ISSN 1392-0138 (print)
ISSN 2029-4174 (online)

LITHUANIAN ACADEMY OF SCIENCES
LIETUVOS MOKSLŲ AKADEMIJA

Acta medica Lituanica

The issue has been compiled in cooperation with the Faculty of Medicine of Vilnius University and the National Cancer Institute

Leidinys sudarytas bendradarbiaujant su Vilniaus universiteto Medicinos fakultetu ir Nacionaliniu vėžio institutu

Supplement to Volume 25. 2018

LIETUVOS MOKSLŲ AKADEMIJA
Vilnius – 2018

Acta medica Lituanica, ISSN 1392–0138 (print), ISSN 2029-4174 (online)

Journal of the Lithuanian Academy of Sciences
Published since 1994 one volume (4 issues) per year. Fully peer-reviewed
Types of contribution: Review articles – Original papers – Preliminary notes – Case reports – Short communications – Book reviews

Indexed in PubMed, Index Copernicus, Index Academicus, EBSCO (www.epnet.com, Academic Search Complete)

Published by the Lithuanian Academy of Sciences
Gedimino pr. 3, 01103 Vilnius, Lithuania, tel. +370 5 261 3620
Editor- Diana BARTKUTĖ BARNARD
Layout design Dainius MILIAUSKAS
Email: leidyba@lma.lt
Website: www.lmaleidykla.lt/actamedicalituanica/

2018 05 23
11,5 sp. l. Tiražas 250 egz.
Užsakymas Nr. 4411
Leidžia Lietuvos mokslų akademija,
Gedimino pr. 3, 01103 Vilnius
Spausdino UAB „BMK Leidykla",
J. Jasinskio 16, 03163 Vilnius

KETVIRTOJI TARPTAUTINĖ KONFERENCIJA

Skirta Lietuvos nepriklausomybės atkūrimo 100-mečiui

2018 m. birželio mėn. 5–10 d. d., Vilniaus universitetas, Vilnius, LIETUVA

EVOLIUCINĖ MEDICINA: SVEIKATA IR LIGOS BESIKEIČIANČIOJE APLINKOJE

Rengėjas – Vilniaus universiteto Medicinos fakultetas

FOURTH INTERNATIONAL CONFERENCE

Dedicated to the 100th Anniversary of the Restoration of Lithuania's Independence

5–10 June 2018, Vilnius University, Vilnius, LITHUANIA

EVOLUTIONARY MEDICINE: HEALTH AND DISEASES IN CHANGING ENVIRONMENT

Organized by the Faculty of Medicine, Vilnius University

INTERNATIONAL SCIENTIFIC COMMITTEE

Vytautas BASYS (Vilnius, Lithuania)
Jonas BUNIKIS (Brussels, Belgium)
Douglas E. CREWS (Columbus OH, USA)
Elena GODINA (Moscow, Russia)
Michael HERMANUSSEN (Aschauhof, Germany)
Rimantas JANKAUSKAS (Vilnius, Lithuania)
Sylvia KIRCHENGAST (Vienna, Austria)
Sławomir KOZIEŁ (Wrocław, Poland)
Marius MIGLINAS (Vilnius, Lithuania)
Sasa MISSONI (Zagreb, Croatia)
Martin MUSALEK (Praha, Czech Republic)
Dario PIOMBINO-MASCALI (Vilnius, Lithuania)
Frank RÜHLI (Zurich, Switzerland)
Wulf SCHIEFENHÖVEL (Andechs-Seewiesen, Germany)
Janina TUTKUVIENĖ (Vilnius, Lithuania)
Algirdas UTKUS (Vilnius, Lithuania)
Marian VANHAEREN (Bordeaux, France)
Inês VARELA-SILVA (Loughborough, UK)
Albert ZINK (Bolzano, Italy)

LOCAL ORGANIZING COMMITTEE

Chair
Janina TUTKUVIENĖ (Faculty of Medicine, Vilnius University)

Conference Secretary
Eglė Marija JAKIMAVIČIENĖ (Faculty of Medicine, Vilnius University)

Members
Arūnas BARKUS (Faculty of Medicine, Vilnius University)
Rima DAUNORAVIČIENĖ (Faculty of Medicine, Vilnius University)
Samanta GRUBYTĖ (Faculty of Medicine, Vilnius University)
Viktorija GURSKYTĖ (Faculty of Medicine, Vilnius University)
Mantas MINSEVIČIUS (Faculty of Medicine, Vilnius University)
Laura NEDZINSKIENĖ (Faculty of Medicine, Vilnius University)
Dominykas STANKEVIČIUS (Faculty of Medicine, Vilnius University)
Andrej SUCHOMLINOV (Faculty of Medicine, Vilnius University)
Lukas ŠALAŠEVIČIUS (Faculty of Medicine, Vilnius University)
Renata ŠIMKŪNAITĖ-RIZGELIENĖ (Faculty of Medicine, Vilnius University)
Violeta ŽALGEVIČIENĖ (Faculty of Medicine, Vilnius University)

Dear Colleagues,

It is with a great pleasure that we welcome you to the Fourth International Conference ***Evolutionary Medicine: Health and Diseases in Changing Environment*** dedicated to the 100th anniversary of the restoration of Lithuania's Independence. We kindly invite PhD students and their supervisors, other junior and senior scientists, medical residents, and undergraduate students from different fields of research to take part at this international interdisciplinary scientific event, which will be held at the **Old Campus of Vilnius University from the 5th to the 10th of June 2018**. Special focus will be placed on worldwide changes in the human body, the general health status, and diseases during the last 100 years.

Conferences on Evolutionary medicine have been organized at Vilnius University biannually since 2012. Evolutionary thinking for medical students at Vilnius University has been implemented since the 1960s–1970s by the anatomist and anthropologist Professor Salezijus Pavilonis. However, stressing the importance of the evolutionary approach while judging about health and disease grew steadily and was launched via collaboration with Professor Wulf Schiefenhövel from Max Planck Institute in Germany. The present Conference will bring together participants from different areas of research (medicine, anthropology, biology, psychology, physical sciences, and others) to discuss changes in the general health status and diseases in relation to different environments, and to deeper fathom out the evolutionary mechanisms of current diseases. Keynote speakers from Austria, Belgium, the Czech Republic, Croatia, France, Germany, Great Britain, Italy, Lithuania, Poland, Russia, Switzerland, and the USA will share their experience and knowledge with young and established scientists.

