of Andrology, Latvia;

² Clinic iVF-Rīga, Latvia;

³ Pauls Stradiņš Clinical University Hospital, Department of Urology, Latvia

Objectives

To initiate the treatment in Latvia by the Autologous Stem Cells of the patients with severe male infertility: non-obstructive azoospermia which failed to be treated by any other means including Testicular Sperm Aspiration (TESA).

Methods

A case report of an infertile man with non-obstructive azoospermia (no sperms found both in ejaculate and in testicles by means of TESA) treated with testicular Injection of autologous stem cells.

Fat tissue acquired from a patient (approximately 20 ml) was twice washed with PBS (Ca²⁺-, Mg²⁺-), added Collagenase Type I and Collagenase Type IV mix. Incubated in 37 °C degree on shaker for 1 to 4 hours until fat tissue dissolved. After incubation centrifugated 5 minutes 1200 rpm, removed the top layer, and only 1 ml with the cell pellet were left. Then the complete media (DMEM low glucose with Glutamax, Human Platelet Lysate 5%, Pen/STR 1%,) was added. Afterwards, cells were incubated in 37 °C degrees, 5% CO₂, for 2–3 days. Then the media is changed each 3 days. When the cell culture is confluent – evaluation for Cell surface markers (CD90, CD44, CD73, CD105), Sterility test, Karyotype, Differentiation and test for Mycoplasma will be performed.

Results

To be reported during the conference (injection is scheduled for March 8, 2019).

Conclusions

The first case report of Testicular Injection of autologous stem cells for treatment of patients with azoospermia in Latvia, and other Baltic countries. More patient cases will be necessary to accumulate to assess the effectivity of the treatment. Anticipated success rate is around 50%.

Angiogenesis in Dilated Human Ascending Aorta Wall

Dr. Ivars Brecs^{1,2}; *Edzus Beinars*²; Prof. *Peteris Stradins*^{1,2};
Prof. *Iveta Ozolanta*²; *Dr. med. Martins Kalejs*^{1,2};
*Dr. med. Sandra Skuja*³; Prof., *Dr. habil. med. Valerija Groma*³

¹ *Pauls Stradiņš Clinical University Hospital, Department of Cardiac Surgery, Latvia;*

² *Rīga Stradiņš University, Latvia;*

³ *Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia*

Objectives

CD34 is a transmembrane phosphoglycoprotein expressed by hematopoietic stem cells and progenitor cells, endothelial progenitors, fibroblasts, keratocytes, muscular satellite cells and others. Given to expression in endothelium, CD34 can be used as a marker for angiogenesis. Normally the aortic wall tunica media (TM) layer is avascular. When oxygen diffusion is reduced due to structural changes, inflammation and atherosclerosis in the aortic wall, angiogenesis is promoted from the vasa vasorum, leading to vascularization of the avascular TM. This can increase risks of aortic dilatation and dissection. This study aimed the estimation of CD34 expression within vascular bed using surgery material obtained from patients with ascending aorta dilatation.

Methods

Materials were obtained from 22 patients undergoing surgery due to ascending aorta dilatation. The specimens were fixed and processed conventionally. Paraffin sections were stained routinely with hematoxylin and eosin. Thereafter immunohistochemical reaction applying anti-CD34 antibody was conducted. CD34 positive blood vessels found within the aortic TM layer were estimated semiquantitatively by grading as follows: “0” – no expression, “1” – 1-30%, “2” – 31-60%, “3” – 61-100%. Fifteen randomly selected vision fields were analyzed at 100× magnification by using bright field optics light microscopy.

Results

Four subjects presented with inflammation observed in the tunica adventitia (TA) when analyzed routinely. CD34 expression was observed in all analyzed vascular bed materials. CD34 expression estimated as “1” was observed almost exclusively adjacent to the TA, but in “3” – diffusely throughout the TM. The levels of CD34 expression found in TM appeared as follows: “1”, “2”, and “3” – 40, 18.2 and 40.9%, respectively.

Conclusions

Angiogenesis evidenced by CD34 staining was observed in all analyzed ascending aorta bed samples. Diffuse angiogenesis in TM was found in 49.9% of samples. This could be a major risk factor of ascending aorta dilatation.

Postoperative Torsades de Pointes Induced by General Anesthesia: Case Report

*Dr. med. Irina Evansa; Viktorija Dzabijeva;
Nikita Ivanovs; Dr. Alla Hadunkina; Natalija Zlobina;
Ph.D. Eva Strike; Prof. Indulis Vanags*

*Rigas 1st hospital, Department of anaesthesiology
and intensive care, Riga, Latvia*

Objectives

Torsade de pointes is a rare, but fatal polymorphic ventricular tachycardia, that often occurs in patients with prolonged QT, a condition of abnormal cardiac repolarization. Routinely administered perioperative drugs such as antibiotics, opioids, antiemetics, inhalation anesthetic agents, antihistamines and antiarrhythmic have been shown to cause QT interval prolongation.

Methods

A case report of the patient undergoing laparoscopic cholecystectomy. The analysis of medical history and literature.

Results

48 years old woman (ASA II, 96 kg) undergoing laparoscopic cholecystectomy. The induction of anesthesia was performed with fentanyl 0.2 mg, propofol 200 mg and atracurium 30 mg. For the maintenance of anesthesia sevoflurane was used with mean alveolar concentration of 0.8, dexamethasone 8 mg, ondansetron 8 mg, acetaminophen 1 g was administered as well. After 30 minutes of surgery refractory hypotension occurred, with no reaction to ephedrine 50 mg in separate boluses intravenously, nor fluid boluses. Continuous intravenous infusion of norepinephrine 0.1 g/kg/min was received. 3 minutes after end of the surgery torsades de pointes occurred on cardioscopic monitor. Cardiopulmonary resuscitation was performed for 40 minutes until atrioventricular rhythm with peripheral pulse occurred. After the accident levels of serum electrolyte were normal, cardiac markers, echocardiography and coronarography didn't show abnormalities. Electrocardiogram in policlinics showed QT 0.30 s, after accident - 0.49 s. After 10 days the patient was discharged from the hospital without neurological or cardiovascular insult.

Conclusions

Perioperative QT interval prolongation during general anesthesia occurs in 80% of patients undergoing noncardiac surgery. Perioperative administered medications are associated with a substantial QT prolongation, that might end with hazard consequences. It's prudent to increase the vigilance with measures like the assessment of the preoperative baseline QT interval duration, the display of the QT on cardioscopic monitors, and the avoidance of potentially dangerous drugs interactions.

Systemic Air Embolism with Cardiac Arrest after Percutaneous Lung Biopsy

Dr. Arturs Bogorodickis¹; Ph.D. Peteris Oss²

¹ Rīga Stradiņš University, Department of Anaesthesiology and Intensive Care, Latvia;

² Pauls Stradins Clinical University Hospital, Department of Intensive Care, Latvia

Objectives

Percutaneous computed tomography (CT) guided lung biopsy is less invasive than surgical one, but still has possibility of complications. Among rarest and most dangerous of them is systemic air embolism (SAE).

Methods

We report a case of successfully treated post-lung-biopsy SAE with cardiac arrest.

Results

Case presentation: a 56-year-old male with unremarkable medical anamnesis was undergoing ambulatory percutaneous CT guided core biopsy of suspicious lesion in left lung's lower lobe. He was lying prone while under local anesthesia four specimens were obtained using 18G needle. Afterwards patient sat up and became bradycardic, unconscious, breathless, pulseless. Prompt cardiopulmonary resuscitation succeeded after four minutes with patient regaining consciousness. Urgent CT scan of thorax revealed 4 mm thick air layer in ascending aorta and small left-sided pneumothorax. Patient had normal neurological examination, but was complaining of stabbing retrosternal pain. Arterial hypotension, supraventricular tachycardia and electrocardiographic ST-elevation signs of acute myocardial ischemia were present. Concomitant coronary air embolism was suspected so patient underwent hyperbaric oxygen therapy (HBOT) at 2 atmospheres for 80 minutes. Following HBOT patient's vital signs and electrocardiogram instantly normalized, complains resolved, aortic air disappeared on control CT scan. Transient elevation of high-sensitivity cardiac troponin I was noted. Further clinical course was uneventful and patient was discharged in stable condition two days later.

Conclusions

SAE is dangerous because of ability to cause devastating cerebral, cardiac or spinal ischemic events. According to literature, SAE complicates approximately 0.07% of lung biopsies. However, true incidence may reach 1.5% because majority of SAE cases are occult. They can become symptomatic, for example, after patient repositioning. Post-biopsy CT screening can reveal occult SAE and allow its timely management. HBOT remains the most effective SAE treatment. Though SAE is rare, providers of percutaneous CT guided lung biopsies must be vigilant and ready to deal with this complication.

Susac Syndrome – Rare Neurologic Disorder, Disease Manifestations and Outcomes

*Dr. Vitalija Romanova; Dr. Stanislavs Mironovs;
Dr. Janis Mednieks; Prof. Evija Miglane; Prof. Andrejs Millers*

Rīga Stradiņš University, Department of Neurology, Latvia

Objectives

Susac syndrome is a rare disease, which is characterised by triad of brain retinal artery occlusion (BRAOs), hearing loss and encephalopathy, as well as common changes on brain MRI scan – corpus callosum central lesions.

The purpose of this study is to present a patient case with a rare neurological condition – Susac syndrome, discuss clinical symptoms, neurological and radiological disease progression and long-term prognosis.

Methods

This is a retrospective clinical case study of a patient with rare neurologic disease – Susac syndrome, that was treated and observed in Pauls Stradiņš Clinical University Hospital.

Patient history data and information about the disease evolution, patient common and neurological status, treatment, medication and investigations were obtained during hospitalisation in Neurology department. Additional investigations including MRI of brain, audiogram, ocular coherence tomography (OCT) were carried, relevant information from patient's relatives was also included.

Investigations carried out recently and patient's neurological status were compared to ones from 2014 when the condition was initially diagnosed to assess disease progression and current it's activity.

Results

Over time patient developed neurologic deterioration with dysarthria, ataxia, cognitive impairment and right-side hemiparesis after cerebral infarction in 2014.

Patient was performed MRI brain scan, audiometric un vision testing. MRI brain scans demonstrated manifest corpus callosum central demyelination lesions, cerebellum and brainstem changes with increased subatrophic changes comparing with 2014 year.

Ophthalmologic examination, OCT revealed both eyes retina slight angioplasia with enlarged retinal veins.

Audiometry finding showed chronic profound bilateral sensorineural hearing loss, 110 dB HL.

After comparing patient clinical condition to 2014 year and performing radiological and functional diagnostics, negative disease dynamics was observed. During diagnostics, patient did not have MRI contrast accumulating lesions and active immune suppressive therapy was not necessary.

Conclusions

Although we could not detect presence of full symptoms of the condition with instrumental methods available in the hospital (Fluorescein angiography is not available in Pauls Stradiņš Clinical University Hospital), but there is clinical evidence of involvement of all three organ – CNS, ears and eyes.

Considering negative OCT with clear clinical impairment of vision, one might suggest that OCT does not serve as equal alternative for fluorescein angiography, and therefore later is mandatory to confirm Susac syndrome. Despite that OCT serves as one of the main diagnostics investigations, our patient did not develop typical changes on OCT, so we consider these findings are not enough for clinical triad.

Generally, since 2014 patient did not develop full clinical triad, but applying our findings to Susac syndrome diagnostics criteria guidelines, patient fulfills the criteria for probable Susac syndrome, that is confirmed by CNS involvement on MRI and audiometry finding.

Macrophage Activation Syndrome in Children With Still's Disease – Clinical Manifestation, Laboratory Findings and Treatment: Single Centre Case Series

Ieva Šlēziņa¹; Ph.D. Zane Dāvidsone²

¹ Rīga Stradiņš University, Faculty of Medicine, Department of Paediatrics, Latvia;

² Rīga Stradiņš University, Department of Paediatrics, Latvia;

Children's Clinical University Hospital, Department of Rheumatology, Latvia

Objectives

Aim of the research was to identify clinical manifestations, laboratory findings and treatment tactics of patients with secondary macrophage activation syndrome (MAS) complicating Still's disease (sJIA) at Children's Clinical University Hospital (CCUH) during time period from January 2013 till November 2018.

Methods

We performed a retrospective review of a relatively large cohort of 8 patients with Still's disease with MAS in CCUH over 6 years. Patients' demographic characteristics, length of hospitalization, clinical manifestations, laboratory findings, treatment tactics, and outcomes were analyzed.

Results

We identified 8 patients (all female, mean age 7 years 8 months (2y 11mo to 15y 4mo) with Still's disease and MAS. Mean hospitalization length was 29 days (18–51 days).

In our patients' cohort 7 of 8 patients fully met new classification criteria (Ravelli, 2016) for sJIA with MAS based on hyperferritinemia (mean value 11 263 ng/ml, according to criteria ferritin > 684 ng/ml), elevated aspartate transaminase, high triglycerides and decreased fibrinogen values.

All 8 patients had fever and rash, 7 had arthralgias, 5 – confirmed arthritis, 5 – myalgias, 6 – hepatomegaly, 4 – splenomegaly, 6 – lymphadenopathy, 5 – serositis, 4 – hemorrhagic manifestations, 3 – cardiological issues (long QT syndrome, cardiomegaly), 6 – respiratory symptoms (rhinitis, tonsillitis, pneumonia), 4 – gastrointestinal problems, 4 – genitourinary problems, and 4 – CNS dysfunction (headaches, somnolence).

Patients' treatment tactics initially included methylprednisolone pulse (all 8 cases), adding cyclosporine A (all 8 cases) and, finally, introducing tocilizumab (IL-6 receptor inhibitor; 7 of 8 cases). All patients reached remission.

Conclusions

Targeted investigation and laboratory criteria play the main role in early diagnosis of secondary MAS in cases of Still's disease.

Patients mostly presented with systemic symptoms, multi-organ failure, and significant changes in laboratory findings, with minimal joint involvement manifesting mostly as arthralgias not persistent arthritis.

Biological treatment with tocilizumab was started in 7 of 8 cases resulting in faster recovery and disease remission.

Life-Saving Pulmonary Endarterectomy in a Latvian Patient with Chronic Thromboembolic Pulmonary Hypertension

Dr. Kristaps Sablinskis^{1,2}; *Matiss Sablinskis*³;
Prof. *Aivars Lejnieks*^{3,4}; Dr. med. *Andris Skride*^{2,3}

¹Rīga Stradiņš University, Department of Doctoral Studies, Latvia;

²Pauls Stradiņš Clinical University Hospital, Latvia;

³Rīga Stradiņš University, Faculty of Medicine, Latvia;

⁴Rīga East University Hospital, Latvia

Objectives

Chronic thromboembolic pulmonary hypertension (CTEPH) is a unique subtype of pulmonary hypertension (PH) which in most cases is caused by single or recurrent episodes of pulmonary embolism (PE) [1].

Pulmonary endarterectomy (PEA) is the therapy of choice in case of CTEPH. It is a potentially curative surgical intervention available for selected patients, leading to a notable improvement in hemodynamics, functional capacity and survival [1-3].

We report a case of a patient with CTEPH and end-stage right heart failure who underwent successful PEA.

Methods

On November 27, 2018 a 31-year-old male with diagnosis of bilateral deep vein thrombosis, bilateral PE, prominent PH and recurrent episodes of syncope was transferred to PSCUH from a regional hospital. Patient hemodynamic characteristics at admission & before are shown in table 1. Patient's medical history revealed that since May 2014, while working in the UK, the patient has had recurrent episodes of deep vein thrombosis and PE despite anticoagulant therapy and subsequently had underwent RHC in May 2017 (Table 1), after which patient returned to Latvia without receiving follow-up at a PH center.

Upon admission the patient was immediately transferred to ICU due to the progressing right heart failure and a CTEPH team was contacted in Vienna, which decided that an urgent PEA is needed, and a PEA surgeon flew to Riga shortly thereafter.

Results

PEA was successfully performed on December 3, 2018. During the procedure the thromboembolic material was removed from main, segmental and subsegmental branches of both pulmonary arteries (Image 1) Both operative and postoperative period was without any significant complications and the patient was discharged in a good medical condition on December 14.

Conclusions

Continuity of care is challenging in the modern world with increased global migration.

Pulmonary endarterectomy is a complex procedure performed only by experienced specialists, thus its availability is somewhat limited for patients from smaller countries due to lack of experience and limited number of patients. So far there have been only eight pulmonary endarterectomies performed on Latvian CTEPH patients, all done either in foreign excellence centers or by visiting experts. Therefore, a successful international collaboration plays a major role in the management of CTEPH patients in Latvia.

Possible Genetic Imitator of Wilson's Disease Phenotype

*Agnese Zarina*¹; *Dr. Dmitrijs Rots*²; *Dr. med. Madara Kreile*³;
*Dr. med. Ieva Tolmane*⁴; *Dr. Gunta Cernevska*⁵; *Dr. Ieva Pukite*⁵;
*Dr. med. Zita Krumina*¹; *Dr. med. Linda Gailite*²

¹ Rīga Stradiņš University, Department of Biology and Microbiology, Latvia;

² Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia;

³ Rīga Stradiņš University, Scientific Laboratory of Molecular Genetics, Latvia;

Rīga Stradiņš University, Department of Biology and microbiology, Latvia;

⁴ Riga East University Hospital, Latvian Centre of Infectious Diseases;

⁵ Children's Clinical University Hospital, Latvia

Objectives

Wilson disease (WD) is an autosomal recessive disorder of copper metabolism caused by pathogenic variants in gene ATP7B. Although WD has strict diagnostic criteria, some of WD clinically suspected cases fail to be confirmed molecularly – no pathogenic variants are found in the ATP7B gene, leading to the assumption about influence of other genes to the WD-like phenotype. One of the candidate genes is ceruloplasmin encoding gene CP. Ceruloplasmin binds and transports copper by interacting with ATP7B.

Methods

Study included 51 unrelated patients with clinically confirmed Wilson disease. ATP7B gene genotype was ascertained by using PCR-BiPASA, direct sequencing and MLPA. All patients underwent investigation of CP gene promoter region by direct sequencing. For phenotype-genotype analysis two of the variants (rs66508328 and rs11708215) were tested. The frequencies of CP gene variants were compared between two groups: first group – patients with clinically and molecularly confirmed WD (n = 49) and second group – patients with only clinically confirmed WD (n = 12). For statistical analysis “PLINK 1.07” software was used analysing for recessive inheritance model.

Results

Both variants had statistically significant differences between analysed groups – rs66508328 variant AA genotype and rs11708215 variant GG genotype were more common among the patients with only clinically confirmed WD (2/10 vs. 0/49 for rs66508328; p = 0.03061; and 2/10 vs. 0/48 for rs11708215). Two patients from only clinically confirmed WD patient group having previously mentioned genotypes experienced the neurological form of WD.

Conclusions

CP gene different variants contribute to WD-like phenotype in clinically confirmed WD patients with neurological symptoms and without pathogenic variants in ATP7B gene, but for a confirmation a larger study group is required.

Metabolic Control and Anthropometric Parameters of Phenylketonuria Patients in Latvia in 2018

*Olga Lubina*¹; Prof. *Rita Lugovska*²; *Natalja Pronina*²;
*Dr. Olga Sterna*²; *Anna Kvasova*²; *Dr. Jurgita Gailite*³;
*Parsla Vevere*²; *Dr. med. Madara Kreile*¹

¹ *Rīga Stradiņš University, Latvia;*
Children's Clinical University Hospital, Latvia;
² *Children's Clinical University Hospital, Latvia*

Objectives

Phenylketonuria (PKU) is the most common inherited metabolic disorder in Latvia, PKU is one of two disorders which Latvia has included in newborn screening since 1987.

Methods

Data was collected in 2018 from January 1st till December 31th for patients with age under 18 years. Data we used was phenylalanine (Phe) levels during 2018 and anthropometric parameters.

Results

Median Phe level in age group from birth till 1 y.o. is 136 $\mu\text{mol/l}$. Median Phe level in age group from 2 till 3 y.o. is 191 $\mu\text{mol/l}$. Median Phe level in age group from 4 till 8 y.o. is 201 $\mu\text{mol/l}$. Median Phe level in age group from 9 till 12 y.o. 427 $\mu\text{mol/l}$. Median Phe level in age group from 13 till 18 y.o. is 607 $\mu\text{mol/l}$. Mean weight in age group from birth till 1 y.o. is 8.7 kg (SD \pm 1.6 kg), mean height 73 cm (SD \pm 39.3 cm). Mean weight in age group from 2 till 3 y.o. is 15.3 kg (SD \pm 4.7 kg), mean height - 96 cm (SD \pm 29.4 cm). Mean weight in age group from 4 till 8 y.o. is 22.7 kg (SD \pm 9.3 kg), mean height - 116 cm (SD \pm 13.7 cm). Mean weight in age group from 9 till 12 y.o. is 40.8 kg (SD \pm 13.9 kg), mean height - 145 cm (SD \pm 55.6 cm). Mean weight in age group from 13 till 18 y.o. is 57.3 (SD \pm 8 kg), mean height - 165 cm (SD \pm 7 cm).

Conclusions

Metabolic control in patient group till nine years old is good, but by the age of nine metabolic control becomes worse. Anthropometric parameters in patient group till 9 y.o. is in normal range, but patients in age group $>$ 9 y.o. are on higher risk to become overweight and obese.

Prenatal Diagnostics of Rare Diseases in Latvia 2013–2017

*Dr. Ieva Malniece*¹; *Dr. med. Madara Kreile*²

¹ *Children's Clinical University Hospital, Clinic of Medical Genetics
and Prenatal Diagnostics, Latvia;*

² *Rīga Stradiņš University, Department of Biology and Microbiology, Latvia*

Objectives

The aim was to recognise the coverage of prenatal diagnosis of rare diseases in Latvia comparing to EUROCAT and UK data.

Methods

1. All live birth and terminated pregnancies due to medical indications with structural/ chromosomal anomalies were analyzed in CUH.
2. Compared data with EUROCAT and UK results.

Results

Rare fetal conditions were diagnosed LV/UK/EU: spina bifida - 57%/91%/89%, omfaloclele - 57%/100%/89%, gastroschisis - 74%/100%/91%, diaphragmal hernia - 45%/50%/73%, Edwards syndrome - 92%/77%/93%, Patau syndrome - 79%/75%/95%, Down syndrome LV/EU - 72%/71%. Structural anomalies in LV/UK/EU 57%/87%/86% were diagnosed less than in the UK and EU at least in second trimester ($p = 0.0002$). Comparing diagnostics of fetal chromosomal defects in LV/EU presents similar data 77%/77%, but Trisomy 21 detection rate was better in Latvia 72%/71% ($p = 0.8828$).

Conclusions

1. Fetal structural defects in Latvia are seen less than in UK.
2. Fetal structural defects in Latvia are seen less than in EU.
3. Fetal chromosomal defects in Latvia are seen the same as in EU.

Primary Immune Deficiency – Interleukin-12/ Interleukin-23 Receptor Deficiency: Clinical Case from Latvia

*Dr. med. Natalja Kurjane*¹; *Dr. Elina Aleksejeva*²;
*Dr. Lota Ozola*²

¹*Rīga Stradiņš University, Department of Biology
and Microbiology, Latvia;*

²*Children's Clinical University Hospital, Latvia*

Objectives

The aim of this presentation is to demonstrate a rare immune disease in clinical practice.

8 years old girl has had recurrent infections since her birth. Every month she had recurrent stomatitis, finger infections in a form of paronychia as well as bronchitis and pneumonias. The causative infectious agents were Haemophilus influenzae, Pseudomonas aeruginosa, and the last time – atypical Mycobacteria. Periodically she also had unclear elevation of liver enzymes in peripheral blood (till 560-780 IU) without any reasons. All other blood tests and immunological tests were normal (B cells and T cells subpopulations, IgG subclasses, immunoglobulins A, G, M, complement components C3 and C4). From 2015 girl receives prophylactically Azithromycin.

Methods

In February 2016 genetic test (of Exome Sequencing) was performed in Amsterdam, Netherlands.

Results

The result of Exome Sequencing was that it is a de novo (not present in the two parents) mutation in STAT1, c.1154C>T, p.Thr385Met, previously described in IMMUNODEFICIENCY 31C, in the group of Mendelian susceptibility to mycobacterial infections (MSMD) or inherited disorders of the Interleukin 12/23 Interferon Gamma Axis. Now patient continues the prophylactic antibiotic and antifungal treatment as well as intravenous immunoglobulins once per month. For the future treatment approach we suggest the bone marrow transplantation.

Conclusions

Despite the normal full blood test results as well as immunological tests in several cases patients need genetic testing to be performed for the confirmation of the diagnosis.

Partial Duplication of the Genitourinary System with Total Colonic Duplication in a Boy after in Vitro Fertilization: Case Report

*Dr. Marisa Maija Butnere*¹; Prof. *Arnis Engelis*²;
*Dr. Ainars Gilis*³; *Dr. Daila Pugacevska*²; *Dr. med. Astra Zviedre*²;
*Dr. Mohit Kakar*²; Prof. *Aigars Petersons*⁴

¹*Rīga Stradiņš University, Faculty of Continuing Education,
Department of Paediatric Surgery, Latvia;*

²*Rīga Stradiņš University, Department of Paediatric Surgery, Latvia;*

³*Children's Clinical University Hospital, Latvia;*

⁴*Rīga Stradiņš University, Latvia;
Children's Clinical University Hospital, Latvia*

Objectives

Children with combinations of large colorectal and genitourinary duplications are rare, however, there is an elevated prevalence suggested with the rise of fertility treatments. Some malformations are so rare that the occurrence worldwide is less than 100 reported cases. Since these cases are so rare, it is believed that this is the very first case of such magnitude to be fully documented. This report follows a patient, who has multiple congenital anomalies, from delivery through all surgical treatments to the current health status.

Methods

This case report depicts a boy born after in vitro fertilization (IVF) presenting with two anuses, true diphallia, hypogonadism, spina bifida and myelocele. Upon further diagnostic investigations, the patient had total duplication of the colon, rectum, anus, and urinary bladder each with its own urethra.

Results

The patient underwent multiple surgically treatments, which include bladder autoaugmentation, anal Hegar dilatation, penial amputation with scrotoplasty, enteroenteroanastomosis, and resection of the imperforate anus within the first year of life. The patient has a functioning singular urinary system. The double colon is intact with regular defecation through a single anus.

Conclusions

Postoperatively, the patient regularly follows up with the medical team as he develops bouts with constipation and synovitis. Since attending kindergarten, the patient has been learning the process to defecate, which has reduced the frequency of constipation. The current health status shows improvement in the quality of life with continuous interdisciplinary treatment.

Pregnant Woman with Anti-NMDAR Receptor Encephalitis

*Sintija Locane*¹; *Baiba Vikmane*¹;
*Tatjana Muravska*²; Prof. *Evija Miglane*¹

¹ *Rīga Stradiņš University, Latvia;*
Pauls Stradiņš Clinical University Hospital, Latvia;
² *Pauls Stradiņš Clinical University Hospital, Latvia*

Objectives

Clinical case – a 24 year old female with 6 year medical history of focal and generalized epileptic seizures presented to the Emergency Department of the regional hospital complaining of persistent headaches, reduced sensitivity at the left side of the body. Patient at that moment was at 24/25 week of pregnancy. In the neurology department, the patient's mental status rapidly worsened. She developed repeated generalized tonic – clonic epileptic seizures, followed by decreased consciousness. She was admitted to the intensive care unit for close neurologic monitoring and further workup. Repeated consultations of neurologist and gynecologist were made. Imaging including MRI/MRA of the brain revealed postictal edema at the left brain hemisphere or low malignancy tumor as a cause of her encephalopathy. Lumbar puncture and CSF analysis revealed no pathology.

Methods

Patient received therapy with anticonvulsants, and was transferred to Pauls Stradiņš Clinical University Hospital. At that time her neurological status – patient had no verbal contact, extremities were atonic, episodic focal seizures at the left side of face, bilaterally positive Babinski sign. The patient was intubated and placed on a respirator mechanical ventilation in the intensive care unit.

Results

There were made repeated electroencephalography and MRI of brain – considering a wide brain edema and middle structures dislocation – decompressive hemicraniectomy were done by neurosurgeons. At a 32 week of pregnancy caesarian section was done – healthy boy was born.

Conclusions

As anti-NMDAR antibodies were detected in the patient's CSF, her condition was definitively diagnosed as anti-NMDAR encephalitis. She was given a course of IV immunoglobulin and prednisolone, than cyclophosphamide – after what hepatic enzymes elevated. After all received course of therapy there were no clinical improvement. Her course was complicated by refractar status epilepticus, ventilator-associated pneumonia and relapsing urinary infections. As a permanent vegetative state was established, appropriate symptomatic intrahospital care of patient was continued.

Multidisciplinary Approach Can Save Life in Deadly Subclavian Artery Injury

*Dr. med., Assist. Prof. Aigars Lacis*¹;
*Dr. med. Martins Kalejs*²; *Dr. Krista Grigorovica*²

¹ *Rīga Stradiņš University, Department of Surgery, Latvia;*
Pauls Stradiņš Clinical University Hospital, Centre of Vascular Surgery, Latvia;

² *Rīga Stradiņš University, Laboratory of Biomechanics, Latvia;*
Pauls Stradiņš Clinical University Hospital, Centre of Cardiosurgery, Latvia;

³ *Rīga Stradiņš University, Department of Surgery, Latvia;*
Pauls Stradiņš Clinical University Hospital, Centre of Thoracic Surgery, Latvia

49 years old male was found on the street unconscious with a puncture / cut wound ~2 cm length above the left clavicle. Total blood loss until hospitalisation is not known. Objectives: Arterial blood pressure is not detectable. Minimal external bleeding. Stridor, caused by expanding upper mediastinal hematoma. Signs of cardiac tamponade (distended neck veins, muffled heart sounds). Pre-operative radiological findings: Left side hemothorax, tracheal deviation away from the side of injury. Wounded left subclavian artery ~1 cm above aortic arch. Multidisciplinary surgical team: vascular surgeon, cardiac and thoracic surgeon. Surgery: supraclavicular incision and partial median sternotomy. Subclavian artery end-to-end anastomosis with following video-assisted left side thoracoscopy for blood clots evacuation. The most commonly injured great thoracic vessels – subclavian arteries (21%), and subclavian veins (13%). Mortality – venous injuries (82%), and arterial injuries (60%). Up to 61% subclavian vessel injuries are dead on arrival to the hospital. External or intrathoracic bleeding is hardly possible to control because of anatomic position behind the clavicle. Cerebral vasospasm can severely exacerbate ischemia. Delay to diagnostics of oesophageal or pharyngeal injury is directly related to poor outcome. Vascular thrombosis or an intimal flap can completely occlude an injured vessel and save the life, but the absence of bleeding does not rule out a major vascular injury.

A multidisciplinary approach can save patient's life in case of deadly subclavian artery injury.

Severe Laryngeal Manifestation of Rheumatoid Arthritis

Dr. Kristīne Ivanova

Rīga Stradiņš University, Department of Internal Diseases, Latvia

Objectives

To acknowledge and learn from past experience and careful literature examination more optimal and safer way for upper airway complications in rheumatoid arthritis patients.

Methods

Evaluating possible differential diagnosis in patient with progressive stridor and long standing rheumatoid arthritis receiving biological disease modifying anti rheumatoid drug, ascertain possible biological drug involvement on the development of stridor.

Results

There are many possible causes of stridor in rheumatoid arthritis patient, the most common one is rheumatoid arthritis manifestation in cricoarytenoid joints with leading vocal cord immobility, most often unilateral, rarely bilateral. The most affected are seropositive females with high disease activity despite treatment. Other causes for stridor may be rheumatoid nodules on vocal cords, nervus laryngeus damage. There are no specific cases of tocilizumab (il-6 receptor antibody) induced larynx damage other than infections that can lead to stridor as one of the symptoms. Due to these facts the most necessary examination is laryngoscopy assessing vocal cords, possible hyperemic and edematous tissues, looking for fixation of vocal cords. Computer tomography and magnetic resonance imaging will undoubtedly help to determine the severity of laryngeal joint damage but it will take time and if stridor is progressing rapidly – the most important thing is to provide respiratory function. After excluding infectious agent as cause of stridor the most effective immediate treatment is glucocorticosteroids, after the reevaluation of long term antirheumatic drug should be done.

Conclusions

Unfortunately rheumatoid arthritis is chronic disease, sometimes with very aggressive course that even with new and promising drugs can lead to life threatening conditions. It is important to consider cricoarytenoid joint arthritis in every rheumatoid arthritis patient with stridor and hoarseness. Especially suspicion for this complication should be seropositive patient with long standing active aggressive disease without reaching low activity score or remission of adequate treatment.

Gangliosidosis: Autopsy Case Report

Dr. Sergejs Dubencovs¹; Dr. Ginta Pogule²

¹ *Rīga East University Hospital, Latvia;*

State Centre for Forensic Medical Examination of the Republic of Latvia;

² *State Centre for Forensic Medical Examination of the Republic of Latvia*

Objectives

We report a case of autopsy findings in 1-year and 9-months young boy with gangliosidosis.

Methods

At 5 months age patient was admitted to hospital because of growth retardation and suspected storage disease. Available examinations shown the high suspicion of GM1 gangliosidosis and patient's material was sent for further molecular examination. At the age of 1-year and 9-months boy was admitted to the hospital in terminal state and died shortly. The forensic autopsy was performed.

Results

Body was hypotrophic, weighting 5.5 kg, body length 80 cm, arms and legs were markedly thin. Brain weight - 1350 g, grey matter of brain macroscopically was weakly structured. Liver and spleen weight - 340 g and 40 g respectfully. Lungs were edematous, with dark red areas of parenchyma. Microscopically massive brain gliosis, decrease of neuronal quantity and dystrophic neuronal changes with their swelling, granularity and vacuolation of cytoplasm was observed. We stained frozen sections of cerebral samples with Periodic acid Schiff (PAS) and observed massive accumulation of PAS-positive substance in neuronal and glial cells, which was compared with samples obtained from another person (died of trauma), where cells were PAS-negative. In viscera there was marked accumulation of foam cells in pulmonary alveolar spaces, spleen and liver parenchyma, lymph nodes. Hepatocytes and epitheliocytes of renal canaliculi showed prominent dystrophic changes with cytoplasmic granularity and vacuolation. Besides that, pneumonic changes were observed microscopically.

Conclusions

Morphological features seen macroscopically and microscopically using routine and histochemical staining techniques are not specific for GM1 gangliosidosis, the same or similar features can be observed in other diseases. In our case the precise diagnosis was already known and confirmed by molecular examinations and the forensic autopsy was performed to confirm the cause of death. Nevertheless, such pathomorphology can guide the autopsy pathologist towards the potential diagnosis of lysosomal storage disease.

Simultaneously Diagnosed Primary AL Amyloidosis and Multiple Myeloma: Case Study

*Dr. Daiga Auziņa¹; Dr. Ilze Trociukas¹;
Dr. Jurijs Nazarovs²; Dr. Oksana Mahmajeva²;
Dr. Dārta Balode¹; Prof. Sandra Lejniece¹*

¹*Rīga East University Hospital, Oncology Centre of Latvia;*

²*Rīga East University Hospital, Pathology Centre, Latvia*

Objectives

The aim of this clinical case report is to demonstrate a case of primary AL amyloidosis and simultaneous multiple myeloma (MM) diagnosis in one patient.

Case description

Our patient was 51 y old female who presented with papules with a hemorrhagic component on the eyelids and periorbitally. These symptoms were present for about 2 years. Then similar changes appeared in the mucous membrane of the mouth, tongue enlargement was present as well. Patient experienced weight loss – approximately 9 kg in a year. Patient had submandibular lymphadenopathy ~ 1 cm.

Starting investigations, myocardium and valves with enhanced echogenicity, hypertrophic myocardium and signs of diffuse kidney parenchymal damage were found. Bone marrow biopsy was performed: multiple myeloma was confirmed histologically. At the same time, amyloidosis was confirmed in the biopsy of skin.

Patient received 6 courses with Bortezomib, Dexamethasone and Cyclophosphamide, achieving remission. In April 2016 autologous stem cell transplantation was carried out. After this treatment complete remission was achieved which continues for 36 months.

Conclusions

The combination of AL amyloidosis and MM is extremely rare. This case report demonstrates that early AL amyloidosis diagnosis and correct course of treatment is the basis for good laboratorial and clinical outcome.

Low LDL-C – Is It Always a Good Sign? Case of a Rare Cause

*Dr. Ieva Tonne¹; Dr. Inga Balcere²; Dr. Sabīne Upmale¹;
Prof. Aivars Lejnieks¹; Prof. Ilze Konrāde¹*

¹ Rīga Stradiņš University, Latvia;

² Riga East University Hospital, Latvia;

Rīga Stradiņš University, Latvia

Objectives

Familial hypobetalipoproteinaemia (FHBL) is a rare, monogenic cause of hypocholesterolaemia. Over 80 mutations have been reported in the apoB gene (APOB) which lead to production of truncated apoB species that results in decreased fat absorption and disturbed lipid transport from liver into the blood subserving fat accumulation in the liver. Inheritance is co-dominant: homozygous phenotype is severe with fat malabsorption, fat soluble vitamin deficiency, neurological and ophthalmological disturbances; heterozygotes are asymptomatic with mildly elevated transaminase levels but early hepatic steatosis. Due to low blood LDL-C, it is thought that FHBL subjects are protected against atherosclerosis, still there is high risk of hepatic steatosis and its consequences such as insulin resistance, steatohepatitis, cirrhosis and hepatocellular carcinoma.

Results

A slightly overweight woman (48y) with multiple neurovegetative complaints, episodic diarrhoea, mild diabetes and hypertension was investigated and, unexpectedly, hypolipidemia was found (LDL-C – 1.14 mmol/L, Tg – 0.47 mmol/L). Patient reported mild steatohepatitis in 2009, liver biopsy from that episode already showed moderate macrovesicular steatosis in 25–50% of hepatocytes. Most secondary causes of hypolipidemia were excluded: no malignancy found, no hepatic or accumulation diseases, thyroid and adrenal function – normal. Coronary artery angiography and carotid ultrasound showed no atherosclerosis. Patient reported that her mother and grandmother also had very low LDL-C levels. ApoB level was checked and found low – 31.31 mg/dL (N – 60–117), diagnosis of FHBL was established. Genetic testing in process.

Conclusions

It is important to investigate cause of low LDL-C levels even in young and apparently healthy patients to find heterozygotes of FHBL due to the high risk of steatohepatitis, its metabolic consequences and progressive liver disease in future.

Multiple Endocrine Neoplasia Type 2b (MEN2B) Syndrome in Young Men

*Dr. Ieva Tonne*¹; *Dr. Inga Balcere*²;
*Dr. Sabīne Upmale*¹; Prof. *Ilze Konrāde*¹

¹ *Rīga Stradiņš University, Latvia;*

² *Rīga East University Hospital, Latvia;*

Rīga Stradiņš University, Latvia;

Objectives

MEN2B is a rare syndrome, caused by RET protooncogene mutations. MEN2B causes medullary thyroid carcinoma (MTC) pheochromocytoma, and unique physical characteristics including mucosal neurinoma, distinctive facial appearance, and Marfanoid habitus. Most patients have abdominal symptoms such as bloating and intermittent diarrhea. MTC is the most important determinant of mortality.

Results

16 year old patient visited family doctor due to pain in his neck. Ultrasound showed suspicious thyroid nodule and he was referred to endocrinologist. FNA revealed atypical cells, also high calcitonine level (790 pg/ml) was found. Total thyroidectomy and neck lymphadenectomy was done. Histological diagnosis – MTC. Boy showed typical Marfanoid phenotype, accented large lips and thick eyelids. Also surgical excision of multiple gingival and mucosal neurinomas was done earlier. In his childhood boy was repeatedly examined in pediatric hospital due to low body weight, short stature and recurrent gastroduodenitis. Genetic testing revealed RET gene mutation and MEN2B syndrome was established. Calcitonine levels after operation persisted high, scintigraphy, SPECT/CT and PET were done, but no dissemination found. After 2 years patient came back to endocrinologist complaining about back pain. The CT was done and 1 × 3 cm lesion above left adrenal was found. Pheochromocytoma was suspected, although catecholamine level in 24h urine -not elevated. Also immune thrombocytopenia was found which was compensated after methylprednisolone pulse therapy. During operation a lesion distinct from left adrenal was found, histologically – ganglioneurinoma. Calcitonin level still – 518 pg/mL. It is planned to do FNA of lymphnode with calcitonin detection, but CT, ultrasound of the neck and SPECT/CT did not show suspicious lymphadenopathy.

Conclusions

Early recognition of the phenotype of MEN2B syndrome is crucial to perform a prophylactic or curative thyroidectomy. The mucosal neuromas, which are usually present from infancy, are a particularly important characteristic.

Adult-Onset Bartter Syndrome: Case Report

*Dr. Ieva Tonne¹; Dr. Sabīne Upmale²;
Dr. Mihails Romanovs¹; Prof. Ilze Konrāde²*

¹ Rīga Stradiņš University, Latvia;

² Rīga Stradiņš University, Department of Internal Diseases, Latvia

Objectives

Hypokalemia is one of the most common electrolytic disturbances in clinical practice. Bartter syndrome type 3 is a rare clinically heterogenous hereditary salt-wasting tubulopathy caused by mutations of the chloride voltage-gated channel Kb gene (CLCNKB), which affects the NaCl reabsorption in the renal tubule. It is characterized by renal potassium wasting with hypokalemia and metabolic alkalosis.

Results

A 53-year old caucasian woman was admitted to clinic for investigation due to polyuria, polydipsia, and hypokalemia. It was revealed that at the age of 38 the patient had been admitted to an intensive care unit with critical hypokalemia and renal insufficiency. At the time diagnosis of Bartter syndrome was suspected. The patient received potassium substitution and spironolactone, which was shortly after discontinued due to an allergic reaction. In the outpatient setting furosemide was prescribed to the patient, which she had been taking for 15 years ever since. Remarkably, the patient reported that the potassium levels remained low normal without potassium supplements, and oedema would occur after discontinuation of diuretics. Physical examination was normal. Basic investigations showed mild hypokalemia (3.16 mmol/l), normal magnesium levels, elevated urinary potassium (43.1 mmol/24 h), sodium (60.3 mmol/24 h), phosphate (18.2 mmol/24 h), and normal urinary calcium (4.8 mmol/24 h). Impaired renal function (GFR 37 ml/min) with secondary hyperparathyroidism (PTH 348.3 pg/ml), and also secondary hyperaldosteronism was found. Chronic vomiting was excluded. Ultrasound revealed severe nephrocalcinosis. The aforementioned findings point towards the diagnosis of Bartter syndrome type 3, therefore eplerenone 25 mg × 1 with potassium supplementation was started. The patient is now being treated with oral potassium supplements and eplerenone with near-normal potassium levels.

Conclusions

We present the case of a patient with hypokalaemia caused by Bartter syndrome type 3, despite concomitant loop-diuretic use. Due to the normal serum magnesium and urinary calcium levels it can be differentiated from the more common Gitelman syndrome.

Rheumatoid Arthritis Can Still Surprise

Dr. Kristīne Ivanova; Prof. Inga Stukēna

Rīga Stradiņš University, Department of Internal Diseases, Latvia

Objectives

A 56-year old female patient was admitted to emergency unit with complaints about progressive dyspnea and voice hoarseness within last two months. She also complained about joint pain – especially in knees, wrists, shoulders and elbows, with morning stiffness more than an hour and weight loss – 10 kg in the last half year.

Methods

In 1999 patient was diagnosed with seropositive rheumatoid arthritis. In the beginning she received methotrexate, sulfasalazine, from 2008 biological treatment was started – IL-6 receptor blocker tocilizumab. In 2017 she had bilateral pulmonary embolism. By the admitting time her therapy consisted of three medications – Rivaroxaban, Tocilizumab and Diclofenac.

Results

By examinations there was severe inspiratory stridor observed, no fever, lung auscultation – crepitation in lower segments, severe hand and feet deformities – typical for rheumatoid arthritis. In lab test there was leukocytosis with neutrophilia, CRP – in reference range, chest x-ray showed bilateral basal infiltration. At admission DAS28 was 3.84 – moderate disease activity. Main medical concern – progressive stridor. Two differential diagnosis were the most probable – larynx damage as severe complication that manifested as stridor and hoarseness or upper respiratory tract infection that are typical in patient receiving biological drugs. In CT scan arytenoid and cricoid cartilage deformation with cricoarytenoid joint bilateral involvement was observed. Infection diseases were excluded, including opportunists. Treatment with Solu-Medrol was initiated, with good response. Stridor and hoarseness significantly improved. Later peroral glucocorticosteroids were initiated with subsequent dose reduction. Tocilizumab was changed to TNF alfa inhibitor infliximab.

Conclusions

Rheumatoid arthritis progression to larynx was first described in 1880. It is rare complications of rheumatoid arthritis and is more common in seropositive females who did not reach remission or low disease activity. Frequently the damage is subclinical and found only by autopsy. 66% of laryngeal symptoms are associated with arthritis in cricoarytenoid joints.

Effects of Peritoneal Dialysis in Chronic Heart Failure Patient: Case Report

*Dr. Nadežda Šeršņova; Dr. Maija Motivāne; Dr. Baiba Vernere;
Dr. med. Viktorija Kuzema; Dr. Ilze Puide; Prof. Aivars Pētersons*

Pauls Stradiņš Clinical University Hospital, Latvia

Objectives

Peritoneal dialysis may be an additional therapeutic option in patients with severe congestive heart failure to control fluid overload.

Methods

A clinical case

Results

We report a case of a 70-years-old female with diuretic-resistant chronic heart failure (CHF) (NYHA class III-IV), non-uremic chronic kidney disease IV-V and peritoneal dialysis (PD) was started as a salvage therapy to control fluid overload. Patient had a history of diffuse atherosclerosis with renovascular disease and coronary heart disease with old myocardial infarction at the age of 45. Therefore she received percutaneous coronary intervention at the age of 47, and coronary artery bypass grafting at the age of 59. From November 2015 to November 2016 she was admitted to hospital 3 times because of the persistent dyspnea. In November 2016 patient was hospitalized because of the CHF decompensation. Despite medical therapy, she had dyspnea, oedema and oliguria hence acute haemodialysis was started to reduce overhydration, neglecting the fact that her serum creatinine level was 365 $\mu\text{mol/l}$ (GFR - 16 ml/min) with no signs of uremic intoxication. Then PD catheter was implanted and PD was continued for 1 year. After initiation of PD her symptoms and daily activity improved. Re-hospitalization due to CHF was not been needed for 12 months. In December 2017 patient passed away with acute thrombotic event at the age of 71.

Conclusions

We have observed a very good response to PD in therapy resistant CHF patient in regard of physical activity, clinical symptoms and rate of CHF related recurrent hospitalizations. PD may be advocated to patients with diuretic-resistant edema, progressive cardio-renal syndrome and maybe as a bridge to heart transplantation. Further prospective studies are need to clarify this important clinical possibility.