During the last hundred years, the accumulation of scientific knowledge led to increasing specialization by fragmenting many research fields into smaller and rather narrow disciplines or sub-disciplines in order to gain a thorough understanding of many scientific questions. Due to rapid technical advances, biomedical science has developed at an unprecedented stride as well. For many years, biomedical research was carried out mainly within the boundaries of one department (a multidisciplinary approach to many research problems prevailed). Today, however, the development of new methods, the abundance of scientific knowledge, and the needs for high expertise in different fields leads to overpassing the boundaries of particular branches of research. The modern researcher must fully understand the advantage of the interdisciplinary approach and aspire to transdisciplinary thinking in solving a particular research problem. Within doctoral studies, it is essential to provide young researchers with special knowledge of how to combine scientific experience from many research fields, and how to launch an interdisciplinary research project.

Human evolution is no longer the research object of the biologists alone. Recently, many research areas – from medicine, biological anthropology, and physics to sociology, humanities, and linguistics – have been dealing with evolutionary issues. Solving problems in evolutionary medicine – understanding the background of a variation in a human norm and pathology or the emergence of diseases that especially challenges the inter- and transdisciplinary approach. Evolutionary understanding is vital to a better perception of numerous health problems of the modern world: metabolic diseases, obesity pandemic, food safety issues, the cardiovascular risk, prevalence of autoimmune diseases, the neurodegenerative disease, cancer, emerging infectious diseases, and antimicrobial resistance.

Our organisms are in the process of continuous reshaping to maximize adaptation and survival under changing environment. The evolutionary approach to changing global health in relation to human ecology should serve more effective prevention or treatment of modern diseases. Therefore, evolutionary medicine devotes growing attention to changing environment and social and economic conditions under which living organisms exist and try to flexibly adapt in order to maximize their fitness and avoid threats to their lives. To address these issues, the present conference will focus on health and diseases in changing environment. We strongly believe that these 100 presentations (exactly the same number as 100 years of the restoration of Lithuania's Independence!) of our PhD students and other young researchers will shed light on the most topical issues of modern biomedical science. We hope that this conference with no parallel sessions will help our young and experienced researchers from different fields get into a closer collaboration, pursue inter- and trans-disciplinary approaches in solving of a variety of medical problems, and endow a much deeper understanding of the variation in the human norm and why humans are vulnerable to a particular disease. We wish all the participants active involvement, brainstorming discussions, and fruitful outcomes for joint projects.

On behalf of the Organizing Committee,

Prof. Algirdas Utkus

Dean, Faculty of Medicine,
Vilnius University

Prof. Janina Tutkuvienė

Vice-Dean for Research and PhD studies,
Faculty of Medicine,
Vilnius University

KEYNOTE SPEAKERS OF PLENARY SESSIONS

Dr. Jonas Bunikis

European Research Council, Brussels, Belgium
GRANTSMANSHIP FOR BIOMEDICAL RESEARCH: FACE-TO-FACE WITH A PEER-REVIEW PANEL. EUROPEAN RESEARCH COUNCIL PERSPECTIVE

Prof. Douglas E. Crews

Department of Anthropology, Ohio State University, Columbus OH, USA
CHANGING ENVIRONMENTS, UNCERTAINTY, AND ALLOSTATIC LOAD

Prof. Elena Godina

Institute and Museum of Anthropology, Lomonosov Moscow State University, Moscow, Russia
PHYSICAL DEVELOPMENT OF CHILDREN AS A REFLECTION OF THEIR HEALTH STATUS: GEOGRAPHIC VARIATIONS OF GROWTH PARAMETERS IN RUSSIA

Prof. Michael Hermanussen

Kiel University, Aschauhof, Altenhof, Germany
EVOLUTION, NUTRITION, OR ADAPTIVE PLASTICITY: THE WORLD-WIDE VARIATION IN HUMAN GROWTH

Prof. Rimantas Jankauskas

Department of Anatomy, Histology, and Anthropology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University
"PATHOGENS MAKETH MAN": PALEOGENETICS OF PLAGUE AND SMALLPOX

Prof. Sylvia Kirchengast

Department of Anthropology, University of Vienna, Vienna, Austria
THE AGEING PLANET: HUMAN SENESCENCE IN A CHANGING WORLD

Prof. Sławomir Kozieł

Department of Anthropology, Hirszfeld Institute of Immunology and Experimental Therapy. Polish Academy of Sciences, Wroclaw, Poland
GROWTH AND DEVELOPMENT OF CHILDREN EXPOSED TO PRENATAL MATERNAL STRESS CAUSED BY NATURAL DISASTER

Prof. Marius Miglinas

Clinic of Gastroenterology, Nephro-Urology and Surgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
THE ROLE OF THE KIDNEY IN THE HYPERTENSION PANDEMIC: AN EVOLUTIONARY PERSPECTIVE

Prof. Saša Missoni

Institute for Anthropological Research, Zagreb, Croatia
COMPONENTS OF METABOLIC SYNDROME IN CROATIAN ADOLESCENTS

Dr. Martin Musalek

Department of Kinanthropology and Humanities, Faculty of Physical Education and Sport, Charles University, Praha, Czech Republic
SLIM FAT PARADOX: EVOLUTIONARY MISMATCH

Prof. Frank Rühli

Institute of Evolutionary Medicine, Medical Faculty, University of Zurich, Switzerland
Discipline of Anatomy and Pathology, Medical School, University of Adelaide, Australia
ONGOING HUMAN EVOLUTION – OF CHANGING BODIES AND HUMAN PHYSIOLOGY

Prof. Wulf Schiefenhövel

Human Ethology Group, Max Planck Institute for Ornithology, Starnberg-Seewiesen, Germany
ADAPTING TO THE MODERN WORLD? CONTINUITY AND CHANGE IN MORBIDITY PATTERNS AMONG THE EIPO IN THE HIGHLANDS OF WEST-NEW GUINEA

Prof. Janina Tutkuvienė

Department of Anatomy, Histology and Anthropology, Institute of Biomedical Sciences,
Faculty of Medicine, Vilnius University, Vilnius, Lithuania
PUBERTAL MATURATION IN CHANGING ENVIRONMENT: SECULAR TREND IN MENARCHEAL AGE DURING THE LAST 100 YEARS – AN EXAMPLE OF DEVELOPMENTAL PLASTICITY

Prof. Marian Vanhaeren

Department of Social and Human Sciences, University of Bordeaux, Bordeaux, France
ENVIRONMENTAL FACTORS IN THE PREHISTORIC HUMAN PAST: IMPLICATIONS FOR HUMAN HEALTH ISSUES

Prof. Inês Varela-Silva

School of Sport, Exercise, and Health Sciences, Loughborough University, UK
PHYSICAL GROWTH AND CARDIOVASCULAR HEALTH: A FOCUS ON STUNTING

Prof. Algirdas Utkus

Department of Human and Medical Genetics, Institute of Biomedical Sciences,
Faculty of Medicine, Vilnius University, Vilnius, Lithuania
EVOLUTIONARY AETIOLOGY OF CONGENITAL ANOMALIES. IS IT TRUE?

Prof. Albert Zink

Institute for Mummies and the Iceman, EURAC Research, Bolzano, Italy
MODERN MUMMY RESEARCH AND THE EVOLUTION OF PATHOGENS

PROGRAMME

Tuesday, 5 June

14.00–15.00 **Registration** (lobby near Aula Parva, Old University Campus, Universiteto St. 3)

15.00–15.30 **Opening ceremony and concert** (Aula Parva)

15.30–17.50 **Session I** (Aula Parva)
Chairperson: Janina Tutkuvienė

15.30–16.10 **Frank Rühli**, Nicole Bender, Kaspar Staub, Patrick Eppenberger, Maciej Henneberg
ONGOING HUMAN EVOLUTION: OF CHANGING BODIES AND HUMAN PHYSIOLOGY

16.10–16.50 **Rimantas Jankauskas**
"PATHOGENS MAKETH MAN": PALEOGENETICS OF PLAGUE AND SMALLPOX

16.50–17.30 **Algirdas Utkus**
EVOLUTIONARY AETIOLOGY OF CONGENITAL ANOMALIES. IS IT TRUE?

17.30–17.50 **DISCUSSION**

18.00–22.00 **Welcome party** (Café at the Faculty of History, Old University Campus, Universiteto St. 7)

Wednesday, 6 June

8.30–9.00 **Registration** (Room 239, Old University Campus, Universiteto St. 3)

9.00–11.00 **Session I** (Room 239)
Chairpersons: Frank Rühli, Algirdas Utkus

9.00–9.40 **Marian Vanhaeren**, Wulf Schiefenhövel
ENVIRONMENTAL FACTORS IN THE PREHISTORIC HUMAN PAST: IMPLICATIONS FOR HUMAN HEALTH ISSUES

9.40–10.20 **Wulf Schiefenhövel**
ADAPTING TO THE MODERN WORLD? CONTINUITY AND CHANGE IN MORBIDITY PATTERNS AMONG THE EIPO IN THE HIGHLANDS OF WEST-NEW GUINEA

10.20–10.30 **Andreas Lehmann**, Jana A. Eccard, Christiane Scheffler,
Ralf H. J. M. Kurvers, Melanie Dammhahn
PACE-OF-LIFE SYNDROME: LIFE-HISTORY, RISK-TAKING, AND CARDIOVASCULAR PHYSIOLOGY IN ADOLESCENTS

10.30–10.40 **Donatas Austys**, Nomeda Valevičienė, Rimantas Stukas
LIFESTYLE OF LITHUANIAN ADULTS WITH CORONARY ARTERY DISEASE

10.40–10.50 **Rokas Baltušnikas**, Tomas Baltrūnas, Kęstutis Ručinskas
THE LITHUANIAN VERSION OF THE WALKING IMPAIRMENT QUESTIONNAIRE

10.50–11.00 **DISCUSSION**

11.00–11.30 **Coffee break** (University Café, Universiteto St. 3)

11.30–14.00 **Session II** (Room 239)
Chairpersons: Marian Vanhaeren, Wulf Schiefenhövel

11.30–12.10 **Inês Varela-Silva**
PHYSICAL GROWTH AND CARDIOVASCULAR HEALTH: A FOCUS ON STUNTING

12.10–12.50 **Marius Miglinas**
THE ROLE OF THE KIDNEYS IN A HYPERTENSION PANDEMIC: AN EVOLUTIONARY PERSPECTIVE

12.50–13.00 **Andrius Berūkštis**, Aleksandras Laucevičius
MODIFICATION OF THE SYMPATHETIC NERVOUS SYSTEM IN TREATMENT OF HYPERTENSION, ONE OF THE BIGGEST EVOLUTIONARY DISEASES

13.00–13.10 **Rokas Šerpytis**, Lina Puodžiukaitė, Saulius Petrauskas, Pranas Šerpytis
SURVIVAL OUTCOMES AFTER PERCUTANEOUS CORONARY INTERVENTION VERSUS. CORONARY ARTERY BYPASS SURGERY FOR OCTOGENARIANS WITH LEFT MAIN CORONARY ARTERY DISEASE

13.10–13.20 **Skaistė Sendžikaitė**, Rita Sudikienė, Mieczyslaw Litwin, Agata Rybak, Lukasz Obrycki, Inguna Lubaua, Pauls Silis, Augustina Jankauskienė
ARTERIAL HYPERTENSION AND MARKERS OF EARLY VASCULAR AGING IN CHILDREN WITH COARCTATION OF THE AORTA

13.20–13.30 **Karolis Jonas**, Virginijus Jakutis, Rita Sudikienė, Virgilijus Lebetkevičius, Virgilijus Tarutis
TRANSPOSITION OF THE GREAT ARTERIES: THE EVOLUTION OF TREATMENT IN A SINGLE LOW-CASE

13.30–13.40 **Mindaugas Budra**, Artūras Lipnevičius, Kęstutis Ručinskas, Vilius Janušauskas, Aleksejus Zorinas, Giovanni Speziali, Agnė Drąsutienė, Diana Zakarkaitė, Audrius Aidietis
EARLY OUTCOMES IN DEGENERATIVE MITRAL REGURGITATION SURGERY: CONVENTIONAL MITRAL VALVE REPAIR VERSUS TRANSAPICAL NEOCHORD IMPLANTATION

13.40–13.50 **Rūta Žulpaitė**, Arminas Skrebūnas, Urtė Builytė, Givi Lengvenis, Germanas Marinskis
THE ASSOCIATION OF PREOPERATIVE INTRASAC ABDOMINAL AORTIC ANEURYSM THROMBUS WITH OUTCOME FOLLOWING EVAR

13.50–14.00 **DISCUSSION**

14.00–15.00 **Lunch** (University Café, Universiteto St. 3)

15.00–17.30 **Session III** (Room 239)
Chairpersons: Inês Varela-Silva, Sławomir Kozieł

15.00–15.40 **Michael Hermanussen**, Christiane Scheffler
EVOLUTION, NUTRITION, OR ADAPTIVE PLASTICITY: THE WORLD-WIDE VARIATION IN HUMAN GROWTH

15.40–16.20 **Elena Godina**
PHYSICAL DEVELOPMENT OF CHILDREN AS A REFLECTION OF THEIR HEALTH STATUS: GEOGRAPHIC VARIATIONS OF GROWTH PARAMETERS IN RUSSIA

16.20–16.30 Violeta Bartuškienė, Antanas Kairys, Roberta Šarvaitė, **Valerija Tutukova**, Janina Tutkuvienė
INFLUENCE OF MATERNAL UNDERNUTRITION ON THE BEHAVIOURAL PATTERNS OF TWO OFFSPRING GENERATIONS IN A RAT MODEL

16.30–16.40 **Rūta Morkūnienė**, Jelena Isakova, Eglė Marija Jakimavičienė, Nijolė Drazdienė, Vytautas Basys, Janina Tutkuvienė
THE DISTRIBUTION OF NEWBORN HEAD CIRCUMFERENCE: AN EXAMPLE FOR THE EVOLUTIONARY FIXED DEVELOPMENTAL MECHANISMS?