Case Report of a Partial AZFa Region Deletion

*Baiba Alkšere*¹; *Dace Bērziņa*¹;
*Juris Ērenpreiss*²; *Dr. Aigars Dzalbs*³; *Una Čonka*¹;
*Dr. Aļesja Dudorova*¹; *Santa Andersone*¹; *Dr. Liene Korņejeva*⁴;
*Dr. Ieva Grīnfelde*³; *Dr. Violeta Fodina*¹

¹ iVF Rīga Clinic, Latvia;

² iVF Rīga Clinic, Latvia;

Rīga Stradiņš University, Latvia;

³ iVF Rīga Clinic, Latvia;

Children's Clinical University Hospital, Latvia;

⁴ iVF Rīga Clinic, Maternity Hospital, Latvia

Objectives

Deletions of one or more AZF region parts in chromosome Y are one of the most common genetic causes of male infertility. Microdeletions of AZF regions in Y chromosome occur as de novo event in 2–13% non-obstructive azoospermia or oligospermia cases. Real time polymerase chain reaction, using STS markers as stated by the European Academy of Andrology (EAA) and the European Molecular Genetics Quality Network (EMQN), is a convenient method to detect these changes. Usually full or partial AZF deletions are associated with spermatogenic failure.

Methods

Aim of the study was to evaluate partial AZFa region deletion detected in a man with a normal sperm count. AZF region deletion testing was done using AZF System Y-chromosome (Sacacce) reagents' kit. More detailed analysis of AZFa region was done as previously described.

Results

We report a case of a Caucasian man with partial AZFa region deletion from a couple with secondary infertility (early term missed abortion). Patient is 31 years old, healthy individual. All tested biochemical markers – prolactin, vitamin D, testosterone, T4 and TSH – were in normal range. Semen analysis did not show significant changes in sperm motility or concentration. Morphology of spermatozoa was deteriorated. The patient was referred for AZF microdeletion testing after karyotype analysis, which revealed slightly decreased levels of constitutive heterochromatin in the long arm of chromosome Y. Microdeletion of AZFa region marker sY84 was detected, but sY86 was intact. To exclude allelic variants in region of primer binding site PCR was performed with subsequent capillary electrophoresis. Lack of expected PCR product confirmed microdeletion of marker sY84. For detection of size of deletion several markers were used.

Conclusions

Partial AZFa deletion not always affects spermatogenesis. If partial AZFa deletion is observed it should be tested in details, to exclude involvement of genes which are significant for normal spermatogenesis.

Löffler's Endocarditis: Challenging Case Report

Dr. Linda Kundziņa¹; Dr. Aldis Strēlnieks²

¹ *Rīga Stradiņš University, Latvia;*

² *Rīga East University Hospital, Department of Cardiology, Latvia*

Objectives

Hypereosinophilic syndrome (HES) as Löffler syndrome can be caused by parasitic infections, autoimmune disease, allergic reaction, malignancy or idiopathically which leads to eosinophilic infiltration in lungs, heart, skin, gastrointestinal tract and brain. Therapy consists of conservatively administered glucocorticosteroid's, chemotherapeutic agents as well as surgical treatment. We report case that shows challenging diagnostic road to final diagnosis.

Case presentation

A 64-years old Caucasian male patient was admitted in Department of Hematology due to complaints of weakness, dyspnea and eosinophilia in laboratory findings for further investigation. From anamnesis was known that patient has developed these symptoms after acute viral infection which has happened almost a half-year ago. No lymphoproliferative causes have been found while performing trephine biopsy and flow cytometry. Due to such findings as mass formation in left ventricle with progressive mitral regurgitation in echocardiography and data of endomyocardial biopsy differentialdiagnose as Löffler's eosinophilic endocarditis has been suspected for first time. Patient was transferred to Department of Cardiology with progressive cardiac decompensation. With administration of massive glucocorticoid dosages disturbances in laboratory findings disappeared as well as slightly improved the general condition of patient. Cardiac MRI was performed as the gold diagnostic standard for a such HES as Löffler's endocarditis. Imaging showed suspicions about severe restrictive cardiomyopathy, endomyocardial fibrosis with massive thrombotic lesions in apex of left ventricle with reduced cavity as well as changes in right ventricle's basal wall. Unfortunately, despite of provided therapy refractory cardiac insufficiency progressed till gradual cessation of all vital functions and patient died in less than a year after first symptoms showed.

Conclusions

This case showed typical presentation of one of the hypereosinophilic syndromes - Löffler's endocarditis which was presented with mainly nonspecific complaints, as well proved importance of various specialty doctor's team involvement to provide the best diagnosis and care for a patient.

Limb-Girdle Muscular Dystrophy

*Baiba Vikmane; Sintija Locāne;
Dr. Natalja Predkele; Dr. Jānis Mednieks*

*Pauls Stradins Clinical University Hospital,
Department of Neurology, Latvia*

Objectives

Clinical case – 31-year-old man, presenting to Pauls Stradiņš Clinical University Hospital with main complaints of abdominal pain for last four months, with coexisting constipations, shortness of breath, heart palpitations and anxiety. Patients medical history includes progressing muscle weakness of unknown origin, that has started in early childhood and caused movement impairment at early age. He became bedridden at the age of 30 due to muscle weakness and painful contractures, last time he could stand with assistance was 4 months ago. The patient's neurological status has never been examined in a hospital, definitive diagnosis has not been made.

Methods

Neurological examination reveals muscle weakness affecting all extremities, predominantly proximal muscles. Upper-arm and thigh muscles are hypotrophic. Severe contractures in knee and elbow joints are observed. There is no cranial nerve or sensory system involvement.

Results

The patient receives a multidisciplinary approach and complex examination.

Abdominal examination, including FGS, colonoscopy, abdominal CT and MRI reveals no pathology. Respiratory tests show severe restrictive type respiratory insufficiency. Chest CT shows S9, S10 segment pulmonary embolism.

EMG shows myopathy and further genetic testing reveals Limb-girdle muscular dystrophy (LGMD), type 2a – a rare genetic disorder, that results in slowly progressing muscle weakness.

Conclusions

LGMD is not only the reason for patient's neurological state, but also explains abdominal pain as a result of narcotic analgetic usage for pain relief and depression with anxiety because of severe disability. Restrictive respiratory insufficiency is not typical for LGMD, but it can be explained as the result of immobility because of pain and contractures and diaphragmatic weakness, however additional somatic pathology – pulmonary thrombembolism was present.

Unfortunately, there is no pathogenetic treatment to LGMD, however combined symptomatic treatment with analgetics, myorelaxants, selective serotonin reuptake inhibitors, antipsychotics and anticoagulants helped to reduce the symptoms.

Multimodality Management of Primary Cardiac Sarcoma: 3-Year Survival with Surgery, Chemotherapy and Radiotherapy: Clinical Case

*Rūta Ereminienė¹; Dainius Karčiauskas²; Rokas Ereminas²;
Adakrius Siudikas²; Povilas Jakuška²; Eglė Ereminienė¹*

*¹ Medical Academy, Department of Cardiology, Lithuanian University
of Health Sciences, Lithuania*

*² Medical Academy, Department of Cardiac Surgery, Lithuanian University
of Health Sciences, Lithuania*

Objectives

Introduction. Undifferentiated pleomorphic sarcoma (UPS), known as malignant fibrous histiocytoma (MFH) is an extremely rare type of primary cardiac tumor. UPSs are aggressive and locally invasive tumors, frequently making complete surgical excision unfeasible, which leads to a poor prognosis ranging from 6 months to a few years.

Results

Case presentation. We present a case of a 48 years old women who was admitted with the history of dyspnea and chest pain. Two-dimensional echocardiography revealed large masses in the left atrium and in the left ventricle attached to anterolateral walls with outflow tract obstruction. Cardiac magnetic resonance (CMR) imaging was performed to evaluate specific characteristics of masses – the diagnosis of malignant cardiac sarcoma was suspected. Computed tomography (CT) of the chest and abdomen was performed, but no features of metastasis or other origin of malignancy were found, so the patient underwent cytoreductive surgery. The masses from LV cavity, outflow tract and LA were removed, but complete resection was not possible. Histo-pathological examination revealed undifferentiated pleomorphic sarcoma. Patient was referred to oncology department for further chemotherapy with doxorubicin and ifosfamide. She completed 7 cycles of treatment. After combined therapy two-dimensional echocardiography, CMR and abdomen, chest and pelvic CT was performed every three months. 26 months after initial diagnosis during follow up 2D echocardiography revealed new mass in the left atrium and CMR confirmed the recurrence of malignant tumor. Second surgery was performed and a tumor was removed from the left atrium. Histo-pathological examination confirmed the recurrence of UPS. The patient underwent radiotherapy postoperatively and is stable with no compromises of the quality of life 32 months after initial diagnosis of the disease.

Conclusions

Multimodality UPS treatment with surgery, chemotherapy and radiotherapy can improve outcomes of the poor result with tumor resection alone.

Splenic Torsion – Rare Surgical Emergency in Children

*Dr. Anete Rozentalberga*¹; Prof. *Zane Abola*²;
*Dr. Paulis Laizans*³; *Dr. Marija Kraule*⁴;
Prof. *Arnīs Engelis*²; Prof. *Aigars Petersons*²

¹ Rīga Stradiņš University, Faculty of Continuing Education, Latvia;
Children's Clinical University Hospital, Latvia;

² Rīga Stradiņš University, Latvia;

Children's Clinical University Hospital, Latvia;

³ Children's Clinical University Hospital, Department of Pediatric Surgery, Latvia;

⁴ Children's Clinical University Hospital, Latvia;

Liepāja Regional Hospital, Latvia

Objectives

Wandering spleen (WS), or ectopic spleen, is an unusual condition characterized by hypermobility of the spleen due to undevelopment or absence of the ligaments that attach the spleen to the left upper quadrant, allowing the spleen to be mobile within the abdomen and predisposing to the torsion along the vascular pedicle. This is a rare clinical entity, with only about 500 cases reported worldwide. This condition can be asymptomatic or responsible for chronic pain, but it appears as a surgical emergency when an acute twisting occurs. Treatment is often surgical – splenectomy.

Case report

A 12-year-old boy admitted to the emergency department within 10 hours of abdominal pain and 4 days of constipation. On physical examination, the abdomen was distended and tender to palpation. A palpable abdominal mass was located on the left hypochondrium. Laboratory values included a white blood cell count of $15.94 \times 10^3/\mu\text{L}$ and C-reactive protein 29.81 mg/L. Ultrasonography (US) revealed a huge spleen in umbilicus region, which was measured approximately $18.5 \times 7.0 \times 14.0$ cm with a low intensity of vascularization. Computer tomography (CT) scan demonstrated findings compatible with the splenic torsion. The patient underwent laparotomy. Intraoperative ultrasound (IOUS) showed splenic venous thrombosis and infarction with parenchymal ischemia. The splenectomy was performed.

Conclusions

Torsion of wandering spleen is a rare but important differential diagnosis in patients presenting with acute abdomen.

The diagnosis should be made promptly before life-threatening complications develop.

The best method of diagnosis is a CT scan.

The splenic infarction requires splenectomy.

Perianal Crohn's Disease in Children

*Dr. Anete Rozentalberga*¹; Prof. *Zane Abola*²;
Prof. *Arnīs Engelis*²; Prof. *Aigars Petersons*²

¹ *Rīga Stradiņš University, Faculty of Continuing Education, Latvia;*
Children's Clinical University Hospital, Latvia;

² *Rīga Stradiņš University, Latvia;*
Children's Clinical University Hospital, Latvia

Objectives

Introduction. Although perianal complications of Crohn disease (CD) are commonly encountered in clinical practice the frequency in which pediatric patients with CD develop perianal disease is less clear. Available evidence suggests approximately 8% to 13% of patients with CD onset in childhood have perianal fistula present at the time of diagnosis.

Case report

Patient 15 years old with recurrent gluteal abscesses. Treated with incisions and drainage. With no positive results, the patient came to our tertiary care children's hospital. Perianal physical examination showed perianal fistula with the mucosal opening at 11 o'clock with purulent discharge. MRI showed that there is bowel wall thickening, lymphadenopathy, vasa rectalis hypervascularity and fibrofatty infiltration. The conclusion was Crohn's disease with perianal fistula. Laboratory findings: ASCA (anti-Saccharomyces cerevisiae) - IgA > max positive, IgG > 100U/I. Faecal calprotectin 866.2 mg/g. The patient started to receive Adalimumab. Colonoscopy showed regional colitis and ulcer in colon ascendens. A biopsy revealed moderate nonspecific chronic colitis. The patient was treated with antibiotics, ferrum supplement at home. After a time the patient came back to the Children's Clinical University Hospital with no positive course. Perianal physical examination showed that patient still has a perianal fistula with purulent discharge, external fistula opening at the right side of the scrotum with purulent discharge and fistula opening at 5 o'clock in the left gluteal region. MR enterography was ordered and showed that there is a thickened wall of the terminal ileum, lymphadenopathy, vasa rectalis hypervascularity, and fibrofatty infiltration, which was described as Crohn's disease with perianal fistula without a connection to the rectum. Maria index was 14.7. The patient underwent a colostomy surgery.

Conclusions

Although medical therapy for perianal fistulas has improved patients condition, diverting colostomy was a necessary option.

Traumatic Tracheal Injury in Children: Case Series

*Dr. Māra Klibus*¹; *Dr. med. Reinis Balmaks*²;
*Dr. Ivars Veģeris*²; *Dr. Ieva Kārklīņa-Kravale*²

¹*Rīga Stradiņš University, Department of Anesthesiology
and Intensive Care, Latvia;*

²*Childrens Clinical University Hospital, Department of Anesthesiology
and Intensive Care, Latvia*

Objectives

Traumatic tracheal injuries are rare, but have potential for rapid clinical deterioration and can become life-threatening. This study was to analyse diagnosis and management of traumatic tracheal injury in children based on two cases.

Methods

Case series of two patients with tracheal injury. Data was retrieved from medical documentation from Children's Clinical University Hospital.

Results

Case 1. Eight year-old boy fell from his bicycle. His symptoms were dyspnea, neck, thoracic, emphysema. Neck emphysema made endotracheal intubation difficult, it was performed with fibro-bronchoscope. Chest X-ray demonstrated right sided pneumothorax requiring chest drain insertion. On arrival to children's hospital fracture of the base of skull was discovered. Following extubation the patient developed breathing difficulties and was immediately reintubated. Fiberoptic bronchoscopy confirmed an anterior tracheal tear with fibrin layer 1 cm distal from vocal chords and tracheal stenosis approximately 50%. Patient required balloon dilatation for subglottic stenosis. He was extubated and required repeated bronchoscopic evaluations to treat granulations. Patient will undergo tracheal dilatation.

Case 2. Five year-old boy with generalized seizures was admitted to Emergency Department. Following to transfer to pediatric intensive care unit the patient was intubated orotracheally with 5.5 mm tube with cuff. On day 2 the patient was extubated and discharged to the neurology ward. 6 days after he was readmitted to the PICU with progressive breathing difficulties and stridor. He underwent bronchoscopy which revealed fibrin flap 2 cm distal from vocal cords and tracheal stenosis approximately 85%. Fibrinous plaque was difficult to remove therefore the removal was postponed to the following day which was uneventful. Repeated bronchoscopy showed good recovery with mild residual stenosis.

Conclusions

Tracheal tears can become life-threatening. The best method for examining areas for tracheal injury is bronchoscopy. Tracheal injuries often require repeated manipulations. Measuring of ET cuff pressure can be useful to prevent tracheal injuries.

Cryptococcus Neoformans-Induced Myocarditis in Immunocompetent 13-Year- Old Boy

*Dr. med. Liene Smāne; Dr. Gunda Zvīgule-Neidere;
Prof. Inguna Lubāua; Dr. med. Inga Lace; Dr. Gunta Laizane*

Children's Clinical University Hospital, Department of Paediatrics, Latvia

Objectives

Myocarditis is rare in children, with an estimated annual incidence of 1 to 2 per 100 000 children. Pediatric patients with *Cryptococcus neoformans* infection with heart involvement is close to non-existent in literature. *Cryptococcus neoformans* is an opportunistic pathogen which most often affects immunocompromised patients. Exposure to *Cryptococcus neoformans* has been suspected in the initiation of heart autoimmunity, but the direct causal link is lacking.

Methods

Case Presentation.

Results

A previously healthy 13-year-old boy was admitted to Children's Clinical University Hospital in Riga, Latvia with complaints of fever, vomiting, chest and epigastric pain. ECG on admission showed negative T wave in leads I and aVL, ST elevations in lead II, aVF and V3, signs of right ventricle overload. Echocardiography showed anatomically normal heart with preserved systolic function. Serum troponine I was 39 393 ng/L and CK-MB mass – 82.79 ng/mL. C-reactive protein was 121 mg/dl. WBC was 15.64×10^3 /mL. Chest x-ray showed congestion in pulmonary vasculature. Cardiac MR with contrast showed preserved systolic function in both ventricles, however myocardial edema and late gadolinium enhancement was observed in basal and mid-ventricular region of left ventricle wall and in septum and apex. In two blood samples *Cryptococcus neoformans* antigen came back positive in 1:40 titer. As cryptococcal infections are typical for immunocompromised patients, the patient was consulted by immunologist, however neither primary, nor secondary immunodeficiencies could be identified.

Conclusions

Cryptococcus neoformans can cause myocarditis in immunocompetent pediatric patients. CMR is a noninvasive diagnostic test that can help confirm the diagnosis of myocarditis.

CNS Manifestation as Haemophagocytic Lymphohistiocytosis

Inita Buliņa

Rīga Stradiņš University, Latvia

Case report: A 23 years old man with episodic fever $> 38\text{ }^{\circ}\text{C}$ from May 2018 and 8-years history of CNS symptoms.

He had his first complains of headache, dizziness and doubling from 13 years of age (2010) with multifocal supratentorial changes in MRI – periventricular, subcortical, corpus callosum and diffuse demyelination in brain stem – pons, pedunculi cerebelli, bilaterally hemispheres of cerebellum. He was started on ADEM (acute disseminated encephalomyelitis) therapy with glucocorticoids in neurology department, but changes in CNS progressed. 3 times plasmapheresis was performed in 2010 with no clinical improvement. Changes in brain MRI progressed with signs of initial cerebellum atrophy. He was treated with intravenous immunoglobulin (IVIG) therapy – no deterioration in clinical symptoms and brain MRI was observed. Granuloma annulare appeared in 2012, but no skin biopsy was performed.

Immunosuppressive medicines (cyclophosphamide, methotrexate, rituximab and prednisolone) were prescribed for primary angiitis of the CNS (PACNS) according to neurologists and haematologists councils conclusions. Splenomegaly, pancytopenia, focal changes in liver appeared in 2017 and splenectomy was performed. Episodical fever appeared in May 2018 with increasing frequency and macrophage activation syndrome criteria were fulfilled in October 2018. After performing additional genetic and blood tests and cooperation with rare diseases specialists in Europe, Canada and Latvia the final diagnosis for the patient was hemophagocytic lymphohistiocytosis.

“Maternal Impressions” in Latvian Folk Beliefs

Dr. med. Ieva Lībiete

*Rīga Stradiņš University, Institute of the History
of Medicine, Latvia*

Objectives

“Maternal impressions” is a long-lived folk belief and an outdated medical theory that a pregnant woman’s experiences could be directly imprinted onto her unborn child. The concept of “maternal impressions” was used to explain anything odd and unnatural from simple vascular birthmarks to conjoined twins. As a disputable medical theory, it persisted from the Renaissance till the end of the 19th century, when it was challenged by modern genetics and new data on environmental influences. As a folk belief “maternal impressions” originated independently among the people who were widely separated geographically, chronologically and culturally. The aim of this study is to explore this phenomenon in Latvian folklore.

Methods

The object of the study is a collection of 36 790 Latvian folk beliefs, that were compiled and published in 1941 by Pēteris Šmits (1869–1938) in four volumes under the title “Latviešu tautas ticējumi”.

Results

The chapter in Šmits book titled “Wife” (Sieva) consists of 346 folk beliefs mostly concerning pregnancy. Beliefs in “maternal impressions” are distributed under following subchapters: pregnant woman gazing (V), pregnant woman frightened by something (VI), pregnant woman frightened by fire (VII), pregnant woman laughing (VIII), overhearing (IX), smelling (X), dressing (XI), eating (XII), using a pot (XIII), sitting (XIV), standing (XV), walking (XVI), urinating (XVII), thinking (XVIII), talking (XIX), asking for something (XX), sleeping (XXI), giving (XXII), touching (XXIII), carrying something (XXIV and XXV), washing (XXVI), working (XXVII), biting off the floss (XXVIII), slaughtering animals (XXIX) and preparing for childbirth (XXX). The beliefs explain the origins of pathologies such as hairy or vascular birthmarks, hirsutism, lazy eye, cleft lip and cleft palate, phocomelia, lameness, etc., mostly due to looking, laughing, wondering or being afraid of something during the pregnancy.

Conclusions

The notion of “maternal impressions” is well presented in Latvian folklore. Latvian folk beliefs (old and modern for that matter) can just add a point to the theory proposed by teratologist Josef Warkany in 1951, that idea of “maternal impressions” is somewhat inbuilt in the human brain and finds expression whenever children are observed who do not resemble their parents.

Blood Group Research and Its Importance in Latvian Anthropology

Dr. Rita Grāvere

Pauls Stradiņš Museum of History of Medicine, Latvia

Objectives

Since the discovery of human blood groups in 1900, research and use of same in medicine and anthropology have taken an enormous step forward. This research aims to evaluate the published research data about 20th century Latvian blood groups in terms of the importance thereof in the development of anthropology in Latvia.

Methods

Materials: published research data about 20th century Latvian blood groups.

Methods: historical method.

Results

Research into blood groups was begun in the mid-1920s by an assistant at the Forensic Medicine Institute of the University of Latvia's Faculty of Medicine, Miķelis Veidemanis. His work was focused on identifying blood groups so as to determine paternity. The research was based on 1160 patients at the Rīga No. 1 Hospital, using the ABO system to determine blood groups. In 1934, research into ABO blood groups was done by Rockefeller scholarship recipient and neurosurgeon Kārlis Dolietis. He monitored 2645 Latvian patients at the University of Latvia's surgical and propaedeutic clinic, finding, like Veidemanis, that the biochemical index of blood among Latvians was lower than was the in Western European nations, with the closest analogies related to Poles and Russians. In 1940, a medical student conducted similar research related to 2096 patients at the Rīga No. 2 Hospital. In 1939, Nikolajs Cauna produced the first truly anthropological report on Latvian blood groups, collecting data from Latvian soldiers in various regions. The research showed a direct difference in ABO concentration between eastern and western regions of Latvia.

From 1964 until 1968, the History Institute of the Soviet Latvian Academy of Sciences conducted anthropological expeditions in Latvia and Lithuania under the leadership of Professor Raisa Deņisova to study ABO and MN blood groups. The research showed that blood groups, particularly A and B, were quite diffuse in geographic terms in the Eastern Baltic regions. A lower concentration of the q gene (no more than 14%) was found among Lithuanians, and it was higher (17–18%) among Latvians and Estonians. Analogous diffusion was also found in terms of the concentration of the p gene.

Late in the 1980s, the Anthropology Laboratory of the History Institute of the Soviet Latvian Academy of Sciences worked with the Finnish Red Cross Transfusion Service and the Latvian Blood Transfusion Centre to obtain blood samples from another 800 Latvians. These were analysed by Professor Nevanlinna and colleagues at a lab in Helsinki. An international group of researchers discovered the polymorphic indicator "Landsteiner Wiener B" (Lwb) related to genes, and the greatest concentration of same was found specifically among Latvians.

Conclusions

Blood group research in Latvia began in the late 1920s. The first results of typical blood formulae came from physicians who examined their patients. From the anthropological perspective, Latvian blood group research results were published by Nikolajs Cauna in 1943. After World War II, blood groups were studied during an anthropological expedition between 1964 and 1968, and during the 1990s, they were studied and analyses as part of an international project.

Remarks Made by Professor Pauls Stradiņš about His Visits to Foreign Clinics

Edīte Bērziņa

*Rīga Stradiņš University, Institute of the History
of Medicine, Latvia*

Objectives

The aim of the research was to look at opportunities for exchanges of experiences in the 1920s and 1930s and at the way in which these were used by one of the most distinguished physicians at that time, Professor Pauls Stradiņš.

Methods

The researchers relied on Professor Stradiņš' notebooks, notations, summarised lectures and other documents that related to medicine and health care. The documents are in the collection of the Pauls Stradiņš Museum of the History of Medicine. The method brought to bear in the research was the historically comparative method.

Results

During the 1920s and 1930s, Pauls Stradiņš took active advantage of any opportunity to supplement his knowledge by visiting foreign medical institutions and universities. His wide range of interests can be seen in his notebooks and summarised lectures about impressions that he had when it came to foreign clinics. The materials have information about visits to university clinics and hospitals in North America and Europe. Stradiņš had a wide range of interests, starting with the architecture and layouts of buildings, and ending with rooms, furniture and the colours of linens. He demonstrated particular interest in the treatment of cancer patients, surgical methods and statistics. The notes include information about the number of doctors, their salaries and how they taught students. Stradiņš delivered lectures on his impression at meetings of the Latvian Medical society, also publishing his impressions in the Latvian Physicians journal.

Conclusions

During the 1920s and 1930s, international medical congresses, conferences, etc., were organised far less often than is the case today. The ability of doctors to exchange experiences depended on their own initiative and personal contacts. Experiences at foreign clinics were used by Pauls Stradiņš to organise patient care and to establish a new cancer hospital and a blood transfusion clinic.

Look of Physical-Chemist onto Folk-Medicine Recipes in Oncology

Dr. Tatjana Borisova¹; Inta Vegnere²

¹Professional School "Beauty School", Latvia;

²Pauls Stradiņš Museum for History of Medicine,
Pharmacy Museum, Latvia

Objectives

We observed a lot of folk-medicine recipes for treatment and prevention of oncology till 2015 in our previous work. We continued to investigate the recipes for years 2016–2018 in this work.

Methods

Aim of the work is to find evidences of our hypothesis – oncology is crossing of diffusion parts of double electrical layers (DELs) of cells – in recipes of folk-medicine. The analysis of recipes published in popular magazines was done. Fifteen plants were mentioned in them. Water and alcohol solutions were offered by doctors, pharmacists and readers.

Results

The most popular plants were: pot marigold (5), wormwood (4), greater burdock (7), beet (6). They were suggested by doctors, healers, readers. The other plants were: wild strawberry (Cu); buckwheat (Cu, Ni); cabbage stump (Cu); common nettle (Cu, Mn, Ni); common dandelion (Mo, Cu, Zn); cedar nuts (Ag); maize, red clover, wormwood (Au); apricot (Ag); greater celandine (Ag); beet (Rb). Three doctors wrote about golden, silver, copper-silver ("bell") water. Gold enhances processes of death of cancer cells, silver oppresses cancer cells. E. Alksnis offers to use CsCl and beet sap. We assume that pine needles, buds, cones, needles of silver fir contain silver also.

There exist two similar recipes from 1970. One of them is connected to the name of P. Stradiņš, the second was gotten from the Kremlin hospital. Often used Befungin contains cobalt salts. We connect positive action of plants to the content of above mentioned less-hydrated ions. These ions are adsorbed at Stern's layer of DELs of cells, decrease doubled surface potentials. The system receives aggregative stability. Extracellular matrix presence requires system of condensed benzene rings in order to decrease its dielectric constant.

Conclusions

Less-hydrated cations have clear action on surface potential of DELs in the case of carcinoma and decrease degree of swelling of extracellular matrix in the case of sarcoma.

Medicinal Plants, Collection of Stamps in Pauls Stradiņš Museum for History of Medicine

*Elvīgs Kabucis; Edīte Bērziņa;
Inta Vegnere; Ilze Lementujeva*

Pauls Stradiņš Museum for History of Medicine, Latvia

Objectives

The aim of the work is to find out and count how often medicinal plants are depicted in compositions on postal stamps. To analyze their meaning on stamps, whether they are a central figure or take symbolic place. Which medicinal plants are depicted most often.

Methods

In this work was used the collection of Pauls Stradins Museum for history of medicine.

Results

Research reveals that in Pauls Stradins Museum for history of medicine collection medicinal plants can be found on 329 postal stamps from 18 different countries. Most often depicted are poppy, wild rose, chamomile and bay laurel. Most often plants take a central place in postal stamp composition. Most of the plants depicted can be easily recognized, often when they take a central place, there is given local and Latin names, but there are cases when the plant is depicted abstract or unclear, so one can only guess it's true name.

Conclusions

The popularity of medicinal plants is clearly observed in postal stamp themes and from depicted plants, one can guess, which healing plans are most popular globally. There is a clear preference for using plants that are found locally in every given country. One of the depicted plants – bay laurel, which is one of most often observed medicinal plant, has more remote symbolic meaning as it is a popular symbolic element in the coat of arms and portraits. In Pauls Stradins Museum for history of medicine collection postal stamps are only part of art items with depictions of medicinal plants. It would be interesting and important to explore other art forms and to compare if medicinal plants that can be found there are in similar count and symbolic meanings.

Most Common Diseases and Traumas in Latvian Army in 1920–1940

Inna Gīle

University of Latvia, Institute of Latvian History

Objectives

The objective is to study the diseases that Latvian military personnel were medically treated most frequently for in the time period from 1920–1940, by reviewing the dynamic changes in patients treated in inpatient care and those in outpatient care.

Methods

The main sources used are unpublished sources – War Sanitary Administration documents, like orders of the senior officers, reports of war physicians, etc. The health statistics of residents in the country and the war medicine statistics for the time period of 1927 to 1934, which contains information on military personnel treated in inpatient and outpatient care.

Results

In the time period from 1927 to 1934 most outpatient cases per 1000 of army personnel were registered in 1931 (9244 cases), the highest number of inpatient cases – in 1929 (902 cases). The number of patients treated in inpatient care in Latvia in 1929–1934 fluctuated between 89 579 and 103 367, including 16 372–20 133 cases in the army, while the number of military personnel treated in outpatient cases ranged from 149 677 to 189 549. The highest number of medical cases in the army was registered in 1930 – 209 682 cases. 90% of them were treated in outpatient care. The largest group of diseases in the army in the time period from 1929 to 1934 included – general infectious (excluding parasitic) diseases, diseases of airways, venereal diseases and traumatic, thermal and chemical injuries, etc. Generally in the state – general infectious and parasitic diseases, gastrointestinal diseases, nervous system diseases, individual organ diseases, venereal diseases, traumatic, thermal and chemical injuries, etc.

Conclusions

The statistics in the army reflect the general trends in the country, because military personnel were subject to regular medical monitoring. The regular medical tests performed in the army significantly affected the overall statistics, because, for instance, venereal diseases in the country were most frequently detected in males. This is also true with respect to high trauma rates, because, for instance, in 1929, 27% of all traumas treated in inpatient care involved military personnel of the army. The army paid increased attention to sanitary conditions, therefore epidemic diseases like dysentery or typhus, etc. which were widespread in the army during the war of independence and in the early 1920s, had been steadily declining in the army by 1940, apart from individual outbreaks.

Modelling in Wax for Human Anatomy: Review of Methods in Past

Prof. *Dzintra Kažoka*

Rīga Stradiņš University, Department of Morphology, Latvia

Objectives

The technique used for anatomical wax modelling varied according to the different time periods and successful collaboration between sculptors and anatomists. There are several anatomical wax models in different Museums in Latvia and it's very interesting to know some more details about ceroplastic.

The aims of this study are to draw the attention of some waxwork modelling methods of anatomical specimens and a review of the existing literature on these historical methods.

Methods

Documents are drawn from several articles and scientific publications in English in the PubMed, Scopus and medical history sources.

Results

The art of wax modelling reached its height in the late 1700s. Cadaver preparations were used for moulding their structures and the moulds were filled with wax. The waxes had different origins, characterized by their color and melting point. Creating models was highly labour-intensive. The specimens were made essentially by two techniques: the superimposition of wax handmade models of organs on the original skeletal bones, and the fusion of the wax into a plaster mold of the organs. The demonstrative specimens were made by skilled anatomists and artists: the first technique was used by Ercole Lelli's (1702–1766) school in Bologna, the second by Clemente Susini's (1754–1814) school in Florence. The most problematic parts of the process were the construction of the final model and the slow melting of the wax in a water bath at exactly the right temperature. After the moulds had been removed, each item would be cleaned and finished. The anatomists were responsible for deciding on how to place the organs in correct places.

Conclusions

In some cases the exact process of making the models and the equipment were considered a professional secrets. The fascination of these specimens was in the precision with which the details of the anatomical structures were reproduced.

Saint Hildegard of Bingen and her VIRIDITAS as Basis for the Model for Slow Medicine

Marika Zelča-Čerāne

Rīga Stradiņš University, The Red Cross Medical College, Latvia

Objectives

Our modern life is offering us not only fast food, but also quick cures by using modern technologies and medicines. Although modern medicine is extremely good during emergency care and saving life, the number of chronically ill patients suffering with life time diseases from year to year increases.

Methods

Hildegard of Bingen (1098–1179) was a twelfth century nun, a German Benedictine abbess of the monastery. She was not only a theologian and spiritual guide, visionary, preacher and music composer, but she was also a healer, a whole body healer – for both spiritual and physical healing.

Along with medieval elements of humoral theory, Hildegard introduced the concept of viriditas. It means the “greening power of God”. It is considered as a vital life energy what animates and sustains not only human beings, but also plants, minerals, animals. Everything that blocks the flow of viriditas through us contributes to physical diseases and spiritual ailments. Hildegard as a healer and spiritual companion was teaching how to bring viriditas back to a person’s life. She was teaching how to cultivate viriditas by making wise life style choices, not to mention diet, regime, physical and spiritual exercises.

Results

Modern medicine tries to fix a health problem, it becomes compartmentalized, not taking into account whole body well-being. It tries to fix a problem instead of giving a time and supporting the body to heal itself. Doctors have limited time to investigate patient (that could be enough in emergency situations), but there is no time to get to know patient, to find out what is blocking patients from healing. Emerging concept of slow medicine is beginning to address these problems undertaken by viriditas.

Conclusions

Already in the twelfth century the viriditas of Hildegard organically comprised the findings whose importance has been neglected and that we are just slowly recovering nowadays.

Latvian Medical Illustrator for a Nobel Prize Winner

Prof. *Juris Salaks*¹; Prof. *Aigars Pētersons*²

¹ *Rīga Stradiņš University, Institute of the History
of Medicine, Latvia;*

² *Rīga Stradiņš University, Latvia;
Children's Clinical University Hospital, Latvia*

Objectives

To explore the collaboration between Latvian artist Jānis Cīrulis (1908–1995) with distinguished physicians, as well as his contributions by producing illustrations for international medical textbooks.

Methods

Primary sources: The personal archive of Cīrulis from the Latvian National Archive and the Pauls Stradiņš Museum of the History of Medicine, bringing historical and issue-related chronological methods to the study.

Results

Jānis Cīrulis was graduated from the Latvian Academy of Art in 1934 as an artist and decorator. His plastic anatomy teacher was Professor Jēkabs Prīmanis, with whom he maintained contacts after emigration in 1945, first to Sweden and then, in 1956, to the United States, where Prīmanis was also living. Between 1960 and 1991, Cīrulis worked seriously as an illustrator of general and paediatric surgery and cancer research at the Harvard University School of Medicine in Cambridge. This required deeper knowledge about anatomy, and the artist spent all of his time at the hospital, carefully observing operations and then producing drawings that were later improved and completed after interviews with surgeons. The artist used a *tote-washing* technique that highlighted details with an exact half-tone shade.

Cīrulis' masterpiece was a set of more than 1,000 illustrations for Professor Richard Warren's book "Surgery" in 1963. This was followed by illustrations for Robert Smith's "Anaesthesia for Infants and Children" (1968) and Robert Gross' "An atlas of children's surgery" (1970). Later in life he illustrated the capital achievement of J. M. Folkmann, *Angiogenesis*. Cīrulis also provided illustrations for Professor Joseph E. Murray's (1919–2012) book on surgery. These drawings were produced at the Peter Bengt Brigham Hospital in Boston. In 1990, Murray received the Nobel Prize in physiology and medicine for his discoveries concerning organ and cell transplantation in the treatment of human diseases.

Conclusions

Harvard Professor A. J. Erkalis wrote in 1971 that "Janis Cirulis illustrations have received the highest acclaim from surgeons and publishers alike as works of art. The standards of technical perfection and artistic quality have enabled the teachings of members of the Harvard Medical School surgical staff to be clearly understood by students of surgery throughout the world".

Contribution of Professor Modris Melzobs to Development of Pharmacology in Latvia: Commemorating his 90th Birthday

Prof. *Santa Purviņa*; Prof. *Antons Skutelis*;
Dr. *Ardijs Ranks*; Prof. *Jānis Baltkājs*

Rīga Stradiņš University, Department of Pharmacology, Latvia

Objectives

Professor Modris Melzobs was the Head of the Department of Pharmacology for many years, he was an outstanding scientist, educator and scientific organiser.

Methods

To explore the areas of Modris Melzobs's (1927–2014) scientific and educational work and his contribution to the development of pharmacology as well as authorisation of medicines in Latvia. Research is based on scientific publications by Professor Modris Melzobs and archive documents.

Results

Modris Melzobs was the first student to graduate with excellence from Alūksne Secondary School in 1947. After that he enrolled in the Faculty of Medicine of the University of Latvia, subsequently transformed into Riga Medical Institute in 1950. After graduating with excellence, he became a post-graduate student in pharmacology supervised by the outstanding scientist Maksis Beļņkijs. In 1957, he defended his Candidate of Sciences thesis. Already while being a post-graduate student, he became a lecturer at the Department of Pharmacology, and after receiving a scientific degree also joined its administration. He was the Head of the Post-Graduate Section, the Pro-Dean of the Faculty of General Medicine and, after Maksis Beļņkijs passed away, the Head of the Department of Pharmacology (1966–1994). Modris Melzobs was developing teaching aids in Latvian. Four textbooks and 10 teaching methodology guidelines were published with his participation.

In 1974, Modris Melzobs defended a Habilitated Doctor of Medicine thesis. His scientific research focussed on myotropic, anaesthetic, antihistamino, adrenergic, cholinergic, antioxidant compounds and calcium antagonists. He gave presentations at scientific conferences of the Baltic Republics and the USSR as well as international conferences and congresses in Prague, Warsaw, San Francisco, Helsinki and Paris. He was a visiting lecturer at Tartu University. Modris Melzobs is the author of 230 scientific publications as well as five inventions. Five doctoral theses have been developed under his supervision, and he was a reviewer of 30 doctoral theses.

In addition to his educational and scientific work, Modris Melzobs was the founder of the Latvian Society of Pharmacology and was its President for many years (1972–1995), a member of the Editorial Board of the journal of Pharmacology and Toxicology, the Head of the Republican Programme for Development and Research of New Medicines and the Head of the Rationalisation and Inventions Bureau of the Health Protection Ministry.

After Latvia restored its independence, Professor Modris Melzobs undertook organising the legitimation and authorisation of medicines, initiated the publication of periodicals for the Medicinal Product Register of Latvia. He was the first Head of the Pharmacology and Pharmacopoeia Committee, subsequently transformed into the State Agency of Medicines of Latvia (SAMLV) (1990–1994). Until his retirement in 2000, Professor Melzobs was the Head of the Pharmacology Department of the SAMLV and the Chairman of the Medicines Marketing Authorisation Department of the SAMLV.

Professor was awarded the title of State Emeritus Scientist and awarded honorary medals named after outstanding scientists, such as Kravkov, Schmiedeberg, Grindel.

Conclusions

Modris Melzobs was a colleague, scientist and educator, an extremely educated and intelligent, possessing versatile knowledge and following high ethical standards.

Different Time: Photography of Janis Rieksts within the Collection of Pauls Stradiņš Museum for History of Medicine

Inese Bondare

*Pauls Stradiņš Museum for History of Medicine,
Collection Department, Latvia*

Objectives

To identify and evaluate the collection of photographs of Janis Rieksts in the museum.

Methods

Historical research methods.

Results

110 years ago, at 17 Aleksandra Street (now at 41 Brīvības Street), photostudio was opened by photographer Janis Rieksts (1881–1970). Now on the building wall there is a sign: “Pub – “A Different Time””. Due to Rieksts great contribution “a different time” is still alive and begging to be explored further today.

Rieksts talent in taking portraits are characterized in 13 photos: portraits of well known medics such as Professor Peter Snikeris, Prof. Janis Jankovskis, Dr. Marija Vecrumba.

The collection includes the photo of famous folklorist Krisjanis Barons in family circle of their son Karlis (founder of the Latvian University Dental Institute) in 1909, and a photo from the first Latvian Physician and Dentist Conference in 1925.

The activities of the Latvian Red Cross are documented in photos: the medical and auxiliary rooms of hospital can be seen as well as medical staff and patients. The collection contains pictures of chemical pharmaceutical factory “Eikert, Marshall&Co”. Rieksts has been recognized as outstanding First World War photojournalist. The vital importance of Rieksts photography in the preservation of historical and personal memories is illustrated by postcards placed into an album by pediatrician Jekabs Nimanis with pictures of soldiers defending Riga and the eternal flame from Brethren Cemetery.

Conclusions

The Museum collection holds 80 photos taken by Janis Rieksts and three postcards issued in the first half of the 20th century. This allows assessing the importance of photographer work in documenting the history of Latvia, including the development of medicine.

At the beginning of the 20th century and in the 1920s & 30s, Latvian photographers made an invaluable contribution to the formation of Latvia State. Photographs of Janis Rieksts are valuable evidence of the history of Latvia’s medicine.

Distinguished Palaeontologist and Owner of Zarnikau Estate, Christian Heinrich von Pander

Maija Pozemkovska

*Rīga Stradiņš University, Institute of the History
of Medicine, Latvia*

Objectives

An examination of the global leader of palaeontology Christian von Pander, his life in Zarnikau, and papers that he published about Devonian Era fossils that he had collected in Latvia.

Methods

Use of materials from the Latvian State Historical Archive, the St Petersburg branch of the Russian Academy of Sciences, the St Petersburg Mining University Museum (the Pander collection), the Russian National Library and the Library of the University of Latvia (books by Pander) to organise historical research aimed at gaining new knowledge about Pander and his achievements in science.

Results

Born and raised in Rīga, Christian Heinrich von Pander (1794–1865) was a scientist of global renown in the 1820s, and he is seen, with good reason, as the father of palaeontology in the Russian Empire. Pander was also known as an outstanding embryologist and geologist, and Devonian Era fossils that he found in Latvia are stored at the St Petersburg Mining University.

Pander studied medicine at Dorpat, Berlin, Göttingen and Würzburg. He earned his doctorate in 1817 after defending a dissertation on the development of chickens while they are still embryos in an egg.

Pander was a member of the Leopoldina academy (1818), also a member of the Imperial Academy of Sciences (1821–1827). Pander received the Demidov Prize for outstanding achievements in science (1857) for his work – the first monograph devoted to Devonian Era fish in the Baltic region, correlating the results of many years of careful examination of the relevant fossils.

Conclusions

Pander wrote about Devonian armoured fish in the ancient Gauja (Aa) River valley, Lake Burtnieks, as well as fish from the Silurian system. The fossils were all donated to the Mining Institute in St Petersburg, where Pander worked from 1844 until his death in 1865. Darwin declared von Pander to have been a predecessor for his theory of evolution.

Leutners and Professor Gaston Backman

*Maija Pozemkovska*¹; Prof. *Alīda Zigmunde*²

¹ *Rīga Stradiņš University, Institute of the History
of Medicine, Latvia;*

² *Rīga Technical University, Institute for Humanities, Latvia*

Objectives

Research the two families of the Riga entrepreneur Alexander Leutner (1864–1923) and the Swedish scientist Gaston Backman (1883–1964).

Methods

Use the collections of the archives and museums of Latvia and Sweden as well as printed media with methods of historical research and comparative methods; to find out lesser known and new facts about the Backman and Leutner families and their achievements in different areas.

Results

Alexander Leutner produced bicycles. He was one of the best known entrepreneurs in Riga at the end of the 19th and begins of the 20th century. His wife Jenny Elisabeth Leutner (1876–1976) was of German nationality. Their daughter Nadezhda (1898–1976) got married on July 4th 1927 in Riga to the Swedish professor of anatomy and anthropology Gaston Backman. He worked at the University of Latvia (1920–1925). He got to know Nadezhda at the Anatomicum, because she was able to produce valuable lung preparations. When the Second World War started Nadezhda and her husband wanted that J. Leutner resettle to Sweden. In October 1939 professor Backman demanded a passport for his mother-in-law so that she could come to Sweden. He got permission for her to come to Sweden. But finally he found out that she had already left Latvia. On November 1939 she took part in the resettlement of the Baltic Germans to the German Reich into the Poznan area. Her final days she passed in Sweden.

Conclusions

Different studies and research about Professor Backman looked at his scientific and pedagogic activities, but the life and success of a scientist results also from the support he gets from his family. Backman had a strong love for Latvia, but because of different circumstances he had to leave Latvia. After he returned to Sweden in 1925 he was still interested in Latvia and took part in a Swedish-Latvian association.

Prizes Awarded by Latvian Red Cross (1922–1940) in the Collection of Pauls Stradiņš Museum of the History of Medicine

*Ilze Bule*¹; *Laima Kostrica*²; *Mārtiņš Vesperis*¹

¹ *Pauls Stradiņš Museum for History of Medicine, Latvia;*

² *National History Museum of Latvia*

Objectives

Examination of the collection of Latvian Red Cross prizes in the collection of the Pauls Stradiņš Museum of the History of Medicine (MVM) and the people who received them.

Methods

Latvian State History Archive, MVM card catalogues, periodicals.
Content analysis, historical method.

Results

Originally the Latvian Red Cross introduced a three-level system of prizes; the first award took place in 1922. In the 1930 introduced a four-level system of prize: these included the Cross of Honour, the Sign of Honour, the Sign of Recognition and the Badge of Honour. The prizes were awarded for special contributions, work done by the administrator, long years of successful work, as well as hard work. When the system was expanded, prizes received during the earlier period could be exchanged for awards for the new design. All told, between 1922 and 1940, the Latvian Red Cross awarded 1,033 prizes. The collection of the MVM has 19 such prizes, and another 13 have been found at other museums in Latvia. People could receive various prizes of various levels over the course of time.

Conclusions

The collection of the MVM has all four levels of prizes, both the initial and the new design. These include the Cross of Honour, 1st degree (4 prizes), Sign of Honour, 2nd degree (7 prizes), Sign of Recognition, 3rd degree (7 prizes), and Badge of Honour, 4th degree (1 prize). Only in four cases were researchers unable to determine the recipient of the prize. Known recipients include several doctors, including Kārlis Barons (1925), Ernests Putniņš (1925), Edgars Francmanis (1927), Paula Vitenberga (1930), Rūdolfs Skaidrais (1933) and Vladimirs Stiprais (1934), nurses, including Justīne Kuške (1925), Ebba Krēmane (1928), Alīda Tilika (1928, 1937), Ženija Bormane (1930), Olga Indzere (1936) and Līdija Buivide, as well as journalist Jānis Akmens (1925) and teacher Emma Marija Akmens (1939).