16.40–16.50 **Agnė Jagelavičienė**, Justina Kučinskaitė, Agnė Krživickytė, Vytautas Usonis
ATOPIC MARCH IN PRESCHOOL AGE: WHAT IS THE ROLE OF VACCINES?

16.50–17.00 Odeta Kinčinienė, **Augė Lesinskaitė**, Rokas Šambaras, Sigita Lesinskienė
TEN-YEAR DYNAMICS OF SELF-POISONING: AN OVERWIEV OF CHILDREN'S RESCUCITATION AND INTENSIVE CARE UNIT AT VILNIUS CITY CLINICAL HOSPITAL

17.00–17.10 **Aistis Žalnora**
EVOLUTIONARY THOUGHTS IN JĘDRZEJ ŚNIADECKI'S WORK *O FIZYCZNYM WYCHOWANIU DZIECI* (ON THE PHYSICAL EDUCATION OF CHILDREN)

17.10–17.30 **DISCUSSION**

Thursday, 7 June

8.30–9.00 **Registration** (Room 239, Old University Campus, Universiteto St. 3)

9.00–11.00 **Session I** (Room 239)
Chairpersons: Elena Godina, Michael Hermanussen

9.00–9.40 **Douglas E. Crews**, Nicholas C. Kawa
CHANGING ENVIRONMENTS, UNCERTAINTY, AND ALLOSTATIC LOAD

9.40–10.20 **Sławomir Kozieł**
GROWTH AND DEVELOPMENT OF CHILDREN EXPOSED TO PRENATAL MATERNAL STRESS CAUSED BY NATURAL DISASTER

10.20–10.30 **Alexandra C. Tuggle**, Jeffrey H. Cohen, Douglas E. Crews
CHANGING ENVIRONMENTS AND ALLOSTATIC LOAD: MODELING EXPERIENCES OF MEXICAN MIGRANTS IN THE UNITED STATES

10.30–10.40 **Vaida Taminskienė**
POPULATION HEALTH IN THE CONTEXT OF CLIMATE CHANGE

10.40–10.50 **Aida Grabauskaitė**, Mindaugas Baranauskas
INTEROCEPTION AT ITS PSYCHOLOGICAL AND PHYSIOLOGICAL LEVEL: EMPHASIS ON WORRYING

10.50–11.00 **DISCUSSION**

11.00–11.30 **Coffee break** (University Café, Universiteto St. 3)

11.30–14.00 **Session II** (Room 239)
Chairpersons: Douglas E. Crews, Marius Miglinas

11.30–12.10 **Janina Tutkuvienė**, Simona Šilovė
PUBERTAL MATURATION IN CHANGING ENVIRONMENT: SECULAR TREND IN MENARCHEAL AGE DURING THE LAST 100 YEARS – AN EXAMPLE OF DEVELOPMENTAL PLASTICITY

12.10–12.50 **Sylvia Kirchengast**
THE AGEING PLANET: HUMAN SENESCENCE IN THE CHANGING WORLD

12.50–13.00 **Sigita Mėlynytė**, Sidse Arnfred, Inga Griškova-Bulanova
GENDER DIFFERENCES IN SOMATIC AWARENESS

13.10–13.20 **Eglė Audronytė**, Gintaras Kaubrys
OLFACTORY DYSFUNCTION AS A BIOMARKER FOR THE EARLY DIAGNOSIS OF ALZHEIMER'S DISEASE

13.00–13.10 **Rasa Strupaitė**, Laima Ambrozaitytė, Raimonda Meškienė, Loreta Cimbalistienė, Ieva Strupaitė-Šakalienė, Algirdas Utkus
CLINICAL HETEROGENEITY OF THE LITHUANIAN RETINITIS PIGMENTOSA GROUP

13.20–13.30 **Tatjana Liakina**, Jörg Wellmer, Rūta Mameniškienė
ADVANCES IN THE POST-PROCESSING OF PARACLINICAL DATA FOR DIAGNOSIS AND MANAGEMENT OF EPILEPSY

13.30–13.40 **Agnė Ovčinikova**, Rasa Kizlaitienė, Gintaras Kaubrys, Gytė Pakulaitė-Kazlienė, Jurgita Žižienė, Julius Griškevicius, Kristina Daunoravičienė
ATAXIA: FROM SUBJECTIVE TO OBJECTIVE EVALUATION

13.40–13.50 **Domantas Valančius**, Rytis Masiliūnas, Aistė Paškonienė, Kristina Ryliškienė
TRANSLATION AND VALIDATION OF THE LITHUANIAN VERSION OF THE DIZZINESS HANDICAP INVENTORY

13.50–14.00 **DISCUSSION**

14.00–15.00 **Lunch** (University Café, Universiteto St. 3)

15.00–17.30 **Session III** (Room 239)
Chairpersons: Sylvia Kirchengast, Jonas Bunikis

15.00–15.40 **Jonas Bunikis**
GRANTSMANSHIP FOR BIOMEDICAL RESEARCH: FACE-TO-FACE WITH A PEER-REVIEW PANEL. EUROPEAN RESEARCH COUNCIL PERSPECTIVE

15.40–16.20 **Martin Musalek**
THE SLIM FAT PARADOX: EVOLUTIONARY MISMATCH

16.20–16.30 **Bronius Buckus**, Gintautas Brimas
ADIPOSE TISSUE DISTRIBUTION AND ITS IMPACT ON METABOLIC DISTURBANCIES IN OBESE PATIENTS

16.30–16.40 **Indrė Sakalauskaitė**, Arūnas Barkus, Jonas Drąsutis, Janina Tutkuvienė
BREAST VOLUME CHANGES IN RELATION TO SKINFOLD THICKNESS DURING PREGNANCY AND ONE YEAR POST-PARTUM PERIOD

16.40–16.50 **Aistė Kielaitė-Gulla**, Julija Razumienė, Rima Budvytytė, Vidutė Gurevičienė, Tadas Penkauskas, Artūras Samuilis, Kęstutis Strupas
DIAGNOSTIC ACCURACY OF HEAT SHOCK PROTEIN-90 AND INTRAVENOUS CONTRAST-ENHANCED ULTRASONOGRAPHY IN ACUTE PANCREATITIS

16.50–17.00 **Violeta Mikštienė**
GENOME EDITING IN MEDICINE: STATE OF THE ART AND PERSPECTIVES

17.00–17.30 **DISCUSSION**

Friday, 8 June

8.30–9.00 **Registration** (Room 239, Old University Campus, Universiteto St. 3)

9.00–10.40 **Session I** (Room 239)
Chairpersons: Rimantas Jankauskas, Albert Zink

9.00–9.40 **Albert Zink**
MODERN MUMMY RESEARCH AND THE EVOLUTION OF PATHOGENS

9.40–9.50 **Andrius Vaitiekus**, Artur Versocki, Mindaugas Kvietkauskas, Janina Tutkuvienė
COMPARATIVE ANALYSIS OF ANTHROPOMETRIC AND RADIOGRAPHIC METHODS FOR THE EVALUATION OF THE TIBIOFEMORAL ANGLE ALIGNMENT. A PILOT STUDY

9.50–10.00 **Tomas Sveikata**, Paulius Kanopa, Martyna Sveikataitė, Dalius Klimas, Narūnas Porvaneckas
DO PATIENT FACTORS INFLUENCE THE OUTCOMES OF A TOTAL KNEE ARTHROPLASTY?