From Cestoda to Ursus: Use of Animal Image in Medical Posters

Inga Vigdorčika

*Pauls Stradiņš Museum for History of Medicine,
Department for History of Medicine and Exposition, Latvia*

Objectives

Since the end of the 19th century the poster has developed as one of the means how to communicate with public. Through a study of the poster collection of Paul Stradin's Museum of History and Medicine, to find out how animal images are used in medical posters to influence public opinion on important issues dealing with human health and the solutions to these problems.

Methods

Structural-functional. Historically comparative.

Results

From the 998 medical posters used in the study, 714 can be marked with an exact year of issue. They cover the period from 1910 to 2012. Most of them (611) were issued in the 1960's and 1970's by the USSR and approved by the USSR Ministry of Health. 33% of the posters use animal images. They include representatives of all animal species (mammals, birds, insects, reptiles, amphibians, fish). In some cases the animal image has been used to bring to the attention the role of these animals in spreading certain diseases and to warn the public of the dangers of being in contact with these animals, and to encourage their extermination (flies, rats). Other animals have become metaphors and personifications (fox, bear). In some cases recognisable characters of fairy tales and fantasies are used.

Conclusions

The museums poster collection provides a valuable insight into the strategies used by USSR in promoting questions relating to health and health politics, namely, into using posters as an important and effective way to influence public opinion. Animal images play an important role in these posters – throughout using animals images, the society is introduced to the origin, course, distribution, consequences and prevention of various diseases and is encouraged to act according to the situation in order to prevent infection and further spread of the disease.

Collection of Books Owned by Riga Physician Johann Bavarus (1575–1636)

Diāna Klešnika

Rīga Stradiņš University, Latvia

Objectives

The Academic Library Handwriting and Rare Book Department at the University of Latvia includes several books about medicine that are stamped with the words “Ioannes Bavarus D.”, which created in-depth interest about this individual.

Mission: To find out what is known about this doctor from the first half of the 17th century, also examining the most important medical books that were part of his private library.

Methods

Historical method.

Results

The father of Johann Bavarus Junior (1575–1636), Johann Bavarus Senior (?–1601) arrived in Rīga in 1585, possibly from Bavaria. His father held a doctorate in medicine and worked as a physicus in Rīga. The son studied medicine at the University of Padua, and in 1617, he was elected as the vice-physicus of Rīga. During the course of his life, Bavarus accumulated a substantial number of books about medicine, the natural sciences, linguistics, as well as religious books, including five incunabulas. Bavarus' will left the books to the Rīga City Library (est. 1524).

Among the most important books are *Liber pandectarum medicinae*, which was written by Matthaeus Silvaticus and published in Venice in 1480. It is seen as one of the first medical lexicons in history. Also important is *De medicamentis empiricis* by Marcellus and *Libri novem* by Galen, with commentary by Jan Kornarius, published in Basel in 1536. There is also a large and colourful book containing texts by Hippocrates that was published in Venice in 1588.

Conclusions

Little is known about Bavarus' life and work. Texts about him mostly relate to his large number of books. It is not known how many books he donated to the library because of preservation problems over the course of the centuries. This particularly applies to a fire in 1941 which destroyed approximately 90% of the collection, including card catalogues and registration lists.

Training in Preventive Medicine in Latvia for Nearly a Century

Jānis Indulis Dundurs

Rīga Stradiņš University, Department of Occupational and Environmental Medicine, Latvia

Objectives

In 1921, the main preventive area of medicine – Hygiene Institute – were established at the first Latvian Higher School, which can be considered as the predecessor of the Department of Occupational and Environmental Medicine, where students are trained in the basic field of preventive medicine – Occupational and Environmental medicine. This year, in the 100th anniversary of the proclamation of the State of Latvia, this event, along with other developments in medical development, should be remembered and noted. The aim was to trace the course of nearly a century the changes in medical and health professionals training in preventive medicine.

Methods

Various materials (descriptions, photographs, documents, narrative stories, etc.) were collected in archives and personal collections to prepare the review.

Results

In the same year, the Department of Hygiene was established. Students training in the department was carried out according to the research and findings of the 19th century. During the first years of the post-war Soviet occupation the training took place in the programs developed by the Soviet Union.

Along with our country's independence restoration of preventive medicine was given a much larger scale, the program was designed after the latest findings concerning the medical sector – hygiene and life sciences sectors – human ecology close interrelationship.

The integration of training in the content and form of hygiene and ecology contributed to the qualitative preparation of future doctors in both preventive and ecological directions.

Since 1990 department was renamed by the Department of Occupational and Environmental Medicine. In recent years, programs for six medical faculties have been renewed, new textbooks, methodological materials in Latvian and English have been written.

Conclusions

There have been significant positive changes in the training of preventive medicine towards the creation and quality assurance of a single European Higher Education Area.

Sexual Dissent and Categorized Soviet Citizens: Sexually Transmitted Disease Policy in Soviet Latvia from Khrushchev to Gorbachev (1958–1985)

Dr. Ineta Lipša

University of Latvia, Institute of Latvian History

Objectives

The paper explores the elaboration of sexually transmitted disease policy in the Soviet Latvia through the categorisation of Soviet citizens, focusing on gender and sexual dissent from 1955 to the 1985 decree of the Ministry of Interiors of the USSR, that lead to the termination of the operative group at the Administration of Riga City Militia which had been established in 1965 for the purposes of fighting STDs.

Methods

The research is primarily based on archival documents, elaborated both by the Ministry of Health Protection and the Ministry of Internal Affairs. Both agencies worked in collaboration.

Results

The paper will provide an analyses on how instruments of the compulsory sexual contact tracing system and the filing system of surveillance agencies (the militia and the Republican Venereological hospital) as the surveillance mechanism were elaborated and how they changed the attitude of the Ministry of Interiors in regards to its involvement in the fighting of STDs.

Conclusions

The mechanism of surveillance was established, which marginalized and sexualized particular categories of Soviet citizens as morally questionable persons. A key target group to be controlled were persons, who avoided socially useful work and led 'an amoral and parasitic lifestyle', namely, 'prostitutes, runners of deprived establishments, pimps, homosexuals'. The secret decrees on the fighting the STDs issued by the Central Committee of the Communist Party of the Soviet Union and the government of the Soviet Union were duplicated on the level of the Latvian SSR with a varied intensity, which depended on the STDs statistics.

Development of Exhibition “Anatomical Hermitage”

Victoria Gavrilina; Prof. Andrey Akopov

*Pavlov First St. Petersburg State Medical University,
Department of Clinical Anatomy and Operative Surgery,
Russian Federation*

Objectives

The level of knowledge of the human body structure among the population is rather low. At the same time, such knowledge is part of the common culture.

Methods

An analysis of the visits to the anatomical exposition was carried out among several groups of visitors: physicians, museum employees, pupils and students, tourists. “Anatomical Hermitage” consists of 6 exhibitions devoted to different sections: the central nervous system and sensory organs, internal organs, the skeletal system, radiological anatomy etc.

Results

The history of our museum started in the beginning of 20th century, however, it opened its’ doors for wide public only in 2017. At the current moment the amount of visitors is increasing each month. Professionals get acquainted with different methods of embalming, anatomical sections on Pirogov, unique specimens made by Prives’ method, modern plastination method. Pupils are able to look into the inner world of human being, which will open many secrets and unclear moments of the human body. Guys have the opportunity to ask any question about health and talk about “delicate” topics and also decide whether they want to connect their life with medicine or not. Residents and guests of St. Petersburg have a unique opportunity to visit the historically significant building, find out about the history of the anatomy in Russia and in the world and a lot of interesting facts about our body.

Conclusions

“Anatomical Hermitage” is of interest to all visitors, and depending on the age and occupation, they find their own interest, the solution of their current problems and raise educational level in health care field.

Upsala Notes by Nicolaus von Himzel

Artis Ērglis

Pauls Stradiņš Museum of the History of Medicine, Latvia

Objectives

Explore the involvement of an educated society in Riga in the European academic and social environment of the 18th century with the example of Nicolaus von Himzel.

Methods

Primary sources: Nicolaus von Himzel's travel notes, using historical chronological and comparative methods.

Results

Riga City doctor Nicolaus von Himzels (1729–1764) is travelling around a Europe from 1752 to 1757 after obtaining a doctore degree at Göttingen University in 1751. He visits in Upsala in 1756 on August 6–12. The descriptions of Upsala are given on twenty-one pages (pages 354 to 374 of Volume 3 of the travel diary).

Himzel provides a description of Upsala, of the librarie and the Observatory. Especially Himzel describes a meeting with the rector of Upsala University, Carl Linnaeus (1707–1778). He brings a variety of materials from his “Friends of London” to Linnaeus. They meet for three days on 9, 10 and 11 August, meet the herbarium, the fossils, the botanical garden, with the J. Ellis construction microscope studying the Coral Collection. They also meet in a private atmosphere. Linnaeus shows to Himzel the new manuscript and gives Himzels a number of dissertation disputus of his students. The description consists three drawings, an instrument, a container and a part of the plant, the meaning of which should be clarified. Karl Linnaeus gives Himzel letters of recommendation for a further trip to Falun, where he meets Swedish mining.

Conclusions

The example of Nicolaus von Himzel shows well the involvement of Riga in the academic and cultural circulation of 18th century Europe. The study makes public the contents of the previously unexplained descriptions of Himzell's journey and conducts the text research.

Professor Pauls Stradiņš in Arts

Ilze Lementujeva

*Pauls Stradiņš Museum for History of Medicine, Latvia,
Collections department, Latvia*

Objectives

There was a task to identify all portraits of prof. Pauls Stradiņš in the collection of the Pauls Stradiņš Museum for History of Medicine.

Methods

To explore those materials a historical comparative method was used.

Results

Professor Stradins believed that even a weak artwork was better than the best photography. Therefore, he encouraged artists to create portraits of significant doctors for the museum. Due to his modest character, he posed little for his own portraits. Most of them were created after the Professor's death by using photos.

As a result, 7 oil paintings, 5 wooden intarsias, 3 pencil drawings, 3 ceramic medals, 2 bronze medals, a dyed stucco bust, a bronze bust, an undyed stucco model of the award, a charcoal drawing, an ink drawing, an ink caricature, a print of exlibris, a watercolour and low reliefs of wood and clay were found in collection. There are 31 divergent portrait. The collection also stores the Stradins Prize in five copies, postage stamps and envelopes on which the watercolour is reproduced.

Authors of the works: A. Jupatovs, L. Kokle, A. Partizpanjans, M. Polis, I. Ranka, I. Stradina, J. Strupulis, V. Zeile, etc.

Every portrait has a different view. Part of them are representative. Works of Irena Stradina, the daughter of Professor, stands out with the most intimate interpretation. She sketched him in rare moments of rest and used as a model for her diploma painting "Nikolay Pirogov in the lazarette of Sevastopol". Consequently, the drawing and painting with Pirogov are also included in the total number of portraits.

Conclusions

In conclusion, the artworks, although produced between 1947 and 1983, represent the Professor at different stages of his life from 1923 to the mid-50s of the 20th century. There is a great variety both of technology and of content.

Medical Education in Liepaja – from Patient Attendants to Medical Nurses

Lāsma Gaitniece

*Rīga Technical University, Faculty of E-Learning
Technologies and Humanities, Latvia*

Objectives

To study Liepaja hospitals as historically significant institutions involved in training of medical staff in Kurzeme starting with their origins in 1830 until present.

Methods

Historical research methods, materials from the State Archive of Liepaja Region and Latvian libraries.

Results

1830 is considered the year of origination of Liepaja hospital, when the first health care facility was arranged in a wooden barrack. The first attempts to educate and train medical staff in Liepaja date back to 1905. Patient attendants were trained on the hospital premises so that they could take care of the patients suffering from infectious diseases.

In 1919, when a surgeon Dr. med. Jēkabs Alksnis became the head of Liepaja hospital, the courses for patient attendants acquired the status of an educational establishment. Being aware of the role of adequate patient attendance, J. Alksnis developed the program for training of the sisters of charity. Liepaja Medical School was established in 1945 and it worked until its reorganization in 2004, when it was transformed into Liepaja Medical College. On 14 May 2010, the college became part of Rīga Stradiņš University, and its name was changed to Liepaja Medical College of Rīga Stradiņš University. Since 1945, more than 3400 nurses, nurse assistants, physician assistants, birth attendants, health and sports specialists, and masseurs graduated from the educational establishment. Currently, it is the only educational establishment in Kurzeme that educates and trains medical staff. The school educates and trains about 200 students annually.

Conclusions

Liepaja hospitals historically performed educational role and they keep performing this role also at present.

Novel Technique for Radiation Dose Visualisation in Large Space

Martins Piksis

Liepāja Regional Hospital, Radiation Safety Department, Latvia

Objectives

Radiation protection planning could be greatly enhanced by providing staff with a simple and easy to use tool to make source simulations and generate 3D visualizations.

This study sought to create the 3D visualization method that any potential user could emulate and adapt for any of a variety of purposes. Furthermore this software could be a useful tool for generation of 3D visualizations for augmented reality applications.

Methods

A field is divided into a set of finite elements with each element containing a series of bounds, an intensity value and a central coordinate. Each element is considered to act as a single representation of an intensity value for a field within the local bounds of that element. These elements are geometrically simple shapes such as cubes or boxes. These individual elements can be thought of as a physical representation of a volumetric pixel (voxel) [4]. Voxels can be used to represent data in a three-dimensional space as they contain both a physical location and a value at that location.

Results

Method accuracy was evaluated in the following stages:

- 1) assessment of the radiation source Monte Carlo model accuracy relative to the measurements in water phantom;
- 2) visualized dose model accuracy relative to the KERMAAIR measurements – point dose in software compared with measured dose at specified coordinate in room.

For further evaluation of the program was created the linac bunker 3D model, with virtual radiation source (Linac) inside.

Point doses from model was taken for 46 points and compared with measured dose under the same conditions.

Results obtained vary between 3.54% and 10.09%. In addition, there is a trend that the error increases with increasing distance from isocenter. It could be explained by the fact that the precision of measurement is less at lower dose rate.

Conclusions

In this study, a novel methodology for the display of 3D radiation fields was developed. New approach was formulated which focused on keeping the field definition process separate from the modeling process to maximize potential definition techniques. The types of expected issues associated with 3D radiation field visualizations were discussed and analyzed.

Perception of Usefulness of Clinical Skills in Medical Students and Young Doctors

Marija Jurčenko¹; Dr. med. Oļegs Sabeļņikovs²

¹ *Rīga Stradiņš University, Faculty of Medicine, Latvia;*

² *Rīga Stradiņš University, Department of Clinical Skills and Medical Technology, Latvia*

Objectives

Different perception of usefulness of clinical skills is a common issue among undergraduate medical students. After graduation, when young doctors are exposed to clinical work some clinical skills obtained during undergraduate studies may be re-evaluated.

The aim of this study was to compare perception of clinical skill usefulness among undergraduate medical students and young doctors.

Methods

Sixth-year medical students and the first-year residents of Rīga Stradiņš University were asked to name the most and the less useful clinical skills acquired during undergraduate studies. Three most frequently mentioned skills were identified in the both responders' groups.

Results

67 respondents completed the survey – 39 (58.2%) residents and 28 (41.8%) medical students. The total 67 answers out of 386 people in both groups resulted into 17.4% response rate. In students' group the most useful skills were cardiopulmonary resuscitation (CPR) (n = 20, 71.4%), i/v injections and infusion (n = 17, 60.7%), respiratory support (n = 6, 21.4%); as less useful – obstetric skills (n = 7, 25.0%), i/v injections and infusion skills (n = 6, 21.4%) and otoscopy (n = 4, 14.3%) got the same score as endoscopy (n = 4, 14.3%).

In residents' group the most useful were CPR (n = 26, 66.7%), i/v injections and infusion skills (n = 24, 61.5%), surgical suturing (n = 10, 25.6%); as less useful – obstetric skills (n = 7, 17.9%), gynaecological skills (n = 6, 15.4%) and otoscopy (n = 6, 15.4%).

Conclusions

Sixth-years medical students and first year residents have a quite similar perception of usefulness of clinical skills acquired during undergraduate studies. CPR skills were mentioned as the most useful by both groups. There are not common opinion regarding i/v injection and infusion skills amongst medical students. Medical residents have clearer vision regarding usefulness of clinical skills.

Patient Death in High-Fidelity Simulation – Outcomes Measuring Medical Student Self-Confidence and Emotions

*Dr. Ardis Bērziņš¹; Dr. Jekaterina Jagodzinska-Peškova²;
Dr. med. Oļegs Sabeļņikovs²*

*¹Rīga Stradiņš University, Faculty of Continuing Education,
Department of Clinical Skills and Medical Technology, Latvia;*

*²Rīga Stradiņš University, Department of Clinical Skills
and Medical Technology, Latvia*

Objectives

Psychological fidelity is an important aspect of simulation-based medical education (SBME). The benefits and disadvantages of simulated patient death (PD) in SBME remain unclear. The authors of this study hypothesize that simulated PD may be beneficial as a teaching tool in order to prompt reflective thinking among medical students.

This research attempts to evaluate the effects of simulated PD compared to return of spontaneous circulation (ROSC) on medical student self-confidence and emotional self-assessment.

Methods

This observational study included 30 volunteer participants – third to sixth year medical students with varying experience in high-fidelity CPR training. The volunteers were randomized in two groups with predefined simulation outcomes – either PD or ROSC. After simulation and debriefing the volunteers completed a self-assessment survey stating their initial emotional response and self-confidence.

Results

No significant self-confidence evaluation difference was found among the compared volunteer groups. A wide range of emotional response was recognized among the volunteers. From the 30 volunteers that completed the self-assessment survey 11 students stated that their confidence has increased (5 PD vs 6 ROSC) and 11 students stated that there was no change in their confidence (6 PD vs 5 ROSC) and in 8 cases the volunteers noted a decrease in their confidence (4 PD vs 4 ROSC). Overall impression based on volunteer self-assessment ranking tended to show more signs of reflective thinking in the negative outcome group.

Conclusions

Patient death as a teaching tool has no negative effect on medical student self-confidence. Patient death in high-fidelity simulation tends to promote beneficial reflective thinking to a greater degree compared to positive outcome scenarios.

Telementoring for Simulation Instructor Training and Faculty Development

*Dr. med. Reinis Balmaks¹; Dr. Luīze Bidiņa²; Travis Whitfill³;
Dr. Marc Auerbach³; Ph.D. Isabel Gross³*

¹ *Rīga Stradiņš University, Department of Clinical Skills
and Medical Technologies, Latvia;*

² *Rīga Stradiņš University, Department of Pediatrics, Latvia;*

³ *Yale School of Medicine, United States*

Objectives

We aimed to explore the use of remote simulation faculty development in Latvia using telesimulation and telementoring with an experienced debriefer located in the United States (US).

Methods

This was a prospective, simulation-based longitudinal study. Over the course of 16 months, the experienced remote instructor (RI) from the US mentored the local instructor (LI) in Latvia remotely, facilitating and debriefing simulations with teleconferencing. The facilitation and debriefing responsibility gradually transitioned from the RI to the LI throughout the progression of the study. At the end of each session, the Debriefing Assessment for Simulation in Healthcare (DASH) student version form (DASH-SV) and a general feedback form were filled out by the participants. Facilitation of simulation was assessed by the LI using the instructor version of the DASH form (DASH-IV). Outcome measures were the changes in DASH scores over time.

Results

A total of eight simulation sessions were co-facilitated over a period of 16 months. The debrief quality measured with the DASH-IV did not change significantly over time, while the DASH-SV score decreased statistically significantly from a total median score of 89 (IQR 86, 98) to a total median score of 80 (IQR 78, 85) ($p = 0.005$).

Conclusions

Telementoring is a promising, scalable modality to build local simulation expertise while promoting sustainability of high-quality simulation and learning.

Self-Learning for Medical Professionals – Is It Good or Bad?

*Dr. med. Anna Miskova¹; Prof. Dace Rezeberga¹;
Dr. Marina Šarkele²; Dr. med. Oļegs Sabeļņikovs²*

*¹ Rīga Stradiņš University, Department of Obstetrics
and Gynaecology, Latvia;*

*² Rīga Stradiņš University, Department of Clinical Skills
and Medical Technology, Latvia*

Objectives

It is necessary to continue to learn for all health care professional during their carrier in medicine. Different models of teaching and learning are recommended for medical professional. Self-learning is known to be an effective learning method for students in higher education. This method needs high motivation of the student. The aim of this study was to establish the role of self learning for doctors, midwives and anesthesiological – intensive care nurses who participated in obstetrics emergencies trainings necessary for further certification.

Methods

The study took place in Riga Maternity hospital from October 2018 till January 2019. Four multidisciplinary simulation trainings in obstetric emergencies for the staff were organised. Certified obstetricians, anaesthesiologists, midwives and anesthesiological – intensive care nurses all together 80 persons participated in the trainings. For three groups theoretical material for self-learning was provided a week before the simulation course. One group had nothing to learn before the practical course. All the participants had a pretest immediately before the simulation course, which consisted of 20 questions based on material for self-learning and local medical protocols. Academical stuff (medical teachers) were excluded from the study.

Results

From 80 participant only 63 participants give back the results of their self-learning assessment and 4 persons were academical stuff, so 59 pretest results were analysed. There was no statistically significant difference between the groups. In the self-learning group (n = 42) the average test result was 56.4% (50.3–70.5%). Participants from the group nothing to learn (n = 17) in average had 55.3% of correct answers (40.3–68.7%). Academical stuff (n = 4) demonstrated very good results in average 95.6%.

Conclusions

Self-learning is a very low efficacy learning method for the medical professionals.

Video Visit in Home Care

Iveta Ozoliņa¹; Ilona Zariņa²

¹ *Rīga Stradiņš University, Faculty of Public Health and Social Welfare,
Department of Welfare and Social Work; Latvia;*

² *Rīga Stradiņš University, Faculty of Public Health and Social Welfare,
Department of Nursing and Midwifery, Latvia*

Objectives

The aim of the literature review is to record relevant literature on the video visit and its application.

Methods

Design. An integrative literature review as part of the master thesis. Method. Data collection comprised a literature search in data basis EBSCO, SAGE Publications, Science Direct, PubMed, Cochrane Database.

Results

This review shows that in most studies the video visit service is delivered on a daily basis and in combination with in-person visits. The findings suggest that older or people with health problems and home-dwelling patients can benefit from video visits in terms of enhanced social inclusion and medication compliance. Service clients and their caregivers found video visits satisfactory and suitable for care delivery in home care to the elderly.

Conclusions

1. Video Visit (VV) is a preventive communication, support and security system for clients of all ages, especially for older customers.
2. VV is an innovative and up-to-date approach to customer care using cutting-edge technology tailored to social and health care.
3. The quality of customer service is improved with the help of the VV service, taking into account not only the client's physical but also respecting the client's needs for communication.
4. VV reduces isolation, promotes socialization and social inclusion.
5. A VV customer can be used without prior technology experience. On - line is an opportunity to add many different advices (doctor, ergoter, psychologist, lawyer, etc.).
6. With the help of VV, it is possible to get to the client in minutes, in any weather conditions, which allows to significantly reduce labor costs.

Edutainment, Gamification and Effective Training: SIMCUP Experience

Prof. *Pier Luigi Ingrassi*

Università del Piemonte Orientale, Italy

It has been demonstrated that simulation can meet the general educational goals of transfer of knowledge, strengthening of cognitive strategies, and skill development while adding a dimension of team training.

An important change in medical and nursing education is the arrival of millennial students. To ensure success, medical educators need to know and accept the unique characteristics of these new learners.

The use of gamification is becoming more and more popular to motivate teaching and learning, also in the medical field. Gamification is the process by which users are encouraged and enticed to perform tasks by incorporating elements of game design and competition. Inherent reward and enjoyment can foster motivation. The effectiveness of competition in medical education has been well supported in the literature.

Taking inspiration from the SimWars, the competition format was modified and a new simulation competition was designed with the aim of engaging participants to partake in deliberate practice and to experiment using different types of simulations and simulators. The education value of this new format will be demonstrated. Our 4-year experience with SIMCUP and its grounding pedagogical and educational rationales will be reported.

Role of Simulation-Based Medicine in Quality and Safety of Medical Care

Juergen Lorenz

*Hamburg Applied Science University, Faculty of Life Science,
Department of Biomedical Engineering, Germany*

Simulation-based medical education (SBME) has made significant progress within the last decade. The series of baltic sea symposia on simulation and virtual reality for health care education and patient safety started in 2016 in Riga and aims to update and share the experiences and research in the field of SBME within the medical education community of the associated universities. This review focusses on the major features of SBME with special emphasis on knowledge and skill acquisition in critical care procedures in pre-clinical settings and inter-professional training scenarios of mass casualty victims. Four areas will be addressed and discussed: i) selection of simulation modality and fidelity; ii) integration of curricular content for technical and non-technical skills; iii) definition and record of outcome measures; iv) feedback and debriefing.

Transforming the Challenge of Working with a Mixed Proficiency Class into an Educational Advantage

Svetlana Muhejeva; Nīna Zazerska

Rīga Stradiņš University, Language Centre, Latvia

Objectives

Working with mixed proficiency classes is considered to be a major challenge in TEFL (Teaching English as a Foreign Language). The present research focuses on teaching the English Sports and Fitness Terminology course. In this course, students have considerable fluctuations in their English proficiency levels. Apart from that, their age, knowledge and experiences in the chosen specialty differ as well. The goal of the present research is to develop a systematic approach to working with seemingly discrepant student groups.

Methods

Both qualitative and quantitative research methods are employed through needs analysis questionnaires, class activities observation, test result analysis (79 students), and end-of-course surveys (50 students).

Results

Bearing in mind that the aim of the TEFL course for Health Sports specialists is to enhance their communicative skills, the pivotal role is given to the vocational component, since the students' avid interest in their chosen specialty offers the common ground to foster group cohesion. Another essential course component is learners' autonomy and initiative which allows more proficient students to provide linguistic input whereas less linguistically proficient learners may be valuable vocational input providers. Thus, every participant makes a substantial contribution to the course. Furthermore, a wide variety of linguistic task types ensures the adaptability of the course teaching materials to students' needs.

Conclusions

Although challenging, teaching a mixed proficiency class may offer a distinct advantage of involving all level learners in true-to-life meaningful communication. To gain this advantage, a well-structured learning environment with flexible teaching materials and use of learners' autonomy should be provided.

Project on Intercultural Communication: Overcoming Barriers and Celebrating Diversity

Svetlana Muhejeva; Ludmila Jermakoviča

Rīga Stradiņš University, Language Centre, Latvia

Objectives

Since the language is both an integral component of culture and a means of its expression, a multipurpose project on intercultural communication has been implemented within the Rīga Stradiņš University Russian Language course. One of the main project objectives is to raise the students' awareness of how multifaceted the process of communication is and how cultural aspects may facilitate or impede it. Furthermore, the project incorporates the elements of the Latvian and Russian cultures, enriches the content of the course and allows the students to acquire a deeper knowledge of the cultures and to develop their research skills.

Methods

The project is based on the student-centered approach which encourages learners' initiative and autonomy. The participants are given some training on how research of intercultural communication is carried out. Afterwards, the students make their decisions on research group formation, research area and methods, as well as research reports.

Results

Most commonly, the students of communication-related study programs choose to research such aspects of culture as well-established traditions of religious festivals, weddings, the significance of folk costumes and dance. The students of business-related study programs tend to choose the topics of business etiquette, hierarchy, personal space, punctuality. The participants may go beyond the Russian and Latvian cultures and incorporate the cultures of India, Spain, Japan. They vary the ways to present the research results and make an interactive presentation or a video. In their research, the students compare and contrast cultural aspects to find out how they may affect the outcomes of communication.

Conclusions

The use of the student-centered approach in the given project is justified as it fosters the students' interest in conducting their research. However, the participants should receive some guidance from the academic staff in order to keep their research focused.

Benefits of Latin in Learning Plant Taxonomy

Ieva Fībiga, Līva Bodniece

Rīga Stradiņš University, Language Centre, Latvia

Objectives

The purpose of this poster is to:

- 1) demonstrate how the comprehension of basic Latin grammar can benefit the learning of the taxonomy system;
- 2) provide examples of how the knowledge of Latin can help avoid confusion with plant names in local languages.

Methods

Plant taxonomy deals with the identification, systematization, and naming of plants.

Learning the taxonomy of plants is rather complicated because one must learn not only many plant names in various languages, but also the relations between them – sometimes it can be confusing whether a term is for class, order, family, or genus.

Descriptive and quantitative methods are used for the research.

Results

Lower taxonomic ranks (micro taxonomy) like family and genus contain many plant species and plant family names. These ranks are permanently alternating because of the new discoveries in plant taxonomy.

Knowledge and comprehension of Latin can help navigate the detailed and extensive taxonomic ranks.

Certain types of Latin adjectives are used to name the order, family, and species of plants, i.e., order: Fagales; family: Fagaceae; species: *Fagus sylvatica*.

These adjectives are derived from the Latin substantive *Fagus* 'a beech-tree', but with different suffixes -alis, -ale and -ceus, -cea, -ceum. The name of a species consists of two words: the first shows the genus, but the second – the species.

Conclusions

Explanation how simple Latin grammar works in plant taxonomy can make the learning processes much more effective because one who learns all that understands the logic behind the taxonomy system.

Communicative Approach in Latvian as a Foreign Language: Case of the Textbook “Latvian in Dentistry”

Dr. Inga Znotiņa; Inga Laizāne

Rīga Stradiņš University, Language Centre, Latvia

Objectives

The present research aims to widen the understanding of communicative approach in language learning by analysing the example of the newly created Latvian as a foreign language textbook “Latviešu valoda zobārstniecībā” = “Latvian in Dentistry”. In order to do that, the theoretical scope of communicative approach must be described. Then, the necessity for widening the common understanding must be explained. Finally, an example of the widened understanding used in a study material must be provided.

Methods

In order to reach the objectives of the study, referative analysis of various language acquisition research papers and Latvian as a foreign language textbooks is carried out. Further, the textbook “Latvian in Dentistry” is descriptively analysed.

Results

The current understanding of communicative approach is briefly described, including the misconception that it cannot be used for highly grammatical languages, such as Latvian. Then, the use of communicative approach in the textbook “Latvian in Dentistry” is demonstrated, emphasizing the parts that deal with grammar acquisition.

Conclusions

It is noted that the lack of grammatical explanations is not inherent of the communicative approach and they should therefore not necessarily be avoided when creating textbooks for languages that feature a complex grammatical structure. Such languages can even benefit from this kind of added material as long as it is used in a connection with the current communication objectives. The textbook “Latvian in Dentistry” offers how that can be done without losing the emphasis on communication.

Age and Gender Sensitive Health-Related Habits: Case of Ozolnieki County, Latvia

Dr. Dina Bite

Rīga Stradiņš University, Department of Humanities, Latvia

Objectives

Results of the survey made in Ozolnieki county at the end of 2017 have revealed some differences in people's behaviour that they have declared according to different age groups and gender. Therefore, the objective of the paper is to describe the main issues of health related habits between age groups and gender. Theoretically, a set of personal, social and contextual variables influence health-related habits. They cannot be seen abandoned by the health care policy in the country and, more generally, from the standpoint of health as a value in the society.

Methods

The research was done in a quantitative manner with the aim to find out and to describe existing situation in Ozolnieki county. 370 respondents took part in the survey that was considered to be a representative amount of population in the county. Respondents were asked to characterise their habits concerning food, physical activities, prophylactic treatment and usage of addictive substances.

Results

Some results of the research fit with other surveys made in Latvia and typical behavioural models between gender and age groups. For instance, women are more tended to take care of their health than men. It is seen in frequency of prophylactic surveys, eating more vegetables and fruit etc. Another example concerns the differences between age groups in their physical activities. The most inactive group seems to be middle aged people that are busy in their jobs and mostly move using their cars. All respondents are willing to openly describe their health-related habits, even if they cannot call them healthy, except the majority of middle aged women (26–53). They seem to be more closed and tend to give more socially accepted answers.

Conclusions

To conclude, gender and age typical behaviours are transparent in the survey that raises questions about the existing health care policy and ways they address people.

Anima and Animus: Towards an Integrated Self

Ph.D. Vents Sīlis

Rīga Stradiņš University, Department of Humanities, Latvia

Objectives

One of the main assumptions of Carl Gustav Jung's analytical psychology is the principle of opposite polarities – conscious and unconscious, Persona and Shadow, etc. According to this principle, every male carries within him an universal image of a woman which Jung calls “anima” (the soul). With a female the situation is reversed – she also has an image of man, called “animus” (the mind or spirit).

Methods

Both anima and animus are archetypes – fundamental psychological structures of perception and human potential, autonomous systems of unconsciousness that determine individual's life. Archetypes are “primordial images” which are result of repeated experiences of humanity that are condensed and inborn in every human.

Results

Anima and animus contain the potential for mutual understanding between the genders. Men experience their encounter with anima as highly emotional process, while women meet their animus in a structured, logical manner. A man can be dominated by his female side, in which case he will not be able to control his emotions and moods. A female that is dominated by her animus, will try to appear extremely feminine, yet at the same time be very opinionated and stubborn.

Conclusions

It is important to note that anima and animus have less to do with the gender identity, but more with the formation of an integrated self. As both anima and animus are fundamentally unconscious, the task of the individual is to adapt them into their consciousness. Without it the process of individuation is not complete – denial of this aspect of personality will result in an infantile and conflicted individual. The integration is achieved by application of transcendent function that allows both archetypes to be expressed in a balanced way.

Challenging Aspects of Protecting Patient's Will

Prof. *Vija Sīle*; Ph.D. *Vents Sīlis*; *Mairita Satika*

Rīga Stradiņš University, Department of Humanities, Latvia

Objectives

The aim was to study moral dilemmas in the treatment of juvenile patients.

Methods

The notion of patient's will presents a dual challenge. Requirement of informed consent may lead to certain dilemmas, i.e., according to natural law, the principle of dignity requires to respect the will of any person capable of making reasonable decisions. An 18 year-old person has all statutory rights, whereas a 17 year-old person has no such rights. A 17 year-old may be considered capable of making own decisions, however, formally an underage individual is not a legally capable patient. Is this morally acceptable? From a legal point of view, theories describing expression of willpower say that the inner will must reflect the external expression of the will – the rights of the patient. However, as consent of a patient is driven by the inner will, or motives, wishes and etc., health care professionals should also consider such inner will. While legal frameworks are based on theories focusing on expression of willpower, legislation does not clarify what course of action health care providers should take in conflicting cases, when law and ethics collide.

Results

In Latvia, the Law on the Protection of the Rights of the Child defines child as a person younger than 18 years of age, whereas the Sexual and Reproductive Health Law regulates the response of healthcare professionals to patients under the age of 16. If a girl, younger than 16, gets pregnant, health care professional determining the pregnancy is requested to hear the patient out and give serious consideration to patient's beliefs, taking into account the patient's age and maturity. Health care professionals are required to also notify pregnant patient's parents or guardian (Article 27.1). What should physicians do in cases not covered by the existing framework? When patient is aged between 16 and 18 years? Does this mean that, for example, a 17-year-old girl can independently decide to terminate pregnancy although she has not yet reached legal age, and is not considered an adult?

Does this mean that, for example, a 17-year-old girl can independently decide to terminate pregnancy although she has not yet reached legal age, and is not considered an adult?

Conclusions

According to theories regarding the expression of willpower, health care professional should consult the girl's parents. But from the point of view of the inner will, physician can choose to respect the wishes of the pregnant girl instead of notifying parents. Which legal and theoretical standards should health care professionals follow in such cases? Will ignoring the will of parents be considered ethically appropriate?

Connection Between the Course “Medical Terminology in the Latvian Language” and Actual Communication with Patient in Clinics

Ph.D. Solveiga Čeirane; Dace Žibala; Daiga Tetere

Rīga Stradiņš University, Language Centre, Latvia

Objectives

The aim of the research was to identify the practical use of the course “Medical Terminology in the Latvian Language” for international students in their communication with patients in the clinical environment.

The material of the research consists of 2 groups:

1. SSNMF students participating in the course “Medical Terminology in the Latvian Language” (100 people).
2. Teachers of the clinical courses (20 people).

Methods

The following methods were used in the research:

1. Analysis of the scientific literature.
2. Surveys.
3. Empirical observations.
4. Data processed by using mathematically statistical research methods.

Results

The results of the analysis of the literature and practical research revealed that for the majority of students the course helps to develop successful communication with the patient. Most of them have described substantial improvement of the language skills which facilitate communication with their patients.

Conclusions

To sum up the results gained it can be concluded that:

1. Students feel the course is practical and see the connection between the course and actual communication with patient in clinics.
2. It must be taken into account that students have different levels of language knowledge at the beginning of the course which considerably affects the achievement of the result expected.
3. For the successful integration of communication skills developed in the course innovations are required such as a video simulation-oriented approach.

Pluralistic Policy of Determination of Death: Report on Public Views

Ph.D. Ivars Neiders¹; Vilius Dranseika²

¹ *Rīga Stradiņš University, Department of Humanities, Latvia;*

² *Vilnius University, Institute of Philosophy, Lithuania*

Objectives

Many authors in bioethics literature have expressed the view that whole brain conception of death is philosophically indefensible. If they are right, what criteria for death determination should be used instead? Several authors have proposed alternative solutions. Some suggest that we should go back to the old cardiopulmonary criterion of death and abandon the so-called Dead Donor Rule. Others argue for a pluralist solution. For example, Robert Veatch (Veatch, 1999) has defended a view that competent persons should be free to decide which criterion of death should be used to determine their death. In this paper, we present data of a study with Latvian participants (N = 1416). The data suggest that the pluralist solution fits best with the way our study participants think about death determination – widely differing preferences concerning death determination criteria were observed with most people choosing one of the three criteria discussed in the literature: whole brain, higher brain, and cardiopulmonary. The data also indicate that people tend to prefer less restrictive criteria for determination of their own deaths than for determination of deaths of their closest relatives as well as that these preferences are largely in accord with the Dead Donor Rule for organ transplantation.

Methods

To achieve our objectives we conducted an online survey. 1491 Latvian participants took part in an online survey. After removing 3 participants for indicating age lower than 18 years old and another 72 participants for not providing answers to at least one of the four main measures, N = 1416 (67% females, 32% males, 1% chose 'other / prefer not to answer', 3 participants did not indicate their answer; mean age: 35.1; age SD = 10.0; age range 18–81, 38 participants (2.7%) did not indicate their age).

Results

Our data shows that all three candidate criteria seem to have some support in our sample. Vast majority chose one of the three options that were designed to mimic death determination criteria familiar from the literature. This was true both for preferences concerning determination of their own death and death of their relatives. Stage 4 (whole-brain death) was the most popular option for self (38.4%) and for relative (43.5%), but Stage 3 (higher-brain death) was also a popular option (35.8% for self and 19.8% for relative). Stage 4 (cardiopulmonary death) was preferred by 18.6% for self and 31.6% for relative. This result supports the idea of widening the set of criteria available for choice: not only whole-brain death and cardiopulmonary death but also higher-brain death should be in the choice-set.

Conclusions

Our data give preliminary evidence that people do have different views about death determination and all three conceptions of death discussed in bioethics literature are supported by a considerable proportion of participants. Moreover, our data also shows that that the three conceptions of death that are suggested by Veatch as candidates for people to choose from are not entirely arbitrary. In addition, since whole brain criterion was the most frequently chosen answer, this would provide some prima facie evidence that – if default option is needed – this criterion should be used as the default. Also, as participants in most cases indicate that provided that they have consented to donate their organs, the organs should be procured after their death is determined, our data provide some support for the Dead Donor Rule, i.e., they suggest that the rule fits well with people's personal preferences. Last but not least, our study provides some evidence that people have a tendency to make different judgement about the death of their close relatives than they apply to themselves. This result underscores the importance of advance directives in establishing preferences concerning death determination criteria.

Awareness of Students' Learning Style Preferences for the Purpose of Adaption of Appropriate Instructional Methods

Sabine Grinberga

Rīga Stradiņš University, Department of Occupational and Environmental Medicine, Latvia

Objectives

The aim of study was to gain an understanding of the learning style preferences of health care and medical students of Rīga Stradiņš University.

Methods

To achieve this goal we conducted the research based on a questionnaire. The questioning was done last spring semester. 168 respondents (138 women, 30 men) participated in the research. There were local and international students of the Health Care and Medicine study programs. The participants were both full-time and part-time students. Some Open University students also participated in the inquiry. The Index of Learning Styles – Learning Style Questionnaire was used. Questionnaire was originally designed by Richard Felder and Linda Silverman at North Carolina State University, USA. The Felder-Silverman distinguish four dimensions of learning styles: active or reflective, sensing or intuitive, visual or verbal, sequential or global.

Results

Most of all students (60%) had an active learning style, meanwhile, 40% students had a reflective learning style. Activists are more likely to learn by doing something active, for example, applying the new information, discussing or explaining it to others. Analyzing the second dimension of learning, we could conclude that 79% respondents had a sensing learning preference and they like to learn facts, to do hands-on activities, and study subjects related to real life. Unlike students with sensing learning style, intuitive learners (21%) like innovation and do not like courses that involve a lot of memorization and routine calculations. The study also showed that most respondents (82%) had a visual learning style contrary to verbal preference that was observed for 18% students. Visual learners remember best what they see, but verbal learners – what they read and hear. Finally, research data indicated that 63% prefer to study in incremental linear steps as sequential learners, in turn 37% global learners more likely learn in large leaps.

Conclusions

There is a growing necessity to structure instructional materials in accordance with different students' learning styles. According to survey, discussions, problem solving activities in the groups should be used side-by-side with lectures. Very important is to give more examples how theoretical concepts apply in practice. Furthermore, instructional materials e.g. lecture presentations, should be enriched by visual representations: pictures, diagrams, flow charts, time lines, films etc. Course materials must be structured in a logical order, besides that, educators should encourage students to study continuously and regularly.

International TATA Study Slice in Latvia

*Dr. med. Ilze Skuja*¹; *Dr. Andris Puce*¹; *Dr. Maris Taube*²;
Prof. *Inga Stukena*³; Prof. *Aivars Lejnieks*³; *Jean Yves Le Reste*⁴

¹ *Rīga Stradiņš University, Department of Family Medicine, Latvia;*

² *Rīga Stradiņš University, Department of Psychiatry, Latvia;*

³ *Rīga Stradiņš University, Department of Internal Medicine, Latvia;*

⁴ *Université de Bretagne Occidentale, UFR médecine et sciences de la santé, France*

Objectives

Improving the quality of health care is a constant goal in medicine. Technical knowledge is necessary but the human factors and the challenge of communication must as well be in balance. Doctor – patient communication and the collaboration could be an effective method of adhering to treatment and self-confidence in chronic disease management. EGPRN has launched a study to develop an effective tool for assessing the doctor – patient cooperation and adapting it to everyday use in primary care.

The aim of this study is to involve Latvia in this project. It is planned to conduct a round-trip translation of all national research groups in the spoken language using the Delphi consensus method for translation and validation of this tool in Latvia.

Methods

The participants of this study are a small group consisting of two interpreting philologists, two general practitioners and one psychiatrist. In the big group there are forty different Latvian GPs. Translation is done according to Delphi Consensus Methodology, as well as according to control of cultural differences to ensure the homogeneity of translation across the Europe.

Results

Two small group meetings have been held and have resulted in tables with translations, which have been sent to GPs. Now the GPs are evaluating newly created translation, which will be further improved by the results obtained. The next regular meeting will produce next version, which then will be sent out to the participants of the research in the second, third and fourth rounds.

Conclusions

This study will lead to creation of an internationally validated tool for the assessment of doctor and patient collaboration, which will be used in a further international quantitative study to calculate the Cronbach alpha factor for this tool. In the future this tool will be used in primary care to evaluate both becoming and existing general practitioners.

Body Mass Index and Nutrition Knowledge in Primary Care Practice

*Justine Rudzite-Rjabceva*¹; *Dr. med. Laila Meija*²

¹ Rīga Stradiņš University, Medical residency program, Latvia;

² Rīga Stradiņš University, Department of Sports and Nutrition, Latvia

Objectives

Data show that prevalence of normal weight in adult population in Latvia is only 42.9%. Public campaigns have been organised to increase awareness of a healthy diet and normal weight.

The aim of this study was to investigate the relationship between nutrition knowledge and body mass index (BMI).

Methods

A total of 114 participants (aged 18–74 years) completed a validated General Nutrition Knowledge Questionnaire (GNKQ), consisting of 40 questions. Height and body weight was self reported. Study conducted in December 2018 in the general practitioner practice in Liepāja. Data were processed in MS Excel 2013 and SPSS v22.

Results

80.7% were female and 19.3% male. Normal BMI (18.5–24.9 kg/m²) was 45.6%, reduced BMI (17.0–18.4 kg/m²) – 1.8%, overweight (25.0–29.9 kg/m²) – 30.7%, obesity (> 30 kg/m²) – 21.9%. Normal BMI was in age group: 18–34 years – 65.3%, 35–44 years – 37.5%, over 45 years – 30.3% (p < 0.001). Only 34.5% of participants understood concept of BMI. Overall nutritional knowledge was 57.2% (95% CI 54.7–59.7). No association was found neither between GNKQ scores and age (p = 0.348) no GNKQ scores and gender (p = 0.259). People with higher education had a higher GNKQ scores (p = 0.047), but no association with BMI (p = 0.186). There was no association between BMI values and GNKQ scores (p = 0.268).

Conclusions

Overweight and obesity is prevalent in primary care. Older people tend to be more likely overweight than younger. Findings indicate modest nutritional knowledge and no connection with BMI. Education level influenced nutrition knowledge, not BMI. This suggests that nutritional knowledge might be not the most important factor for preventing overweight and obesity, and other factors should be investigated.

Diabetes Mellitus and Cancer Screening Uptake in Latvia: Self-Reported Data from National Health Interview Surveys 2003, 2008 and 2014

*Dr. med. Ieva Strēle¹; Una Kojalo¹;
Santa Pildava²; Prof. Inese Gobiņa¹*

¹ Rīga Stradiņš University, Department of Public Health
and Epidemiology, Latvia;

² Latvian Centre for Disease Prevention and Control, Latvia

Objectives

Several studies from high-income countries suggest that cancer screening uptake is lower in people with diabetes mellitus than in the non-diabetic population, thereby, leading to a more advanced stage at diagnosis and worse cancer outcomes. The aim of this study was to compare self-reported cancer screening uptake by diabetes status in Latvia.