10.00–10.10 **Eglė Janušonytė**, Edita Paulikaitė, Emilija Šermukšnytė, Virginija Bukelskienė, Grita Skujienė, Violeta Žalgevičienė
EFFECTS OF FLUORINE AND BORON OVERDOSE CONCENTRATION IN DRINKING WATER ON THE RAT EMBRYO MASS, SKELETON FORMATION, AND TEETH STRUCTURE

10.10–10.20 **Eglė Vindašiūtė-Narbutė**, Tomas Linkevičius
FACTORS ASSOCIATED WITH REMOVAL OF THE CEMENT EXCESS IN IMPLANT-SUPPORTED RESTORATIONS

10.20–10.30 **Paulius Andrijauskas**, Jonas Alkimavičius, Saulius Žukauskas, Tomas Linkevičius
CLINICAL EFFECTIVENESS OF RUBBER DAM AND GINGIVAL DISPLACEMENT CORD WITH COPY ABUTMENT ON REDUCING RESIDUAL CEMENT FOR CEMENT-RETAINED IMPLANT CROWNS

10.30–10.40 **Lorna Anne Dawson**, Dario Piombino-Mascali, Svanlaug Elsa Steingrímsdóttir
THE USE OF ORGANIC BIOMARKERS AS INDICATORS OF HUMAN DECOMPOSITION IN ANCIENT CRYPT CONDITIONS

10.40–11.00 **Coffee break** (University Café, Universiteto St. 3)

11.00–13.00 **Session II** (Room 239)
Chairpersons: Saša Missoni, Martin Musalek

11.00–11.40 **Saša Missoni**
COMPONENTS OF METABOLIC SYNDROME IN CROATIAN ADOLESCENTS

11.40–11.50 **Greta Balčiūnienė**, Valerija Tutukova, Diana Ramašauskaitė, Gražina Stanislava Drąsutienė
QUANTATIVE ULTRASOUND ANALYSIS OF FETAL LUNG MATURITY TO PREDICT NEONATAL RESPIRATORY MORBIDITY

11.50–12.00 **Aušvydas Patašius**, Albertas Ulys, Robertas Adomaitis, Giedrė Smailytė
DEVELOPMENT OF THE PSA-BASED PROSTATE CANCER EARLY DETECTION PROGRAMME IN LITHUANIA BETWEEN 2006 AND 2009

12.00–12.10 **Ieva Vincerževskienė**, Domantas Jasilionis, Giedrė Smailytė
URBAN-RURAL DISPARITIES IN CANCER INCIDENCE AND MORTALITY IN LITHUANIA, 2001–2009

12.10–12.20 Gabrielė Kalvelytė, **Austėja Žibūdaitė**, Daiva Radzišauskienė, Kęstutis Žagminas
EPIDEMIOLOGY AND CLINICAL PRESENTATION OF TICK-BORNE ENCEPHALITIS (TBE) IN THE LIGHT OF THE HIGH AND LOW NUMBER OF INCIDENCE

12.20–12.30 **Andrius Bleizgys**
VITAMIN D DEFICIENCY IN MODERN SOCIETIES: WHY AND HOW?

12.30–12.40 Closing oral presentation: **Andrej Suchomlinov**
ON THE EVOLUTION OF HOBBITS FROM MIDDLE-EARTH

12.40–13.00 **DISCUSSION**

13.00–14.00 **Lunch** (University Café, Universiteto St. 3)

14.00–17.00 **Session III** (Room 239) Short oral presentations (*) and E-poster session
Chairpersons: Andrej Suchomlinov, Arūnas Barkus

***Aušra Aleknaitė**, Gintaras Simutis, Juozas Stanaitis
PREDICTION OF CHOLEDOCHOLITHIASIS PRIOR TO LAPAROSCOPIC CHOLECYSTECTOMY USING AN ORIGINAL PROGNOSTIC INDEX

***Giedrė Baliūnienė**, Rasmutė Manelienė
PRESCRIPTION OF ANTIBIOTICS BY THE MEMBERS OF THE LITHUANIAN SOCIETY OF ENDODONTOLOGY: A PILOT STUDY

***Vytenis Bertašius**, Žymantas Jagelavičius, Ričardas Janilionis
DISASTROUS COMPLICATIONS AFTER TRACHEOSTOMY IN ONE PATIENT: IS SURVIVAL POSSIBLE?

***Inga Bikulčienė**, Orinta Golubevaitė, Dovilė Karčiauskaitė, Vaiva Hendrixson, Arvydas Kaminskas, Zita Aušrelė Kučinskienė
THE RELATIONSHIP BETWEEN FATTY ACID COMPOSITION OF PLATELET MEMBRANE, BLOOD SERUM MALONDIALDEHYDE, AND BODY MASS INDEX IN HEALTHY MEN

Jekaterina Byčkova, Gabrielė Černytė, Margarita Gromova, Silvija Kiverytė, Vaiva Mickevičienė, Violeta Mikštienė, Eugenijus Lesinskas
AETIOLOGY OF DEAFNESS AND THE EFFECT ON PEDIATRIC COCHLEAR IMPLANTATION OUTCOMES

***Eglė Brokartaitė**, Ieva Strupaitė-Šakalienė, Greta Bukelytė, Janina Tutkuvienė
GENDER DIFFERENCES IN BODY IMAGE AND SELF-ESTEEM PASSING FROM ADOLESCENCE TO ADULTHOOD

***Greta Bukelytė**, Greta Bružytė, Tomas Strainys, Eglė Kontrimavičiūtė
A COMPARISON OF ANALGESIA METHODS AFTER KNEE JOINT ARTHROPLASTIC SURGERY: INTRATHECAL MORPHINE VERSUS LOCAL INFILTRATION WITH ROPIVACAINE

*__Ieva Buzytė__, Saulius Drukteinis, Vytautė Pečiulienė, Hagay Shemesh
MICRO-COMPUTED TOMOGRAPHY ASSESSMENT OF DENTINAL MICRO-CRACKS AFTER ROOT CANAL PREPARATION WITH ROTARY, HYBRID, AND RECIPROCATING NICKEL TITANIUM INSTRUMENT SYSTEMS

Eglė Čiburienė, Joaquim Cevallos, Nilesh Pareek, Vicki Chambers, Stuart Rosen, Alexander Lyon
THE PREVALENCE AND TYPES OF IRON DEFICIENCY IN CARDIO-ONCOLOGY CLINIC PATIENTS

*Dovilė Geštautaitė, **Greta Jankutė**, Evelina Pajėdienė
PREVALENCE OF NARCOLEPSY SYMPTOMATOLOGY AMONG THE LITHUANIAN PEOPLE

*__Samanta Grubytė__, Kęstutis Žagminas
EPIDEMIOLOGY OF ACUTE HEPATITIS C VIRUS INFECTION IN LITHUANIA FROM 2005 TO 2017

*__Eglė Jakubauskienė__, Laurynas Vilys, Arvydas Kanopka
INFLUENCE OF HYPOXIA ON ALTERNATIVE APP AND TAU SPLICING

Jonas Jarašūnas, Goda Jakovlevaitė, Audrius Aidietis
ANXIETY AND DEPRESSION IN PATIENTS WITH PAROXYSMAL ATRIAL FIBRILLATION

*Šarūnas Judickas, **Greta Stanevičienė**, Jūratė Šipylaitė
COLONIZATION OF CRITICALLY ILL ONCOHEMATHOLOGICAL PATIENTS WITH MULTIRESISTANT MICROORGANISMS AND THEIR DYNAMICS

*__Augustė Kačėnienė__, Edvardas Danila, Saulius Cicėnas, Giedrė Smailytė
SUICIDE RISK AMONG LUNG CANCER PATIENTS IN LITHUANIA

Aistė Kadziauskienė, Ernesta Jašinskienė, Rimvydas Ašoklis, Eugenijus Lesinskas, Leopold Schmetterer
DISPLACEMENT OF *LAMINA CRIBROSA* AFTER GLAUCOMA SURGERY

*__Justina Kučinskaitė__, Agnė Krživickytė, Agnė Jagelavičienė, Vytautas Usonis
THE ONSET OF ATOPIC DERMATITIS IS NOT RELATED TO THE DOSES OF VACCINES RECEIVED DURING THE FIRST SEVEN MONTHS OF LIFE

*__Benediktas Kurlinkus__, Audrius Šileikis, Mindaugas Valius, Jonas Cicėnas, Algirdas Kaupinis, Marija Ger, Marius Petrulionis, Kęstutis Strupas
PROTEOMIC ANALYSIS OF CANCEROUS, INFLAMMATORY, AND HEALTHY PANCREATIC TISSUES: DISCOVERY OF A POTENTIAL BIOMARKER TO IMPROVE DIAGNOSTICS OF PANCREATIC CANCER

Jurgita Kuzmickienė, Gintaras Kaubrys
DEMOGRAPHIC, CLINICAL, AND COGNITIVE PREDICTORS OF THE RESPONSE OF ALZHEIMER'S DISEASE TO TREATMENT WITH DONEPEZIL

Guoda Laurinavičiūtė, Violeta Bartuškienė, Agnė Žiniauskaitė, Symantas Ragauskas, Giedrius Kalesnykas, Violeta Žalgevičienė, Renata Šimkūnaitė-Rizgelienė, Ramunė Čepulienė, Eglė Marija Jakimavičienė, Saulius Galgauskas, Janina Tutkuvienė
MORPHOLOGICAL CHANGES OF THE AGING RETINA IN AN EXPERIMENTAL MODEL OF MATERNAL NUTRITIONAL RESTRICTION

*__Rūta Maceinaitė__, Genė Šurkienė
TEACHERS' PARTICIPATION IN SCHOOLCHILDREN'S HEALTH PROMOTION PROCESS: RESULTS OF A PILOT STUDY

Domantė Mačiulytė, Viktorija Andrejevaitė
SMOKING CESSATION SUPPORT FOR MENTALLY ILL PATIENTS. A CLINICAL CASE

*__Aleksas Makulavičius__, Matas Urmanavičius, Giedrius Mazarevičius, Mindaugas Klinga, Valentinas Uvarovas, Xavier Martin, Narūnas Porvaneckas
RETURN TO SPORT COULD BE FASTER AFTER OPEN REPAIR OF ACUTE ACHILLES TENDON RUPTURE

*__Sandra Mažeikienė__, Sigitas Laima, Sigitas Chmieliauskas, Dmitrij Fomin,
Rokas Šimakauskas, Jurgita Stasiūnienė
DEONTOLOGICAL EXAMINATION AS A CRITERION FOR THE ASSESSMENT OF PROFESSIONAL QUALITY IN PERSONAL HEALTH CARE

*__Eglė Mazgelytė__, Dovilė Karčiauskaitė, Aušra Linkevičiūtė, Zita Aušrelė Kučinskienė
METHODOLOGICAL CONSIDERATIONS FOR MEASURING HAIR CORTISOL LEVEL AS A BIOLOGICAL MARKER OF CHRONIC STRESS

__Greta Mickevičiūtė__, Tomas Baltrūnas, Kęstutis Ručinskas
SURVIVAL AFTER LOWER-LIMB AMPUTATION

__Vitalija Miežutavičiūtė__
THE 110TH BIRTH ANNIVERSARY OF PROFESSOR VLADAS KVIKLYS, THE INITIATOR OF SCHOOL HYGIENE IN LITHUANIA

*__Ignas Milkevičius__, Jonas Tutkus, Erika Šalčiūtė, Eduardas Ambrasas, Andrius Klimašauskas
THE IMPACT OF NUTRITION ON THE MORTALITY RATE IN INTENSIVE CARE UNITS

__Raminta Mozūraitė__, Lina Šlekienė, Donatas Stakišaitis, Ingrida Balnytė, Angelija Valančiūtė
EFFECTS OF SODIUM VALPROATE ON CHICKEN EMBRYO CHORIOALLANTOIC MEMBRANE AFTER SMALL CELL LUNG CANCER TUMOUR TRANSPLANTATION

__Julija Mozūraitienė__, Aistė Petrovaitė, Kristina Bielskienė, Živilė Gudlevičienė
EFFECT OF FBW7 ACTIVATOR ORIDONIN AND MDM2 INHIBITORS NUTLIN-3/RITA ON HUMAN MELANOMA CELL LINES