Methods

Data were pooled from three consecutive (2003, 2008, 2014) national health interview surveys conducted by the Central Statistical Bureau of Latvia. Of the total 3.608 men and 4.713 women aged 45–74 without a history of cancer, 153 men (4.2%) and 310 women (6.6%) reported diabetes diagnosed by a doctor. Proportions of respondents reporting the use of screening examinations were calculated. Age and survey adjusted odds ratios (aOR) of the use of screening tests by diabetes status with 95% confidence intervals (CI) were estimated in logistic regression analysis.

Results

Diabetes patients reported higher use of screening examinations for breast and colorectal cancers. Regarding breast cancer screening, 63.5% of diabetic vs 52.4% of non-diabetic women had ever received mammography or breast ultrasound examinations (aOR 1.33; 95% CI 1.03–1.73, $p = 0.031$). Regarding a faecal occult blood test, 47.5% of diabetic vs 31.1% of non-diabetic men reported having ever had the test (aOR 1.90; 95% CI 1.30–2.78, $p = 0.001$), whereas, among women, these proportions were 51.6% vs 37.2%, respectively (aOR 1.66; 95% CI 1.26–2.20, $p < 0.001$). There was no difference between diabetic and non-diabetic women in the use of a cervical smear test.

Conclusions

In Latvia, diabetes patients reported higher use of screening examinations compared to non-diabetic individuals, except screening for cervical cancer. These findings indicate that the association between diabetes and screening uptake might be country and health care system specific. Closer contacts with health professionals might facilitate a referral of diabetes patients to screening examinations.

Differences of Electronic Prescriptions in Cross-Border Healthcare in Three Selected Countries of the European Union

Agnese Puķīte

Erasmus University Rotterdam, Netherlands

Keywords: cross-border healthcare, electronic prescriptions, e-Health, EU law.

Objectives

Electronic prescriptions are part of cross-border healthcare allowing people to acquire medical care and medications while traveling across the European Union (EU), however countries face challenges when recognizing them in other EU Member States.

The aim of this study was to analyze the legal framework of electronic prescriptions under EU law, compare process and functions of electronic prescription system in selected countries.

Methods

Three different countries: Estonia, the Netherlands and the United Kingdom were included to determine the similarities and differences in the accessibility of medications in terms of cross-border healthcare from patient point of view. Materials were selected from EU legal documents, European Commission, international and national publications including ministry and National Health Service reports. Legal framework of cross-border e-Health systems according to the EU law was developed based on what detailed country analysis was performed with a focus on the operation of health care and electronic prescription systems in each selected country.

Results

Obtained data indicated that there are various advantages and challenges of the electronic prescription system on national level and they differ among chosen countries. Data analysis showed that more effective electronic prescription system from patient perspective is in Estonia, where access to the medication and pharmacy service is well organized.

Conclusions

Systems of electronic prescriptions are different in Estonia, the United Kingdom and the Netherlands, which is related to diverse national health policies leading to disharmonized cross-border systems for recognizing electronic prescriptions in other EU countries. Structural reforms are needed for the implementation of harmonized and sustainable cross-border electronic prescription system while securing access to medication and medical services to all EU citizens.

Sleep Duration among Adolescents in Latvia by Age and Sex

Solvita Klavina-Makrecka;
Prof. *Anita Villerusa*; Prof. *Inese Gobina*

*Rīga Stradiņš University, Department of Public Health
and Epidemiology, Latvia*

Objectives

Sleep is important domain of daily life and being related to adolescents' daily functioning, emotional regulation and behaviour. This study investigates sleep duration on schooldays and weekends among adolescents in Latvia by age and sex groups.

Methods

Data of 5557 adolescents aged 11, 13 and 15 years from Health Behaviour in School-aged children (HBSC) 2013/2014 survey in Latvia were used for data statistical analysis. Sleep duration was measured by computing answers from the questions: 'At what time do you usually 1) go to bed and 2) wake up (on schooldays, and on weekends or during holidays)?'

Results

The average sleep duration for both sexes is 7.98 (\pm 1.16) h daily, with variations from 3 to 11 h daily, on schooldays and 10.5 (\pm 1.65) h daily, with variations from 3 to 17 h daily on weekends or holidays. Proportion of adolescents with sufficient sleep duration on schooldays (8–10 h daily, according to USA National Sleep foundation) for boys was 79.6% in 11 years, 64.9% in 13 years and 48.1% in 15 years aged boys ($p < 0.001$); for girls is 82.5% in 11 years, 57.9% in 13 years and 39.6% in 15 years aged girls ($p < 0.001$). The proportion of those with insufficient sleep duration on schooldays (less than 8 h daily) increased by age in both sexes – 18.9% in 11 years, 34.6% in 13 years, 51.9% in 15 years aged boys ($p < 0.001$) and 16.2% in 11 years, 41.7% in 13 years, 60.4% in 15 years aged girls ($p < 0.001$).

Conclusions

In general, 62.4% adolescents meets recommended sleep duration of 8–10 h daily on schooldays. However, one third of adolescents on schooldays sleeps less than recommended. In the age group of 15 years more than half of adolescents sleep less than recommended for both sexes. Associated factors with sleep duration among adolescents should be investigated more into the details. Parents should pay more attention to control the length of sleep of adolescents. Sleep hygiene should be included in health promotion programs for adolescents.

Patient Assessment of Nursing Care in Internal Medicine Wards

Zane Baļķena; Dr. Gunta Bēta

Rīga Stradiņš University, Latvia

Objectives

The aim of the study was to investigate patient satisfaction with care provided by nurses and the relationship between potential demographic factors in the internal medicine departments. Patients have the right to receive high-quality care while in hospital, and patients' well-being depends on it. Patient satisfaction is an important indicator in determining the effectiveness of nursing care.

Methods

In order to achieve the objective of the study, a quantitative, descriptive, cross-sectional study was conducted. Data were collected using Newcastle Satisfaction with Nursing Scale Questionnaire (NSNS) which is the original instrument by Thomas et al. Participants evaluated 45 statements about a nursing care aspects on the Likert scale. The study population consisted of one hundred internal medicine department patients from wards A and B, aged 18–87, who were in a ward at least 2 days. They were selected using the convenience selection method.

Results

Patient satisfaction in ward A is 73.0%, while in ward B, 75.1%, which gives a total satisfaction of 74.1%, that indicates that the patients' satisfaction is "good", but other studies confirm that it is possible to achieve better results. Overall patient experience in ward A is 67%, while in ward B – 67.7%, which gives a total score of 67.4%, that indicates that the level of patient experience is "satisfactory". No statistically significant relationship was found with patient satisfaction and demographic data – gender, age, education, and length of stay in a hospital.

Conclusions

Improvement of nursing communication and interpersonal skills should be considered as well as nurses should be more active in educating patients. In order to obtain compelling results about the relevance of satisfaction with demographic data, a larger number of respondents is needed. Based on the results obtained, it is possible to evaluate nursing care for further nursing care improvement.

Occupational Morbidity as Significant Occupational Health Problem in Latvia

*Ph.D. Maija Eglite; Dr. Ieva Kalve;
Dr. med. Ivars Vanadzins; Dr. med. Tija Zvagule*

*Rīga Stradiņš University, Department of Occupational
and Environmental Medicine, Latvia*

Objectives

Objectives of the study is to analyse occupational morbidity in Latvia during a 21-year period focusing mainly on diseases of musculoskeletal system and appreciate the opinion of occupational physicians on causes of occupational morbidity.

Methods

The analysis of occupational diseases and patients revealed for the first time during a year according to the data from the Latvian State Registry of Occupational Diseases (OD) for 21 years period 1996–2017; the interview of 120 occupational physicians to find out their thoughts about the causes of OD.

Results

The total number of newly revealed OD patients per 100 000 employed persons was 20.4 in 1996 and 176.1 – in 2017. The structure of OD in 2017 shows musculoskeletal diseases (MSD; 68.4%) as the leading group of diseases followed by diseases of the nervous system and sensory organs. The most commonly occurring MSD are tendinitis, bursitis, rotator cuff syndrome, vertebral column disorders. [Other more common registered occupational diseases are carpal tunnel syndrome, vibration disease (local and whole body), arthrosis, noise induced hearing loss, bronchial asthma, varicose veins. All interviewed occupational physicians underline the difficulty of dealing with MSD. Possible causes of high prevalence: new forms of work (lifting / moving heavy loads, repetitive movements, tiring or painful positions); ageing workforce, gaps in current strategies used to manage work-related MSD.

Conclusions

Occupational morbidity characterizes the general situation in occupational health and safety. The increase of registered OD is related to growing awareness of employees, increasing number of occupational physicians, as well as the possibility to receive monetary compensation.

Work Motivation of Nurses in Hospitals in Latvia

Diana Platace; Amanda Kreile; Dr. med. Inga Millere

Rīga Stradiņš University, Department of Nursing and Midwifery, Latvia

Objectives

Motivation is a set of individual psychological factors or motifs of personality that triggers human activity – a certain behavior – and gives it direction or a set of behavioral goals. The level of motivation that is most successful is the optimal level of motivation. If the motivation is too strong, the tensions that cause a decrease in operational efficiency and deterioration of results also increase. The choice of a person's profession is based on orientation and his social values. Two sources of motivation are distinguished:

- 1) internal motives or internal psychological behavioral factors;
- 2) external motives. It therefore distinguishes between internal and external motivation (Mārtinsone et al., 2015).

Methods

Aim of the work was to study motivation in nurses practice to work in chosen profession in hospitals of Latvia.

The study used a quantitative study method – survey (n = 100). The study consisted of two parts. The first part contained a theoretical overview of motivation description, professional motivation review, description of Maslow motivation theory and review of Frederik Irving Herzberg two factor theory. The second part of the study consisted of creation of questionnaire for participants, collection and analysis of the results and development of conclusions.

Results

The data obtained from the study indicate that the material factors that mostly motivate nurses to work in the hospitals of Latvia are job security (53%), work quality supplement (36%), night work allowance, overtime (30%). Maternal factors that do not necessarily contribute to the desire of nurses are salary (39%), health insurance and social guarantees (27%), and non-work activities – sports games, tours, work balls (62%). The results of the research show that non-material factors, which mostly motivate nurses to work in hospitals of Latvia, are relations with colleagues (43%), job manager's attitude (45%), respected at work (53%), and recognition of work done (42%). Also, pride and respect for work (32%) and challenges, job interest and diversity in work assignments (31%) largely encourage nurses to work in the chosen profession. The data obtained in the research show that the factors hindering motivation in hospitals of Latvia are the amount of work, intensity (27.7%), wages (25.6%) and working hours, night-time (16.8%).

Conclusions

The results of the study shows that motivation of nurses to work in chosen profession is more internal. The motivation are mainly affected by non-material factors: relationship with colleagues, the attitude of the leader, to be respected in a workplace, the recognition of the work, the pride and respect for the work that is to be done, challenges, interesting work and diversity of the working tasks. Collected data indicate that higher salary and less work intensity would motivate nurses to work in the hospital.

Evaluation of Functional Physical Health Status ahead of High Endurance Exercises

Prof. *Liāna Pļaviņa*¹; *Silva Smagare*¹;
*Andris Cakstins*¹; *Dr. Anete Zahare*²

¹ *Rīga Stradiņš University, Morphology department, Latvia;*

² *National Armed Forces, Latvia*

Objectives

Musculoskeletal disorders among military personnel are the most common problem. Musculoskeletal disorders manifest with pain symptom and functional dysfunctions that have influence on daily duty activities and physical working capacity. The physical load, psychological and emotional stress factors play significant role in military service environment as health hazards. Impact of high-intensity exercise may favour the development of psychosomatic pathology. Analysis of posture status and foot status, evaluation of functional tests results and anthropometric parameters allow to fixed problems and provided preventive measures for high physical endurance exercises and psychological load to reduce health disorder. The purpose of the study is evaluation of functional physical health status for cadets- participants of Combat training course.

Methods

The study group includes cadets of both genders (41 males and 8 females) in aged 22–29 years. We evaluated posture status and foot status, functional tests results and anthropometric parameters, and data of Nordic Questionnaire (for analysis musculoskeletal symptoms (Kuorinka et al.,1986).

Results

According standardized Nordic Questionnaire for analysis musculoskeletal symptoms cadets indicated main problematic regions which are: the lower back, upper back, then the neck region, knee region and the foot region. Musculoskeletal symptoms (pain) were connected to physical load for 41.7% of male and 21.3% of female in study group. Posture analysis in examined group revealed that 74.3% of cadets-male and 66.6% of cadets-female have asymmetric posture in sagittal plane. 80.8% of male and 58.3% of female have asymmetry in frontal plane. We have fixed combined asymmetric posture in sagittal and frontal plane for 70.2% cadets-male and 58.3% of cadets-female. We have found that muscular hypertonus of individuals was induced by posture frontal asymmetry ($p = 0.371$). Foot status evaluation revealed foot asymmetry and weight distribution problems for 50% of females and 23.4% of males. We have fixed coordination dysfunction of individuals correlated to frontal posture asymmetry ($p = 0.1$) and balance status disorders ($p = 0.759$).

Conclusions

Advanced health status assessment, evaluation of posture and foot status as well functional tests results were topical to reduce the health risk for musculoskeletal disorders related to high physical load in military field environment. Persons with expressed posture asymmetry and foot during dynamic load and static load need special attention and medical preventive measure to prevent musculoskeletal overstress.

Quality of Life in Patients with Cataracts

Dr. med. Olga Fokina; Tatjana Zorina

*Rīga Stradiņš University, Department of Nursing
and Maternity Care, Latvia*

Objectives

The aim of the study was to determine, analyze the quality of life in patients with cataracts.

Methods

A quantitative research method, the VFQ25 – SA questionnaire, was chosen for achieving the goal, because it does not require much time, it is more convenient to collect the data obtained.

Results

The research involves 100 cataract patients who voluntarily agreed to participate in the research. The research involved 53.13% women and 46.88% men, patients with diagnosed nonoperative cataract who were treated in outpatient conditions. The average age of respondents diagnosed with cataracts was 65.61 years. The average length of the disease for respondents was 3.56 years, while half (50%) of the respondents disease did not exceed 3 years. The results indicate that the disease is more disturbed by activity limitations in the distance (indicator 66.12) and near (indicator 63.57). The overall quality of life of respondents is lowered by general health (49.24) and general vision (indicator 44.11). The highest quality of life is found in the age group of 61 to 67. The lowest quality of life is in the age group from 71 to 79 years (indicator 88.19). The quality of mental health determines that women (63.02) are more likely than men (58.93). The duration of the disease is not significant and affects the quality of life indicators at the p statistic significance level.

Conclusions

The quality of life of respondents is mostly influenced by age, not by diagnosed illness ($p > 0.05$).

Air Pollution and Respiratory Diseases in Riga, Latvia

*Dr. med. Marija Avota*¹; *Dr. Javier Botella*²

¹ *Rīga Stradiņš University, Department of Occupational and Environmental Medicine, Latvia;*

² *University of Madrid, Resident of Occupational Medicine, Spain*

Objectives

The aim of the study is to analyse respondents' socio-demographic data about risk factors associated with living in air polluted areas. Presence of possible respiratory symptoms and diseases in individuals who are making sport outside in polluted areas and their current knowledge about air pollution and environmental policy.

Methods

The analysis of data about the relationship of respiratory diseases versus air pollutants was made, and then a transverse observational study was conducted, using a questionnaire with 60 respondents (30 males and 30 females) among students of Rīga Stradiņš University. The data was calculated and analysed by using Microsoft Excel 2010 and IBM SPSS Statistics 22.0.

Results

All respondents of the study are living in city. 13% of women and 26.67% of men are smokers. Male group 13.3% has more cases of bronchial asthma than in female group 6.6%. Female group 73.33% has more knowledge about the risk effects of air pollutants than men group 60%. Female group 16.66% considers that the government is trying to fight against the air pollution, in male group – 46.66%. In male group 36.67% are doing sports outside, in female group – 33.3%. There are more respiratory symptoms in female group – 36.6% than in male group – 30%.

Conclusions

There are studies that correlate the exposure of individuals that are making sports outside in polluted areas with respiratory symptoms and diseases, and we observe increased frequency about respondents that are living in Riga, that are making sports outside, with respiratory diseases and symptoms. Then we can perform a new hypothesis that students that are making sports outside could increase the incidence and prevalence of respiratory diseases and respiratory symptoms.

Is Smoking Prevalence Declining over the Decade in Latvia? Age and Cohort Analysis

Prof. *Ģirts Brīdis*

Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia

Objectives

The hypothesis about health behaviour improvement in Latvia exists. It has been supported by OECD data about decrease in Latvian adult smoking prevalence during the time period 2006–2016 from 33% to 24.7% being one of the biggest decline in Europe. The aim of the study was to analyse the change of everyday smoking prevalence in Latvian adult population from 2003 to 2015 using two cross sectional survey data with particular interest on gender specific age and cohort effects (e.g., changes over time in consecutive birth cohorts).

Methods

Two European Health Interview survey data of Latvian adult population (15+) were used. Surveys were carried out in 2003 and 2015 by Central Statistical Bureau of Latvia, making twelve-year time difference for comparisons. Random combined (stratified and non-stratified) population samples were used with correspondingly 6837 and 6456 persons included into the analysis. Five-year age groups were used for age effect analysis. For the cohort effect analysis 5-year age groups in the second survey were calculated with respect of age increase by 12 years in comparison with the first survey. Question about everyday smoking was used. Taking into account sample size calculation methods, all the differences were considered as statistically significant at 95% level.

Results

In 2003 total smoking prevalence was 32.6% (50.5% male and 17% female), but in 2015 – 27.1% (45.9% male and 12.2% female). Age effect analysis reveals that prevalence peak age groups for male were 35–39 years (63.9%) in 2003 and 40–44 years (61.7%) in 2015; for female – 40–44 years (26.5%) in 2003 and (20.1%) in 2015. Further smoking prevalence decreased with growing age. Cohort analysis tells, that the only age group of both sex with smoking prevalence increase during 12 years were 15–19 years old at the beginning point. All other cohorts formed by other age groups revealed prevalence decrease over time.

Conclusions

Smoking prevalence in Latvia has decreased in all age groups and all age cohorts, but the youngest group (15–19 years), supporting health behaviour improvement hypothesis.

Newly Designed Furniture Prototype Testing and Ergonomic Evaluation by Digital Infrared Thermography

*Dr. med. Jelena Reste*¹; *Guntis Zingis*²;
*Dr. med. Ivars Vanadzins*¹

¹ *Rīga Stradiņš University, Institute for Occupational Safety and
Environmental Health, Latvia;*

² *W chair Ltd., Latvia*

Objectives

The aim of the study was to investigate the potential of digital infrared thermography in evaluation of newly designed furniture through the testing of its immediate health effects and ergonomics.

Methods

Original prototypes of kneeling chair (“W chair”) designed by Guntis Zingis were tested by digital infrared thermography in laboratory settings with controlled ambient environment. A healthy male spent three hours sitting on the first prototype of the W chair. Surface skin temperature was measured before and after the trial. Anterior and posterior surfaces of the legs, back, and dorsal part of the neck were chosen as regions of interest. After body regions with elevated skin temperature were identified and evaluated in context with chair shape and ergonomics some recommendations on improvements of chair design were given to the designer. Later the improved second prototype was checked under the same conditions and the results were compared. Skin temperature measurements were made by the high-resolution medical digital infrared camera ICI ETI 7320 Pro.

Results

Testing of the first prototype of W chair showed the decrease of skin temperature over the lumbar part indicating relaxed condition of lumbar muscles simultaneously with keeping well shaped curvature of the spine. At the same time an increased temperature was found over the dorsal surface of the neck and upper back indicating the overload. Areas of increased temperature were found also on the anterior surface of the lower legs (maximum over tuberositas tibiae), over the medial surfaces of the upper legs and tuber ischiadicum) indicating pressure zones during the sitting. Additionally, temperature of the chair was measured immediately after the sitting. Zones of increased temperature on the chair corresponded to the closest contact with the body and maximal pressure points. Recommendations to improve padding of the chair and slightly correct the shape of the sitting surface were given according to the findings. During the testing of improved second prototype and providing support for the upper part of the body with height adjusted table the overload of the neck and upper back was almost resolved. The pressure zones were also reduced.

Conclusions

Digital infrared thermography provides excellent possibilities to test the immediate health effects of the furniture on human body and improve the design at the stage of modelling.

Difference in Participation in Bowel Cancer Screening among Women and Men

*Sandra Perkone*¹; *Marita Kirse*²

¹ Rīga Stradiņš University, Liepāja branch, Latvia;

² Gunta's Jefremova's family doctor's practice, Latvia

Objectives

The aim was to study the difference in participation in bowel cancer screening among women and men.

Methods

Quantitative, descriptive research. Data was acquired by surveying 101 respondents aged 50–70. Surveying tool – a questionnaire created by the author with 17 questions that contain information about demographic characteristics, patient knowledge and awareness regarding preparation for and participation in screening. The obtained data were analysed using SPSS 22.0, and the hypothesis was tested using the Mann–Whitney test for comparing two independent selections.

Results

Overall 50.5% of the participants in the study were men and 49.5% were women. According to the research data, information about the State-funded colorectal cancer screening from the family doctor most often was received by men (52.5%), while the same information from the family doctor's nurse was most often received by women (54.5%). Regarding proper preparation for screening, women (52.9%) more often than men (47.1%) were aware of the need for a fibre-rich diet prior to the screening, but the respondents of both genders were equally well informed that you may not eat rare meat or take iron supplements and aspirin before the screening. Regarding proper collection of material better informed were men (52.3% vs. 47.7%), whereas women were better informed than men (51.4% vs. 48%) regarding proper storage of the material. By analysing data, it is evident that of the annual screening participants 47.4% are men and 52.6% are women, but that men themselves are more interested in the screening results than women.

Conclusions

Research data show that information about State-funded colorectal cancer screening from the family doctor is most often received by men, but from the family doctor's nurse – by women. Men were better informed about the proper collection of materials, but women were better informed about the storage of materials until they are handed over to the family doctor. Annual cancer screening is more often done by women, but men are more likely to be interested in the results of their analysis. The study shows that male and female participation in the screening slightly differs, which is both influenced by the knowledge of patients about the preparation for screening, the procedure, material storage and the frequency of preventive visits.

Impact of Environmental Problems on Health of the Population Living in the Region of Oil and Gas Industry

Ph.D. Aigul Utepkaliyeva; Ph.D. Bibigul Shagatayeva

*West Kazakhstan Marat Ospanov State Medical University,
Aktobe, Kazakhstan*

Objectives

About 70% of oil reserves in Kazakhstan are concentrated in the Western region: Aktobe, Atyrau, West Kazakhstan, Mangistau regions. The main problem of oil and gas companies activities is environmental pollution. The progressive deterioration of the atmosphere, water and soil causes irreparable harm to public health. The aim of the study was to assess the impact of environmental distress on public health.

Methods

We observed the neurological manifestations, the state of the ENT-organs of 282 people of 18–50 years old of the West Kazakhstan region (WKR). The main group consisted of 171 people living in Aksay and Berezovka villages of WKR – the territory of oil and gas fields. The control group – 111 people living in Uralsk city of WKR, where there are no oil and gas facilities. Neurological status was assessed according to the generally accepted scheme. ENT-status was studied by rhinoscopy, otoscopy, laryngoscopy and pharyngoscopy.

Results

In the main group we observed next complaints: headache (23.9%); fatigue (16.8%); sleep disturbance (13.4%); decreased memory (12.9%); decreased performance (12.9%); general weakness (11.7%); back pain (24.6%); difficulty in nasal breathing (37.2%); dry nose (18.4%); nasal discharge (20.1%); dry cough (15.8%); hearing loss (15.8%); tinnitus (10.1%); ear discharge (9.2%). In the control group, the severity of complaints was lower 4.1 times. The severity of vegetative dystonia was higher 4.1 times; astheno-neurotic – 3.2; focal microsymptomatics – 2.2; movement disorders – 4.5; vertebral – 2.3 times in the main group compared with the control. In the control group the ENT-diseases were lower 1.9 times.

Conclusions

Persons living in the region of oil and gas industry have more pronounced lesion of the nervous system and ENT-organs. The results of the study can be used to develop measures to prevent the effects of environmental problems on public health.

Effect of Body Composition Parameters on Energy Expenditure in Walking and Running Exercises

Rudīte Lagzdīna; Maija Rumaka; Prof. Leons Blumfelds

Rīga Stradiņš University, Department of Human Physiology and Biochemistry, Latvia

Objectives

It is known that energy expenditure (EE) is greater for people with larger body mass, however data of body composition effect on EE are sparse. The aim of the study was to measure the exercise EE and analyse bodily factors which influence its magnitude.

Methods

After informed consent 98 volunteers (44 were males) at the age from 21 to 49 years had their body height, hip and waist circumference were measured. The multi-frequency bioimpedance analyser Tanita MC-180 MA was used for the determination of body mass and body composition, including fat and lean body mass (LBM) segmental distribution – in each extremity and trunk. The resting metabolic rate (RMR) and EE in walking and running exercises on treadmill were measured with Oxycon Pro gas analysis system. EE difference (ΔEE) from RMR for both exercises and relative ΔEE , when expressed on body mass and LBM kilogram were calculated.

Results

The RMR was 1.4 ± 0.1 and 1.0 ± 0.1 kcal \times min $^{-1}$ for males and females respectively. ΔEE for males in walking exercise was 3.3 ± 0.5 kcal \cdot min $^{-1}$, and in running 10.4 ± 1.4 kcal \cdot min $^{-1}$, but for females 2.8 ± 0.6 and 8.6 ± 1.1 respectively. ΔEE in running expressed on both – body mass and LBM kilogram were higher for females than males, but ΔEE in walking for females was higher only when expressed on LBM kilogram ($p < 0.05$).

There were negative correlations between ΔEE in both exercises and hip and waist circumferences, body, trunk and leg fat % only for males ($p < 0.05$), but after controlling for the body mass there was no significant relationship between these parameters. For females after weight control appeared positive correlation of ΔEE in walking with waist circumference, fat percent in both arms and ΔEE in running and hip circumference ($p < 0.05$).

Conclusions

In female subjects higher relative ΔEE in running could be attributed to greater step frequency to maintain the same running speed than males. In females visceral fat rating, fat % in arms and waist circumference are positively associated with relative ΔEE in walking and hip circumference – with ΔEE in running when adjusted for body mass. The results could be explained with the biomechanical factors since slender body segments have lower inertia in movement and could reduce energy cost in locomotion.

Experience and Needs for Cooperation between Public Health Authorities and Health IT Small-Medium Enterprises in Latvia

Prof. *Inese Gobina*¹; *Elina Millere*¹;
*Dita Heibergera*¹; *Margarita Apine*¹; *Ance Balode*²;
*Didzis Glazitis*²; *Aigars Miežitis*¹

¹ Rīga Stradiņš University, Institute of Public Health, Latvia;

² "Telemedica", Latvia

Objectives

In order to strengthen the institutional capacity of Public Health Authorities (PHAs), the Interreg BaltCityPrevention project "Innovative Lifestyle-Related Disease Prevention Model in the Baltic Sea Region" aims to foster the cooperation between PHAs and health-IT small-medium enterprises (SMEs) from the eHealth sector. In Latvia, municipalities play important role in public health and health promotion on a local level. This study aims to investigate the experience and needs for cooperation in health promotion between municipalities and health-IT SMEs in Latvia.

Methods

Online data collection for health promotion municipalities was organized by the Public Health Institute at Rīga Stradiņš University in collaboration with the Centre for Disease Prevention and Control using the database of the National Health Promoting Networks. A total of 112 municipalities were targeted, and the response rate was 38% (n = 42). The project partner in Latvia "Telemedica" sent a link to the online questionnaire to 12 health-IT SMEs in Latvia. The response rate was 50% (n = 6).

Results

92.9% of municipalities have had experience in health promotion interventions. Of those, 79.5% had applied e-tools for health interventions. The use of mobile apps (94.9%), wearable health monitoring devices (89.7%), and e-games (84.6%) were the most frequently reported. However, 12.8% reported the lack of e-tools for planning and implementing health promotion interventions. Only 23.1% of health promotion municipalities reported SMEs as one of the collaborative partners for health interventions but 25.6% would like to establish stronger collaboration with SMEs. Four of six targeted SMEs have had experience in cooperation with PHAs by delivering eHealth services, but the rest showed interest in collaboration with PHAs. Slow decision-making process and finding the contacts were reported as major challenges in cooperation with PHAs.

Conclusions

In Latvia, the cooperation between municipalities and health-IT SMEs should be improved for developing innovative health promotion interventions by using e-Health tools.

Cytokines Involvement in Workers Chronically Exposed to Asbestiform Fibers

Prof. *Venerando Rapisarda*¹; Prof. *Carla Loreto*²;
*Dr. med. Ermanno Vitale*³; Prof. *Rosario Caltabiano*⁴;
*Dr. Vera Filetti*²; Prof. *Vincenzo Baylon*⁵; Prof. *Caterina Ledda*³

¹ *Occupational Medicine Institute, Italy;*

² *University of Catania, Department of Biomedical and Biotechnological Sciences,
Human Anatomy and Histology, Italy;*

³ *Occupational Medicine Institute, Department of Clinical and Experimental Medicine, Italy;*

⁴ *University of Catania, Department 'G.F. Ingrassia', Anatomic Pathology, Italy;*

⁵ *Research & Innovation, St James's University Hospital, United Kingdom*

Objectives

The term naturally occurring asbestos (NOA) refers to the exposure of the general population to asbestiform mineral fibers, natural component of soils and / or rocks. NOA phenomenon were detected in various parts worldwide. In Biancavilla's town (South-west slope of Mt. Etna, Sicily, Italy) environmental investigations showed the presence of an asbestiform mineral fiber, called fluoro-edenite (FE) and used for 50 years for house building. These fibers represent a risk for cancer development, such as malignant mesothelioma, in exposed subjects. In the present study we investigated FE immunotoxicity pathways in a group of 30 occupationally exposed, in order to find any biological markers of its effect.

Methods

Subjects underwent respiratory function tests and HRCT total chest scanning. Serum IL-1 β , IL-6, IL-8, IL-18 and TNF- α were measured. Workers exposed, residing in Biancavilla, were examined; 30 not exposed workers (age and working age matched 1:1), living and operating least 40 km away the area of Biancavilla were recruited as control group.

Results

The presence of pleural plaques was significantly greater in subjects exposed than in the control. In subjects exposed, IL-1 β , IL-18 and TNF- α values were significantly higher than controls.

Conclusions

A significant association was observed between IL-18 and pleural plaques scores. Results showed an involvement of pro-inflammatory cytokines probable linked with the activation, by fluoro-edenite fibers, of the proteic complex defined inflammasome.

Adolescent Self-Reported Lifetime Gender-Specific Suicidal Ideation in Latvia: Association with Peer-Related Factors

Toms Pulmanis; Lauma Sprinģe;
Prof. *Māris Taube; Dr. med. Inga Millere*

Rīga Stradiņš University, Latvia

Objectives

The aim of the study was to assess relationship between self-reported lifetime suicidal ideation and peer-related factors among 14–17 year old boys and girls in Latvia.

Methods

Nationally representative sample of 7299 school children within the 2011 data collection of the European School Survey Project on Alcohol and other Drugs (ESPAD) was used. Adjusted logistic regression models were applied. Adolescent self-reported lifetime suicidal ideation as dependent variable and three peer-related factors (suicidal experience among peers, experienced verbal bullying in school and peer emotional support) as factor variables were analyzed in both gender groups.

Results

After adjusting for age, family material situation and studied peer-related factors, suicidal experience among peers (OR = 7.7; 95% CI 6.1–9.7; $p < 0.001$), always / often experienced verbal bullying in school (OR = 3.7; 95% CI 2.6–5.4; $p < 0.001$) and sometimes experienced verbal bullying in school (OR = 1.5; 95% CI 1.1–1.9; $p < 0.05$) was independently associated with significantly higher odds of lifetime suicidal ideation for adolescent boys. Suicidal experience among peers (OR = 3.3; 95% CI 2.8–3.9; $p < 0.001$), always / often experienced verbal bullying in school (OR = 2.5; 95% CI 1.8–3.5; $p < 0.001$), sometimes experienced verbal bullying in school (OR = 1.6; 95% CI 1.4–2.0; $p < 0.001$), never / rarely experienced peer emotional support (OR = 1.5; 95% CI 1.1–2.1; $p < 0.05$) and sometimes experienced peer emotional support (OR = 1.3; 95% CI 1.0–1.7; $p < 0.05$) was independently associated with significantly higher odds of lifetime suicidal ideation for adolescent girls.

Conclusions

Peer-related negative experiences play a significant role regarding adolescent self-reported suicidal ideation in Latvia – these findings extend the importance of school based mental health promotion and suicide prevention programs.

Inter-Rater, Test-Retest and Internal Consistency Reliability for Latvian Version of WHODAS 2.0

Zane Rožkalne; Dr. med. Anīta Vētra

*Rīga Stradiņš University, Latvia;
Children's Clinical University Hospital, Latvia*

Objectives

WHO Disability Assessment Schedule 2.0 (WHODAS 2.0) is a practical, generic assessment instrument that measures health and disability. It has sound theoretical underpinnings, good psychometric properties and numerous applications in different participant groups. The aim of this work was to test the inter-rater, test-retest and internal consistency reliability of the Latvian version of WHODAS 2.0.

Methods

Twenty participants aged 16–21 (Me 18, IQR = 19–17) years with diagnosis cerebral palsy (CP) and without cognitive impairment participated. Inter-rater reliability was tested between two physiotherapists with more than five years of experience in work with youth with CP, test-retest reliability was done with having one week between the two assessments, internal consistency was tested for the whole assessment and also for each of the six domains (Cognition, Mobility, Self-care, Getting along, Life activities, Participation) of WHODAS 2.0.

Results

Test-retest reliability for the total score of WHODAS 2.0 was $r_s 0.994$ ($p < 0.01$), for the domains $r_s 0.957$ – 0.992 ($p < 0.01$). Inter-rater reliability for the total score was $r_s 0.969$ ($p < 0.01$), for the domains $r_s 0.914$ – 0.986 ($p < 0.01$). Internal consistency for the whole assessment of WHODAS 2.0 was Cronbach's alpha 0.836, for the domains – Cognition 0.787, Mobility 0.710, Self-care 0.846, Getting along 0.722, Life activities 0.866 and Participation 0.787.

Conclusions

The results of reliability testing for Latvian version of WHODAS 2.0 are good to excellent. It can be assumed that the Latvian version is reliable to use when measuring the limitations on activity and restrictions on participation experienced by an individual.

Level of Pesticide Residues in Lakes of Sapropel Deposit in Eastern Regions of Latvia

*Dr. med. Ivars Vanadzīņš; Dr. med. Alise Silova;
Aneka Kļaviņa; Ph.D. Linda Dobkevica; Ph.D. Inese Mārtiņšone;
Laura Komarovska; Līga Ribkinska*

*Rīga Stradiņš University, Institute for Occupational Safety
and Environmental Health, Latvia*

Objectives

The aim of this study was detection of pesticide residues in the lakes of Latgale region with potential sapropel deposits suitable for development of biomedicine products. This study was done as part of the ERDF project “Analysis of characteristics of medical sapropel and its usage for medical purposes and elaboration of industrial extraction methods” (No. 1.1.1.1/16/A/165).

Methods

The concentration of various pesticide residues such as DDE/DDT, glyphosate and 2,4-D was determined in samples obtained from surface water and sapropel of five lakes in Ludza region of Latvia. Sapropel and surface water were taken from several places and different depths in each lake. For the quantitative screening of pesticide residues commercially available ELISA kits manufactured by Creative Diagnostic (USA) were used. Absorption measurements by a microplate reader SPARK (Tecan Ltd., Austria) were performed for all samples. Evaluation of measurements were performed using ELISA evaluation program Four Parameter Logistic Regression and calculated using program 4-PL, results were expressed as ppb.

Results

From persistent compounds only the presence of DDT and its decomposition product DDE were detected in collected water samples at different levels. The concentration of DDE/DDT between lakes and sample locations were different. The concentrations of DDE/DDT found in surface water from lakes were in general were lower than those found in samples of sapropel. The pesticide residue levels of 2,4-D and glyphosate in all investigated samples were below limit of detection, respectively, below 2 ppb and 0.075 ppb.

Conclusions

Previous studies have shown the common occurrence of organochlorine compounds in lake sediments indicating that a contamination source is still present and this was also confirmed in this study although the levels detected were low. Analysis of harmful components as pesticide residues in sapropel samples are significant for evaluation of potential use of sapropel in medicine.

Problematic Issues in Access to Education of Persons with Intellectual Disabilities

Eva Kauliņa

Rīga's Social Care Center "Stella maris", Latvia

Objectives

The goal is to examine the issue of legal guarantees to access to education for persons with intellectual disabilities.

Methods

Analytical method: the article is based on the analysis and review of several national and international laws, legislation, studies and documents, especially concerning Latvia, UK, Germany, and France.

Results

There are a number of problematic issues such as, among others, the fact that legislation is not fully regulated, and implementation of existing guarantees is flawed, there is lack of a valid concept of disability, no unified definitions for legal clarity (e.g. learning difficulties, appropriate physical environment), and the lack of the enforcement of rules and regulations relating to access to education. Governments should concentrate more on inclusive and integrative education. Plans to encourage inclusive education exist, unfortunately, such policies are not always implemented – governments often develop long-term education strategic plans but fail to meet annual operational plans. The principal obstacles for ensuring this are financial shortages, environmental inaccessibility, and untrained staff.

Conclusions

The right to education is not only a basic human right but also essential in ensuring that persons with intellectual disabilities are involved in the labour market and can be independent. To ensure access to education for disabled students, authorities must remember that: persons with special needs and intellectual disabilities need a specially equipped physical and information environment – infrastructural changes to the premises, as well as specially adapted study programmes and materials. According to legal provisions, however, educational institutions in some countries are not obliged to make any such changes if they are not willing. Such circumstance can be regarded as discriminatory towards persons with special needs. That is why it is necessary to improve the rule of law and develop effective mechanisms ensuring accountability.

Time Trends in Cervical Cancer Survival in Latvia

*Una Kojalo*¹; *Dr. Irina Jermakova*²; *Dr. med. Jana Žodžika*²;
*Santa Pildava*³; Prof. *Ģirts Briģis*⁴; Prof. *Gunta Lazdāne*¹

¹ Rīga Stradiņš University, Institute of Public Health, Latvia;

² Rīga Stradiņš University, Latvia;

Rīga East University Hospital, Latvia;

³ The Centre for Disease Prevention and Control of Latvia;

⁴ Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia

Objectives

Cervical cancer (CC) is the fourth leading cause of cancer death in women globally. Despite introduced cervical cancer screening programme in 2009, Latvia is amongst countries with lowest survival from CC and highest incidence and mortality. The aim of this population-based study was to examine changes over time in survival for patients with CC diagnosed in Latvia during 1993 to 2016.

Methods

The study includes data from the Latvian cancer registry. The sample includes 5248 female patients with diagnosed and histologically confirmed cervical cancer from 1993 to 2016. Relative survival ratios (RSR) were calculated for five time periods. Additionally, time trends in cervical cancer incidence and mortality in Latvia were analysed. Data was processed using programmes IBM SPSS Statistics, Stata and Joinpoint Software.

Results

Lowest age-standardized five-year RSR observed in 1997–2001 and it increased by 6% points up to 55.1% in 2012–2016. RSR improvement observed in all age groups except women age 70 and older. Best improvement in five-year RSR, by 22% points observed in age group below 40, and for patients with disease stage II, by 11% points. Age-standardized incidence rates of CC has increased on average by 2.9% (95% CI 2.3–3.4) per year; age-standardized mortality rates of CC has gradually increased by 1.5% (95% CI 0.9–2.1) on average per year.

Conclusions

The study showed the increasing CC incidence and mortality in Latvia and trends do not showed any changes since introduction of the organised screening programme. Overall and stage-specific relative survival rates improved in all age groups except the oldest, however, the survival from CC remains among the lowest in the Europe. Actions for improving screening effectiveness needed.

Innovative Soft Drinks with High Antioxidant Capacity for Oral Health

*Ph.D. Andrejs Skesters¹; Dr. med. Alise Silova¹;
Rolands Brinkis²; Dr. med. Aldis Rozenblats³*

¹ Rīga Stradiņš University, Laboratory of Biochemistry, Latvia;

² DabasDots Ltd, Latvia;

³ Rīga Stradiņš University, Institute of Stomatology, Department of Oral and Maxillofacial Surgery, Latvia

Objectives

During last years has remarkably increased interest about role of soft drink intake frequency on oral health and periodontal diseases. In some high income states such USA, UK, Taiwanese teenage and middle-aged adults were observed. Results show increase of obesity, type 2 diabetes, dental caries and others pathologies. Sugars and low pH can provoke dental effects: erosion and cavities such as increase of oxidative stress in saliva.

Aim of our investigation was to detect capacity of antioxidants (AO) and antiradicals (AR) in innovative products – herbal teas and juice mixtures.

Methods

Were examined:

- 1) Yarrow (tea)76% / Aronia (juice)20% + 4% fructose;
- 2) Chamomile 85% / Rhubarb 11% + 4% fructose;
- 3) Peppermint 83% / Blackcurrant 10% + 7% honey;
- 4) Sea buckthorn 88% / Rowan 9% + 3% quince syrup;
- 5) Fireweed 80% / Pumpkin 15% + 5% quince syrup.

For the evaluation of Total Phenolic Content the Folin-Ciocalteu assay was used (Singleton, 1999), Total Antioxidant Status determined by RANDOX (Crumlin, UK) kit, antioxidant activity was investigated by the DPPH (Wang et al., 2008) and ABTS* assay based on the scavenging ability of AO (Re, 1999) methods. Reducing ability or total AO capacity was examined by using the FRAP assay (US patent, Benzie and Strain, 1999), NO radical scavenging was detected by L.A. Santiago, 2014, method.

Results

The highest AO and AR capacity of the mixed drink – herbal tea / juice / sweetener – was observed in the Yarrow / Aronia drink. The capacity decreased in the following order: Peppermint / Black currant, Sea buckthorn / Rowan, “Fireweed” / Pumpkin and, finally – Chamomile / Rhubarb.

Conclusions

All tea / juice mixtures have shown high content of AO / AR properties, especially high level in Yarrow / Aronia and Peppermint / Black currant.

Our regards that high content of AO / AR to decrease or prevent the onset of various oral diseases.

Motivation of Nurses to Control Infection in Surgery Departments

Diana Platace; Žanna Šedova; Dr. med. Inga Millere

*Rīga Stradiņš University, Department of Nursing
and Midwifery, Latvia*

Objectives

Human resources are very important components in health care system and, in order to achieve much better public health indices, it is not enough to have modern technologies or new medicines. Surgical nurses to supervision and care of the patient 24 hours a day and play an invaluable role in controlling infections and reducing hospital infections. The choice of a person's profession is based on orientation and his social values. No less important role in nurses motivation play psychological factors, such as attitudes, habits, stress and tolerance.

Methods

The aim of the work was to study motivation of nurses to control infection in surgery departments of Latvia's hospitals.

The study used a quantitative study method – survey (n = 60). The study consisted of two parts. The first part contained a theoretical overview of motivation description, professional motivation review, description of Maslow motivation theory and review of Frederik Irving Herzberg two factor theory. The second part of the study were to create a questionnaire with an aim to find out the motivating factors of infection control in nurse practice, as well as about the risk factors of motivation in surgery departments, to perform research, to summarize and to analyze results and to make conclusions.

Results

The survey showed that the greatest motivation for nurses is fear of infection. Primarily nurses are motivated by patient safety and the prevention of spread of infection. The motivating factor for all nurses is the satisfaction of work, the social work environment (workplace supplements), and general precautions, based on the assumption that any patient may be the carrier of infectious diseases. Hand hygiene is the most powerful preventive measure in the fight against health-related infections, and all nurses agreed with the statement that the implementation of manual hygiene measures during patient care and their recommendations is easy to implement.

At study, respondents acknowledged that they were motivated by more or less patient health concerns. 33 nurses (55%) said that hospital regulations for isolation of infectious patients are not easy to implement and understandable, which is an obstacle to motivating care for infectious patients in the isolation rooms.

Conclusions

The study has identified nurses' motivators for infection control, they are fears of infection, general precautions (based on the assumption that any patient can be a causative agent or carrier of infectious diseases), job satisfaction, and social work environment (premiums). And at the same time, there are also factors that disturb nurses' motivation, such as attitude, stress and work in a hurry.

Determination of Muscle Fatigue in Handling Operations of Metal Processing Enterprise

Prof. *Henrijs Kalkis*¹; Prof. *Zenija Roja*²; Dr. med. *Inara Roja*³;
*Kristine Bokse*²; Ph.D. *Sandis Babris*⁴

¹ *Rīga Stradiņš University, International Business and Economics Department, Latvia;*

² *University of Latvia;*

³ *Rīga 1st Hospital, Outpatient Department, Latvia;*

⁴ *BA School of Business and Finance, Latvia*

Keywords: Myoton-3, Borg scale, manual work, posture.

Objectives

In Latvia work related muscular skeletal disorders (WRMSDs) in manufacturing of finished metal products are growing in last years, where employees are basically exposed to manual work and standing forced posture. Standing is a common working position when the workers are handling heavy materials, pushing and pulling excessive loads. The aim of this study was to determine physical load and muscle fatigue of workers in the medium sized metal manufacturing enterprise. The research involved 10 operators in assembly line of ironing boards: 5 packaging operators and 5 control operators (6 females and 4 males in the age group 25 ± 5.6 , with length of service 6 ± 4.3 years). All operators were found to be healthy in the mandatory health checks and all agreed to take part in the objective measurements. The study was approved by the Human Ethics and Institutional Review Board of University of Latvia in 2018.

Methods

In the research the Borg Rating of Perceived Exertion (RPE) scale was used. This scale, developed by Swedish researcher Gunnar Borg (1982), is a tool for measuring an individual's effort and exertion, breathlessness and fatigue during physical work and so is highly relevant for occupational health and safety practice. Also a non-invasive method was applied to study muscle fatigue by using Myoton-3 (Vain, Gapeyeva, 2007). The Myoton-3 myometer is a reliable tool for quantifying muscle tone, elasticity, and stiffness of such muscle groups: m. extensor digitorum, m. flexor carpi radialis, m. tibialis anterior, m. gastrocnemius, m. trapezius. Measurements were made over a one week intensive working cycle.

Results

Majority of operators (70%) complain about heavy manual work and fatigue in the arms and legs after work, but 30% complain about fatigue in the arms, legs and upper back after work. Higher level of physical load was indicated by packaging operators. According to Borg Scale analysis, 60% of operators assess their work as very heavy (score level: 17...18), but 40% – heavy (score 15...16) and noted that the work was done in standing position. The assessment of muscle fatigue at the beginning of work showed that the highest strain was observed for m. tibialis anterior of the right legs (22.0 Hz), while the lowest tension was observed for the m. gastrocnemius of the right leg (13.1 Hz). During the weekly work cycle in the observed muscle groups, muscle tension decreases and corresponds from 15.0 to 16.4 Hz (category II). An analysis of muscle stiffness shows that the muscle groups studied during the working week cycle increases at the beginning ($303 \pm 61...410 \pm 51$ n/m), but at the end – only slightly decrease ($251 \pm 21...394 \pm 38$ n/m) and corresponds to category II. This indicates the muscles work intensity at the beginning of the week, but they are able to adjust to the severity of the work during the working week cycle. The objective results of muscle fatigue measurements during intensive working conditions do not match with the subjective opinion and assessment of employees.

Conclusions

The results showed that for a determination of muscle fatigue in handling operations there is a need of a combined approach that involves survey, subjective and objective assessment. The further study will be performed using the EMG method to expand the state of deep muscles in intensive work mode.

Towards Conceptual Model of International Competitiveness of Latvian Health Sector

*Daiga Behmane*¹; *Dr. Didzis Rūtītis*²

¹*Rīga Stradiņš University, Latvia;*

²*BA School of Business and Finance, Latvia*

Objectives

Competitiveness concept lacks a universally accepted definition. The aim of the study is to introduce a competitiveness definition for health care sector and develop a conceptual model for the international competitiveness assessment and its management within the Latvian health sector.

Methods

The literature review and comprehensive analysis of theoretical aspects of competitiveness and its international dimension, comparative analysis of competitiveness definitions and frameworks within health care industry.

Results

Efficiency of health care providers significantly depends on their capability to be competitive regionally and globally. Different studies (e.g. Porter, 2000, Krugman, 1996) propose a variety of approaches to define competitiveness and interpret within different levels of economic analysis. From a national or regional perspective, it looks at the sustainability of the current level of growth, as well as sector's productivity level. Macroeconomic factors, such as quality of institutions, macroeconomic policies, set the broader context in which health care providers operate, microeconomic factors (service environment quality, clusters, communication tools) have a more direct impact on service productivity. Endowments, such as geographical location and the size of economy, affect how the macro and micro economic factors amendable to policy action translate into sustainability and competitiveness.

The dynamics of the health care requires new tools and approaches for the strategic development of the sector. Due to globalization health sector can gain from specialization related to its comparative advantage realized through production of services at a lower opportunity cost, economies of scale for specialization, greater choice and preferences for consumers and value-based health care approach.

Conclusions

The study proposes a conceptual framework for improving international competitiveness of the Latvian health care sector. Authors introduce a conceptual model for managing systemic competitiveness on meta, macro, meso and micro levels and accordingly selected measurement instruments.

Mortality among Drug Users in Latvia

*Diāna Vanaga-Arāja*¹; *Dzintars Mozgis*²; *Iveta Gavare*³

¹*Latvian Centre for Disease Prevention and Control, Addiction Monitoring Unit, Latvia;*

²*Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia;*

³*Latvian Centre for Disease Prevention and Control, Latvia*

Objectives

The aim of the study was to estimate mortality rates and basic causes of death among 15–49 years old opioid, stimulant and synthetic cannabinoid users in Latvia during a time period from 2013 to 2017.

Methods

Retrospective cohort study. The Narcological Registry has been used, where the information has been supplemented with data from the Causes of Death Database. The subject is a 15–49-year-old drug user, who has recorded a treatment episode during the period 2013–2017 in which indicated opioid, stimulant and (or) synthetic cannabinoid use in the last 30 days. Subjects are followed from the time they were added to the cohort (January 1, 2013) until – 1) death, 2) 50 years to reach, or 3) the end of the study (December 31, 2017), depending on which condition was met first.

The crude mortality rate (CMR) and the standartized mortality ratios (SMRs) were estimated.

Results

During the study period 182 (or 7.9%) deaths were recorded. From them 52.7% deaths were for opioid users, 26.4% for polydrug users, 11.0% – stimulant users and 9.9% were for synthetic cannabinoid users. The average age at death was 33.7 years.

The most common cause of death representing 36.8% (n = 67) was due to the effects of external causes.

The estimated crude mortality rate was 28.8 per 1000 person-years; standartized mortality ratio was 5.3 (95% CI 4.56–6.10).

Conclusions

Mortality cohort studies provide useful insights into the impact of problem drug use on mortality. Compared with the general population, people who use drugs have a higher risk of death – with a higher risk for women than men. Women who use drugs have 10.7 times higher risk of dying than women of the same age who do not use drugs, while for men the risk of dying is 4.7 times higher than men who do not use drugs.

Comparison of 30 Days Mortality Variance among Latvian Hospitals

Alina Dudele; Prof. Ģirts Brīģis

*Rīga Stradiņš University, Faculty of Public Health
and Social Welfare, Latvia*

Objectives

The aim was to compare 30-day acute myocardial infarction (AMI) mortality across Latvian hospitals between 2014 and 2017.

Methods

To calculate and compare 30-day mortality in Latvian hospitals data of National Health Service was used for the time period from 2014 till 2017. Data were stratified according to hospital level: regional, university and other. Mortality risk ratios were calculated.

Results

Overall 30-day mortality after hospital care of AMI was slightly decreasing from 11.7% in 2014 till 11.0% in 2016, but increasing up to 14.7% in 2017. There is substantial variance between hospitals: the best performing hospitals had 8.9% mortality rate vs. 36.8% at the worst performing hospital. There were no positive dynamics in mortality rate. Variance of mortality between hospitals remains substantial during entire period. Risk ratio between group of regional hospitals and university clinics is 1.32, but between other hospitals and university clinics – 1.80.

Conclusions

Thirty-day mortality in Latvian hospitals remains the highest in EU. The variability between hospitals is also very high. There is no positive dynamics in changes in mortality.

Use of Short Version of Orebro Musculoskeletal Pain Screening Questionnaire for Patients with Low Back Pain in Primary Care: Pilot Study

*Dr. Matīss Mežals*¹; *Dr. Agnis Mežals*¹;
*Dr. Inese Kokare*²; Prof. *Ināra Logina*³

¹ *Rīga Stradiņš University, Latvia;*

² *Pauls Stradiņš Clinical University Hospital, Latvia;*

³ *Rīga Stradiņš University, Department of Neurology
and Neurosurgery, Latvia*

Objectives

The aim of the study was to evaluate possible use of a short version of the Orebro Musculoskeletal Pain Screening Questionnaire (OMPSQ) proposed by Linton et al. in primary care. Chronic back pain is world's leading cause of disability. It's associated with decreased quality of life, high health care and social costs. In Latvia there is no commonly used identification tool for early screening of risks factors for disability development.

Methods

This pilot study included 36 patients who visited primary care specialist with complaints about low back pain. Patients were asked to complete OMPSQ and Oswestry Low Back Pain Disability Questionnaire at the beginning of the treatment. Follow up interview was conducted six weeks after the first visit. IBM SPSSv23 was applied for statistical analysis including evaluation of correlations, descriptive assessment of mean values and 95% confidence intervals (CI).

Results

Eleven questionnaires (N = 11) out of 36 were recognized as suitable for the study. Mean value of OMPSQ at the first visit was 45.8 (95% CI 31.16–60.47) and after six weeks 38.72 (95% CI 24.82–53.63). Mean value of Oswestry disability index (ODI) at the first visit was 16.74 (95% CI 10.04–24.36), after six weeks 15.9 (95% CI 8.72–24.36). Positive and strong correlation was found between OMPSQ and ODI at the beginning of the treatment $r = 0.876$ ($p < 0.001$) and six weeks after the first visit $r = 0.9$ ($p < 0.001$).

Conclusions

Six weeks after the first visit of primary care specialist mean scores of OMPSQ and ODI slightly decreased, demonstrating that disability remained high despite the treatment. OMPSQ strongly correlated with ODI, therefore OMPSQ could be used independently to stratify patients by their need for early interventions in order to reduce possible disability development in the future.

Musculoskeletal Pain and Associated Ergonomic Factors among Latvian Workers

Darja Kaļūznaja; Dr. med. Žanna Martinsone

Rīga Stradiņš University, Department of Occupational and Environmental Medicine, Latvia

Objectives

The aim was to analyze association between musculoskeletal pain and ergonomic work environment factors among Latvian workers.

Methods

Work analyze “Work conditions and risks in Latvia 2012–2013” research database from questionnaires (Computer Assisted Personal Interviews) results (n = 2382). The computer programme SPSS for Windows 22.0 is used for data statistical analysis – descriptive statistics methods, crosstabs analyse with Chi-Square test and multinominal logistic regression analysis. Thesis include some models to explore adjusted relations between work environment factors and musculoskeletal pain, also according to worker sex, age and occupation.

Results

The results show, that one third of respondents at last year had pain at least in one body part. One third (28.8%) of all respondents have experienced pain in at least one part of the body in the last year, of which half (55.6%) had moderate pain, a third (30.5%) had severe and only a small part (13.9%) weak pain. Women (32.1%), workers aged 45–54 (36.7%) and unskilled workers (39.5%) are more likely to experience pain.

The most common ergonomic factors in the work environment, between respondents who have experienced pain in at least one part of the body are awkward posture (51.8%), uniform movements (45.4%), work with computers (39.9%) and moving heavy objects (36.3%).

Pain is more often experienced by workers who are subjected to carrying or moving heavy objects, working with tools and equipment (men are more prone to both factors), working in awkward posture and uniform movements (both sexes are equally exposed to these two factors). Employees working with computers have less chance of pain, which may be due to the fact that the duties are not related to the hard work. Multinomial logistic regression analysis results show, that after adjustment, higher risk to pain have employees exposed to awkward posture (OR = 1.41), exposed to uniform movements (OR = 1.34), and lower risk to pain have employees exposed to work with a computer (OR = 0.71). Socio-demographic factors that increase the chances of pain are of great importance – women have 1.81 times higher risk compared to men, two times higher risk have 55–80 year-old (OR = 2.07) and 45–54 year-old employees (OR = 2.14), compared to younger workers (18 to 24 years old) and most – 2.38 times higher risk have unskilled workers compared to managers.

Conclusions

The work hypothesis that workers exposure to ergonomic factors increases the likelihood of experiencing musculoskeletal pain is partially confirmed, as exposing workers to various work environment factors, the chances of pain increases by two of the ergonomic factors – uncomfortable or tiring position and repetitive tasks, while adverse – working with computer reduce pain risk, in addition, it is important to analyse data in different socio-demographic groups.

What Old Age Feels Like in Latvia: Preliminary Results from the First SHARE Data Collection Wave in 2017

*Dr. med. Signe Tomšone*¹; *Andrejs Ivanovs*²; *Diana Baltmane*³;
*Līva Jansone*³; *Anete Alberte*³; Prof. *Gunta Lazdane*²

¹ *Rīga Stradiņš University, Department of Rehabilitation, Latvia;*

² *Rīga Stradiņš University, Institute of Public Health, Latvia;*

³ *Rīga Stradiņš University, Statistics Unit, Latvia*

Objectives

Survey of Health, Ageing and Retirement in Europe (SHARE) is a multidisciplinary and cross-national panel database of micro data on health, socio-economic status, social and family networks of more than 120 000 individuals aged 50 or older. Currently SHARE covers 27 European countries and Israel. SHARE has started in 2004; however, the first data collection wave in Latvia occurred only in 2017.

Methods

SHARE project specific questionnaire were used and data were collected by face-to-face interviews during home visits in period between May and September in 2017 all over in Latvia. The cluster sample based on an address register was used for survey purposes. 1710 participants took part in this data collection wave and were included in the analysis. Data were weighted according to the general structure of the population 50+ years of Latvia.

Results

61.0% of the survey participants were female, majority represented age group 50–59 yrs (33.6%) and 60–69 yrs (29.7%). Majority were retired persons (55.4%) but 32.0% of participants indicated that they are employed (or self-employed).

The mean life satisfaction level of participants was 6.4 ± 2.3 points (in scale between 0 and 10). Lower scores were associated with older age and differed according to education, job situation and income. Participants ($n = 1682$) indicated that sometimes (30.2%) or often (25.1%) age prevents them from doing things. At the same time majority of participants ($n = 1681$) stated that they can do things they want to do often (35.1%) or sometimes (30.7%). Financial aspect is important for activities in old age as the participants ($n = 1681$) stated that lack of money stops them of doing things often (40.5%) or sometimes (33.3%). Reading books and magazines was most frequent activity (39.1%) among the participants ($n = 1693$). From 1660 participants 29% stated that rarely future looks good to them.

Conclusions

The study sample is representative for the 50+ aged population of Latvia and provides a sufficient number of cases for subgroups to be analyzed; the findings will serve for future comparative and more specific analysis. The planned forthcoming data collection waves in Latvia will provide opportunity for longitudinal data analysis and is essential for long-term strategic planning.

Unmet Health Care Needs of Elderly: Prevalence and Situation Comparison among 27 European Countries

*Marija Oniščuka*¹; Prof. *Gunta Lazdāne*²;
*Andrejs Ivanovs*¹; *Diāna Baltmane*¹

¹ *Rīga Stradiņš University, Statistics Unit, Latvia;*

² *Rīga Stradiņš University, Institute of Public Health, Latvia*

Objectives

The objective of the study is to describe the existing situation of unmet health care needs of people aged 50 and older in 27 European countries. It allows assessing the inequalities in access to health care within countries (diversity of socio-economic and health level of individuals) and among countries (various level of health care expenditures and health care systems).

Methods

The data from the seventh wave of the Survey of Health, Ageing and Retirement in Europe (SHARE) covering Israel and 27 European countries including Latvia with more than 70 000 interviews conducted from March to October 2017 is used. SHARE is a survey focusing on people aged 50 and older and covers data on economic, social and health factors funded by the European Commission (Horizon 2020), the US National Institute on Aging, and national sources especially the German Federal Ministry of Education and Research.

Results

In average almost every fifth person after 50 in the countries of the study had unmet healthcare need due to costs, including unaffordability of a visit to a physician or dentist as well as unaffordability of drugs. The prevalence ranged from 6% in Slovakia and Malta to 27% in Latvia and Greece, peaking at 36% in Romania. Unmet healthcare need due to long waiting lists ranged from 1% in Switzerland and Slovakia to 12% in Estonia and 15% in Latvia, with the average at 6%.

At the individual level, higher risk of unmet need in access to health care has the following groups: women; persons with obesity; persons with limited activities due to health reasons; persons less satisfied with life or current job; persons with chronic illnesses; persons who rated their current health status as poor; persons who have experienced physical abuse from parents in childhood and persons living alone.

Conclusions

Results showed that there is high diversity in access to healthcare among the elderly within Europe. National healthcare and well-being policies are to focus on the findings of the most in need including individual socio-economic status and health level.

Activity Calculator – Method to Determine Balance between Activity and Energy Level

Zane Liepiņa¹; Klinta Epalte²

¹ Rīga Stradiņš University, Department of Rehabilitation, Latvia;

² National Rehabilitation Centre "Vaivari", Latvia

Objectives

Aim of the study was to test validity of "The Activity Calculator" version in Latvian in occupation therapy practice with patients with osteoarthritis.

Methods

Research design is non-experimental, descriptive, quantitative study. Guidelines for cross – cultural adaptation process were used to create a version of the assessment tool in Latvian. Participation in the study was voluntary and each participant received informative letter on participation in the study. The test-retest took place with the presence of the author. Descriptive statistical indicators were used for the analyses of the obtained data. The reliability of the assessment tool was determined using the intraclass correlation coefficient.

Results

Twenty four participants aged from 54 to 84 years with diagnosed osteoarthritis took part in the study. Latvian version of "The Activity Calculator" has excellent reliability. ICC for activity week schedule is 0.994 (with 95% CI 0.901–1.000) and time registration list 0.927 (with 95% CI 0.839–0.968).

Conclusions

The "Activity Calculator" helps to obtain a clear, objective and measurable outcomes of activities of daily living and the level of energy. The Latvian language version of the "Activity Calculator" can be used in practice in Latvia for patients with osteoarthritis.

Relationship between Use of Reflectors and Use of Preventive Health Care in Latvia: Year 2016

*Aija Bukova-Žideļūna*¹; Prof. *Anita Villeruša*²;
*Daiga Grīnberga*²; *Iveta Pudule*²

¹ *Rīga Stradiņš University, Department of Public
Health and Epidemiology, Latvia;*

² *Latvian Centre for Disease Prevention and Control,
Department of Research and Health Statistics, Latvia*

Objectives

From the review of literature, it is widely accepted that the use of reflectors reduces pedestrian accidents and death by 75–85%. Groups at higher risk of traffic-related accident, injury or illness include those already ill. Objective of the study was to examine the relationship between self-reported use of reflectors and use of preventive health care services in Latvia.

Methods

Methods: Data of Health Behaviour among Latvian Adult Population 2016 survey was selected for analysis. T-test and logistic regression analyses were conducted to compare the use of reflectors, visiting the family doctor, free preventive health check at family doctor, immunisation against diphtheria, tickborne encephalitis and influenza.

Results

Results: Only 46.4% (n = 1667) of 3596 respondents used reflectors when walking in dark areas with no lighting. Odds to use reflectors were higher for respondents who had visited their family doctor during last 12 months (OR = 1.1; 95% CI 1.0–1.3), for respondents who had ever made free preventive health care check at family doctor (OR = 1.2; 95% CI 1.0–1.5), for respondents who were immunised against diphtheria regularly (OR = 1.1; 95% CI 1.0–1.2), for respondents who were immunised against tickborne encephalitis regularly (OR = 1.1; 95% CI 1.0–1.3), for respondents who were ever been immunised against influenza (OR = 1.2; 95% CI 1.0–1.4). Gender, age groups and education level were identified as independent risk factors.

Conclusions

The study indicates that not using reflectors when walking in dark areas with no lightning can be consistent with other health related risk-taking behaviour such as not using preventive health care services. Usage of reflectors could be included as the issue of promoting preventive activity in primary care.

Restrictions of Human Fundamental Rights in Interests of Public Health in Latvia

Aldis Liepiņš

*Rīga Stradiņš University, Faculty of Public Health
and Social Welfare, Latvia*

Objectives

1. To provide a restriction of the situation regarding restrictions of the Fundamental Human Rights in the interests of Public Health in Latvia.
2. To identify cases of mandatory and compulsory medical treatment and medical treatment without patient's consent.
3. To estimate whether it is in the interests of Public Health in Latvia to set additional measures to limit the Fundamental Human Rights in the interests of Public Health.

Methods

Scientific research methods known in the theory of law used at this research:

- 1) analytical method;
- 2) comparative method;
- 3) historical method;
- 4) sociological method;
- 5) inductive method;
- 6) deductive method.

Results

Latvian legal acts provide legal mechanisms for mandatory medical and laboratory human examination, as well as for mandatory and compulsory isolation and medical treatment or in other words restricts the Fundamental Human Rights to choose not to cure when

- 1) a person can cause harm to himself and others due to mental illness or disorder;
- 2) in cases of infectious and dangerous infectious diseases.

Treatment without patient's consent is also in the interests of Public Health and is acceptable in 2 cases:

- 1) the treatment is urgent (hesitation endangers patient's life) and it is not possible to ascertain the patient's (or authorized person's) will;
- 2) during surgical or other invasive intervention the treating doctor ascertains a necessity for the patient to take pre-planned medical treatment if the patient must be provided with emergency medical assistance or if in a case of an undone treatment will be caused greater damage to the patient's health.

Conclusions

Existing mechanisms that restricts the Fundamental Human Rights are established in accordance with the international human rights standard.

It has not been legally evaluated whether the right not to vaccinate against dangerous and infectious diseases does not endanger the right of other society members to right to health established in Article 111 of Constitution.

In the interest of Public Health is to prevent that newborn infants are not vaccinated against dangerous and infectious diseases, thus putting the lives of newborn infants at risk and cultivating the spread of dangerous and infectious diseases that endangers the society. In this regard it is suggested to amend Article 22 of Cabinet Regulation No. 330 "Vaccination Regulations".

Relation between Sense of Coherence and Work Quality Competence among Hospital Nurses

*Kristaps Circenis*¹; *Svetlana Lakisa*²;
*Ph.D. Arturs Paparde*³; *Kristine Bite*¹

¹ Rīga Stradiņš University, Department of Nursing and Midwifery, Latvia;

² Rīga Stradiņš University, Institute for Occupational Safety
and Environmental Health, Latvia;

³ Rīga Stradiņš University, Department of Human Physiology
and Biochemistry, Latvia

Objectives

The aim is to find out the relation between sense of coherence (SOC) scale and Quality work competence (QWC) scale among hospital nurses.

Methods

The research was performed using two questionnaires – Sense of coherence scale (SOC) include 3 subscales: Comprehensibility, Manageability and Meaningfulness and Quality work competence questionnaire include 11 subscales: Goals, Management feedback, Participatory management, Employeeship, Leadership, Efficiency, Competence and development, Work-related exhaustion, Work climate, Organizational energy and Work intensity. Nurses from different hospital departments participated in the survey (n = 159); all respondents were females. The total number of distributed questionnaires were 200, response rate 79,5%. Spearman correlation coefficient was used.

Results

We found some statistically significant correlations between Sense of Coherence scale subscales and Quality-Work Competence questionnaire subscales.

QWC Organizational energy and Work-related exhaustion subscales correlated with SOC scales the most.

Moderate significant correlations between SOC subscale Manageability and QWC Goals (r = -0,43), Organizational energy (r = -0,43) and Work-related exhaustion (r = -0,49) for Medical department nurses and Leadership (r = -0,53) and Work climate (r = -0,49) for Mental health department nurses were found. As well as between SOC subscale Meaningfulness and QWC Goals (r = -0,43, Mental health nurses), Participatory Management (r = -0,41, Surgical nurses), Leadership (r = -0,48, Mental health nurses), Work-related exhaustion (r = -0,49, Medical department nurses) and Organizational energy (r = -0,48 Surgical nurses; r = -0,44, Intensive care nurses; r = -0,54, Medical department nurses) were found.

Conclusions

Nurses with better sense of coherence are less exhausted, irritated, nervous and restless. They note that goals are more clear, leadership and relationships with colleagues are better, and they are able to decide and influence their own work tasks and give their point of view.

Correlation of Health Loss with Capacity Ability to Fulfill Existing Work Obligations for Adults With Occupational Diseases

*Jelena Civako*¹; Prof. *Aivars Vetra*²; Dr. *Sandra Ausekle*³

¹ State Medical Commission for the Assessment of Health Condition and Working Ability, Latvia;

Rīga Stradiņš University, Faculty of Continuing Education, Latvia;

² Rīga Stradiņš University, Faculty of Rehabilitation, Latvia;

³ Rīga Stradiņš University, Faculty of Continuing Education, Latvia

Objectives

To investigate correlation between loss of health and ability to carry out labor duties people with occupational diseases.

Methods

Medical experts calculated disability at adults with occupational diseases (30–87 years) which followed disability assessment (n = 100), using “Criteria of determination of disability as percent for people with occupational disease, %”. The severity of realization of labor duties (if the respondent works) was estimated by respondents by means of “The questionnaire of a self-rating of the functional capacities for persons aged after 18 years (it is adapted: there are no difficulties = 1, very serious difficulties = 5). Data on temporary disability, change of the place of work or a duty, dismissal were estimated (it is adapted: if there is no of the listed facts = 1, if there is one of the listed facts = 2.). The severity of loss of health was equated to the number of diagnoses in the conclusion about occupational disease and presence of the accompanying pathology. Data were analysed with use of a method of correlation (by means of Spirman coefficient of correlation).

Results

The number of diagnoses of occupational diseases, the accompanying pathology weren't bound to the disability percent estimated by medical experts (rs = 0.189); the accompanying pathology weren't bound to severity of realization of the labor duties estimated by the respondent, (rs = -0.1456). The severity of the performance of the work duties calculated by the respondent was not related to data on incapacity, change of work or work arrangements, dismissal, (rs = 0.148).

Conclusions

Disability assessment among adults with occupational diseases is still concentrated mainly on medical factors. The number of diagnoses of occupational diseases, the accompanying pathology weren't bound to the disability percent estimated by medical experts, weren't bound to severity of realization of the labor duties estimated by the respondent, the severity of the performance of the work duties calculated by the respondent was not related to data on incapacity, change of work or work arrangements, dismissal.

From Mathematical Modeling of HIV Epidemic to Innovative Public Health Intervention for Key Populations in Latvia: Preliminary Results of HERMETIC Project

*Dr. med. Anda Kīvīte-Urtāne*¹; *Ph.D. Lise Marty*²; *Ruta Kaupe*³;
*Indra Liniņa*¹; *Dr. Inga Upmace*⁴; *Ph.D. Virginie Supervie*²

¹ Rīga Stradiņš University, Latvia;

² French National Institute of Health and Medical Research;

³ NGO "DIA+LOGS", Latvia;

⁴ NGO "Baltic HIV Association", Latvia

Objectives

To estimate undiagnosed number of people living with HIV (PLWH) in Latvia; to diminish number of undiagnosed cases through introduction of innovative testing technology in the country – oral fluid rapid test.

Methods

For the mathematical modeling of undiagnosed infections data from national HIV case registry hold by the Centre for Disease Prevention and Control of Latvia have been taken (from 2000–2016) and the clinical-stage based back-calculation was used. The modeling exercise was carried out by the leading partner of HERMETIC project (French National Institute of Health and Medical Research). For testing activity OraQuick® rapid test was used and 310 people who inject drugs (PWID) and 205 men who have sex with men (MSM) were tested via outreach services between September 2017 and February 2018. Accuracy of OraQuick® was assessed against positive capillary blood rapid test (CHIL®) or self-reported positive serostatus. Acceptability of the test was assessed through mixed methods (quantitative questionnaires, focus groups, in-depth interviews). Chi square or Fisher exact test were used to analyze quantitative data, qualitative data were analyzed by using thematic analyses.

Results

Number of PLWH not knowing their diagnosis is 1826 in Latvia (1.4 per 1000 inhabitants) PWID and MSM being the most affected populations. Sensitivity of OraQuick® test was 84.4%, specificity – 99.1%, positive and negative predictive values – 94.2% and 97.3%. No significant differences were identified in accuracy measures between PWID and MSM. Awareness on oral fluid test before the study was greater among MSM than PWID ($p < 0.001$). MSM had also greater trust in the validity of the test ($p < 0.001$) and they recommended the test more often to others ($p = 0.08$). PWID trusted the capillary blood test more than the oral fluid test ($p < 0.001$).

Conclusions

One third of HIV cases are undiagnosed in Latvia. Accuracy and acceptability of the oral fluid test is high in the country.

Balance Parameters of BMX Riders in Correlation with Incidence of Fall Times

*Evita Dubiņina*¹; *Regīna Virse*²

¹ *Latvian Academy of Sport Education,
Department of Sport Medicine, Physiotherapy,
Massage and Adapted Physical Education;*

² *Latvian Academy of Sport Education*

Objectives

BMX is one of the most extreme and traumatic sports. There's a lack of research for injury incidence in this sport and what factors are causing them, or how to decrease them. Also the connection between times of falling and balance have never been researched before.

Aim of this research: to evaluate balance of BMX riders and to study correlations between riders balance results and the incidence of fall times.

Methods

Research design: Quantitative, descriptive analytic, non-experimental research.

Research participants: 19 BMX riders 14 to 17 years old, who are training in BMX sport at least three years, who have not had a serious trauma in last six months, and whose parents had given a permission to participate in this research.

Instruments: balance was evaluated with HUR BT4 balance platform. Two balance tests were performed – Romberg 30 seconds test with eyes opened and eyes closed, and Limits of Stability test. Before evaluation data was collected with questionnaire about fall times and injuries in last season.

Results

Correlation between riders balance results and the incidence of fall times was insignificant ($p > 0.05$). All participants fitted into the HUR Labs iBalance Premium software normative for Rombergs 30 second test with eyes opened and eyes closed. Average result for parameter C90 area was 121.20 ± 55.81 mm². Rombergs quotient average was 162.7 ± 85.08 mm². In the Limits of Stability test average result fitted into the norm only in forward direction, it was 7.05 ± 1.50 . In rearward direction average result was 4.24 ± 1.48 , in leftward direction it was 6.59 ± 1.24 , and in rightward direction 6.78 ± 1.06 .

Conclusions

Results in static balance were appropriate to the normative and far more superior comparing to the results given in literature. Dynamic balance is well developed only in forward direction. In rearward, leftward and rightward directions results are low, they don't fit in the HUR software normative. In researched group no correlations were found between times of falling and balance results ($p > 0.05$).

Sickness Absence Demographic Structure in Latvian Working Population

*Svetlana Lakisa*¹; Prof. *Inese Gobina*²;
*Dr. med. Ivars Vanadzins*³

¹ *Rīga Stradiņš University, Institute for Occupational Safety and Environmental Health, Latvia;*

² *Rīga Stradiņš University, Department of Public Health and Epidemiology; Institute of Public Health, Latvia;*

³ *Rīga Stradiņš University, Institute for Occupational Safety and Environmental Health; Department of Occupational and Environmental Medicine, Latvia*

Objectives

Research of sickness absence has received great attention from the point of view of health and economics. Beside the health status of an individual, sickness absence is influenced by the demographic, socio-economic factors and social insurance system. The aim of study is to investigate the demographic structure of sickness absence from 2011 to 2017 in Latvia using the data from the state-funded sickness benefit statistics.

Methods

State Social Insurance Agency statistics was used. Sickness benefits paid during the year starting from 11-day were analyzed, as until 10-day sick leave is paid by the employer. A total of 892 775 sickness benefit recipients were analyzed (45% male, 55% female). Duration differences of sickness absence and number of sick-leave episodes in gender and age groups were investigated with one-way ANOVA. Chi - square test was used to compare percentage distribution of sickness absence in gender and age groups between years. The data was analyzed with the SPSS 22 software.

Results

Number of average sickness absence paid days increased from 52.7 in 2013 to 55.1 in 2017. On average, males had 2 days longer sickness absence than females. The average days of sickness absence increased with age - from 26.7 days in age under 24 to 65.3 days in age group over 64. In general, there was a significant increase of total percentage of sickness benefit recipients in the age group 55+ from 10.4% in 2011 to 19.4% in 2017.

Sick-leave episodes increased from 1.18 in 2011 to 1.23 in 2017 and increases with age. There was a significant increase during the years for more than 2 sick-leave episodes from 11.5% in 2011 to 17.8% in 2017.

Conclusions

Conclusions: The number of sickness absence paid days and episodes increase during the observed period. Sickness absence structure is different in demographic groups.

Contributing Factors of Prolonged Hospitalisation in Malnourished Patients

*Dr. Olga Sjomina*¹; *Ph.D. Lilian Tzivian*²; *Alina Graubergere*²;
*Dr. Aleksandra Jeniceka*²; *Dr. Zane Dzerve*²; *Dr. Igors Gubarevs*³;
*Dr. Olesja Basina*¹; *Prof. Aleksejs Derovs*¹

¹ Rīga Stradiņš University, Latvia;

² University of Latvia;

³ St. Barbara-Klinik Hamm GmbH, Germany

Objectives

Malnourished patients have higher mortality rate, higher prevalence of infective and non-infective complications, as well as longer hospital stay in comparison with normally nourished population. The aim was to compare the length of hospitalisation of malnourished patients and of normally nourished patients in different hospital departments, as well as to evaluate factors which affect hospitalisation length.

Methods

A cross-sectional study was performed in Riga East University Hospital in the years 2017–2018. A questionnaire included MUST and NRS screening tools, questions on patients' lifestyle, blood test results, length of hospitalization and therapy tactics, was applied. Three departments participated in the research: departments of gastroenterology (GD), endocrinology (ED) and general surgery (SD). The data was processed with the IBM SPSS 25.0 program.

Results

Overall, 149 patients participated. Malnutrition was found in 33.6–36.2% of patients. Average length of hospitalisation was 13.6 days, median was 10 days. For GD it was 19.1 days, median – 16 days (± 12.1); ED – 9.6 days, median – 8 days (± 5.9); SD – 12.7 days, median – 9 days (± 10.3 days). For NRS screening tool, a group with high-risk for malnutrition had significantly longer median length of hospitalization (18 days) than in a low-risk group (7 days), $p < 0.001$. Same results were achieved for MUST screening tool: 7 days in low-risk group versus 18.5 days in high-risk group. Hospitalisation length in malnourished patients (by MUST) was significantly affected by a patient's higher age ($p = 0.02$), gender, and reduced albumin ($p = 0.068$ and 0.057 respectively). In NRS, it was affected by patients' age ($p = 0.019$), weight loss ($p = 0.001$) and low albumin level ($p = 0.006$).

Conclusions

More than a third of all hospitalised patients had high malnutrition risk. Higher age, uncontrolled weight loss, dietary limitations, and low albumin levels may contribute to longer hospitalisation.

Nutrition Economics as Supportive Tool for Decision-Making in Health Economics

Diāna Arāja

Rīga Stradiņš University, Latvia

Objectives

In circumstances of the rising of health care expenditures, the aging of population and more complex health interventions, the decision-making in health economics needs to have the supportive tools to optimise the outcomes. Research is performed to investigate the potential role of nutrition economics data as a supportive tool for decision-making in health economics.

Methods

To achieve the objectives of this research, the methods of theoretical (literature review) and empirical research (quantitative approach) are used. For data processing and analysis, the methods of economic analysis and statistical analysis are embraced.

Results

Health economics is based on rational behavioural models, production function, supply, demand and market adjusted to the characteristics of health care services. From the normative perspective, health economics studies the efficiency, economic planning and economic outcomes of health care policy in order to establish priorities and select strategies, taking into account the limitation of public and private resources. At the same time, the largest number of chronic diseases, such as cardiovascular diseases, endocrine, nutritional and metabolic diseases, neoplasms, osteoporosis, are identified as nutrition-related diagnoses. The essential role of the alternatives approaches is justified by several randomised controlled trials, which show that lifestyle interventions based on diet and exercises, reduce the suffering by chronic diseases. The economic analysis discovers, that in circumstances of a limited budget, the current health care financing system has tendency to insure the allocative efficiency, but not the overall efficiency, and the treatment alternatives (nutrition programme, consultation provided by specialists, training of patients) are not evaluated sufficiently.

Conclusions

The overall economic efficiency of health care would be achieved by the evaluation and wider use of the alternatives and complementary methods, particularly based on nutrition economics approach, which would reduce the suffering of patients and optimise the public expenditures for nutrition-related diseases.

Psychological Impact of Changing Habits in Contemporary Society Communication on Socialisation Processes

Dr. Inguna Griškēviča

*Rīga Stradiņš University, Faculty of Public Health and Social Welfare,
Department of Health Psychology and Paedagogy, Latvia*

Objectives

The psychological treatment of mental health problems is beginning to undergo enormous change due to changes in communication habits driven by the widespread availability of digital technology (Fairburn, C. G. & Patel, V. 2017 Behaviour Therapy and Research). Research has found that recent seven generations that inhabit our society have very different relationships with digital communication.

This qualitative pilot study was designed as research to determine if differences existed between generations surrounding their preferred communication methods. In examining the social identity perspective of groups, scholars have found that many groups are categorized based on the social structure in which they exist. Generational groups have created their own social structure and set of cultural norms that define each generation. One of the unique differences among these generations is the methods they use to communicate.

Methods

The research for this study was framed around the following three questions:

1. Are there differences in preferred methods of communication- based on generational classification?
2. Is there any difference in generation's use of technology as a socialization instrument?
3. Is there a difference in the quality of intermediate and indirect communication?

A focused semi-structured interview was created to determine how much of the daytime different generations spend on intermediate and indirect communication and how the quality is perceived.

Results

The results demonstrate differences in preferred methods of communication- based on generational classification, in generation's use of technology as a socialization instrument and in the quality of intermediate and indirect communication.

Conclusions

The psychological treatment of mental health problems has to change due to changes in communication habits driven by the widespread availability of digital technology.

30-day Mortality Rates of Acute Myocardial Infarction with ST-Elevation and Non ST-Elevation Patients

*Jolanta Skrule*¹; *Santa Pildava*¹; Prof. *Juris Bārzdīņš*²;
*Artis Luguzis*²; Ph.D. *Rīta Konstante*³

¹ *Centre for Disease Prevention and Control of Latvia;*

² *University of Latvia;*

³ *Sykehusbygg HF, Norway*

Objectives

Coronary heart disease is leading cause of burden of disease in the Europe. One of the care quality indicators is 30-day mortality after admission for acute myocardial infarction (AMI). Latvia has one of the highest mentioned rate in OECD countries. Main task was to calculate 30-day AMI mortality rate by AMI type (with and without ST-elevation) in Latvia by hospital level for finding possible factors explained high mortality rates.

Methods

Admission data from National Health Service (governmental reimbursement system), had linked with Register of Causes of Death by the period 2014–2017 at person level. Rate of all cause death occurring in and out of hospital within 30 days following hospital admissions for acute myocardial infarction (ICD-10 codes I21-I22) was calculated (inclusion and exclusion criteria used by OECD). Results were divided into two groups: ST and non-ST elevation AMI patients (STEMI and NSTEMI).

Results

There were identified 11 675 acute AMI admissions to 20 hospitals for time period – 4 years. Average 30-days mortality for all AMI admissions was 17.4%. There were 9168 STEMI (78.5%) and 2507 NSTEMI cases (21.5%) for all hospitals admitting AMI patients. Proportion had not significant changes during four-year period. For STEMI cases AMI mortality was 18.8%, for NONSTEMI – 12.2%. The differences in proportion of AMI types between all 20 hospitals were huge: from 0.4% to 47.9% (statistically significant). Lowest NSTEMI proportion was in a hospital where referred 25.5% of all AMI patients.

Conclusions

The huge difference between hospitals in proportion of NSTEMI cases could not be explained as randomness in patient distribution. It is linked with differences in coding tradition among hospitals. NSTEMI type of AMI is undercounted in Latvia. It could be one of reasons explained relatively high rate of 30-day AMI mortality.

Effect of Alcohol Trade from Latvia to Buying Habits and Consumption Pattern of Estonians

Tuuli Muistna

Tartu Health Care College, Estonia

Objectives

Consumption of alcohol in Estonia has decreased probably due to excised taxes during last years. This has lead Estonians to buy more alcohol from the neighboring country Latvia. The aim of this study was to examine how the cross border trading impacts Estonians' buying and drinking habits.

Methods

Study was conducted in collaboration with Kantar Emor Research Company. Web-based questionnaire was carried out 5 times in 2016–2017 among Estonian inhabitants (n = 33000; 18–74 y). The study group involved subjects reflecting Estonian population according to gender, ethnical, age groups and living regions. Differences in proportions were compared using Chi-square test.

Results

5519 participants (♀ = 52%; Estonians = 68%) were enrolled (first to the fifth 495, 802, 1715, 1440, 1067, respectively). 16% of the study group did not buy or use any alcohol and this number did not change during study period. In December 2017 compared to December 2016, the number of alcohol buyers from Latvia increased more than 100% (from 16% to 41%). South Estonians (92%) were the most frequent buyers in December 2017 and North-East Estonians (26%; $p \geq 0.01$) were rare buyers. Purchases were not associated with sex, age or income. Most frequently alcohol buyers were enterprisers (75% of them) in comparing with all other professions ($p \geq 0.01$) and retired people ($p = 0.04$). Results of this study showed that buying is not associated with consuming, because for example frequent buyers (people from Tartu) consume less alcohol than others – probably they resell or store it for future events.

Conclusions

Excised tax or accessibility of a low-priced alcohol from neighboring country does not affect Estonian's alcohol purchase. Final conclusions about changes in consumption habits cannot be made due to a short study period.

Effects of Swedish Massage Course Intensity on Blood Pressure and Heart Rates of Healthy Individuals

Dr. Una Veseta; Ph.D. Oskars Onževs; Antra Gulbe

Rīga Stradiņš University, The Red Cross Medical College, Latvia

Objectives

The aim of the research is to compare effects of the Swedish massage on blood pressure and heart rate of healthy individuals depending on the course intensity.

Methods

The study subjects were 30 healthy young women. The subjects were randomly assigned into 2 groups (Group A and Group B). Subjects are received 10 Swedish back massage (25-minute-long procedure using specified massage protocol) sessions each. In the group A the subjects received a massage twice a week (5 week course), in the group B – once a week (10 week course). Before and after each massage session blood pressure and heart rate were measured (Omron M7-IT). The collected data was analyzed using methods of mathematical statistics. The effect of massage on blood pressure and heart rate was analyzed using regression curves. Regression testing was performed using the Fisher criterion.

Results

Baseline characteristics of the study participants: age of group A 25.0 ± 5.3 and group B 23.7 ± 5.3 ; body weight 63.5 ± 9.0 kg and 65.2 ± 7.6 kg; body height 170.7 ± 6.6 cm and 169.5 ± 8.4 cm; BMI $21.7\% \pm 2.2$ and $22.6\% \pm 1.2$. There was no significant difference between the two groups ($P < 0.05$). The difference in blood pressure and heart rate before and after study interventions (Group A and Group B): systolic pressure 124.7 ± 6.7 mmHg and 123.7 ± 3 mmHg; after 116.3 ± 7.5 mmHg and 113.5 ± 6.4 mmHg, diastolic pressure 79.9 ± 6.5 mmHg and 77.8 ± 5.7 mmHg; after 69.4 ± 8.3 mmHg and 66.5 ± 8.2 mmHg, heart rate 80.5 ± 5.3 BPM and 81.2 ± 7.1 BPM; after 71.3 ± 4.9 BPM and 67.7 ± 6.3 BPM.

Conclusions

Analysis of the obtained data allows us to observe positive trends in Swedish massage to stabilize blood pressure and heart rate despite being healthy new individuals. Statistically significant difference between massage course twice a week and once a week (defined as $p < 0.05$). Further research is needed to investigate the effects of massage therapy on elderly people.

Is Doctor Entitled to be Wrong? Conception of Iatrogeny

Dr. med. Aigars Lacis

Rīga Stradiņš University, Department of Surgery, Latvia

Iatrogenesis is any adverse effect on a patient, resulting from any activity of healthcare professionals or promoting products or services. For many centuries, a traditional view was cultivated that a doctor should not make mistakes. Iatrogenic disease or death caused by a targeted or unacceptable healer's mistake or negligence has been severely punished in many civilizations. In developed countries iatrogeny occurs in 5–20% of hospitalized patients. Treatment has always been and will be associated with a certain risk because the medical practitioner, even working for the best conscience, can make mistakes. Consequences of iatrogeny: medical and legal. Iatrogenic complication – everything is done in accordance with the guidelines, including due diligence and perfect care. Doctor's mistake – not all done properly. Even if the guidelines are followed, something may be missing, for example, diligence or adequate care. Medicine is constantly evolving. Each new patient may create a situation requiring a medical practitioner to show initiative and creativity. Therefore, the doctor, particularly in critical situations, must have some discretion to allow for the prompt adoption of non-standard decisions: it is clear that such behaviour is exposed to certain risks. An excessively regulated treatment process forms a “cookbook medicine” where has no room for creativity and in which a doctor is not obliged or even entitled to take into account the individual characteristics of each patient. Self-defence instinct-based behaviour of a medical practitioner will undoubtedly be the most secure for the patient, but will not allow the best possible results to be achieved.

To improve patient safety, prevent potential risks, and to protect medical practitioners from unjustified charges:

- 1) medical practitioners – modern register of iatrogenic injuries;
- 2) lawyers – legal framework of iatrogeny.

Armeo Spring Usability in Occupational Therapy Praxis: Patient Experience

*Krista Zalcmāne*¹; *Zoja Nesterova*²

¹ *Rehabilitation centre "Jaunķemeri", Occupation Therapy Department, Latvia;*

² *National Rehabilitation Centre "Vaivari", Occupation Therapy Department, Latvia*

Objectives

Aim of the study was to find out the experience of patients in using Armeo Spring technology in occupational therapy practice.

Methods

Research design was qualitative phenomenological study. Participants in the study was 10 National rehabilitation centre "Vaivari" patients who have used Armeo Spring technology during rehabilitation for at least five sessions. The selection of participants according to the principle of convenience, inclusion criteria taken into account. Semi-structured interviews with patients took place from the 1st of April to 15th of May, 2018. A written agreement from each of participants was received to participate in the study. The information after each interview was transcribed. Analysis of the content was performed after interpretative phenomenological analysis. The results obtained were structured according to the SWOT method.

Results

The participants of this study were three women and seven men of which whose functional disorders were caused by circulation disorders in the brain. Almost all participants of the study admitted that engaging with robot technology is exciting and it motivates the patient to become involved in the therapeutic process. Most patients also acknowledged that after working with the Armeo Spring, they were able to identify improvements in motor function in the upper extremities. In general, the participants in the study were not able to identify an improvement in daily activities.

Conclusions

The experience of the participants in the study using Armeo Spring is more positive than negative. The use of innovative technologies will not be able to completely replace traditional occupational therapy methods. The Armeo Spring is able to improve the functions of the upper extremities, provide additional support for the parietal hand, create positive emotions and promote the involvement of the patient. The use of this technology requires the supervision of an occupational therapist.

Analysis of Use of Projected Disability Status as Tool to Prevent Disability or Reduce Disability Degree

*Dr. Leonīds Rozenbergs*¹; Prof. *Aivars Vetra*²

¹ *Rīga Stradiņš University, Faculty of Continuing Education; Latvia;
State Medical Commission for the Assessment of Health Condition
and Working Ability; Latvia*

² *Rīga Stradiņš University, Department of Rehabilitation, Latvia*

Objectives

To determine whether the projected disability status serves as a disability risk reduction tool in Latvia.

Methods

As of 1 January 2011, in accordance with the Cabinet regulations No. 9, the projected disability status was introduced in Latvia with the purpose of reducing functional limitations caused by illness or injury and subsequent disability risk. The prospective disability status criteria are:

- 1) continuous inability to work or treatment for 26 weeks;
- 2) functional limitations caused by an illness or injury, which are not considered sufficiently stable and invariable for the subsequent six months and may be reduced through treatment and rehabilitation measures (reflected in an individual rehabilitation plan).

Healthcare institutions begin the aforementioned measures within 15 days and scheduled surgery within 5 months.

The analysis is based on the data of the Disability Assessment Medical Committee of the Latvian Ministry of Welfare.

Results

Persons with the projected disability status: 2011 Year – 137, 2017 Year – 64.

Persons with sick leave extended for more than 26 weeks: 2011 Year – 2864, 2017 Year – 4186.

Conclusions

It may indicate that the number of people who have been assigned the prospective disability status have decreased. Only about 3%(!) of the people with sick leave over 26 weeks are assigned the prospective disability status. The prospective disability status is not used as a tool for disability risk reduction.

Subjective Self-Assessment of Foot Health Status among Military Population

Darja Nesterovica

*Rīga Stradiņš University, Military Medicine Research
and Study Centre, Latvia*

Objectives

Study goal was to determine subjective perception of foot health status using a self-administered questionnaire and evaluate differences among Latvian military personnel with history of foot overuse injury.

Methods

Cross-sectional study among infantry soldiers during annual medical check-up using Latvian version of Foot Health Status questionnaire. Questionnaire contains seven sub-scales: foot pain, foot function, footwear, general foot health, general health, physical activity, social capacity and vigour; additionally demographic questions and foot overuse injury history over last 6 months. Sub-scale scores range from 0 (lowest health status) to 100 (optimal health) were calculated using specific computerized program. Rīga Stradiņš University Ethics committee approval (No. 40/26.10.2017) for this research was admitted.