*__Audronė Mulevičienė__, Federica D'Amico, Silvia Turroni, Marco Candela, Augustina Jankauskienė
GUT MICROBIOTA PROFILE OF HEALTHY LITHUANIAN INFANTS AND YOUNG CHILDREN: A PILOT STUDY

*__Jūratė Navikienė__, Arūnas Liubšys, Augustina Jankauskienė
EVALUATION OF CEREBRAL OXYGENATION USING NEAR-INFRARED SPECTROSCOPY IN PRETERM INFANTS WITH NATURAL EVOLUTION OF *DUCTUS ARTERIOSUS*

*__Aistė Paškonienė__, Vėtra Markevičiūtė, Givi Lengvenis, Renata Baltagalvienė, Eugenijus Lesinskas
DIAGNOSTIC FEATURES OF THE MENIERE'S DISEASE

*__Ieva Jūra Paulavičienė__, Arūnas Liubšys, Vytautas Usonis
DYNAMICS OF HUMAN MILK MACRONUTRIENT COMPOSITION DURING A 24-HOUR PERIOD

__Dario Piombino-Mascali__, Sarah Shrimpton, Caroline M. Wilkinson
THE LATE MONSIGNOR ANTONIO FRANCO (1585–1626): COMPUTERIZED FACIAL RECONSTRUCTION OF A NEAPOLITAN BLESSED

__Dario Piombino-Mascali__
SPONTANEOUS AND ANTHROPOGENIC MUMMIFICATION METHODS IN SICILY (1600–1900)

Aušrinė Pliauckienė, __Arūnas Liubšys__, Vytautas Usonis
COMPARISON OF TWO NON-INVASIVE NEONATAL CARDIAC OUTPUT MEASUREMENTS

*__Lina Puodžiukaitė__, Karolina Kaunaitė, Lukas Balčiūnas, Jūratė Šipylaitė
IMPACT OF TRAINING ON THE QUALITY OF CARDIOPULMONARY RESUSCITATION

*__Lina Puodžiukaitė__, Donata Ringaitienė, Vaidas Vicka, Jūratė Šipylaitė
PARAMETERS OF BIOELECTRICAL IMPEDANCE ANALYSIS AS RISK FACTORS FOR POSTOPERATIVE HAEMOGLOBIN DECREASE IN CARDIAC SURGERY PATIENTS

Kristijonas Puteikis, Rūta Mameniškienė
EVALUATION OF PATIENTS AFTER TRANSIENT LOSS OF CONSCIOUSNESS IN THE EMERGENCY DEPARTMENT

Gediminas Račkauskas, Germanas Marinskis, Audrius Aidietis
SUBTHRESHOLD HIGH-FREQUENCY ELECTRICAL FIELD STIMULATION INDUCES VEGF EXPRESSION IN CARDIOMYOCYTES

*__Andrius Rybakovas__, Virgilijus Beiša, Gintautas Tamulevičius, Kęstutis Strupas
COULD WE USE AN INTRAOPERATIVE VOCAL CORD ULTRASONOGRAPHY IN IDENTIFYING MOVEMENTS OF VOCAL CORDS AND REDUCING THE RISK OF BILATERAL PALSY? PROSPECTIVE TRIAL DATA

Virginija Rudienė, Sigita Glaveckaitė, Diana Zakarkaitė, Lina Gumbienė, Audrius Aidietis
COR TRIATRIATUM SINISTRUM WITH OBSTRUCTION: A RARE PRESENTATION IN AN ADULT

*__Viltė Gabrielė Samsonė__, Žustina Bezliapovič, Eglė Sakalauskaitė-Juodeikienė, Dalius Jatužis
RECEPTION OF ANIMAL MAGNETISM IN NINETEENTH CENTURY VILNIUS

Svetlana Solovjova, Roma Puronaitė, Milita Stuopelytė, Ligita Ryliškytė
COHERENCE BETWEEN ARTERIAL STIFFNESS AND LEFT VENTRICULAR DIASTOLIC FUNCTION IN PATIENTS WITH METABOLIC SYNDROME: LONGITUDINAL STUDY

Elvyra Stanevičiūtė, Povilas Kavaliauskas, Rūta Prakapaitė, Martynas Ridziauskas, Agnė Kirkliauskienė, Vaidotas Zabulis, Jurgita Urbonienė, Vytautas Triponis, Vytautas Sirvydis
IN VITRO EVALUATION OF ANTISEPTICS AGAINST STAPHYLOCOCCUS AUREUS BIOFILMS FORMED IN DIFFERENT SURROUNDINGS

Austėja Stankutė, Lukas Aranauskas, Aušra Deksnytė
RELATIONSHIP BETWEEN SOCIODEMOGRAPHIC FACTORS AND THE ATTITUDE TOWARDS EMIGRATION AMONG HEALTHCARE PERSONNEL IN LITHUANIA

Giedrė Stundžaitė-Baršauskienė, Janina Tutkuvienė, Rūta Venciūtė, Jolanta Dadonienė
GENERAL HEALTH STATUS, SELF-ESTEEM, AND THE FEELING OF DISTRESS IN SOCIAL ENVIRONMENTS IN PATIENTS WHO FOR DIFFERENT REASONS UNDERWENT NASAL RECONSTRUCTION

*Marija Svetikienė, Donata Ringaitienė, Jevgenija Vėželienė, **Dainius Trybė**, Vaidas Vicka, Radvilė Malickaitė, Laima Jurgauskienė, Jolita Norkūnienė, Mindaugas Šerpytis, Jūratė Šipylaitė
ROLE OF NUTRITIONAL IMMUNOMODULATION IN IMMUNE RESPONSES IN MALNOURISHED PATIENTS UNDERGOING CARDIAC SURGERY

*__Erika Šalčiūtė__, Julita Liučvaikytė, Andrius Klimašauskas, Gintautas Kėkštas, Jūratė Šipylaitė
MEASURED VS. CALCULATED ENERGY EXPENDITURE IN PATIENTS WITH ACUTE SEVERE PANCREATITIS

*__Erika Šalčiūtė__, Julita Liučvaikytė, Andrius Klimašauskas, Gintautas Kėkštas, Jūratė Šipylaitė
NUTRITION THERAPY OF PATIENTS WITH SEVERE ACUTE PANCREATITIS

Eglė Tertelienė, Kazimieras Grigaitis, Narūnas Porvaneckas, Jolanta Dadonienė, Algirdas Venalis
VALIDATION FOR THE LITHUANIAN ARTHROPLASTY REGISTRY

*__Rita Trumpaitė-Vanagienė__, Alina Čebatariūnienė, Virginijus Tunaitis, Alina Pūrienė, Augustas Pivoriūnas
CYTOTOXICITY AND PRIMARY MECHANISMS OF CELL DEATH INDUCED BY COMMONLY USED DENTAL LUTING CEMENTS