Results

Foot Health Status questionnaire was administered by 160 Latvian infantry soldiers with mean age 30.4 years (SD = 7.3) and average service time 7.8 years (SD = 6.7), 80.6% without foot overuse injury (N = 129) and 19.4% with foot overuse injury (N = 31). Median foot function and foot pain scores of non-injured group and injured group were 100 points for each. For response evaluation, Mann-Whitney U test was used and statistically significant group differences were found (foot function mean rank of non-injured group and injured group was 83.8 points and 66.7 points respectively; $U = 1572$, $Z = -3.4$, $p = 0.001$; foot pain – 83.8 and 66.7 respectively; $U = 1751.5$, $Z = -2.1$, $p = 0.03$).

Conclusions

Study showed that military personnel without foot overuse injury report better foot function and less foot pain.

Immune Reaction to Viral Hepatitis B Vaccination in Hemodialysis Patients

*Dr. Corinna Morneau*¹; *Dr. Anna Popova*²;
*Dr. med. Viktorija Kuzema*³; *Dr. med. Ināra Ādamsons*³;
*Dr. Baiba Vernere*³; Prof. *Aivars Pētersons*³

¹ *Marien Hospital Düsseldorf, Germany;*

² *Pauls Stradiņš Clinical University Hospital, Latvia;
University of Latvia;*

³ *Pauls Stradiņš Clinical University Hospital, Latvia;
Rīga Stradiņš University, Latvia*

Objectives

The aim is to determine the prevalence of HBV infection, to identify the type of immune response to HBV vaccination in hemodialysis (HD) patients as well as clinical and laboratory risk factors influencing the responsiveness to vaccine.

Methods

The prevalence of HBV infection was determined cross-sectionally among all HD patients (n = 60) who were currently treated in February 2018 at Pauls Stradiņš Clinical University Hospital. The serum anti-HBs titers were studied retrospectively one to six months after primary vaccination against HBV (four doses Engerix B, 40 mcg) in all subjects who had negative serological markers of HBV infection prior to initiation of HD and vaccination. Patients were divided into two groups: responders (anti-HBs > 10IU/l) and non-responders (titer < 10 IU/l). The study observed factors that may influence the responsiveness to vaccine: laboratory data, hepatitis C co-infection, received immunosuppressive drugs, weekly duration of HD.

Results

41 patients started for the first time HD between 2010 and 2017. The prevalence of chronic HBV infection among HD patients was 1.6%. 10 (16.7%) were immune due to natural HBV infection. Out of 41 patients who were included in study analysis, 23 (56.2%) responded to HBV vaccination, while 43.9% were non-responders. 15 patients (36.6%) had high antibody response (anti-HBs > 100 IU/L). The only variable to show significance in achieving seroconversion was age (p = 0.003). Non-responders (70.28 ± 12.92) were older by 14.67 years than responders (55.61 ± 15.715). Logistic regression showed that the chance of immune response drops by 7% with every year of age.

Conclusions

The prevalence of chronic HBV infection among HD patients is comparable to one of the general population. The seroconversion rate after HBV vaccination in HD patients is lower than in the general population. Age as a non-modifiable risk factor was negatively associated with the type of immune response in HD patients.

Healthcare Tariffs – Government and Healthcare Service Providers Opinion and Evaluation

*Dr. Artūrs Kaļva*¹; Prof. *Ģirts Briģis*²

¹ *Rīga Stradiņš University, Latvia;*

² *Rīga Stradiņš University, Department of Public Health
and Epidemiology, Latvia*

Objectives

Tariffs of Latvian healthcare services are calculated based on Regulations of the Cabinet of Ministers No 555. However, different regulations do not provide system for regular healthcare tariffs review. It is believed that are being reviewed separately healthcare tariffs and most tariffs are historically calculated. In result, most of these tariffs do not show real situation of healthcare expenses. Research goal: to compare opinion of the government representative and healthcare service providers about actuality of healthcare tariffs in Latvia.

Methods

Was used a qualitative thematic analysis study design and legal literature. A total of 5 structured interviews: healthcare service providers (n = 3) and government representatives (n = 2).

Results

Healthcare service providers (representatives of public and private sectors) argues that existing healthcare tariffs do not reflect real expenses of service. Public service providers declare that polity is not interested to calculate real expenses and show them in tariffs. Complementing the public sector representatives, the private sector managers claim that tariffs of healthcare are revised in field that can affected negatively private sector and its services. In turn, government representatives (decision-makers and executive) argue that problems with tariffs do not exist and all processes are regulated by rules.

Conclusions

The public sectors representative consider that need to recalculate all healthcare tariffs in Latvia according real healthcare service expenses. The representatives of private sector agree, pointing out that is important to understand real expenses of healthcare and include in these tariffs real expenses of medical stuff salary, amortization, etc. However, all healthcare service providers acknowledge that real expenses and tariffs can result in need to increase budge of state healthcare budget or reduce health care service basket. Despite the above, government representatives do not see the problems in these processes and believes that there is calculated actual tariffs.

Comparison of Fruit and Vegetable Intake of Vegetarians, Vegans and Omnivores as Potential Health Literacy Indicator

*Mara Grundmane*¹; *Marina Valtenberga*²; *Girts Brigis*²

¹ *Rīga Stradiņš University, Department of Sports and Nutrition, Latvia;*

² *Rīga Stradiņš University, Bachelor's study programme "Nutrition", Latvia;*

³ *Rīga Stradiņš University, Department of Public Health and Epidemiology, Latvia*

Objectives

In 2014 the European Health Interview Survey shows that only 40% of Latvia residents were consuming fruit and 43% vegetables at least once a day. Central Statistical Bureau concluded that five portions of fruit and vegetables daily, recommended by WHO as a part of public health strategy for health promotion, are eaten only by 11% of adults.

WHO acknowledges health literacy as a significant tool in health promotion. Recent studies have revealed the connection between health literacy and fruit and vegetable consumption.

The purpose of the study was to find out and compare fruit and vegetable consumption of vegetarians, vegans and omnivores and its compliance with WHO recommendations.

Methods

The survey was conducted in November 2018. The questionnaire was created on the basis of the study of Eaton et al. Participant recruitment took place within a survey portal VisiDati.lv. The respondents were purposefully addressed through yoga enthusiasts, vegetarian and vegan food suppliers and group members, as well as healthy lifestyle followers in social network. The data were processed by the statistical software package IBM SPSS Statistics and Microsoft Office Excel.

Results

563 participants completed the survey of whom 60.9% were omnivores, 26.8% vegetarians and 12.3% vegans. The distribution of participants was 87.9% female and 12.1% male. 493 respondents (87.6%) were urban area residents. The majority of participants had bachelor degree 37.8% and master degree 30.2%. Participants were asked about their daily eating habits during the past 7 days and the number of portions consumed per day. Summarized answers revealed that the average number of portions of fruit and vegetables eaten per respondent was 8.8 for omnivores, 11.9 for vegetarians and 16.4 for vegans.

Conclusions

Respondents exceeded the WHO recommended minimum of fruit and vegetable daily intake: vegans ate twice as much as omnivores, but vegetarians – almost a quarter more.

Radiation-Ecological Assessment of Territories of West Kazakhstan

Dr. Venera Rakisheva

West Kazakhstan Marat Ospanov State Medical University

Keywords: radioactivity, dose, alpha and beta radiation, radon, gamma background, individual dosimetric control.

Objectives

According to the intensification of activities for the exploration, production and transportation of hydrocarbons Kazakhstan has sharply increased the load on the natural ecosystems of individual regions. For timely adoption of preventive measures to reduce it to the human body there was a need to study these areas near oil and gas fields. As part of an integrated research work on the program “Development of scientific and methodological foundations for minimizing environmental stress, medical care, social protection and improvement of the population of ecologically unfavorable territories of the Republic of Kazakhstan” researchers conducted a study of the state of environmental objects (drinking water), soil and vegetation) and human biosubstrates (blood and hair) in the West Kazakhstan region. Special attention was paid to the settlements of Uralsk, Aksay, which are located near the Karachaganak oil and gas field.

The aim of our study was establishing the possible impact of Karachaganak field on the state of the environment and the accumulation of radioactive substances in human biosubstrates.

Methods

During the study we used the following methods: laboratory-instrumental, alpha and beta spectrometry, statistical, radiometric and dosimetric control, retrospective, gamma-spectrometric analysis of the content of radionuclides.

Results

As a result of the study, we found that in environmental objects (drinking water, soil and vegetation) and human biobustrats (blood, hair), the indicator of radioactive background didn't exceed the maximum permissible concentration.

Conclusions

Thus we can conclude that in the West Kazakhstan region, Uralsk, Aksai and Berezovka, which located near the Karachaganak oil and gas field, the studied background radiation level doesn't exceed the maximum permissible concentration, and in assessing the content of radioactive substances in environmental objects and human biosubstrates the level of radioactive background doesn't have a negative impact on the human body.

Treatment Regimen as Factor Related to Patient Adherence to Asthma Treatment in Latvian Asthma Patients in 2016 and 2017

*Dr. med. Dins Šmits*¹; *Ph.D. Inga Urtāne*²;
*Prof. Dace Bandere*²; *Ieva Rutkovska*²

¹*Rīga Stradiņš University, Faculty of Public Health and Welfare,
Department of Public Health and Epidemiology, Latvia;*
²*Rīga Stradiņš University, Faculty of Pharmacy, Latvia*

Objectives

Low treatment adherence is instrumental in insufficient disease control in asthma patients – adequate asthma control requires regular use of asthma medication. Effects of asthma medicines are measured in a clinical trial setting that differs from the real life conditions. The impact of asthma treatment regimen on patient adherence to asthma treatment in real life setting has not yet been assessed in Latvian asthma patients. Our objective was to investigate whether asthma treatment regimen is related to patient adherence.

Methods

Retrospective analysis was performed of sell-out data base of reimbursed inhaled asthma controller medication of a pharmacy chain for 2016 and 2017. Patients present in the database in each of the years were assessed. We grouped medication according to their recommended usage regime – 2 inhalations 2 times a day (Group 1), 1 inhalation 2 times a day (Group 2) and 1 inhalation once a day (Group 3). We defined purchase of 24 inhalers in the study period of two years as adherence level of 100%. We defined purchasing 17–24 inhalers as good adherence, 9–16 inhalers as average adherence and less than 9 inhalers as poor adherence. Our sample size was 2325 in Group 1, 1828 in Group 2 and 349 in Group 3.

Results

We found that treatment regime with a smaller number of daily inhalations statistically significantly increased the mean level of adherence. Adherence levels were 27.0%, 32.3% and 42.6% ($p < 0.0001$) in Group 1, 2 and 3 respectively. 76% of patients in Group 1 showed poor adherence with 65% and 44% in Groups 2 and 3 respectively.

Conclusions

Treatment regimen of asthma controller medications is related to patient adherence. The less doses patient has to inhale per day the better the adherence. We recommend considering treatment regimen in clinical practice as means of improving patient adherence.

Food and Catering Organisation Aspects in Hospitals and Nursing Homes in Latvia

*Svetlana Aleksejeva*¹; *Dr. Lolita Vija Neimane*¹;
*Santa Salaka*²; *Līga Savicka*²; *Anna Vētra*¹;
*Guna Bērziņa*²; Prof. *Aivars Vētra*²

¹ *Rīga Stradiņš University, Latvia;*

² *Rīga Stradiņš University, Latvia;*
Rīga East University Hospital, Latvia

Objectives

Malnutrition is highly prevalent in hospitals and nursing homes. Regardless of patient's nutritional status on admission, food intake from the hospital menu is key factor for their nutritional status with a longer length of stay at hospital (SA Health, 2014). Insufficient patient food intake is often attributed to the hospital food and catering services (Dupertuis et al., 2003). The main reasons for inadequate nutritional care are: lack of instructions how to manage nutritional problems, lack of knowledge about dietary requirements, practical aspects of the hospital's catering (Kondrup et al., 2002). Specific attention to nutritional intake is required for patients due to their increased requirements and reduced appetites. The aim of this study is to analyse food and catering organization aspects in hospitals and nursing homes in Latvia.

Methods

Online questionnaire with 53 questions, divided in five main sections: information about institution, catering system, screening procedure of patient's nutritional status, screening procedure of patient's swallowing disorders/dysphagia, characteristics of diets. There are 27 hospitals and 5 nursing homes participated in this survey: university, regional, specialized hospitals – 15; local hospitals – 12; nursing homes – 5.

Results

Hospitals and nursing homes mostly use outsourcing companies for food and catering supply. Patient's screening for nutritional needs and ability to eat and drink are not regularly assessed. Food intake records for at risk patients are not performed on a regular basis. There is a small number of nutritionists and dietitians work in hospitals and nursing homes and, thus, cannot provide qualitative nutritional screening and treatment support for all patients.

Conclusions

More nutritionists need to be involved in catering planning and in providing expert guidance and treatment for patients. Nutritional care pathway need to be developed and implemented for screening the patients and defining nutritional risks. The situation is very ambiguous and requires a more detailed study.

Public Health Leaders in Lithuania: Do We Have Them? Do We Need Them?

Prof. *Mindaugas Stankunas*¹;
Kristina Tamulionytė; Roberta Jakaite

¹ *Lithuanian University of Health Sciences*

Objectives

To evaluate self-reported leadership competencies of public health executives in Lithuania.

Methods

The data was collected in a cross-sectional study, in 2015. Questionnaires were distributed to all executives of Lithuanian public health institutions and heads of municipality health administrations (N = 180). Response rate - 55%. Respondents were asked to answer to three sets of questions: LEPHIE project competency framework for an effective leadership in public health area (Czabanowska, 2013); Leadership Practice Inventory (Kouzes & Posner, 2003) and Emotion and Social Competency Questionnaire (Boyatzis, 2007).

Results

Findings suggest, that respondents evaluated their competencies positively, but estimated that they required a higher level of competence than they currently possessed. However, they showed that level of these competences should be higher for their current job position. Maximum and mean and standard deviation scores for the current and required level of competencies are the as following: systems thinking (35; 24.75 ± 4.85 vs 30.88 ± 4.51); political leadership (40; 27.46 ± 60.5 vs 35.62 ± 5.02); collaborative leadership - building and leading interdisciplinary teams (25; 17.73 ± 3.87 vs 22.00 ± 3.47). The most expressed emotional intelligence competences among respondents were from the Self-management and Relationship Management competences groups. Model the way was the dominant leadership practice (52.87 ± 5.05), while the Challenge the process (47.63 ± 7.95) and Inspire a shared vision (47.89 ± 8.20) were the least ones. Our study results revealed, that these public health leaders evaluated their leadership competencies as follows: good - 56.4%, moderate - 35.5%, and poor - 8.1%. Majority (90.3%) are willing to continue to develop their leadership competencies.

Conclusions

Lithuania had intensive reforms in public health sector organization and leaders development. However, still many efforts are required in preparing leaders to face contemporary challenges in public health. Findings suggested that executives see the gap between their current and required leadership competencies. This suggests the need of competencies oriented further leadership development.

Problems Relating to Implementation of Quality Health Care Service

Julija Vasilevska; Sabine Priedite

National Rehabilitation Centre "Vaivari", Latvia

Objectives

Health is one of the phenomena linked to many legal relationships involving a person as a legal entity on a daily basis. The right to health is a fundamental human right. The legislator has not clearly defined what can be understood with high quality healthcare and, therefore, this concept must often be filled with certain content.

Methods

The study has explored the literature and prepared a systematic description of the term "quality" as term characterise health service and medical treatment, and its use in national legislation, using scientific research methods and interpretation of legal provisions methods: grammatical, systemic and teleological.

Results

Mandatory elements for the enforcement of the rule of law (Law on Patients' Rights): quality medical treatment and qualified medical treatment, used as two distinct concepts, but as elements they play an equal role of patient rights. In turn, interpreting the legal rule by teleological method, "qualified medical treatment" and "quality medical treatment" are used as two related concepts. "Quality medical treatment" means a content-enhanced concept which includes the term "qualified medical treatment" in the content. A quality health care service can be defined as a service which conforms to at least the minimum quality requirements, which may be defined as the conformity of the qualification of a medical treatment institution and a medical practitioner with the requirements specified in regulatory enactments, the conformity of medical treatment with approved medical technologies or clinical guidelines, the informed consent of the patient.

Conclusions

The results of the study give insight into the understanding of the term "quality" in context of health care, its use in national legislation and indicate directions for further research.

Volatile Organic Compounds Analysis Results Evaluation for Five Consecutive Years

Ph.D. Pāvels Sudmalis

*Rīga Stradiņš University,
Department of Pharmaceutical Chemistry, Latvia*

Objectives

Objectives. To evaluate how the situation in Latvian workplaces in the area of volatile organic pollutants (VOC) changes.

Methods

Materials and methods. Measurement results were obtained from the Rīga Stradiņš University, Laboratory of Hygiene and Occupational Diseases database between 2014 and 2018 year. VOC comparison was made by exposure index (EI). The potential health risk for workers by VOCs and the distribution of exposure index was determined by Republic of Latvia Cabinet Regulation No. 325 "Labour Protection Requirements when Coming in Contact with Chemical Substances at Workplaces".

Results

The results. Total of five years were examined 388 work places to the presence of volatile organic compounds: 66 in 2014, 41 in 2015, 94 in 2016, 78 in 2017 and 109 in 2018. The average mean level of exposure index was 1.33, median - 0.11 and standard deviation - 5.21. The average mean level of numbers of chemical compounds what was detected in one work place was 2.26, median - 2 and standard deviation - 1.48. Results among the groups were as follows: $EI \leq 0.1$ (49.74%), $0.1 < EI \leq 0.5$ (22.42%), $0.5 < EI \leq 0.75$ (4.90%), $0.75 < EI \leq 1.0$ (3.61%) and $EI > 1.0$ (19.33%). A similar distribution was also looking at the results over the years.

Conclusions

Conclusions: Nearly half of the jobs surveyed have a very low health risk for the health of the employed, but despite this, the health risk of 20% of work places is very high. Doing research was found that the distribution of exposure index over the years is similar and ranges in a very wide range.

Trace Element Determination in Sapropel

*Laura Komarovska*¹; *Līga Ribkinska*²; *Aneka Kļaviņa*²;
*Dr. med. Alise Silova*²; *Dr. med. Ivars Vanadziņš*²;
*Ph.D. Inese Mārtiņšone*²

*Rīga Stradiņš University, Institute for Occupational Safety
and Environmental Health, Latvia*

Objectives

Sediments have been frequently analysed in order to estimate the extent of pollution and the impact of anthropogenic activities on the environment. Determination of trace amounts of lead (Pb), cadmium (Cd), nickel (Ni), cobalt (Co) and copper (Cu) in sediment is of great importance due to their toxicological importance and persistent character in the environment.

The aim of this study is to determine the metal concentration across the thickness of the sapropel of five lakes in eastern part of Latvia.

Methods

Trace metal concentrations were determined in sapropel samples by electrothermal atomic absorption spectrometry with Zeeman background correction. Prior to analysis, sapropel samples were dried at 105 °C and finely ground with a mortar and pestle. Decomposition of the samples was done in a closed vessel microwave-assisted digestion system using nitric acid and hydrogen peroxide.

Results

The analysis of metal contents in the sapropel provides information on natural and anthropogenic origin of the metal flow in the lake's ecosystem and the influence on sapropel application in medicine. Metal concentrations for all the five lakes sapropel vary over a wide range: 1.6–7.4 mg/kg Pb, 0.1–0.3 mg/kg Cd, 3.4–21.6 mg/kg Ni, 2.2–8.8 mg/kg Co and 3.1–14.7 mg/kg Cu. Pb and Cd presence in the upper layers of sediments indicate anthropogenic impacts growth on lake ecosystem. In some samples the slightly increased Ni concentrations are associated with its natural origin deposited in sediments. Anthropogenic metals as Cu, Co are correlated with Ni.

Conclusions

To evaluate the ecological condition of sapropel, these trace metals – Pb, Cd, Ni, Co and Cu – were compared with the allowed maximum concentration of trace metals in the soil. All metal concentrations don't exceed the maximum allowed limits. Trace metal concentrations showed that the sapropel isn't contaminated and can't cause adverse effects.

Occupational Health Risks Caused during 3D Printing Process

*Dr. med. Žanna Martinsone¹; Ph.D. Ilona Pavlovskā²;
Dr. med. Ivars Vanadzīņš²*

¹ *Rīga Stradiņš University, Institute for Occupational Safety
and Environmental Health,
Department of Occupational and Environmental Medicine, Latvia;*
² *Rīga Stradiņš University, Institute for Occupational Safety
and Environmental Health, Latvia*

Objectives

Three-dimensional (3D) printing – making the object from a computer-generated image by adding layers of material has become essential in many industries like medicine (printing medical prostheses, orthopaedic and dental implants), etc. Commercially available printers produce huge concentrations of particles including nano-sized particles containing hazardous substances. It is known that acrylonitrile butadiene styrene (ABS) filaments are more hazardous to human health than polylactic acid (PLA) filaments emission of particle and gases are higher when using ABS. ABS produce volatile organic compounds (VOCs), e.g. styrene (possible human carcinogen), but nylon filaments emit a compound called capralactum (irritation of eyes and respiratory system). Some 3D printers use photopolymers (photosensitive liquid resins that become solid after exposure to laser or UV light) that are known to be toxic. During 3D metal printing very fine metal powder are used that are capable to become a respiratory hazard. Aim and tasks of this pilot study on 3D printing are identification, assessment and evaluation of 3D linked occupational health risks.

Methods

All measurements and calculations were done according to international standards (LVS EN ISO 10882-1:2002) and methods. The particles' size distribution were detected by an electrical low-pressure impactor (ELPI+, Dekati Ltd), where a 14-stage cascade impactor distributes particles by size.

Results

Pilot study results show exceeding of following occupational risk factors: particle number concentration (25937 ± 5187 pt/cm³), VOC's (0.64 ± 0.13 mg/m³), formaldehyde (0.23 ± 0.034 mg/m³), air temperature (+25 until +27°C), air humidity (21%) and air velocity (< 0.05 m/s).

Conclusions

The main occupational health risk during 3D printing processes are emitted chemical substances (particles, VOC's etc.). Furthermore, the high temperature and low humidity can contribute to negative health effects caused by chemical substances. Particle size distribution should be estimated for better description of occupation health risks and and elaboration of preventive measures.

Food Waste: Causes and Consumer Attitudes

Dr. Lolita Vija Neimane¹; Diāna Jakuboviča²; Olga Rajevska

¹ Rīga Stradiņš University, Department of Sports and Nutrition, Latvia;

² SIA Baltacon Apotheka, Latvia

Objectives

To find causes and consumers' attitudes towards food waste in households.

Methods

The data was collected in October 2018 by means of a web-based questionnaire using *visidati.lv*. The questionnaire was based on literature review. It was developed in English, translated into Latvian and distributed to Latvian consumers through a social media platform, Facebook. Food waste in this study is only consumable food that is discarded either partially, fully, or purchased in in large quantity, but is not consumed by the expiry date. Food waste was calculated based on question Question 9 of the questionnaire.

Results

Food waste did not depend on gender, type of accommodation, level of education, household size, number of children per household, using shopping list, "how often do you buy food?", "how many days ahead do you plan a meal?" There is a negative correlation between the age of a consumer and food wasted ($Rho = -0.24$, $p = 0.02$), families with children aged 2 to 11 years consume more food ($p = 0.003$), participants aged 18–25 more often "burn or damage food" than people of other age groups ($p = 0.045$). "I feel guilty for throwing food away" didn't affect the amount of food waste ($p = 0.221$), but there is a statistically significant relationship ($p = 0.001$) between "I usually avoid to waste food" and the amount of food wasted. Only 18 respondents donated their food to the poor people.

Conclusions

The results of the study correspond to the patterns described in the literature, except the level of education and using a shopping list. "Feeling guilty of food waste" is the main factor that needs to be taken into account in order to solve this problem.

Importance of Personal Assistance as Prerequisite for Self-Reported Wellbeing of Men and Women with Autism Spectrum Disorders

Ph.D. Ieva Reine

Rīga Stradiņš University, Statistics Unit, Latvia

Objectives

The question addressed in this study is, does the self-reported wellbeing of persons with autism spectrum disorders (ASD) differ from that of others with severe functional disabilities and, if so, what can explain the difference? The study examines whether the results can be attributed to the Swedish personal assistance allowance (PA) which provides hours of personal assistance to support the needs of daily living for persons with severe impairments.

Methods

The population consisted of a survey panel of 2740 persons over 16 of age who received an assistance allowance in both 2010 and 2016 from the Swedish Social Insurance Agency (SSIA). Of these, 479 persons had an ASD. The self-reported wellbeing outcomes studied encompassed social contacts and activities, living as others, feeling safe, having control over one's life and having good living conditions. Logistic regression was used for the analysis. The analytical models examined include measures of satisfaction with PA and the change in assistance hours from 2010 to 2015 and age.

Results

The most important result of the study is that PA enhances the self-reported wellbeing for persons with severe ASD, compared with persons with other recipients of PA.

Conclusions

PA is of considerable importance for persons with ASD. PA is found to be a significant prerequisite for wellbeing. This becomes particularly evident when adjustments are made for the changes in the number of assistance hours provided. It remains to be studied if the level of PA provided is gender biased, which is a possible interpretation of the results. Namely, specific and systematic attention should be devoted to studying the unmet needs of men and women with ASD. The findings of the study suggest that policy focusing on individual support and wellbeing can reduce inequalities in health for persons with severe functional disabilities.

Mobile Telephone Radiation and Male Fertility

*Jānis Indulis Dundurs*¹; *Bella London*²

¹ *Rīga Stradiņš University, Department of Occupational
and Environmental Medicine, Latvia;*

² *Ketteler Hospital Offenbach, Medical Clinic I, Clinic for Gastroenterology,
Oncology, Metabolic Diseases and Palliative Medicine, Germany*

Objectives

To evaluate impact of mobile phone radiation on male fertility and to characterise the risks men expose themselves to by their mobile telephone using habits. To give recommendations for preventing mobile phone radiation risks and for improving the condition of infertility patients.

Methods

Collection about radiation effects on fertility in form literature review and a data of questionnaire were get via social networks and via the website from 156 respondents. The Pivo table was used to analyse the data.

Results

Present studies show an elevation of the testes temperature of over one degree, negative effects on sperm quality parameters, increased sperm cell apoptosis, and increased sperm cell clumping and death. More than half of the respondents are at high risk of harming their fertility by their mobile phone using habits. Especially participants who use their mobile phone for longer time tend to have more risks. Furthermore, younger respondents have a striking lack of knowledge about their fertility status compared to older. Nevertheless, the interest and will are present to improve knowledge about risks of mobile telephone radiation and to change their mobile phone using habits.

Conclusions

There are harmful effects of emitted radiation by mobile phones on male fertility. It is of great importance to raise awareness of mobile telephone radiation and infertility in order to raise interest in this issue and promote further research.

Discrimination of Elderly Patients in Health Care System of Lithuania

Kristina Selli

Lithuanian University of Health Sciences

Objectives

This study aimed to explore and describe the barriers that elderly Lithuanians experience with respect to going to court or other institutions to defend their right not to be discriminated regarding medical care.

Methods

We used a mixed methods approach due to the scarcity of information in Lithuania. First, the review of laws was done using the e-tar database and court cases were searched using the e-teismai database followed by policy analysis. Additional sources of information were identified searching Google Scholar and PubMed, as well as Google for grey literature. The keywords used were: ageism in patient care, discrimination against elderly, elderly and health (English and Lithuanian). Secondly, we conducted in-depth individual interviews with 27 clients of newly-established integrated home care services: 13 elderly patients, and 14 informal caregivers.

Results

The results of the study disclose the following barriers that the elderly in Lithuania face:

- 1) the lack of recognition of the phenomenon of discrimination against the elderly in patient care;
- 2) the lack of information for complaining and the fear of consequences of complaining;
- 3) the deficiencies and uncertainties of laws and regulations devoted to discrimination;
- 4) the high level of burden of proof in court cases and lack of good practices;
- 5) the lack of a patient (human) rights-based approach in all policies and in education as well as the lack of intersectoral work.

Conclusions

This study disclosed the need to: encourage training of legists, lawyers and health care professionals – the burden of leadership for this has to be assumed by universities and public health professionals; incorporate a new article in the ‘Law on the rights of patients and compensation for the damage to their health’, clearly stating where to complain in case of discrimination; promote sustainable results by incorporating a human rights-based approach regarding elderly persons in all policies.

Health Budget Savings from Application of PET/ CT for Hodgkin Lymphoma Patients in Latvia

Dr. Artūrs Kaļva; Daiga Behmane; Prof. Ģirts Briģis

Rīga Stradiņš University, Latvia

Objectives

Positron emission tomography/computed tomography (PET/CT) is a modern radiology method that allows to recognize tiny cancer cell activity in human body. This method, being standard routine procedure in many countries, in case of Hodgkin lymphoma (HL) is a method used for more than ten years but was not covered from the state funding in Latvia till 2018. The aim of the study is to assess the budget impact of including PET/CT in the health care services' basket in Latvia for HL patients.

Methods

A decision tree model was developed to evaluate the costs and consequences of two strategies – standard routine practice (x-ray, ultrasound, computed tomography, etc.) and the application of PET/CT for the HL patients for the 1st treatment year after the detection of the disease. Data for the study were obtained from published clinical studies, clinical guidelines, expert interviews, NHS and health service providers. The health care perspective was applied.

Results

The two decision strategies were based on the difference in the sensitivity and specificity the methods, leading to more accurate distinction of patients in: (I) early stage with favourable outcome, (II) early stage with unfavourable outcome and (III) progressive stage, and further savings from more precise treatment approaches. The PET/CT strategy costs for 10 HL patients were estimated at the level of 159 952 EUR, while the standard approach costs – 387 183 EUR .

Conclusions

The study justifies that precise diagnostic methods, even being more expensive, lead to better patient outcome and savings in overall treatment costs. Introduction of PET/CT method for newly diagnosed HL patient group could save approximately one million euro annually.

Representation of Epilepsy in News Portal Delfi.lv and National News Agency Leta.lv between 2003–2015. Content Analysis

Aleksandra Zeberga

Rīga Stradiņš University, Department of Media and Communication, Latvia

Objectives

My goal is to make some sense and understanding in our society, coworkers, friends and families about what epilepsy is and try to change their mindset : how they see someone who has this illness. My biggest and probably the hardest goal is to create desire in journalists to write about epilepsy patients, their experiences, the path they are going through in a hope that it would help to inform others. Inform that epilepsy is not a weird, scary and incurable illness. Epilepsy is a chronic disorder that causes seizures – a rush of electrical activity in the brain. Yes, it provokes seizures and it can look scary, but the most important thing is to know what to do in a case like that.

Methods

Find out all the articles from those two news pages from yer 3003 till 2015. Figure out a way to break down all the articles.

To find a matching theory: perhaps agenda setting theory or social responsibility theory.
Make analysis.

Results

Finding out the inclusion of patient and their sibling stories would minimize prejudice about epilepsy?

Conclusions

Epilepsy is not enaught researched field in Latvia.

Implementing Digital Slides into Undergraduate Pathology Course at University of Tartu, Estonia

Dr. Ave Minajeva

*University of Tartu, Institute of Biomedicine
and Translational Medicine, Estonia*

Objectives

In the year 2018–2019 the undergraduate pathology course for the third year medical students at University of Tartu was fully based on digital microscopic slides, leaving the traditional microscopy only for demonstrational purposes. The presentation gives an overview of feedback from the students, as well as improvements already made or intended.

Methods

The digital slides were created by using 3D Histech slide scanners, subsequently converted into OpenSlide format and uploaded into the university server. The on-line study at University of Tartu is generally based on Moodle open-source learning management system. In Moodle the database modules were created comprising systematic information for each particular slide, including the diagnosis, link to the digital slide, description, figures and links to supplementary materials if necessary. Also, each slide in the database had links to the tutorial videos created in the Panopto recording system. Web resource: <https://moodle.ut.ee/course/view.php?id=8206> At the end of semester a feedback of the students opinion was launched. The questionnaire comprised comparison of new digital teaching method with the old conventional one. There were questions to which extent the digital course might promote independent learning, as well as about technical issues and proposals for further improvements.

Results

The results of feedback showed all students preferred digital slides to conventional microscopy and over 80% find this independent learning facility a great advantage. Most of the students were using PC laptops as their main device for the independent study. Apart from rare general server crashes or maintenance works, the individual rating of technical solutions and content of materials was estimated as “good.”

Conclusions

Digital microscopy slides are highly welcome among the students, facilitate independent learning in undergraduate pathology course and provide new perspectives in pathology teaching. Technical support for presenting digital materials needs to be maximally matched with the specific study needs.

Eosinophilic Gastritis: Rare Benign Differential Diagnosis of Gastric Cancer

*Dr. Tatjana Tone*¹; *Dr. Juliana Gabriella Pavlenko*²;
*Dr. Džeina Mežale*¹; *Dr. Solveiga Jekabsons*³;
*Prof. Janis Gardovskis*⁴; *Prof. Ilze Strumfa*¹

¹ Rīga Stradiņš University, Department of Pathology, Latvia;

² Rīga Stradiņš University, Latvia;

³ Pauls Stradiņš Clinical University Hospital, Latvia

⁴ Rīga Stradiņš University, Department of Surgery, Latvia

Objectives

Eosinophilic gastritis (EG) is a rare (prevalence 1–20/100 000 as reported by Persic et al., 2001 and Jensen et al., 2016) entity, characterized by intense gastric infiltration of eosinophils in the absence of systemic or parasitic disorders. Although EG is benign, the alarming symptoms and objective findings can resemble cancer (Collins et al., 2018). To reach the diagnosis, high level of clinical suspicion is necessary (Zhang et Li, 2017) therefore we report a reliably confirmed case in order to increase the awareness of EG. The case is remarkable also for the detailed transmural morphological evaluation in surgical material.

Methods

Patient's medical history, laboratory, morphological and immunohistochemical findings were reviewed.

Results

Fifty-five-year-old female was admitted to hospital complaining of progressing (over 3 weeks) epigastric pain, nausea, vomiting. Patient's medical history included surgically treated breast cancer 6 years ago and bronchial asthma, currently in remission. Computed tomography showed diffusely thickened gastric wall with more prominent pyloric involvement and gastric stasis. Oesophagogastroduodenoscopy (OGS) revealed marked stasis and lack of gastric peristalsis. On repeated OGS, infiltrated gastric mucosa was noted. Distal gastric cancer was suspected but biopsy showed chronic active erosive gastritis. Blood count was remarkable for leukocytosis ($27.7 \times 10^9/L$) and eosinophilia (36.0%). Six months later patient underwent gastric resection because of suspected cancer. Histologically, intense transmural eosinophilic infiltration was evident in resected tissues, especially in muscle layer, perivascular and interstitial tissues, focally exceeding 50 or 100 eosinophils/HPF. No malignant tumour was found in the stomach or lymph nodes. By immunohistochemistry, pancytokeratin CKAE1/3 was positive only in normal epithelial cells of mucosa. Thus, eosinophilic gastritis was proved.

Conclusions

Eosinophilic gastritis can present with severe clinical symptoms due to loss of gastric wall elasticity and peristalsis caused by transmural infiltration of benign eosinophils. Association with atopic diseases is characteristic. High level of awareness is mandatory to ensure correct diagnosis and treatment.

Diagnostic Value of Cytokeratin Expression Profile in Primary Small Cell Lung Carcinomas

*Dr. Agita Jukna*¹; Prof. *Ilze Štrumfa*¹;
*Dr. med. Andrejs Vanags*²; Prof. *Jānis Gardovskis*²

¹ *Rīga Stradiņš University, Department of Pathology, Latvia;*

² *Rīga Stradiņš University, Department of Surgery, Latvia*

Objectives

The aim of the study was to evaluate the expression and the diagnostic value of commonly used cytokeratin (CK) 7, 20 and high-molecular weight cytokeratin (CKH) in primary small cell lung carcinomas (SCLCs).

Methods

The retrospective study included 49 consecutive patients' biopsy or operation material of lung small cell carcinoma. Histological subtyping was performed in accordance to the lung tumour classification by World Health Organization, 2015 (Travis et al., 2015). Expression of CK7, CK20 and CKH was detected by immunohistochemistry and evaluated in the following categories: 1) negative, 2) focally positive, and 3) extensively positive, defined as being expressed in more than 50% of neoplastic cells (Thunnissen et al., 2017). Descriptive statistical analysis was performed, including calculation of 95% confidence interval (CI).

Results

Cytokeratin 7 expression presented as focal positivity in 24.5% (CI = 14.6–38.1%) of cases and was extensive (evident in more than 50% of tumour cells) in 8.2% (3.2–19.2) of the studied tumours. However, 67.3% (53.4–78.8) of SCLCs were negative.

CK20 was negative in 96.0% (86.3–98.9) of primary small cell lung carcinomas. Focal or extensive expression was observed in single cases of each, respectively, 2.0% (0.4–10.7).

The CKH assessment disclosed few focally positive cases, comprising 6.1% (2.1–16.5), and 46 negative cases representing 93.9% (83.5–97.9) of the study group.

Conclusions

Expression of cytokeratin 20 and CKH is observed in a minority of small cell lung carcinoma cases and could be valuable in identifying metastatic cancer or non-small cell differentiation while cytokeratin 7 positivity appears in up to one third of primary small cell lung carcinomas.

DNA Methylation-Based Classification of Childhood Brain Tumours: Local Case Series

*Dr. med. Ivanda Franckeviča*¹; Prof. *Ilze Štrumfa*²;
*Dr. med. Maija Lubgane*²

¹Children's Clinical University Hospital, Department of Pathology, Latvia;

²Rīga Stradiņš University, Department of Pathology, Latvia

Objectives

Brain tumours are clinically and biologically diverse, ranging from benign to highly malignant neoplasms. Substantial inter-observer variability has been reported regarding histopathological diagnosis of these entities. DNA methylation-based brain tumour classification has significantly improved the diagnostic precision compared with conventional histology. Therefore, neuropathologists in Heidelberg, Germany have designed a free online DNA methylation-based classifier tool (Capper et al., 2018). The aim of our report is to show the first experience with methylation profile analysis for brain tumour diagnostics in local children.

Methods

We demonstrate brain tumour case series, initially evaluated in Children's Clinical University Hospital, consulted in the University College of London, Queen Square Institute of Neurology (United Kingdom) and diagnosed via brain tumour methylation profiling classifier (Heidelberg) based on Illumina 850K EPIC Array data.

Results

1. In a 7-month-old girl, histology of a brain tumour showed cellular, mitotically active astrocytic tumour in the neocortex and subcortical white matter, suggesting anaplastic astrocytoma, World Health Organization (WHO) grade III. At the age of 12 years, magnetic resonance imaging revealed tumour recurrence with features of malignant change. Histology showed pleomorphic cells exhibiting predominantly astrocytic morphology. The methylation pattern analysis (Heidelberg) of the recurrent neoplasm changed the diagnosis to pilocytic astrocytoma / ganglioglioma spectrum tumour, WHO grade I.
2. Medulloblastoma was found in a 9-year-old boy. Methylation profile analysis revealed MYC amplification and established molecular subclass as subclass 4.
3. A 16-year-old girl and 16-year-old boy both were diagnosed with glioblastoma, IDH-wild type. Brain tumour methylation classifier showed H3.3 G34 mutation and MGM promoter status (methylated in one case, but unmethylated in the other case).

Conclusions

DNA methylation-based molecular profiling with software analysis significantly improves diagnostics of childhood brain tumours. In our experience, it is an important tool to establish correct diagnosis of brain tumours as well as epigenetic changes related to patient's prognosis, treatment and prediction of treatment effectiveness.

Prognostic and Predictive Significance of Immunohistochemically Defined Molecular Subclasses in Glioblastoma

*Dr. Arvids Jakovlevs*¹; Prof. *Ilze Strumfa*¹;
Prof. *Janis Gardovskis*²

¹ *Rīga Stradiņš University, Department of Pathology, Latvia;*

² *Rīga Stradiņš University, Department of Surgery, Latvia*

Objectives

Verhaak et al., 2010 classified glioblastomas (GBMs) in 4 subtypes possessing different molecular alterations: classical, mesenchymal, proneural and neural GBM. Several research teams have successfully applied immunohistochemistry (IHC) for the molecular subtyping of GBM (Le Mercier et al., 2012; Popova et al., 2014). However, the number of studies regarding molecular classification of GBM is still limited. Here we evaluated prognostic and predictive role of proneural (PN) and mesenchymal (MES) subtypes by IHC-based approach.

Methods

The study group comprised 146 GBM cases. All tumours were immunostained to detect p53, CD44, PDGFRA and IDH1 R132H proteins. PN GBM was defined by high expression of p53 and/or PDGFRA and/or positivity of IDH1 R132H. MES GBM was defined by high levels of CD44 and low expression of PN markers. Descriptive statistical analysis was performed including calculation of 95% confidence interval (CI). Survival was evaluated by Kaplan-Meier test.

Results

Among GBMs, 50.0% [95% CI: 42.0–58.0] were classified as PN and 18.5% [13.0–25.6] as MES cases while 31.5% [24.5–39.4] did not fit any of these molecular patterns. The IHC-defined molecular subtypes did not differ ($p = 0.424$) by median overall survival (OS). However, the response to treatment (by OS) was different. In PN GBM, radiotherapy improved OS compared with surgery only ($p = 0.008$); there was also a trend to improved OS by addition of temozolamide compared with adjuvant radiotherapy alone ($p = 0.061$). In MES GBM, addition of temozolamide significantly improved OS compared with adjuvant radiotherapy alone ($p = 0.002$). However, addition of radiotherapy did not improve OS of MES GBM patients compared with surgery only ($p = 0.857$).

Conclusions

1. Glioblastomas can be classified into unequivocal molecular subtypes by IHC.
2. These subtypes lack prognostic role. However, molecular subtyping can be used as a predictive test. Thus, adjuvant radiotherapy brings survival benefit in patients with proneural contrasting with mesenchymal glioblastoma.

Prognostic Role of Ki-67 Labeling Index in Diffuse Gliomas

*Dr. Arvids Jakovlevs*¹; Prof. *Ilze Strumfa*¹;
Prof. *Janis Gardovskis*²

¹ *Rīga Stradiņš University, Department of Pathology, Latvia;*

² *Rīga Stradiņš University, Department of Surgery, Latvia*

Objectives

The non-histone nuclear protein Ki-67 is related to cellular proliferation and thus reflects the biological potential of tumour. Clinical impact of Ki-67 labeling indices (LI) in gliomas has been debated, especially regarding glioblastoma (Jin et al., 2011; Yang et al., 2013). Lack of consensus necessitates further research. We aimed to evaluate expression of Ki-67 in gliomas at protein level by immunohistochemistry (IHC) and to assess the prognostic significance.

Methods

A retrospective study of consecutive, surgically treated gliomas comprised 126 glioblastomas (GBMs) and 23 diffuse astrocytomas (DAs). Nuclear IHC staining (Ki-67, clone MIB-1) was scored quantitatively by proportion (%) of positive neoplastic cells. Survival was evaluated by Kaplan-Meier test. For survival analysis, LI was classified into high vs low using cut-off of 25% in GBM and 5.5% for DA (Jin et al., 2011). Descriptive statistics was applied (Altman et al., 2000).

Results

In GBMs, Ki-67 LI ranged from 13% to 95%, mean 44.4% [95% confidence interval: 41.1–47.6], while in DAs it reached 2 – 15%; mean 6.4% [4.7–8.0]. By the selected cut-offs, high LI was observed in 88.1% [81.2–92.6] of GBMs and 50.0% [30.1–75.0] of DAs. LI showed statistically non-significant association with survival in GBMs ($p = 0.252$) although survival curves were visually different, overlapping in the first five months but diverging thereafter. The median survival of GBM patients with high vs low LI was 7.4 [5.7–9.1] vs 13.5 [9.1–17.8] months. In DAs, LI carried statistically significant survival difference ($p = 0.037$). High LI, observed in 52.2% [33.0–70.8] of DAs, was associated with death rate reaching 58.3% [31.9–80.7] of patients at the end of study, vs 18.2% [5.1–47.7] of patients affected by DA holding low LI.

Conclusions

1. Ki-67 labeling index shows no further prognostic significance in patients with GBMs.
2. In DA, Ki-67 is significantly associated with survival VAI prognostically significant. It must be used along with the established WHO histological grading criteria.

IDH1 and ATRX Status in Childhood Gliomas by Immunohistochemistry

*Dr. med. Maija Lubgane*¹; Prof. *Ilze Štrumfa*²;
*Dr. med. Ivanda Franckeviča*²

¹*Rīga Stradiņš University, Department of Pathology, Latvia;*

²*Rīga Stradiņš University, Department of Pathology, Latvia*

Objectives

To detect immunohistochemically the isocitrate dehydrogenase 1 (IDH1) mutant protein of primary glial brain tumours and reclassify paediatric glial tumours in local patients according to the most recent World Health Organisation classification.

Methods

Consecutive, primary, histologically verified brain tumours, diagnosed within the preceding 15 years, were identified by a retrospective archive search in Children's Clinical University Hospital of Riga (Latvia). The respective histological slides were reviewed to identify the presence and type of tumour. Secondary tumours and recurrences were excluded from further evaluation. Immunohistochemical staining for IDH1 and alpha-thalassemia/mental retardation, X-linked (ATRX) proteins was performed. Descriptive statistics was carried out.

Results

There were 110 histologically diagnosed primary brain tumours (2004–2018). Astrocytic tumours, comprising 66.4% (95% confidence interval (CI): 60.1–72.0) of all brain neoplasms, represented the most frequent histological type. Astrocytic brain tumours were further classified according to their histologic features on light microscope in haematoxylin / eosin-stained sections. Histopathological glial tumour distribution: pilocytic astrocytomas 24.7% (95% CI: 7.3–42.1), grade II astrocytomas (diffuse astrocytomas 23, pleomorphic xanthoastrocytomas 2) 34.2% (95% CI: 19.0–49.4), anaplastic astrocytomas 26.0% (95% CI: 8.9–43.1) and glioblastomas 15.1% (95% CI: 0.0–34.8). The presence of mutant IDH1 protein and ATRX loss was further analysed immunohistochemically in 23 grade II – IV glial tumours (12 diffuse astrocytomas, 5 anaplastic astrocytomas and 6 glioblastomas). By immunohistochemistry, mutant IDH1 protein was not observed. Immunohistochemical analysis showed positive ATRX protein expression.

Conclusions

1. Glial tumours represent the largest histological group of paediatric brain tumours in Latvia.
2. Grade II diffuse astrocytoma is the most common astrocytic tumour in paediatric population of Latvia.
3. Analysed grade II-IV glial tumours were negative for the mutant IDH1 protein and did not show loss of ATRX protein expression.

Interaction Between Local and Systemic Inflammatory Response in Colorectal Carcinoma: Two Faces of Janus

*Dr. Inese Driķe*¹; *Sandra Cipkina*²; *Fanija Čukure*³;
Prof. *Ilze Štrumfa*¹; Prof. *Jānis Gardovskis*⁴

¹Rīga Stradiņš University, Department of Pathology, Latvia;

²Rīga Stradiņš University, Faculty of Medicine, Latvia;

³Rīga Stradiņš University, Department of Surgery, Latvia;

⁴Rīga Stradiņš University, Department of Surgery, Latvia

Objectives

High-grade peritumorous inflammation is associated with better prognosis in many cancers (Wang et al., 2016). In contrast, marked systemic inflammatory response (SIR) is linked to worse survival (Krenn-Pilko et al., 2014). The aim of our study was to evaluate the local inflammatory reaction in relation to SIR in colorectal cancer.

Methods

The study was designed as a retrospective morphological and laboratory assessment of consecutive primary colorectal carcinoma cases subjected to surgical treatment with curative intention. The local inflammatory reaction in tumour tissues was assessed according to Klintrup-Makinen score (Klintrup et al., 2005). In short, carcinomas were classified by the intensity of inflammation into four groups, which were further re-distributed into two classes: low-grade (no or mild inflammation) vs high-grade (moderate or severe) inflammation. SIR was analysed by calculating neutrophil/lymphocyte ratio (NLR), platelet/lymphocyte ratio (PLR), lymphocyte/monocyte ratio (LMR) and neutrophil/monocyte ratio (NMR) using data from preoperative blood counts. Descriptive statistical analysis and Spearman rank correlation test were applied to evaluate the results.

Results

The study comprised 182 colorectal carcinomas, including 101 (55.5% [95% confidence interval: 48.2–62.5]) cases featuring low-grade inflammation and 81 (44.5% [37.5–51.8]) tumours showing high-grade local inflammation. Spearman test confirmed statistically significant association between the intensity of local inflammation and NLR ($p = 0.04$) as well as PLR ($p = 0.03$). In patients presenting with low-grade local inflammation, the median NLR was 2.4 (interquartile range (IQR): 1.7–4.0) and PLR: 166 (IQR: 118.5–244.0), contrasting with NLR of 3.15 (IQR: 2.3–4.6) and PLR of 224 (145.5–281.5) in those having high-grade peritumorous inflammation. LMR ($p = 0.11$) and NMR ($p = 0.12$) lacked statistically significant association with the intensity of local inflammation.

Conclusions

In colorectal carcinoma, high-grade local inflammation is associated with higher NLR and PLR. There is no correlation between local inflammation and either LMR or NMR. These associations should be considered when elaborating prognostic algorithms.

C-Reactive Protein and Other Sir Parameters in Relation to Lymph Node Yield in Colorectal Carcinoma

*Dr. Inese Driķe¹; Fanija Čukure²; Sandra Cipkīna²;
Prof. Ilze Štrumfa²; Prof. Jānis Gardovskis²*

¹*Rīga Stradiņš University, Department of Pathology, Latvia;*

²*Rīga Stradiņš University, Department of Surgery, Latvia*

Objectives

To ensure reliable morphological staging of colorectal carcinoma in surgical material, pathologist must retrieve at least 12 regional lymph nodes. Different factors can affect lymph node (LN) yield. Thus, the significance of preoperative treatment, iatrogenic factors and different laboratory mistakes has been reported. Our research aim was to evaluate the association between systemic inflammatory response (SIR) and LN yield in surgically treated colorectal carcinoma.

Methods

The study was carried out via retrospective design, enrolling consecutive patients diagnosed with colorectal carcinoma and subjected to surgical treatment. The removed tissues were examined via standardized morphological investigation protocol including also the number of retrieved LN. The cases were then classified by LN count as scant (less than 12 LN found within operation material) vs adequate yield (at least 12 LN retrieved). SIR was assessed by 1) preoperative level of C-reactive protein (CRP); 2) calculated cellular ratios: neutrophil/lymphocyte ratio (NLR), platelet/lymphocyte ratio (PLR), lymphocyte/monocyte ratio (LMR) and neutrophil/monocyte ratio (NMR) based on preoperative blood counts. Descriptive statistical analysis and Spearman rank correlation test was applied to evaluate the results.

Results

The study included 84 colorectal carcinomas. The overall median LN count per case reached 12 (interquartile range (IQR): 8–16). In 37 (44.0% [95% confidence interval: 33.9–54.7]) cases, LN yield was scant (less than 12 LN), while in 47 (56.0% [45.3–66.1]) it was adequate (at least 12 retrieved LN). CRP levels were not significantly different between these groups ($p = 0.36$). In patients with scant LN yield, the median preoperative CRP level was 6.5 mg/l (IQR: 1.0–21.8), in those with adequate LN yield: 7.8 mg/l (IQR: 2.4–36.9). No statistically significant correlation was found between retrieved LN count and NLR ($p = 0.81$), PLR ($p = 0.48$), LMR ($p = 0.21$) and NMR ($p = 0.72$).

Conclusions

Preoperative CRP levels and overall systemic inflammatory response show no association with LN count found by pathologist.

Role of Epigenetics in Diagnostics of Brain Tumours

Dr. Zane Jaunmuktane

UCL Institute of Neurology and The National Hospital for Neurology and Neurosurgery, United Kingdom

Objectives

Traditionally, brain tumours are classified by histological patterns. However, intra- and inter-observer variability has been repeatedly demonstrated for many of the brain tumour entities. Furthermore, brain tumour classification based on histological features often does not reflect the underlying tumour biology and may not correlate with clinical behaviour. Recent advances in characterisation of genetic and epigenetic alterations in many brain tumour entities provide pathologists with an opportunity to transform the diagnostic approach and classify many of the brain tumours in biologically relevant entities with significant impact on the clinical management.

Methods

The majority of brain tumours operated at, or referred to the National Hospital for Neurology and Neurosurgery (London, UK) over the last four years, routinely underwent molecular diagnostic workup with analysis by single-gene sequencing, typically including a panel of IDH1, IDH2, TERT promoter, H3F3A and BRAF genes, and assessment for chromosome 1p, 7p, 10q and 19q copy number alterations and MGMT promoter methylation status. DNA methylation-based CNS tumour classification using Illumina 450k/850k methylation arrays and the brain tumour classifier tool, developed in Heidelberg, Germany, was performed on a proportion of the cases.

Results

The diagnostic approach comprising PCR-based molecular studies complemented with DNA methylation-based classification can significantly improve diagnostic precision, particularly on small, non-representative biopsies or on morphologically unusual, diagnostically challenging cases.

Conclusions

We recommend a two-step diagnostic process, comprising parallel single-gene sequencing and copy number assessment, followed by DNA methylation-based profiling for diagnostically challenging cases or for tumour entities with prognostically relevant subgroups. Classification of brain tumours incorporating genetic and epigenetic alterations provide most accurate diagnosis and can lead to a change of the initial histological diagnosis and sometimes also the grade of the tumour, often with considerable implications for optimal clinical management of the patients.

Data-Driven White Matter Axonal Guidance (DWMAG)

Arets Paeglis

Latvia

Objectives

The goal of the DWMAG project is the development of a computational framework for fully automated inference and construction of approximate white matter connectivity, using data acquired from MRI. It aims to provide a practical method for constructing highly biologically accurate statistically inferred connectomes using local connectivity statistics and brain-wide tractography data.

Methods

DWMAG approaches the problem of inferring approximate connectomes from local connectivity statistics and tractography by developing a new class of algorithms that take advantage of the existing fibre tracking techniques in order to identify the white matter axonal pathways and create a co-registered structural and connectivity dataset in the form of transformation matrix that is then used to align the tracts with a pre-generated brain surface. Each tract is assigned with the source and destination region, closest triangles in the brain surface mesh, etc. These data are then used to compute region connectivity statistics, which are used to fit compartmental neuron models to the white matter tracts, creating an approximation of the connectome.

Results

The results of the DWMAG protocol are used to produce rich datasets of *in silico* brain activity, in the form of spike trains, simulated EEG, MRI, etc. data, which are compared, using appropriate similarity analysis techniques, to empirical *in vivo*-derived results to assess the accuracy of the simulation.

Conclusions

The development of this methodology for representing neural connectivity of the brain could have the capacity necessary to serve as a practical and accurate automated intermediate solution between low-resolution neural mass or field models and resource-intensive reconstructive connectomics and biophysically detailed neuron models. The scalability of DWMAG will allow a high degree of flexibility, both in neuron and synapse representations and in hardware requirements ranging from single workstations to HPC clusters and supercomputers.

Expression of HIV Reverse Transcriptase in Implanted Murine Adenocarcinoma Cells Increases Burden of Liver Metastasis in BALB/C Mice: Pilot Study

*Dr. Džeina Mezale*¹; *Ekaterina Bayurova*²; Prof. *Ilze Strumfa*¹;
*Dr. med. Andrejs Vanags*³; *Dr. Ilze Fridrihsone*¹; *Ph.D. Stefan Petkov*⁴;
*Ph.D. Juris Jansons*⁵; *Ph.D. Ilya Gordeychuk*⁶; *Dr. Maria Issagouliantis*⁷

¹ Rīga Stradiņš University, Department of Pathology, Latvia;

² Chumakov Federal Scientific Center for Research and Development of Immune-and-Biological Products of the Russian Academy of Sciences, Russian Federation; Gamaleya Research Center of Epidemiology and Microbiology, Russian Federation;

³ Rīga Stradiņš University, Department of Surgery, Latvia;

⁴ Karolinska Institutet, Microbiology and Tumor Biology Center, Sweden;

⁵ Rīga Stradiņš University, Department of Research, Latvia; Biomedical Research and Study Centre, Latvia;

⁶ Chumakov Federal Scientific Center for Research and Development of Immune-and-Biological Products of the Russian Academy of Sciences, Russian Federation; Gamaleya Research Center of Epidemiology and Microbiology, Russian Federation;

⁷ Rīga Stradiņš University, Latvia

Objectives

Patients with HIV have an increased incidence of oncological diseases. Tumorigenicity of HIV proteins per se has been suggested, however factual data confirming the concept are sparse. The aim of the study was to characterize the capacity of tumors formed by murine adenocarcinoma cells expressing HIV-1 reverse transcriptase (RT) to metastasize in liver.

Methods

Cell lines 4T1_luc2-RT1.3, 4T1_luc2-RT5.3 and 4T1_luc2-RT20.1 were generated from cell line 4T1-luc2 (Perkin Elmer) by transduction with lentivirus encoding HIV-1 RT at multiplicity of infection 1, 5 and 20, respectively. Mice were injected subcutaneously with 4T1_luc2-RT1.3 (n = 9), 4T1_luc2-RT5.3 (n = 8), 4T1_luc2-RT20.1 (n = 7) and parental 4T1luc2 cells (n = 8). By days 7-9 all formed solid tumors. Metastases were detected and evaluated in liver samples collected on day 21 after their formalin-fixation and paraplast-embedding. Area of metastases per sample was quantified in 25 microscope fields (400 ×) of hematoxylin-eosin-stained slides by computer-assisted morphometry using specialized NIS-Elements software (Nikon, Tokyo).

Results

Liver micrometastases were found in all study groups (nn per mouse ± SD/mean size ± SD): 56 in 4T1_luc2_RT1.3-implanted group (6.22 ± 1.72/632.69 ± 247.99 μm²); 103 in 4T1_luc2_RT5.3 (12.88 ± 1.64/546.61 ± 260.95 μm²); 114 in 4T1_luc2_RT20.1 group (16.29 ± 1.38/366.54 ± 162.57 μm²); and 27 in 4T1-luc2 control group (3.37 ± 3.2/699.35 ± 280.52 μm²). RT-expressing cell lines had higher frequency of metastasis formation compared to parental cells, although the metastases were smaller (both p < 0.05). The number of metastases per animal increased with increasing level of RT expression by the cell line, while the size of metastases decreased (both p < 0.05).

Conclusions

The most aggressive tumor variant was formed by 4T1_luc2_RT.20.1 cell line expressing high levels of HIV-1 RT, although these tumors tended to form smaller metastases compared to the parental cell line. This new data is an evidence of a direct tumorigenic potential of HIV-1 antigens.

Juxtaglomerular Cell Tumour: Report of Unique Case

*Ph.D. Maris Sperga*¹; Prof. *Ilze Strumfa*¹; Prof. *Ondrej Hes*²

¹*Rīga Stradiņš University, Department of Pathology, Latvia;*

²*University Hospital Plzen, Department of Pathology, Czech Republic*

Objectives

In Latvia renal cancer has exceeded 500 cases (2016–2017). Considering the predominance of clear cell carcinoma. Juxtaglomerular cell tumour (JGCT) is an extremely rare renin-secreting neoplasm arising from specialized smooth muscle of glomerular afferent arteriole in juxtaglomerular apparatus. JGCT was first described by Robertson et al (1967). Worldwide, less than 100 cases have been reported. Here we present a well-documented case.

Methods

Patient's medical history was reviewed along with laboratory, morphological, immunohistochemical and ultrastructural findings.

Results

A 34-year-old female suffered from arterial hypertension. Physical examination showed no abnormal findings except elevated blood pressure (BP) reaching 150/100 mmHg. Abdominal computed tomography revealed right-sided kidney mass, 2.8 cm in largest diameter. Renal function and urine analysis were normal. Plasma renin activity and aldosterone levels were not investigated. Right-sided segmental nephrectomy was performed. Grossly, a well-demarcated, solid, light-tan mass, 2.7 × 2.4 cm, containing small gelatinous cyst, was found in the renal segment. Histologically, tumour consisted of nests composed by small, uniform ovoid cells exhibiting pale cytoplasm. No mitoses were observed. The tumour lacked capsular or vascular invasion. By immunohistochemistry, the neoplastic cells were negative for CD10, CK7 and CK20. For consultation, paraffin blocks were sent to prof. O. Hes (Plzen). By extended immunohistochemistry, tumour cells expressed CD34, β-catenin and renin but lacked CD117, Bcl2 and actin. After tissue post-fixation in glutaraldehyde, electron microscopy showed rhomboid granules of renin in the cytoplasm of neoplastic cells. Thus, JGCT was confirmed. Notably, BP normalized 4 days after the surgery.

Conclusions

Here we report a unique renal neoplasm. The occurrence in a young adult is typical. Morphological structure necessitates wide differential diagnostics with glomus tumour, hemangiopericytoma and solitary fibrous tumour.

Childhood Pineoblastoma – Rare Brain Tumour

*Dr. med. Maija Lubgane*¹; Prof. *Ilze Štrumfa*²;
*Dr. med. Ivars Melderis*³

¹*Rīga Stradiņš University, Department of Pathology, Latvia;*

²*Rīga Stradiņš University, Department of Pathology, Latvia;*

³*Rīga Stradiņš University, Institute of Anatomy and Anthropology, Latvia*

Objectives

Pineal tumours are rare. Nevertheless, wide spectrum of lesions can develop from pineal gland or surrounding tissues (Alexiou et al., 2012). Pineoblastoma is an unusual malignant embryonal tumour arising from pineal parenchyma (Kahraman et al., 2015). The aim of the current report is to increase awareness of clinical and morphological features of pineoblastoma in childhood.

Methods

Medical documentation was retrieved retrospectively from archives of Children's Clinical University Hospital, Riga, Latvia (CCUH) and carefully re-evaluated for demographic, clinical and radiological features as well as findings of laboratory assays. The respective histological slides were reviewed to identify the presence and type of tumour.

Results

A single case of pineoblastoma has been encountered in CCUH over 15 years. A 10-month-old boy was admitted to hospital because of subfebrility, anorexia, nausea, vomiting and somnolence. Objectively, tense anterior fontanelle was found. Computed tomography revealed a mass in the pineal gland. Magnetic resonance imaging (MRI) disclosed poorly demarcated pineal tumour, causing stenosis of cerebral aqueduct. Laboratory findings were unremarkable. In the cerebrospinal fluid, neoplastic cells were found. An urgent ventriculoperitoneal shunting was performed. Two weeks later, transventricular biopsy was obtained. The histopathological examination yielded the features of pineoblastoma: tumour consisting of densely packed small round blue cells with round to mildly irregular nuclei and scant cytoplasm. It showed high mitotic activity and necrotic areas. Immunohistochemically there was a positivity of synaptophysin, neurofilament, chromogranin A and neuron specific enolase. The proliferation fraction by Ki-67 was high, ranging between 60 and 65%. Chemotherapy was started. However, neurologic symptoms progressed and repeated MRI showed tumour enlargement and dissemination in frontal skull bone. Patient died at the age of 12 months.

Conclusions

Stenosis of cerebral aqueduct can be caused by rare brain tumours – pineoblastomas characterised by aggressive clinical course and high-grade malignant features by morphology.

Amyloid Goitre in Patient with Long-Standing Psoriasis

*Dr. Ilze Fridrihsone; Dr. Marta Riekstina;
Prof. Arnis Abolins; Prof. Ilze Strumfa*

Rīga Stradiņš University, Department of Pathology, Latvia

Objectives

Amyloid goitre can be either the first manifestation of systemic amyloidosis (Cabrejas Gomez et al., 2015) or a localised manifestation of amyloidosis in a single organ (Joung et al., 2014) leading to diagnostic difficulties. To increase the awareness of amyloidosis, we present amyloid goitre on the background of prolonged psoriasis.

Methods

The medical documentation, pathology slides and radiologic investigations were reviewed in the context of up-to-date medical literature.

Results

A significantly enlarged thyroid gland was found in a 59-year-old lady while she was undergoing examination and treatment because of severe urinary tract infection on the background of immunosuppression. Her medical history was remarkable for psoriasis since the age of 13 years. The patient was also suffering from psoriatic arthropathy, which was treated with non-steroidal-anti-inflammatory drugs (NSAID). She was diagnosed with chronic kidney disease stage IV at the age of 55 years. Kidney damage was attributed to the NSAID usage. Six months later, her renal function deteriorated to end-stage renal disease. Kidney biopsy was performed, disclosing chronic interstitial nephritis and kidney amyloidosis. Kidney allotransplantation was performed successfully and continuous immunosuppressive therapy was started. Two years after the transplantation, the patient underwent hospital treatment because of severe urinary tract infection. During this treatment episode, the thyroid enlargement was discovered. Computed tomography (CT) of the chest demonstrated considerably enlarged thyroid gland with multiple heterogenous nodules, causing compression. By thyroid scintigraphy, uneven distribution of radiopaque/technetium was revealed characterised by mostly cold nodules. FNA revealed follicular epithelial proliferation without any evidence of malignant change. Considering the goitre with tracheal compression, total thyroidectomy was performed. On histological examination light eosinophilic deposits were observed. Positive staining with Congo red and apple green birefringence on polarisation microscopy confirmed the presence of amyloid.

Conclusions

In the case of amyloid goitre diagnostics can be difficult due to lack of awareness of this condition.

Primary Renal Lymphoma Mimicking Nephroblastoma: Rare Case of Childhood Tumour

*Dr. med. Ivanda Franckevica*¹; *Ph.D. Sergey Nikulshin*²;
*Dr. Marika Grutupa*³; *Dr. med. Maija Lubgane*²

¹ *Rīga Stradiņš University, Department of Pathology, Latvia;*

² *Children's Clinical University Hospital, Department of Pathology, Latvia;*

³ *Children's Clinical University Hospital, Department of Oncology and Hematology, Latvia*

Objectives

Primary renal lymphoma (PRL) is rare disease defined as a non-Hodgkin's lymphoma (NHL) involving the kidney in the absence of primarily extrarenal lymphatic disease. PRL constitutes 0.7% of extranodal lymphomas and is extremely rare in childhood. Most common reported cases of PRL are of diffuse large B cell lymphoma, however Burkitt lymphoma is described in paediatric age group (Chen et al, 2016; Agarwal et al; 2015; Coca et al, 2017). The aim of our report is to demonstrate rare case of paediatric kidney tumour.

Methods

We demonstrate a patient with renal lymphoma mimicking nephroblastoma and diffuse nephroblastomatosis in radiologic investigation.

Results

A 4 year old boy was admitted to hospital complaining of transient abdominal pain and palpable abdominal masses discovered of his mother. Abdominal ultrasonography and magnetic resonance investigation revealed mass lesion in left kidney 11.5 × 9.5 × 15.5 in diameter as well as multiple lesions in both kidneys suggesting diffuse nephroblastomatosis. Abdominal or chest lymphadenopathy was not found. Bone marrow investigation showed no malignant cells. The patient received preoperative chemotherapy for nephroblastoma according Umbrella SIOP 2016 protocol followed by subsequent nephrectomy. Histological investigation of surgically removed tumour showed diffuse monotonous infiltration of medium sized uniform cells with many mitotic figures and high fraction of apoptosis ("starry sky" pattern). Immunohistochemistry showed strong expression of LCA, CD20, CD19, bcl-6 and CD10. Moderate positive staining pattern of bcl-2 was also found. Ki67 labelling index was high-nearly 100% of cells are positive for Ki67. Histological and immunohistochemical findings were consistent with diagnosis of mature B cells Burkitt like lymphoma.

Conclusions

Although rarely, encountered PRL should be considered in the differential diagnosis of kidney tumours in paediatric patients. Since treatment and prognosis of PRL and other childhood kidney tumours is very different, it essential to confirm radiologically doubtful diagnoses histologically to justify initiation of chemotherapy.

Digital Pathology in Education: Experience of Rīga Stradiņš University, Latvia

Prof. *Ilze Strumfa*¹; Dr. *Dzeina Mezale*¹;
Prof. *Guntis Bahs*²; Dr. med. *Andrejs Vanags*³;
Dr. *Ilze Fridrihsone*¹; Dr. *Arvids Jakovlevs*¹

¹*Rīga Stradiņš University, Department of Pathology, Latvia;*
²*Rīga Stradiņš University, Department of Internal Diseases, Latvia;*
³*Rīga Stradiņš University, Department of Surgery, Latvia*

Objectives

The objective of the current report is to share the initial experience of Rīga Stradiņš University on the implementation of digital pathology in undergraduate education.

Methods

In the report, technical and survey data are summarised.

Results

In the result of the reported activity, database of virtual slides was created in the e-study environment. The slides were supplemented with descriptions and tasks for independent studies. The survey of students and teachers returned highly positive feedback. Notably, the already positive attitude was further improved after guest lectures involving virtual slides.

Conclusions

Digital pathology is a user-friendly method of medical education that is well suited for the current generation of students. It corresponds to European and worldwide standards of medicine and education, thus preparing our students for their practical work, interdisciplinary discussions and medical research.

Proliferation Activity and Epithelial-Mesenchymal Transition in Hepatocellular Carcinoma: Pilot Study

*Dr. Dzeina Mezale*¹; Prof. *Ilze Strumfa*¹;
*Dr. med. Andrejs Vanags*²; *Dr. Ilze Fridrihsone*¹

¹*Rīga Stradiņš University, Department of Pathology, Latvia;*

²*Rīga Stradiņš University, Department of Surgery, Latvia*

Objectives

The high mortality from hepatocellular carcinoma (HCC) is mainly attributed to the invasion pattern and intrahepatic and/or extrahepatic metastases, but the exact mechanism remains unclear. Yet, the escape of neoplastic cells from the solid tumour might be due to process called epithelial-mesenchymal transition (EMT). The aim of the study was to evaluate the proliferation activity and EMT in HCC.

Methods

50 cases of HCC were evaluated: 36 males and 14 females. The expression of Ki-67, vimentin and E-cadherin was detected by immunohistochemistry. The proliferation fraction was scored quantitatively (%) in the neoplastic nuclei. Expression of vimentin and E-cadherin was evaluated semi-quantitatively by intensity (scale, 0–3) and the fraction (%) of positive neoplastic cells.

Results

The mean proliferation fraction was $26.1\% \pm \text{SD } 18.2$ (95% CI: 17.6–34.6; range 2.0–73.0). The mean expression of E-cadherin was $1.5 \pm \text{SD } 1.0$, comparable with the moderate intensity of peritumoural benign hepatocytes ($1.7 \pm \text{SD } 1.0$) but being less than in reactive bile ducts ($2.7 \pm \text{SD } 0.4$). HCCs were mostly negative (85.0% of cases; 95% CI: 63.1–95.6) for vimentin. The mean expression of vimentin was $0.2 \pm \text{SD } 0.6$. The hepatocytes were invariably negative while reactive bile ducts showed higher expression: $1.3 \pm \text{SD } 1.2$.

Conclusions

Currently, there is a considerable body of literature indicating that hepatocellular EMT is a crucial event in HCC progression. However, expression of EMT marker vimentin was a rare event in the present group. Our data match with other studies, suggesting that HCC is a discohesive malignancy with low E-cadherin expression. Furthermore, our data suggest that HCC is tumour with low proliferative activity indirectly indicating low efficacy of chemotherapy.

Immunohistochemical Expression of Cd44 and Ki-67 in Follicular Thyroid Neoplasms

Dr. Ilze Fridrihsone; Prof. Arnis Abolins; Prof. Ilze Strumfa

Rīga Stradiņš University, Department of Pathology, Latvia

Objectives

To distinguish thyroid follicular carcinoma (FC) from a follicular adenoma (FA) capsular, extrathyroidal, or vascular invasion, or nodal/distant metastasis must be found (Yoon et al., 2014). However, differential diagnostic problems is still present – new, more reliable diagnostic parameters needed to be found (Sobrinho-Simoes et al., 2011).

Aim: The aim of this study is to compare Ki-67 and CD44 in benign and malignant follicular thyroid tumours as well as in surrounding thyroid tissues.

Methods

In a retrospective study, 56 patients with morphologically confirmed thyroid follicular neoplasms (48 FA, 8 FC) were included for evaluation of Ki-67 and 39 patients (20 FA; 19 FC) for evaluation of CD44. Tumours were diagnosed according to the classification and criteria issued by World Health Organisation (DeLellis et al., 2004). Expression of Ki-67 and CD44 was detected by immunohistochemistry and assessed by computer-assisted morphometry using NIS Elements (Nikon, Tokyo, Japan) software and optical system consisting of Eclipse Ci-L microscope/ DS-Fi2 camera (Nikon). Statistical analysis included descriptive methods (mean \pm standard deviation), calculation of 95% confidence interval (Altman et al., 2000) and Mann-Whitney test (IBM SPSS Statistics 23; Armonk, USA). $p < 0.05$ was considered statistically significant.

Results

The highest proliferation fraction by Ki-67 was significantly ($p = 0.038$) lower in FA: $4.8 \pm 12.9\%$ [95% confidence interval: 1.1–8.5] than in FC: $8.4 \pm 9.8\%$ [0.2–16.6]. The expression level of CD44 in FC, reaching $74.7 \pm 27.8\%$ [CI: 62.2–87.2], was significantly different from surrounding tissues ($p = 0.004$). The differences between both types of follicular tumours did not gain statistical significance ($p = 0.057$).

Conclusions

The proliferation activity is statistically significantly higher in thyroid FC than in FA. Expression of CD44 is statistically significantly higher in thyroid FC than in peritumoural thyroid epithelium. The diagnostic accuracy could be increased by use of both markers.

Severity of Acute Appendicitis in Elderly Patients: Morphological Evidence

*Sintija Lapsa*¹; Prof. *Ilze Štrumfa*²;
*Dr. med. Artūrs Ozoliņš*¹; *Jānis Gardovskis*¹

¹ *Pauls Stradiņš Clinical University Hospital, Department of Surgery, Latvia;*

² *Rīga Stradiņš University, Department of Pathology, Latvia*

Objectives

The aim of the current study was to assess the severity of morphological changes, related to acute appendicitis in elderly patients in comparison to young cases.

Methods

In a retrospective study, consecutive cases of surgically treated acute appendicitis were identified in the archives of a single university hospital. Two cohorts of patients were defined by age: young cases, diagnosed with appendicitis at the age between 18 and 35 years, and elderly group, including patients older than 65 years. The following parameters were assessed: presence and stage of appendicitis (early acute vs phlegmonous vs gangrenous vs secondary); occurrence of appendicular perforation, periappendicitis, and / or mesenteriolar phlebitis. Descriptive and analytical statistics was carried out by SPSS23 (IBM); $p < 0.05$ was considered significant.

Results

Archive search yielded 59 elderly and 97 young patients subjected to appendectomy for suspected acute appendicitis. The rate of negative appendectomies was 27.8% [95% confidence interval 19.9–37.5] in the young and 10.2% [4.4–20.8] in the elderly cohort; Fisher's exact two-tailed $p = 0.0088$. Phlegmonous appendicitis was found in 88.6% [78.8–94.3] of young patients, contrasting with only 37.7% [25.9–51.2] elderly patients; $p < 0.0001$. Elderly patients were characterised by significantly more frequent occurrence of gangrenous appendicitis: 62.3% [48.8–74.1] vs 7.1% [2.7–16.0] in young patients; $p < 0.0001$ and morphologically evident perforation: 32.1% [21.0–45.5] vs 2.9% [0.2–10.4] in young patients; $p < 0.0001$. Periappendicitis was present in 80.0% [69.1–87.8] of young patients and 98.1% [89.1–100.0] of elderly patients; $p = 0.0019$. In contrast, the frequency of severe purulent periappendicitis and mesenteriolar phlebitis did not differ significantly ($p = 0.85$ and $p = 0.47$, respectively).

Conclusions

Acute appendicitis in elderly patients is more severe, characterised by frequent occurrence of gangrenous changes and morphologically evident perforation at the time of appendectomy. Still, the differential diagnosis at young age seems to be complex, as reflected in the rate of negative appendectomies.

Chronic Vascular Stenosis: Background of Acute Appendicitis in Elderly Patients

*Sintija Lapsa*¹; Prof. *Ilze Štrumfa*²;
*Dr. med. Artūrs Ozoliņš*¹; *Jānis Gardovskis*¹

¹ *Pauls Stradiņš Clinical University Hospital, Department of Surgery, Latvia;*

² *Rīga Stradiņš University, Department of Pathology, Latvia*

Objectives

The aim of the current study was to assess the presence and type of chronic vascular stenosis in appendicular blood vessels, related to acute appendicitis in elderly patients in comparison to young cases. We hypothesized that chronic vascular lesions can be more frequent in older than in young patients operated for acute appendicitis.

Methods

The study was designed by retrospective approach. Consecutive cases of surgically treated and morphologically confirmed acute appendicitis were identified in archives of a single university hospital. Two cohorts of patients were defined by age: young cases, diagnosed with appendicitis at the age between 18 and 35 years, and elderly group, including patients older than 65 years. Presence and type (eccentric versus concentric) of chronic vascular stenosis was evaluated in a. appendicularis, small arteries and arterioles in the mesenterium and in submucosal tissues. Descriptive and analytical statistics was carried out by SPSS23 (IBM); $p < 0.05$ was considered significant.

Results

After the negative appendectomies were excluded, archive search yielded 53 elderly and 70 young patients subjected to appendectomy for morphologically verified acute appendicitis. Chronic vascular stenosis was found in 12/70 s. 17.1% [95% confidence interval 9.9–27.8] young patients contrasting with 37/53 s. 69.8% [56.4–80.6] elderly cases; Fisher's exact two-tailed $p < 0.0001$. In the elderly group, the stenotic changes involved a. appendicularis in 32.1% [21.0–45.5] cases, mesenteric arteries and arterioles in 28.3% [17.9–41.7] and submucosal vessels in 26.4% [16.3–39.7]. Among young patients, the appendicular artery was narrowed in 2.9% [0.2–10.4] cases, mesenteric blood vessels in 7.1% [2.7–16.0] and submucosal arteries and arterioles in 12.9% [6.7–22.9] cases. Notably, elderly patients were characterised by marked concentric vascular stenosis while focal eccentric stenosis prevailed in younger patients ($p < 0.0001$).

Conclusions

Appendicitis in elderly patients is frequently associated with chronic vascular stenosis. Further studies are necessary to assess the pathogenetic significance of this finding.

Digital Pathology: Overview

Arvydas Laurinavicius

Vilnius University, Lithuania

High-resolution / high capacity scanning of microscopy slides transforms tissue pathology as diagnostic, research, and educational discipline. Multiple aspects of digital pathology will synergize and bring disruptive innovations in the domain. This talk will focus on two most promising directions: retrieving essentially novel and rich information from pathology images and new business models for diagnostic pathology.

Post Mortem Radiological Investigations

MD Sünne Remmer

*Estonian Forensic Science Institute,
North Estonia Medical Centre, Estonia*

Post mortem computed tomography (PMCT) and magnet resonance imaging (PMMRI) complement traditional autopsy in determining the cause of death and the presence of injuries. At the Estonian Forensic Science Institute, we have been using PMCT and PMMRI since 2010.

PMCT has proved to be indispensable in detecting certain types of fractures and the presence of gas or air embolism. Some soft tissue injuries can be demonstrated by PMMRI, although conventional autopsy remains the key method for detecting external injuries and organ pathology. 3D reconstructions are useful for presenting injuries in the court of law.

Author Index

A

Abele, Silvija 186
 Ābelīte, Ināra 548
 Ābola, Zane 164, 177, 563, 612, 613
 Abolina, Anna 547
 Abolins, Arnis 578, 739, 743
 Abramavicius, Silvijus 408
 Ādamsons, Ināra 256, 465, 708
 Agaev, Shahin 525
 Aitullina, Aleksandra 398, 400
 Akopov, Andrey 635
 Akota, Ilze 345, 355, 361, 364, 561, 569
 Albano, Davide Giuseppe 141, 452
 Albegova, Ljubov 228
 Alberte, Anete 688
 Aldiņš, Pauls 256
 Aļeiņikova, Darja 208
 Aleksejeva, Elina 120, 596
 Aleksejeva, Svetlana 713
 Aleksīna, Nora 484
 Aliev, Huseyn 525
 Aliyev, Holbek 501
 Alizadeh, Čingiz 523, 525
 Alkšere, Baiba 124, 432, 608
 Allendorf, Antje 193
 Alruwais, Nourah 288
 Amerika, Diana 437, 483
 Amico, Francesco 141, 452
 Ananjeva, Aleksandra 514, 578
 Ananjevs, Vladislavs 514, 578
 Ancāne, Gunta 261, 276, 329, 333
 Ancāns, Artūrs 327, 332
 Ancerevica, Jekaterina 209, 212
 Andersone, Santa 608
 Andrejeva, Katrīna 358
 Aniscenko, Anastasija 194, 206, 214
 Ansabergs, Janis 44
 Apine, Ilze 125, 146, 308, 488
 Apine, Margarita 673
 Apse, Ingus 351
 Apse, Pēteris 362
 Apsīte, Ketija 26, 28, 37, 43, 409
 Arāja, Diāna 226, 235, 421, 422, 699
 Arcimovičs, Toms 504
 Ardava, Elita 416
 Arensburga, Jevgenija 480

Arklina, Baiba 34, 325
 Arnis, Voldemārs 288, 547
 Arons, Mihails 275, 282, 298, 305, 318
 Asmundo, Alessio 451
 Atrohova, Tatjana 203
 Auce, Agris 401
 Auerbach, Marc 642
 Ausekle, Sandra 694
 Auziņa, Daiga 55, 602
 Avota, Marija 667
 Azina, Inga 195

B

Babjoniševa, Aurika 567
 Babris, Sandis 682
 Bāgante, Ieva 355, 361
 Bahs, Guntis 7, 576, 577, 741
 Balcere, Alise 426
 Balcere, Inga 490, 603, 604
 Baļķena, Zane 662
 Balmaks, Reinis 155, 185, 614, 642
 Balode, Aija 469, 470
 Balode, Ance 673
 Balode, Arta Olga 215
 Balode, Dārta 61, 602
 Balode, Dina 39, 40
 Balode, Evija 570
 Balode, Ginta 205
 Balodis, Arturs 268
 Balodis, Dainis 111
 Balta, Liesma 264, 265
 Baltkājs, Jānis 626
 Baltmane, Diāna 688, 689
 Balzer, Hans Ullrich 284
 Bandere, Dace 395, 396, 403, 410, 412, 712
 Bara, Linda 231
 Barene, Ilze 405
 Barkāne, Linda 406
 Barlots, Edgars 147
 Barone, Baiba 50
 Barone, Ilze 436
 Baroņenko, Jevgeņijs 243
 Bartnykaite, A. 100
 Bārzdīņa, Arta 142, 158
 Bārzdīņš, Juris 701
 Basina, Olesja 497, 698
 Bathena Krastina, Vija 161

Author Index

- Baturevica, Marija 41
Bauer, Kathrin 284
Baufāle, Regīna 202
Baumane, Anita 494
Baumane, Beate 472
Baumanis, Edgars 58
Baumbusch, Lars O. 110
Baylon, Vincenzo 80, 141, 449, 452, 453, 674
Bayurova, Ekaterina 222, 736
Bedikere, Zane 333
Behmane, Daiga 683, 723
Beinaroviča, Iveta 55
Beinars, Edzus 587
Beitneriene, Martyna 103
Belajeva, Ludmila 59
Beļaka, Alla 349
Belasova, Ligita 311, 320
Belaunieks, Rudolfs 413
Belte, Maris 432
Berezovskis, Reinis 297
Berga-Švītiņa, Egija 60, 70
Bergmane, Inta 138
Bergmanis, Uldis 510, 537
Berķis, Uldis 226, 235
Bernate, Kristine 59
Bernatoniene, Jurga 415
Bērtule, Dace 118
Bērze, Liene 270, 303
Bērziņa, Antra 101
Bērziņa, Dace 71, 124, 608
Bērziņa, Digna 125, 488
Bērziņa, Edīte 619, 621
Bērziņa, Guna 713
Bērziņa, Sandra 344, 356
Berzina-Novikova, Natalija 322
Bērziņš, Aivars 213, 241
Bērziņš, Alberts 28, 36, 41
Bērziņš, Ardis 641
Berzins, Arvids 18
Bērziņš, Jānis 210
Bēta, Gunta 14, 662
Bezborodovs, Ņikita 291
Bezina, Karina 303
Bičevska, Iveta 126
Bidiņa, Luīze 8, 642
Bikovens, Oskars 479
Bistrova, Anastasija 108
Bite, Dina 651
Bite, Kristine 693
Bitiņa-Barlote, Ērika 68, 81, 86, 147
Bjalkovskis, Artūrs 296
Bladiko, Una 516
Bleidele, Edite 206
Blodniece, Inese 161, 162
Blūma, Elīna 357
Blumbergs, Maris 44
Blumfelds, Leons 333, 672
Blums, Kristaps 539
Bodniece, Līva 649
Bogdanova, Zanda 440, 441, 442
Bogdanovs, Arturs 512
Bogdanovs, Dmitrijs 4
Boginskis, Valts 513
Bogorodickis, Arturs 589
Boichuk, Oksana 409
Bojarovska, Jana 306
Bojarune, Žanna 127
Bokse, Kristine 682
Bokučava, Diāna 121, 126
Bokvalde, Zanda 343
Bondare, Inese 627
Bondareva, Vera 223
Borisāne, Santa 299
Borisova, Tatjana 620
Bormane, Eva 202
Bormotovs, Jurijs 456
Borošenko, Viktors 71
Borroni, Davide 218
Botella, Javier 667
Božko, Margarita 147
Bozotova, Natalija 586
Bradford, Hannah 199
Brangule, Agnese 392, 553, 557
Braun, Andrejs 582
Breics, Ivars 13, 587
Breide, Inese 522
Breiva, Donats 108
Brenna, Elenka 226, 235
Briede, Ieva 5, 12
Briedīte, Ieva 170, 176, 189
Brigis, Ģirts 202, 478, 668, 679, 685, 709, 710, 723
Bringina, Diana 527
Brinkis, Rolands 680
Brinkmane, Anda 358, 359, 360, 367, 369
Briuks, Kalvis 531
Broggi, Giuseppe 80
Broks, Renars 144, 149, 215
Brūna, Krista 303
Brutane, Dagnija 337

Buchynska, Lubov 62
Buiķis, Indulis 97
Buile, Dace 440, 441, 569
Buķe, Kristīne 160
Bukova-Žideļūna, Aija 691
Bukulite, Astra 112
Bule, Ilze 630
Buliņa, Inita 616
Bumbure, Mairita 45, 46
Bušmane, Ināra 202
Butāne, Līna 30
Butnere, Marisa Maija 144, 146, 148, 149,
150, 597
Buza, Anna 155
Bylon, Vincenzo 451

C

Čačka, Kristiāna 111, 224, 434
Čakstina, Inese 57
Čakstiņa, Inese 56, 65, 106, 200, 544
Čakstins, Andris 665
Caltabiano, Rosario 80, 449, 674
Čamane, Evija 12
Capenko, Svetlana 216
Čapligina, Valentīna 245
Caplinskis, Andris 475
Casella, Filomena 141
Cauce, Vinita 68, 81, 86, 131, 231, 485
Caunīte, Laima 8, 25
Cebure, Elizabete 79
Cederstrema, Zeltīte 574
Ceha, Marija 394
Čeirane, Solveiga 654
Celmiņa, Marta 139
Čēma, Ingrīda 368, 389, 426
Cernevska, Gunta 593
Cernevska, Ilze 409
Cešeiko, Rūdolfs 52
Cgojeva-Sproge, Irina 41
Christabel Omon, Okeke-Rain 467
Christie, Sarah 113
Chumakov, Alexey 222
Ciekurs, Rafaels 474
Ciems, Modris 518, 575
Cina, Diana 449
Cinite, Ilva 552
Činokajeva, Zane 444
Cipkina, Sandra 732, 733
Circenis, Kristaps 693
Cirse, Mārīte 436
Cirule, Viktorija 573
Cistjakovs, Maksims 204, 216
Civako, Jelena 694
Čivčiša, Sandra 270
Cocimano, Giuseppe 451, 453
Condorelli, Dario 451, 452
Čonka, Una 608
Cooper, Diane 113
Crichton, Scott 199
Cudars, Edgars 573
Čukure, Fanija 732, 733
Čupeca, Hedija 196, 198

D

Dabužinskiene, Anita 368
Dāle, Rolands 58
Dambergs, Kristaps 491
Dambrauskiene, Ruta 105
Dambrova, Maija 1, 293, 372, 397, 413, 482, 496
Daneberga, Zanda 56, 57, 60, 65, 70, 71, 77, 93,
96, 106
Daugule, Ilva 139
Davidjuka, Irena 212
Dāvidsone, Zane 132, 591
Deičmane, Justīne 90
Deklava, Liāna 143
Deksne, Gunita 119
Demenkova, Maria 228
Demir, Teyfik 523
Dempsey, Fiona 199
Derjabo, Aleksandrs 54
Derova, Jelena 497
Derovs, Aleksejs 255, 257, 497, 698
Dērveniece, Andra 427
Didrihsone, Alise 83, 94
Dimitrijevs, Pavels 412
Di Mizio, Giulio 141, 451, 452, 453
Dirveika, Inga 461
Dobeļe, Zane 59, 133, 565
Dobelniece, Lauma 311, 320
Dobkevica, Linda 401, 677
Dolgusevs, Mihails 475
Domaševs, Pavels 126
Domracheva, Ilona 412
Donina, Simona 74, 225
Dorondo, Anna 534
Dowell, Nicholas 288
Dranseika, Vilius 655
Drava, Krista 359
Driķe, Inese 732, 733

Drizlionoka, Karina 433
Drjagunovs, Ilja 255
Dručka, Eva 79, 439
Drunks, Viesturs 509
Dubencovs, Sergejs 601
Dubiņina, Evita 696
Ducena, Kristīne 434
Dudele, Alina 685
Dudorova, Aļesja 608
Duhanova, Aļina 414
Dukate, Jelena 446
Duļevska, Ilva 571, 573, 579
Dundurs, Jānis Indulis 633, 721
Dupuža, Ilze 160
Dusacka, Diana 206, 214
Džabijeva, Viktorija 454, 588
Dzalbs, Aigars 124, 608
Dzalbs, Romāns 79, 350
Dzerina, Diana 220
Džeriņš, Andris 513, 516
Dzerve, Zane 698
Dzirkale, Aija 263
Dzīvīte-Krišāne, Iveta 136
Dzudzilo, Madara 368, 389

E

Eglīte, Jelena 69, 195, 220, 227, 231
Eglīte, Lasma 246
Eglīte, Maija 663
Eglītis, Jānis 52, 98
Eglītis, Toms Jānis 37
Elbere, Ilze 492
Elksnis, Ēriks 439
Eņģelis, Arnis 122, 128, 140, 144, 146, 148, 149,
150, 164, 177, 180, 188, 217, 597, 612, 613
Epalte, Klinta 690
Erbay, Fatma Kübra 523
Ereminas, Rokas 611
Ereminienē, Eglē 611
Ereminienē, Rūta 611
Ērenpreiss, Juris 133, 432, 586, 608
Ergle, Diana 249
Ērglis, Andrejs 5, 12, 41, 44
Ērglis, Artis 636
Ēriksone, Līga 14
Esposito, Massimiliano 451, 452
Esta, Līga 9, 111, 129
Evansa, Irina 298, 454, 588

F

Ferrari, Stefano 218
Fibīga, Ieva 548, 649
Filetti, Vera 80, 674
Firstova, Larisa 206
Fjodorovs, Aleksandrs 331
Fodina, Violeta 121, 124, 137, 432, 586, 608
Fokina, Olga 666
Folkmanis, Kristofs 98
Folkmanis, Valdis 98, 186
Franckeviča, Ivanda 79, 389, 728, 731, 740
Freimanis, Arvis 95, 233
Freimanis, Ilārs 296
Freivalds, Tāivaldis 97
Fridrihsone, Ilze 736, 739, 741, 742, 743

G

Gaibišele, Agnese 294, 319, 321
Gaibišele, Nata 294, 321
Gaidule-Logina, Dita 135
Gailāne, Ravita 316, 338
Gailīte, Jurgita 594
Gailīte, Linda 8, 19, 20, 59, 116, 120, 133, 136,
202, 285, 481, 534, 565, 593
Gaitniece, Lāsma 638
Galajeva, Jeļena 196, 198
Gardovska, Dace 130, 134, 135, 166, 173
Gardovskis, Andris 71
Gardovskis, Jānis 56, 68, 77, 81, 82, 83, 85, 86,
87, 90, 93, 94, 459, 726, 727, 729, 730, 732,
733, 744, 745
Gavare, Iveta 684
Gavars, Didzis 72
Gavricenkova, Ludmila 579
Gavrilina, Victoria 635
Gebele, Marta 326
Gediņš, Mārcis 42
Geibijeva, Leila 475
Gelderīņa, Elīna 190
Gerbutavičius, Rolandas 103, 105
Geriņa-Bērziņa, Aija 73, 84
Gersone, Gita 6, 436
Gertners, Oskars 429, 439
Gerula, Natalija 232
Ģibietis, Valdis 17
Gibners, Rolands 531
Gīle, Inna 622
Gīlis, Ainars 148, 597
Ģīlis, Ansis 93

- Gintere, Sandra 9, 231, 273
Giorgi, Mario 396
Gitto, Lara 226
Glaskova-Kuzmina, Tatjana 344
Glāzere, Ieva 317
Glazitis, Didzis 673
Glāzniece-Kagane, Zane 443
Glazunovs, Dmitrijs 275, 282
Gobergs, Roberts 185
Gobiņa, Inese 659, 661, 673, 697
Goldsmith, Matthew 192
Golubovska, Iveta 502, 512
Golubs, Grigorijs 405
Gordeychuk, Ilya 222, 736
Grabovskis, Andris 282
Grantina, Ineta 238
Grantina-Ievina, Lelde 213
Grasmane, Adele 136
Graubergere, Alina 698
Graudiņa, Solvita 356
Grava, Laura 472
Grāve, Irina 248
Grāvere, Rita 618
Greaves, Vineta 284
Grebneva, Viktorija 27
Green, Gillian 113
Gribuste, Laura 286
Grigāne, Anda 202
Grigorjeva, Julija 26
Grigorjevs, Dmitrijs 517
Grigorjevs, Sergejs 443
Grigorovica, Krista 108, 599
Grinberga, Sabine 656
Grīnberga, Daiga 302, 691
Grīnfelde, Ieva 120, 608
Griškēviča, Inguna 700
Grišuļonoks, Aleksandrs 366, 578
Gritāne, Klinta 256, 437, 483
Groma, Valērija 55, 91, 239, 277, 304, 487,
580, 587
Grope, Ilze 130, 196, 198
Gross, Isabel 642
Gross, Karlis 142
Grudule, Eva 157
Grundmane, Mara 710
Grutupa, Marika 740
Gubarevs, Igors 698
Gulbe, Anita 412
Gulbe, Antra 703
Gulbe, Gundega 312, 315
Gulbis, Artis 438, 446
Gundlach, Karsten 361
Guseva, Ludmila 209
Gūtmane, Evija 237
Gutņikovs, Oļegs 448
- ## H
- Haduņkina, Alla 296, 298, 305, 454, 588
Halitovs, Mihails 557
Harju, Līga 97
Harlamova, Jeļena 288
Harlamovs, Vladimirs 18, 29, 34, 325
Hartmane, Ilona 427, 436, 447
Hasnere, Sigita 76
Havensone, Guna 485
Heaster, Cindy 9, 273
Hedegaard, Elise 408
Hedman, Klaus 173
Heibergera, Dita 673
Heidbuchel, Hein 47
Hes, Ondrej 737
Hippe, Laura 64, 481
Hoferte, Maruta 165
Hofmane, Dace 6
Hofmanis, Juris 6
Hohlova, Anna 276
Holodnuka, Irina 63, 64, 211, 236
Holste, Irina 11
Hunter, Rachael 226
- ## I
- Igumnova, Viktorija 205, 406, 410
Ilinsky, Valery 228
Ilves, Pilvi 290
Ince, Svetlana 130
Indorato, Francesca 453
Ingrassi, Pier Luigi 645
Irmejs, Arvids 60, 70, 75, 77, 90, 93
Irša, Signe 161
Isaeva, Olga 222
Isajevs, Sergejs 79, 98, 153
Isenberg, David A. 199
Issagouliantis, Maria 228, 230, 736
Ivanova, Anna 78, 79, 91, 350, 354
Ivanova, Kristīne 600, 606
Ivanova, Patricija 11, 23
Ivanovs, Andrejs 221, 226, 568, 688, 689
Ivanovs, Igors 477
Ivanovs, Maksims 271
Ivanovs, Ņikita 454, 588

Ivaščenko, Tarass 26, 37
Ivdra, Iveta 427, 447

J

Jackevica, Ludmila 412, 413
Jafarov, Afgan 523
Jagodzinska-Peškova, Jekaterina 641
Jakaite, Roberta 714
Jākobsons, Gundega 349, 388
Jakovlevs, Arvids 729, 730, 741
Jakubaneca, Dzintra 474
Jakubjanov, Ravshan 501
Jakuboviča, Diāna 719
Jakubovskis, Māris 89, 98, 107
Jakuška, Povilas 611
Jakušonoka, Ruta 504, 505, 507
Janceva, Sarmite 479
Janicka-Kupra, Brigita 55, 59, 66
Jankovska, Iveta 345
Jankovskis, Viktors 353
Jansins, Vladislavs 144, 149
Jansone, Gita 151, 182, 190
Jansone, Inta 253
Jansone, Liva 688
Jansone, Maira 161, 191
Jansone-Ratinika, Nora 554
Jansons, Juris 736
Jasinskis, Vladislavs 195
Jaunalksne, Inta 232
Jaunmuktane, Zane 734
Jaunozola, Elizabete 344
Jaunozolina, Liga 313
Jēgere, Sanda 5, 12
Jekabsone, Solveiga 726
Jeniceka, Aleksandra 698
Jermakova, Irina 69, 88, 104, 246, 679
Jermakova, Olga 216
Jermakoviča, Ludmila 648
Jeršova, Dina 338
Joņina, Viktorija 404
Jubele, Kristīne 15, 31, 41, 43, 44
Jukna, Agita 42, 727
Jumtiņš, Andris 504, 505, 507, 508, 527
Junga, Anna 563
Juozaityte, Elona 100, 103, 105
Jurčenko, Marija 640
Jurjāne, Maruta 439
Jurjāns, Kristaps 42, 268, 330, 331, 339
Jurka, Antra 436
Jursevics, Kirils 479

Jusinskis, Janis 437, 456, 483
Justamente, Ilze 187
Juurmaa, Julius 290

K

Kabucis, Elvigs 621
Kadiša, Anda 239, 535
Kagans, Aleksandrs 443
Kakar, Mohit 144, 146, 148, 149, 150, 217, 597
Kalēja, Anita 15
Kalejs, Martins 13, 51, 587, 599
Kalējs, Oskars 8, 10, 15, 19, 20, 26, 27, 28, 31, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 330, 409
Kalējs, Verners Roberts 17
Kalere, Ieva 487, 495, 496, 580
Kālis, Mārtiņš 481
Kalkis, Henrijs 682
Kalniete, Dagnija 96
Kalnina, Inta 67, 143
Kalnina, Marika 95
Kalniņa, Aira 352
Kalniņa, Diāna 24
Kalniņa, Jūlija 367, 369
Kalniņa, Katrīna 191
Kalniņa, Madara 278
Kalnins, Artis 27
Kaļuzņaja, Darja 687
Kaļva, Artūrs 709, 723
Kalva-Vaivode, Sanita 299
Kalve, Ieva 476, 663
Kamša, Inese 317
Kamzola, Ginta 25, 41
Kande, Linda 316, 338
Kanneniece, Inese 165
Karčiauskas, Dainius 611
Karelis, Guntis 237, 301, 312, 314, 315, 316, 338
Karimov, Murod 500
Karimov, Murodulla 501
Karkle, Santa 122
Karklina, Kristīne 407
Kārkliņa-Kravale, Ieva 614
Karkou, Vicky 267
Karls, Raimonds 426
Karlsen, Anastasia 228
Karlsons, Jānis 164
Karpova, Milana 473
Karro, Helle 183
Karulis, Miervaldis 548, 551
Kashuba, Elena 53, 62, 236

- Kasjanovs, Vladimirs 13, 514, 578
Kasjko, Diana 69, 195
Kataševs, Aleksejs 521
Katvare, Madara 135
Ķauķe, Gundega 338
Kauliņa, Eva 678
Kaupe, Ruta 695
Kazaine, Inese 285, 286
Kaze, Inita 120
Kažoka, Dzintra 542, 566, 572, 623
Kazuša, Irina 550
Keiviša, Anna 348
Keller, Ernst 333
Kempa, Inga 116, 120, 133
Ķēniņa, Viktorija 232, 274, 275, 282, 285, 286,
315, 317
Khrunin, Andrei 565
Kibilda, Signe 412
Kidikas, Helmutis 268
Kiecišs, Aigars 490
Kigitoviča, Dana 17
Ķikule, Ilga 338
Ķikuste, Sarmīte 270
Ķīmsis, Jānis 208
Kirilova, Jelena 67
Kirse, Marita 670
Kise, Ligija 215
Kiselova, Olga 393, 543
Ķīsis, Jānis 430, 440, 441, 442
Ķīsis, Kaspars 42
Kistanova, Elena 479
Kīte, Lasma 411
Ķīvīte-Urtāne, Anda 266, 302, 695
Klagisa, Renata 215
Klaramunta-Antila, Kristīne 131, 484
Kļaviņa, Aneka 401, 677, 717
Kļaviņa, Paula 155, 158
Klavina-Makrečka, Solvita 661
Klegeris, Andis 335, 540
Kleina, Regīna 368, 389
Klesmite, Anna 22
Klešņika, Diāna 632
Klibus, Māra 614
Kļimecs, Vadims 365, 366
Klovins, Janis 490, 492
Knohenfelds, Kristaps 508
Knoka, Evija 5
Kojalo, Una 88, 275, 478, 659, 679
Koka, Maija 151, 182
Koka, Rudīte 395, 554
Kokare, Inese 686
Koķe, Tatjana 541
Kokina, Baiba 35
Koļesņikova, Jeļena 287
Kolesova, Oksana 195, 220
Kolesovs, Aleksandrs 220
Kolosovs, Igors 515
Kolupajeva, Tatjana 206, 209, 212, 214
Komarovska, Laura 401, 677, 717
Konrāde, Ilze 482, 487, 490, 492, 493, 495, 496,
580, 603, 604, 605
Konstante, Rita 701
Konstantinova, Oksana 203
Korņejeva, Liene 120, 124, 126, 608
Kornete, Anna 179
Korņevs, Egils 351
Korotinska, Rita 194
Korsaka, Evelīna 111
Kostrica, Laima 630
Kostrjukova, Karina 553
Kovalcuka, Liga 396
Kovalevska, Larysa 53, 62
Kovaļovs, Sergejs 42
Kozireva, Svetlana 211, 236
Kozlovska, Līga 129
Kraķe, Jana 443, 448
Krama, Santa 131
Kramica, Ksenija 220
Kramica, Tatjana 220
Krasilnikova, Jelena 479
Krasnenko, Anna 228
Krasnika, Jekaterina 298
Kraščiņa, Jana 275, 282
Krasts, Janis 238
Kratovska, Aina 23
Kraule, Marija 612
Kravale, Ieva 134
Kreile, Amanda 664
Kreile, Madara 120, 593, 594, 595
Krieviņš, Dainis 42, 474
Krike, Petra 232
Kristapsone, Gunta 118, 530
Kroiča, Juta 144, 149, 150, 178, 207, 215, 217,
240, 242, 246, 247
Krone, Ilona 270
Kroniņa, Līga 369
Krumina, Astrida 565
Krūmiņa, Aira Aija 551
Krūmiņa, Angelika 119, 196, 198, 213, 231, 255,
400, 426

Author Index

- Krūmiņa, Gaida 295, 308, 313, 324
Krūmiņa, Pārsla 16
Krūmiņa, Tīna 519
Krūmiņa, Zita 71, 120, 593
Krumins, Maris 539
Krustiņa, Ingūna 4
Krustins, Janis 527
Krustins, Uldis 527, 528
Ksennikova, Larisa 305
Kučerova, Viktorija 283
Kucina, Jeļena 502
Kudaba, Iveta 73, 84
Kuka, Janis 372, 482
Kulbacna, Alina 462
Kumsārs, Indulis 5, 12
Kundziņa, Linda 609
Kundziņa, Rita 373
Kunicina, Diana 69, 246
Kupats, Einārs 274, 275, 282, 285, 293, 372
Kupčs, Kārlis 268, 288
Kupics, Kaspars 8, 24, 31, 41
Kurcalte, Irena 27
Kurchakova, Elena 228
Kurjāne, Nataļja 232, 285, 315, 317, 596
Kurmeleva, Alina 156
Kurpniece, Madara 333
Kursite, Anete 224
Kustovs, Dmitrijs 396, 399
Kuzema, Viktorija 243, 256, 463, 465, 607, 708
Kuzmane, Sanita 206, 212
Kuzņecova, Elza 60, 70
Kvasova, Anna 594
Kyuregyan, Karen 222
- L**
- Lacbergs, Andrejs 585
Lāce, Inga 138, 181, 615
Lācis, Aigars 42, 599, 704
Lācis, Jānis 16, 49
Lācis, Kārlis 519
Lācis, Romans 325, 581
Laduss, Arnis 12, 128
Laganovska, Guna 224, 428, 429, 434, 439, 445,
457, 469, 470
Lagzdiņa, Rudīte 672
Laivacuma, Sniedze 227, 255
Laivina, Liva 133
Laizane, Gunta 142, 615
Laizane, Ilona 409
Laizāne, Inga 650
Laizāns, Paulis 164, 177, 612
Laizāns, Sandis 233
Lakisa, Svetlana 693, 697
Lange, Marta 54
Lapidus, Ļubova 151, 182
Lapiņš, Egils 161
Lapsa, Sintija 459, 744, 745
Lāriņš, Viesturs 16, 49
Lāse, Zanda 272
Latkovska, Maija 234
Latkovskis, Gustavs 12
Lauberte, Liga 479
Laudel, Grit 560
Laukaitiene, D. 100
Laurane, Kristine 527
Laurinavicius, Arvydas 746
Lazdāne, Gunta 136, 161, 162, 183, 679,
688, 689
Lazovika, Jeļena 270
Lazovska, Marija 245
Ledda, Caterina 80, 449, 674
Legzdiņa, Diāna 124
Leibuss, Roberts 4, 18, 22, 29, 34, 423, 489
Leidere-Reine, Aija 219
Leimane, Agate 521
Leimane, Kristine 424
Leiše, Andrejs 58
Lejniece, Sandra 55, 59, 61, 63, 64, 66, 497, 602
Lejnieks, Aivars 6, 27, 37, 43, 55, 239, 277,
371, 407, 464, 483, 485, 490, 493, 496, 592,
603, 657
Lementujeva, Ilze 621, 637
Lenz, Jan 361
Leonciķis, Ainārs 211, 236
Leonenko, Klims 107
Le Reste, Jean Yves 657
Lerner, Alexander 504
Lesina-Korne, Baiba 216
Leve, Ilze 67
Lewis, Sarah 374
Liberto, Aldo 453
Lībiete, Ieva 617
Lice, Julija 292
Līcīte, Baiba 90
Līdaka, Lāsma 136
Lielbikse, Kristine 337
Liepa, Veneta 23
Liepa, Zanda 79
Liepiņa, Kristīne 223
Liepiņa, Zane 690

- Liepiņš, Aldis 692
Liepins, Edgars 482
Liepins, Janis 412
Liepniece-Karele, Inta 69, 88, 104, 246
Lietuvietis, Vilnis 58, 89, 95, 98, 107, 233
Ligere, Elina 138
Ligers, Arturs 23
Līkopa, Zane 134
Limborska, Svetlana 565
Lindemane, Biruta 131
Liniņa, Indra 695
Lioznovs, Andrejs 42
Lipša, Ineta 634
Litauniece, Zane Anna 237, 316
Litiņa, Sanita 545
Loca, Dagnija 372
Locāne, Sintija 598, 610
Ločs, Jānis 366, 372, 375, 564
Logina, Ināra 267, 274, 275, 280, 282, 296, 318, 319, 686
Logina, Lelde 332, 333
Loginova, Oksana 167
Logunov, Denis 222
London, Bella 721
Lorenz, Juergen 646
Loreto, Carla 80, 449, 674
Lotko, Marika 431, 471
Loža, Pēteris 77, 90, 93
Lozins, Roberts 201
Lubaua, Ingūna 138, 181, 615
Lūbenko, Jeļena 323
Lubgane, Maija 728, 731, 738, 740
Lubina, Olga 594
Lugovska, Rita 594
Luguzis, Artis 701
Lulle, Reinis 437
Lunga, Asja 226, 235
Lutinska, Daina 368
- M**
- Mača, Līva 9, 273
Machtejeviene, Egle 123
Maciase, Sabīne 289
Macionyte, Gintare 415
Mackevics, Vitolds 6
Madelāne, Monta 221
Madrakhimov, Sarvar 500
Magomedova, Valerija 133
Mahmajeva, Oksana 602
Majore-Dusele, Indra 267
Makarova, Elina 372
Makarova, Svetlana 213
Makrecka-Kūka, Marina 496
Maksimenko, Jeļena 60, 70, 77, 90, 93, 109
Maksimovs, Antons 348
Malakauskiene, Laura 114, 115
Malandrino, Pasquale 141, 453
Malcevs, Aleksandrs 437, 456, 483
Maldupa, Ilze 369, 376
Maleckiene, Laima 114, 115
Māliņa, Maija 296
Malisevs, Artjoms 213
Malniece, Ieva 595
Malzubris, Mārtiņš 517, 526
Mamaja, Biruta 269, 297, 433, 443, 448, 506
Mamedov, Amirullah M. 523
Marcinkevics, Zbigņevs 282
Marconi, Andrea 449
Marčuks, Mareks 135
Margevičus, Viktorija 121, 137
Markevica, Dace 424, 434
Markeviča, Inesa 439
Markova, Santa 147, 151, 162, 182
Mārtiņšone, Inese 677, 717
Mārtinsone, Kristīne 287, 307, 541
Martinsone, Žanna 687, 718
Martinsone-Bērzkalne, Liene 571, 573, 579
Marty, Lise 695
Matsate-Matsone, Baiba 138
Matvieieva, Alina 53
Maule, Linda 223
Mauri, Claudia 199
Maurina, Baiba 393
Maženyte, Brigita 460
Mazule, Mairita 5
Medjānova, Lāsma 554
Medne, Anna 219
Mednieks, Jānis 299, 300, 304, 590, 610
Medvinsky, Alexander 568
Megnis, Kaspars 490
Meiere, Anija 145
Meiers, Dairis 457
Meija, Laila 131, 175, 186, 480, 484, 485, 658
Meilande, Kitija 17
Meisters, Janis 409
Mekša, Līga 237, 318, 319
Melderis, Alvis 475
Melderis, Andis 413
Melderis, Ivars 738
Melluma, Zane 175

Author Index

- Mešečko, Veronika 465
Meurman, Jukka 377
Mezale, Dzeina 726, 736, 741, 742
Mežale, Olga 188
Mežals, Agnis 686
Mežals, Matīss 436, 686
Micko, Lana 242
Mičule, Egija 139
Mičule, Ieva 285
Mieze, Krista 302, 303
Miezitis, Aigars 673
Miglāne, Evija 268, 330, 331, 339, 590, 598
Mihailova, Anna 520
Mihailova, Inese 232, 243
Mihailova, Marija 280
Mikažāns, Ingmārs 427, 441, 447, 520
Mikelsone, Madara 450
Miķelsone, Indra 436
Mikhaylov, Mikhail 222
Mikijanskis, Raimonds 108
Mikitins, Aleksandrs 148
Miklaševičs, Edvīns 60, 65, 68, 70, 71, 81, 86, 90, 93, 96, 106
Mikuda, Karina 59
Milcheva, Rositsa 204
Millere, Elīna 285, 286, 673
Millere, Inga 267, 664, 675, 681
Millers, Andrejs 268, 300, 330, 331, 339, 590
Millers, Jānis 363
Minajeva, Ave 725
Mindere-Gūbele, Anda 358, 359, 360
Minevich, Eugene 171
Minibajeva, Olga 312, 315
Mironovs, Staņislavs 331, 590
Mirzajanova, Irēna 402, 420
Miščuks, Aleksejs 512
Miskova, Anna 116, 117, 179, 643
Mitildzans, Androniks 153
Moisejenko-Golubovica, Jelena 91, 354
Moisejevs, Georgijs 202, 243
Mondini, Sara 334
Montana, Angelo 141, 449, 451, 452, 453
Morneau, Corinna 708
Morozova, Irina 151, 182
Motivāne, Maija 465, 607
Movčāns, Jevgenijs 505
Mozgis, Dzintars 684
Mozule, Biruta 18
Muceniece, Julianna 91, 354, 370
Muceniece, Liene 111, 424, 428
Mudule, Magdalēna 296
Muhejeva, Svetlana 647, 648
Muistna, Tuuli 702
Mukāne, Laima 240
Mukans, Maksims 506
Munkena, Zane 463
Muravska, Tatjana 598
Mūrniece, Sniedze 269, 297
Murovska, Modra 63, 64, 173, 197, 204, 211, 216, 226, 235, 239, 481
Murzina, Jeļizaveta 147
Musumeci, Andrea 453
Muzje, Galina 209, 212
- ## N
- Nadišauskiene, Rūta 159, 183
Nagle, Erika 534
Nakazawa-Miklaševiča, Miki 60, 70, 96
Namiņa, Agne 245
Narbutē, Inga 12
Narbuts, Zenons 5, 73, 82, 83, 84, 85, 87, 94
Nartisa, Inga 120, 565
Nastevica, Anta 112
Nazarovs, Jurijs 90, 602
Nefjodovs, Vadims 350, 510, 524
Neiders, Ivars 655
Neimane, Laura 343, 366
Neimane, Lolita Vija 493, 494, 713, 719
Nesterova, Zoja 705
Nesterovica, Darja 707
Nesterovičs, Georgijs 44
Nesterovičs, Nikolajs 31, 37, 44
Ničiporuka, Rita 82, 83, 85, 87, 94
Nikitina, Evija 371
Nikitina, Agnese 24
Nikitina-Zaķe, Liene 124, 433, 506
Nikolajeva, Glafira 220
Nikrus, Natālija 10, 15, 35, 38
Nikulshin, Sergey 740
Nitiša, Dina 56, 57, 65, 106
Nodieva, Anda 253
Nora-Krūkle, Zaiga 173, 197, 239
Norvaiša, Inga 208, 253
Noviks, Iļja 274, 275, 282
- ## O
- Oginska, Anita 573
Okss, Aleksandrs 521
Oleinika, Kristine 199
Olesiks, Andrejs 316, 342

- Oniščuka, Marija 689
 Onževs, Oskars 416, 703
 Orlovs, Dāvids 102
 Ositis, Janis 108
 Oss, Elvijs 22
 Oss, Peteris 231, 589
 Ozer, Zafer 523
 Ozere, Iveta 205, 208, 253
 Ozerska, Dina 262
 Ozola, Ance 21
 Ozola, Lota 596
 Ozolanta, Iveta 13, 587
 Ozoliņa, Agnese 433, 438, 446, 506
 Ozoliņa, Iveta 644
 Ozoliņa, Sandra 168
 Ozoliņa-Molla, Līga 187
 Ozoliņš, Artūrs 73, 82, 83, 84, 85, 87, 94, 459, 744, 745
 Ozoliņš, Dzintars 201
 Ozoliņš, Kārlis 347
 Ozoliņš, Valts 138
 Ozols, Dzintars 510, 511, 524, 539
 Ozols, Eriks 529
- P**
- Paeglis, Arets 735
 Paiča, Inese 307
 Pajuste, Karlis 412
 Pakarna, Gatis 223
 Panihins, Igors 298, 305, 318
 Papatde, Artūrs 436, 693
 Parekh, Mohit 218
 Pastare, Anita 551
 Pastare, Daina 301, 314, 319
 Pastars, Kalvis 78, 263, 350, 351
 Patanè, Federico 141, 453
 Pavāre, Jana 130, 134, 135, 145
 Pavāre, Zane 504
 Pavlenko, Juliana Gabriella 726
 Pavlova, Ekaterina 204
 Pavlova, Jelena 64
 Pavlova, Jelizaveta 11
 Pavlovičs, Sergejs 42
 Pavlovska, Ilona 718
 Peculis, Raitis 490
 Pekša, Andra 33
 Pentjugova, Anna 176
 Perepjolkina, Viktorija 287
 Perevoscikovs, Jurijs 194, 206
 Perkone, Sandra 670
 Petersen, Asbjørn 408
 Pētersone, Dagnija 155, 185
 Pētersone, Gerda 440, 441, 442
 Pētersons, Aigars 122, 128, 140, 144, 146, 148, 149, 150, 164, 168, 180, 188, 217, 511, 538, 597, 612, 613, 625
 Pētersons, Aivars 240, 243, 256, 463, 465, 607, 708
 Pētersons, Artūrs 486
 Pētersons, Kārlis 128
 Petkov, Stefan 736
 Petraite, Monika 460
 Petrova, Maira 206
 Petrova, Zdravka 204
 Petrovska, Ramona 97
 Pheby, Derek 226, 235
 Pičkurs, Konstantīns 12
 Piksis, Martins 639
 Pikta, Marika 61
 Pilāne, Sintija 425
 Pildava, Santa 478, 659, 679, 701
 Pilmane, Māra 88, 104, 298, 345, 542, 561, 562, 563, 564, 567, 569, 570, 575, 581, 584
 Pimane, Evija 432
 Pirags, Valdis 492
 Pirsko, Valdis 56, 57, 60, 65, 106
 Pirttiniemi, Pertti 346
 Pitkēviča, Ieva 170
 Pitura, Reinis 308, 488
 Pjanova, Dace 67
 Plamše, Kristīne 333
 Platace, Diana 664, 681
 Platkājis, Ardis 499
 Plaudis, Haralds 73, 84, 152, 475
 Pļaviņa, Liāna 576, 577, 665
 Plisko, Olga 69, 88, 104, 246
 Plonis, Juris 68, 81, 86
 Plorina, Emilija Vija 54
 Plotniece, Aiva 412
 Plotniece, Mara 412
 Plūme, Pāvils 128
 Počs, Armands 202
 Podčernina, Jevgenija 346
 Podlesnaja, Marija 575
 Pogule, Ginta 601
 Pokrotnieks, Juris 402, 420
 Pole, Ilva 205, 208, 253
 Polunosika, Elīna 301
 Ponomarjova, Sanita 21, 23, 295
 Poplavska, Elīta 394, 403, 554

Author Index

- Popova, Anna 256, 465, 708
Poziemkovska, Maija 628, 629
Predkele, Nataļja 339, 610
Preiss, Rudolfs 515
Priede, Zanda 278, 330
Priedite, Marta 57
Priedite, Sabine 715
Priladiša, Ksenija 344
Prilina, Agnese 398
Prokofjeva, Tatjana 232, 238
Pronina, Natalja 594
Proskurina, Anna 256
Proskurins, Jevgenijs 344
Protasa, Jana 177
Prutkova, Aļona 191
Ptašņuka, Margarita 73, 84
Puce, Andris 531, 657
Pūcīte, Elīna 294, 319, 321
Pudule, Iveta 302, 691
Pugacevska, Daila 148, 597
Puide, Ilze 243, 256, 465, 607
Pukite, Ieva 120, 146, 593
Pukite, Katrīna 409
Pukite, Margarita 154
Puķīte, Agnese 660
Puksta, Marīte 179
Pule, Daina 213
Pulmanis, Toms 675
Pūpūre, Elizabete 151, 182, 189
Pūpelis, Guntars 146, 475
Pūpkeviča, Irina 15, 28, 35, 43, 409
Pūpko, Igors 124
Pūrkalne, Gunta 90, 96, 99
Pūrmālis, Egīls 52
Pūrvīņa, Santa 396, 400, 402, 420, 626
Pūzuka, Agrita 565
- R**
- Rācene, Laura 152, 163, 178, 184
Rācenis, Kārlis 178, 240, 247
Račko, Iveta 145
Radovica-Spalvina, Ilze 490
Radziņa, Maija 42, 95, 101, 268
Raga, Luīze 526
Raipālis, Guntis 519
Rajevska, Olga 719
Rakisheva, Venera 711
Ramašauskaitē, Diana 115
Rancāns, Elmārs 266, 270, 281, 291, 302, 303
Ranka, Renāte 58, 205, 208, 245, 253, 406, 410, 472
Ranks, Ardijs 626
Rapisarda, Venerando 80, 449, 674
Rasa, Santa 173, 197
Raščevskis, Dāvis 469, 470
Rāte, Elza 350
Raudive, Dace 234
Raumane, Diāna 309
Rautiainena, Linda 130
Raykova, Anette 284
Rēdmanis, Līnards 89, 233
Reihmane, Arnija 22, 423
Reihmane, Dace 187
Reine, Ieva 720
Reinis, Aigars 144, 149, 150, 217, 248, 347, 435
Reinsone, Sanita 397
Rekevica, Agnese 537, 538
Remmer, Sünne 747
Renaltan, Nirthika 408
Repnikovs, Aleksejs 531
Repsa, Lauris 532
Repša, Ilze 478
Repuscenko, Natalija 206
Reste, Jelena 669
Rey Galan, Corsino 185
Rezeberga, Dace 69, 88, 104, 117, 119, 147, 151, 152, 153, 161, 162, 163, 178, 179, 182, 183, 184, 190, 246, 496, 643
Rezevska, Dace 247
Ribkinska, Līga 677, 717
Richmond, Stephen 378
Riekstina, Marta 739
Riekstina, Vija 253
Riekstiņš, Reinis 102
Rikmane, Maija 448
Rilika, Jūlija 126
Rimaido, Katsiaryna 169
Rimdenoka, Olga 524
Rivkina, Alla 63, 64
Rizzo, Roberta 250
Rocane, Kristīne 313
Roccuzzo, Salvatore 451
Rocha de Lossada, Carlos 218
Roga, Silvija 197
Roja, Inara 265, 682
Roja, Zenija 682
Rolle, Udo 193
Romāne, Edita 397, 404
Romanova, Anna 139

- Romanova, Tatjana 203
 Romanova, Vitalija 590
 Romanovs, Mihails 490, 605
 Romanovska, Māra 90
 Rone-Kupfere, Māra 426
 Rose, Geoffrey 79
 Rostoka, Dagnija 217
 Rostoka, Zane 170
 Rots, Dmitrijs 8, 19, 20, 59, 285, 593
 Rovite, Vita 132, 490, 492
 Roze, Dace 264
 Rozenbergs, Leonids 706
 Rozenblats, Aldis 680
 Rozenštoka, Sandra 498
 Rozentālberga, Anete 168, 180, 612, 613
 Rozentale, Baiba 194, 195, 203, 209, 212, 214
 Rozentals, Janis 23
 Rožkalne, Zane 676
 Roznere, Lilīta 95
 Rubins, Uldis 282
 Rucins, Martins 412
 Rudaka, Irina 19, 20
 Rudevica, Zanna 211
 Rudžianskiene, Milda 103
 Rudzīte, Dace 221
 Rudzīte-Rjabceva, Justīne 480, 484, 658
 Rudzītis, Ainārs 12, 48
 Rugājs, Reinis 217, 248
 Rugina, Ieva 289
 Ruks, Kaspars 438, 446
 Rumaka, Maija 672
 Runov, Andrei 228
 Rūsa, Zeltīte 178
 Rusovs, Gundars 521
 Russo, Ilenia 141, 452
 Rusted, Jennifer 288
 Rūtītis, Didzis 683
 Rutka, Katrīna 34, 489
 Rutkovska, Ieva 403, 712
 Rybtsov, Stanislav 568
- S**
- Saarakkala, Simo 3
 Sabeļņikovs, Oļegs 29, 640, 641, 643
 Sablinskis, Kristaps 592
 Sablinskis, Matiss 592
 Sack, Ulrich 284
 Safro, Yelena 27
 Sakne, Sandis 38, 41
 Salaka, Santa 713
 Salaks, Juris 625
 Salerno, Monica 141, 449, 451, 452, 453
 Sālījuma, Elīza 254, 441, 442
 Salina, Anna 249
 Šalma, Ilze 207, 366, 564, 578
 Salmāne-Kuļikovska, Ieva 394, 404
 Šalms, Ģirts 370, 382, 578
 Salokhiddinov, Fahriddin 501
 Salputra, Elza 244
 Sangirejeva, Anastasija 214
 Šankova, Eva 314
 Santere, Ruta 132
 Sapale-Salmāne, Elizabete 224
 Šapele, Inna 270
 Sarajeva, Tatjana 238
 Šarkele, Marina 643
 Satika, Mairita 653
 Saulīte, Gabriela 170
 Saulīte, Lauma 360
 Šauriņa, Eva 468
 Savage, Martin 172
 Savicka, Līga 713
 Savicka, Oksana 194, 206, 214
 Savickiene, Nijole 419
 Savostjanov, Timofei 228
 Savrasova, Larisa 196, 198
 Savukyne, Egle 123
 Saxena, Amulya 144, 149, 150
 Scegolevs, Andrejs 132
 Šedova, Žanna 681
 Seillis, Jānis 202
 Selderiņa, Solvita 223
 Selga, Guntars 353, 363
 Selli, Kristina 722
 Semenistaja, Sofija 189
 Semjonova, Dana 234
 Senakola, Egīta 367, 369
 Sendzikaite, Skaiste 181
 Senfelde, Ilva 246
 Seņkāne, Silva 7, 494
 Šenterjakova, Nataļja 101
 Serova, Jeļena 435
 Šeršņova, Nadežda 607
 Šetlers, Kaspars 29
 Shabaeva, Maria 228
 Shagatayeva, Bibigul 671
 Shikova, Evelina 204
 Shoenfeld, Yehuda 2
 Sidhoma, Elga 561, 562, 564
 Sidlovska, Venta 393, 543
 Sikora, Normunds 138

Author Index

- Siksna, Inese 166
Sila, Daniela 463
Sīle, Inga 397, 416
Sīle, Vija 653
Silina, Vija 7
Silina, Zane 41
Siliņa, Inta 438
Siliņa, Sanda 233
Silineviča, Signe 349
Siliņš, Ilvars 174
Siliņš, Jurgis 344
Silis, Pauls 181
Sīlis, Vents 652, 653
Silova, Alise 202, 464, 677, 680, 717
Silova, Alla 134
Šilova, Natālija 349, 356
Šilovs, Artūrs 102
Simoliuniene, R. 105
Simonsen, Ulf 408
Simsons, Zane 97
Simtņiece, Zane 102
Singh, Jasmeet 260
Sirina, Inga 166
Sitovs, Andrejs 396, 399
Siudikas, Adakrius 611
Sivina, Dace 69, 246
Sjögren, Anders 379
Sjomina, Olga 11, 698
Skaba, Evija 438
Skadiņš, Ingus 207, 217, 242
Skaģers, Andrejs 78, 343, 366, 381, 514, 578
Skaida, Sarmite 292
Šķenders, Ģirts 221, 253
Skesters, Andrejs 26, 399, 462, 464, 680
Sketris, Ingrid 417
Sklarevics, Vladimirs 305
Sklubalova, Zdenka 418
Skride, Andris 17, 30, 592
Skrula, Evita 437
Skrule, Jolanta 701
Skruze-Janava, Gundega 572
Skudutyte-Rysstad, Rasa 383
Skuja, Elīna 96
Skuja, Ilze 657
Skuja, Sandra 197, 277, 487, 580, 587
Skulte, Ilva 555
Skumbins, Raimonds 268
Skutelis, Antons 626
Slaidiņa, Anda 371, 384
Šlēziņa, Ieva 591
Šlisere, Baiba 435
Smagare, Silva 665
Smane, Liene 615
Šmaukstele, Linda 295
Smirnova, Darja 4
Šmite, Daina 30, 276, 503
Šmits, Andris 389
Šmits, Dins 403, 414, 712
Šmits, Lauris 138
Šneidere, Kristīne 288, 541
Soboļeva, Una 347, 352, 371
Sobolevs, Arkadijs 412
Söderlund-Venermo, Maria 173, 251
Soehle, Martin 269
Sokolova, Emma 39, 40
Sokolovska, Jeļizaveta 299
Sokolovska, Liba 216
Soloveicika, Marina 63, 64
Solovjovs, Leonīds 446
Sondore, Dace 5
Soots, Marianne 361
Sorokina, Jelena 586
Sosārs, Dāvis 308
Sosārs, Pēteris 388
Spaka, Irina 63
Spaks, Artjoms 108
Spalis, Viesturs 39, 40
Spalva, Kristīne 35, 36
Spasov, Rosen 204
Specking, Alexander 340
Sperga, Guntars 89
Sperga, Māris 73, 84, 426, 737
Spigulis, Janis 54
Springe, Baiba 371
Sprinģe, Lauma 675
Srebnijs, Andrejs 52
Stanevica, Valda 132
Stankeviča, Jekaterina 573, 576, 577, 579
Stankevicius, Edgaras 408
Stankunas, Mindaugas 714
Stankuniene, Aurima 415
Stars, Inese 546
Stašinska, Katrīna 275, 282
Stašinskis, Roberts 458
Staudzs, Kaspars 23
Štekerhofs, Madara 388
Štelce, Linda 243
Stelfa, Gundega 293
Stepanovs, Jevgeņijs 433, 448, 506
Stepens, Ainārs 287, 288, 290

- Šterna, Olga 285, 594
 Štīpiņš, Juris 438
 Stirāne, Laura 299
 Stirāns, Kārlis 299
 Stoldere, Diāna 37
 Stonko, Veronica 341
 Storoženko, Jeļena 194, 203, 206, 209, 212, 214, 223
 Stradiņš, Pēteris 13, 18, 22, 29, 34, 44, 587
 Straupmane, Dagnija 409, 435
 Strautmane, Sintija 17
 Strautmanis, Jurgis 286
 Strazdina, Arta 95
 Strazdins, Uldis 13
 Strēle, Ieva 166, 478, 493, 495, 496, 659
 Strēlnieks, Aldis 32, 36, 609
 Strelnikova, Marina 445
 Striķe, Eva 4, 18, 22, 29, 34, 325, 489, 588
 Strucinska, Līva 472
 Štrumfa, Ilze 82, 85, 87, 102, 459, 726, 727, 728, 729, 730, 731, 732, 733, 736, 737, 738, 739, 741, 742, 743, 744, 745
 Stück, Marcus 284
 Studere, Agnese 503
 Studers, Pēteris 239, 513, 516
 Stučēna, Inga 33, 606, 657
 Sturmane, Diana 284
 Šuba, Oļegs 202, 258
 Sudmalis, Pāvels 395, 411, 716
 Sudraba, Velga 328
 Suhorukovs, Olegs 531
 Suhorukovs, Vadims 437, 456, 483
 Šukele, Renāte 395, 416
 Sultanova, Alina 204, 216
 Sumeraga, Gunta 491, 584
 Sūna, Dace 498
 Sūna, Normunds 197
 Supe, Ingus 499
 Supervie, Virginie 695
 Surgunte, Irina 455
 Svabe, Vija 120
 Svetickiene, Vilma 103
 Sviestina, Inese 142, 405
 Svilāne, Krista 339
 Svirskis, Simons 6, 400
 Svolaks, Edgars 531
- T**
- Taba, Pille 290
 Tamulionytė, Kristina 714
- Tarasovs, Mihails 277
 Tārs, Juris 79, 350, 351
 Taube, Māris 262, 306, 307, 322, 326, 657, 675
 Taurina, Gita 120
 Tavvēna, Elina 77
 Teivāne, Agnete 296
 Telysheva, Galina 479
 Tembo, Doreen 113
 Tenberga, Santa 126
 Terehova, Rudīte 323
 Terentjeva, Anna 197
 Terjajevs, Igors 517, 526
 Tessma, Mesfin K. 7
 Tetere, Daiga 654
 Timofejevs, Mihails 52
 Timule, Liene 190
 Tirane, Mara 95
 Tirezite, Dace 397
 Titans, Vilnis 140
 Titilayo Olayinka, Awoniyi 466
 Titovica, Galina 220
 Todorova, Katerina 204
 Tolmane, Ieva 593
 Tolocko, Kristina 520
 Tomase, Sofja 450
 Tomsone, Signe 52, 530, 688
 Tone, Tatjana 726
 Tonne, Ieva 603, 604, 605
 Torrisi, Marco 451, 452, 453
 Tracevskis, Mihails 15
 Tretjakovs, Pēteris 6, 7, 130, 140, 392, 436
 Trociukas, Ilze 66, 602
 Trofimovičs, Genādijs 77, 90, 93
 Troščenkovs, Gļebs 261, 276
 Trumpika, Dace 202
 Trušinskis, Kārlis 5, 12, 25
 Truškovs, Artūrs 73, 84
 Tsukanov, Kirill 228
 Tuhvatulin, Amir 222
 Tupahins, Andris 37
 Turks, Maris 413
 Tutane, Anna Inese 59, 120
 Tutkuvienė, Janina 583
 Tzivian, Lilian 186, 698
- U**
- Ūdre, Marta 176
 Ūdre, Santa 121, 137
 Udris, Ints 23
 Ugenskiene, R. 100, 105

Author Index

- Uljanovs, Romans 473
Ullase, Lelde 434
Ulmane, Zane 288
Umbraško, Silvija 571, 573, 576, 577, 579
Umnova, Larisa 398, 486
Umure, Jolanta 280, 300
Ungure, Anita 189
Upeniece, Ilze 444
Upeniece, Irena 547
Upenieks, Janis 537, 538
Upīte, Simona 498
Upmace, Inga 695
Upmale, Sabine 603, 604, 605
Urbāne, Urzula Nora 134, 135
Uribe Espinoza, Sergio Andres 369
Urtāne, Ilga 346
Urtāne, Inga 403, 407, 409, 411, 414, 712
Ušpele, Līva 131, 184
Ustinova, Monta 492
Utepkaliyeva, Aigul 671
Utināns, Artūrs 279
Uzars, Arturs 19, 20
- V**
- Vaitiekus, Domas 103
Vaivads, Mārtiņš 584
Valante, Ramona 300
Valcina, Olga 213
Valdmane, Māra 362
Valeiņa, Sandra 79
Valtenberga, Marina 710
Vanadzīņš, Ivars 401, 663, 669, 677, 697,
717, 718
Vanaga, Eva 338
Vanaga, Līva 414
Vanaga-Arāja, Diāna 684
Vanags, Andrejs 727, 736, 741, 742
Vanags, Indulis 29, 269, 446, 506, 588
Vanags, Juris 439, 469, 470
Van der Gaag, Rutger Jan 336
Van Laethem, Kristel 252
Vārta, Edīte 581
Vasilaviciute, Ieva 123
Vasilevska, Julija 715
Vasilevskis, Edgars 298, 305, 318
Vasins, Olegs 209
Vavere, Andris 45, 46
Vavers, Edijs 293
Vēciņa, Rota 518
Vecstaudza, Jana 372
Vedmedovska, Natālija 121, 124, 126, 127,
137, 160
Veģeris, Ivars 614
Vegnere, Inta 620, 621
Vēgners, Uldis 558
Veidemane, Lauma 406, 410
Veisa, Vija 119, 147, 151, 182, 496
Velika, Biruta 302
Ventina, Ildze 63, 64
Vernere, Baiba 465, 607, 708
Verwoorn, Marjoke 559
Veseta, Una 703
Vesperis, Mārtiņš 630
Vētra, Aivars 52, 521, 694, 706, 713
Vētra, Anita 118, 676
Vētra, Anna 713
Vētra, Jānis 331, 514, 578
Vevere, Parsla 594
Videja, Melita 413, 482
Viduskalne, Ilona 369
Vidžis, Aldis 357
Vigante, Alise 444
Vigdorčika, Inga 631
Vikmane, Baiba 598, 610
Vikmane, Maija 10
Vikmanis, Andris 277, 505, 507
Viksna, Anda 205, 406, 410
Viksna, Ludmila 119, 195, 219, 220, 221, 227,
231, 259, 426
Vīksne, Vita 548
Vilde, Rūdolfs 28, 41
Vilīte, Baiba 4, 489
Vilka, Lolita 471
Villegas, Alejandra 284
Villeruša, Anita 196, 198, 291, 538, 661, 691
Vilmane, Anda 173, 197
Vilmanis, Jānis 478
Vilne, Santa 120
Vilskersts, Reinis 372, 413
Vinčela, Gunita 504
Vinogradova, Vineta Viktorija 281
Virse, Regīna 696
Višņakovs, Aleksejs 316
Visnevskā, Marina 132
Vitale, Ermanno 674
Vitenberga, Zane 567
Vītina, Zane 133
Vītola, Dārta Renāte 476
Vižla, Karīna 328
Vjaters, Egils 68, 81, 86, 95

- Voicehovska, Aleksandra 464
Voicehovska, Jūlija G. 11, 26, 430, 464
Voicehovskis, Vladimirs 26, 37
Voiko, Laura 396
Voita, Daina 112
Volkovs, Olegs 91
Voložonoka, Ludmila 116, 117, 124
Volrāts, Olafs 563
Vonsky, Maxim 228
Von Styern, Per Vult 385
Vorslova, Svetlana 57, 106
Voskresenska, Natalja 464
Vraníková, Barbora 391
Vrubļevska, Jeļena 271, 274, 281, 283, 293
Vugulis, Aigars 533
- W**
- Whiteman, Matthew 408
Whitfill, Travis 642
- X**
- Xu, Man 173
- Y**
- Young, Jeremy 288
- Z**
- Zacesta, Vita 152
Zahare, Anete 665
Zaharova, Jeļena 303
Zaiceva, Veronika 313
Zaķe, Tatjana 487, 495, 580
Zakutajeva, Tatjana 556
Zalcmane, Krista 705
Zaleckas, Linas 361
Zalgaucka, Zanete 203
Zamjatina, Natalija 206
Zamure, Liene 343
Zandberga, Elina 586
Zarina, Agnese 593
Zarina, Larisa 59
Zariņa, Ilona 644
Zariņš, Jānis 78, 263, 350, 524, 564
Zariņš, Uģis 518
Žarkova, Kristīne 477
Zasciurinskiene, Egle 386
Zauers, Ansis 536
Zaura, Egija 387
Zavadska, Dace 135, 157
Zavorins, Aleksejs 430, 441, 442
Zazerska, Ņina 548, 647
Zdanovskis, Nauris 311, 320
Zeberga, Aleksandra 724
Zebolds, Silvestris 508
Zelča-Čerāne, Marika 624
Zeltiņa, Indra 196, 198, 219, 255
Zeltiņa, Undīne 438
Zeltmatis, Reinis 194, 206
Zemītis, Artūrs 439
Zemniece, Liene 95
Žeņiļenko, Taisija 9
Zentiņa, Dace 249, 473
Zepa, Inta 364
Zhurov, Alexei 390
Žibala, Dace 654
Zicane, Daina 413
Ziedina, Ieva 216, 256, 437, 456, 483
Ziediņa, Marika 518
Ziedonis, Douglas 262
Ziemeļe, Dace 310, 316
Ziemeļe, Inga 173
Zigmunde, Alīda 629
Žīgure, Sanita 244, 254
Zikovs, Rems 316, 342
Zile, Iriša 163
Zilvestre, Aija 548
Zingis, Guntis 669
Zlobina, Natālija 454, 588
Znotiņa, Inga 650
Žodžika, Jana 69, 88, 104, 246, 679
Zole, Egija 58, 406, 472
Zolmanis, Matīss 513, 516
Zorina, Tatjana 666
Zubkova, Violeta 232
Zurmutaī, Timurs 168
Zvagule, Tija 663
Zvaigzne, Liene 242
Zvaigzne, Ligita 32
Zvaune, Linda 298, 318, 319
Zvejniece, Liga 293
Zviedre, Astra 122, 128, 140, 177, 180, 188, 597
Zvigule-Neidere, Gunda 142, 615
Zvirgzdins, Vitalijs 23