*__Jonas Tutkus__, Erika Šalčiūtė, Ignas Milkevičius, Eduardas Ambrasas, Andrius Klimašauskas
NUTRITION IN AN INTENSIVE CARE UNIT: ADHERENCE TO GUIDELINES

__Olga Ubartienė__, Genė Šurkienė
HEALTH LITERACY OF THE 11TH–12TH-GRADE SCHOOLCHILDREN, THEIR PARENTS, AND TEACHERS

*__Rolandas Vaicekauskas__, Jurgita Urbonienė, Juozas Stanaitis, Jonas Valantinas
EVALUATION OF ENDOSCOPIC AND ENDOSCOPIC ULTRASOUND FEATURES FOR DIFFERENTIAL DIAGNOSIS OF GASTROINTESTINAL STROMAL TUMOURS AND LEIOMYOMAS IN THE UPPER GASTROINTESTINAL TRACT

*Daiva Valadkevičienė, Andrius Kavaliūnas, Rasa Kizlaitienė, __Mykolas Jocys__, Dalius Jatužis
CHANGES IN THE INCIDENCE OF MULTIPLE SCLEROSIS IN LITHUANIA 2001 TO 2015

*__Domantas Valančius__, Rytis Masiliūnas, Aistė Paškonienė, Kristina Ryliškienė
TRANSLATION AND VALIDATION OF THE LITHUANIAN VERSION OF THE DIZZINESS HANDICAP INVENTORY

*__Diana Vasiljevaitė__, Rūta Žulpaitė, Sigitas Laima, Rokas Šimakauskas, Sigitas Chmieliauskas, Dmitrij Fomin, Jurgita Stasiūnienė
MEDICAL TERMINATION OF PREGNANCY AS AN ALTERNATIVE TO SURGICAL ABORTION. APPLICABILITY OF TELEMEDICINE IN MEDICAL ABORTION SERVICE

__Vaidas Vicka__, Dalia Zokaitytė, Lina Puodžiukaitė, Dalia Gineitytė, Daiva Gražulytė, Donata Ringaitienė, Jūratė Šipylaitė
BIOELECTRICAL IMPEDANCE ANALYSIS-DERIVED PHASE ANGLE IN CARDIAC SURGERY PATIENTS: IMPLICATIONS FOR PROGNOSIS OF LATE MORTALITY

*__Audra Vyšniauskaitė__, Viktorija Andrejevaitė
TREATMENT OF RESTLESS LEGS SYNDROME BY A GENERAL PRACTITIONER: A CASE REPORT

*__Rūta Žulpaitė,__ Žymantas Jagelavičius, Ugnius Mickys, Ričardas Janilionis
PRIMARY PULMONARY MENINGIOMA: WHAT TO EXPECT?

18.30–22.00 **Farewell party in Trakai** (25 km outside Vilnius)
BONA Lounge at the restaurant **ROUND TABLE CLUB** on the shore of Lake Galvė (53 Karaimų St., Trakai). The bus to Trakai leaves from the courtyard next to the Old University Campus (Universiteto St. 3) at **17.00**, and from Trakai back to Vilnius at **22.00**.

Saturday, 9 June

12.00–16.00 Meeting of the Scientific Committee and Working Group
Round table discussion "Promoting Evolutionary Medicine for PhD Students and Postdocs"

Sunday, 10 June

12.00–16.00 Meeting of the Scientific Committee and Working Group
Concluding remarks and future plans

ABSTRACTS OF KEYNOTE LECTURES

GRANTSMANSHIP FOR BIOMEDICAL RESEARCH: FACE-TO-FACE WITH A PEER-REVIEW PANEL. EUROPEAN RESEARCH COUNCIL PERSPECTIVE

Jonas Bunikis

European Research Council, Brussels, Belgium
Email: *jonas.bunikis@ec.europa.eu*

Grantsmanship is the art of convincing a peer-review panel to fund a research proposal. By analogy to a court trial, the review panel is the jury and the applicant is the defence lawyer vindicating the proposal. Converting the panel's scepticism, or systemic doubt – the pillar of the scientific method – into enthusiasm about the proposal requires a composed but also ingenious narrative. A persuasive storyline must be rooted in factual knowledge and data, and reason its way towards the envisioned findings – the realm of imagination, yet not fantasy. The tangibility of these projected findings is a function of fine-tuning between hypothesis- and exploration-driven strategies. They are complementary and mutually informing, but also temper each other's risks – the narrow-mindedness and incrementalism of the former, and the descriptiveness and adventurousness of the latter. Consequently, competitive visionary thinking is a nuanced blend of breadth and focus; ideas both 'of this world' and 'out of the box'; certainty and presumption; real and virtual – all are further solidified by the credible track record of the narrator. This creative formula is ultimately tested for its knowledge-propelling qualities in the research proposal's four-cylinder engine, where little, if any, wobbling is allowed – the hypothesis, rationale, preliminary findings and work plan. The presented talk will expand on the above notions from the perspective of the life sciences peer-review panels of the European Research Council, the authority of benchmarking scientific excellence in the European Union and beyond.

Keywords: grantsmanship, peer-review, research

CHANGING ENVIRONMENTS, UNCERTAINTY, AND ALLOSTATIC LOAD

Douglas E. Crews, Nicholas C. Kawa

Department of Anthropology, Ohio State University, Columbus OH, USA
Email: *crews.8@osu.edu*

Background. Organisms must continually respond to environmental challenges. Humans do so via allostasis, a stressor response system evolved by vertebrates to maintain homeostasis. Effective allostasis eliminates, reduces, or habituates one to stressors, allowing hormonal and physiological systems to attain their current optima. During life, wear-and-tear and senescent biology impair allostasis, leading to an allostatic load. Some stressors are universal; all organisms need to acquire sustenance, avoid predation, and limit their exposures to environmental pathogens and solar radiation. Other stressors, such as famine, warfare, and crowd diseases, have expanded with human population growth. By fostering political instability, food and water insecurity, and large-scale migration, global climate change (GCC) multiplies these stressors.

Objective. Explore the evolution of stressor responses. Review allostasis theory and development of allostatic load indices. Explore how stressors experienced during early life may set lifelong stressor responses (allostasis). As a final objective, illustrate how sociocultural stressors associated with changing environments, specifically, GCC, may increase allostatic load among affected populations.

Methods. Review published theoretical and research-based peer-reviewed articles and chapters detailing evolutionary origins of life, stressor responses evolved by earthly life, and the evolution of allostasis. Review peer-reviewed research on sociocultural changes in response to GCC as possible multipliers of sociopolitical instability and contributors to allostatic load, and illustrate the latter using an ethnographic case study in Peruvian Amazonia.

Conclusions. Sociopolitical changes accompanied by GCC accentuate effects of environmental and sociocultural stressors on human populations and thereby promote higher allostatic load in communities affected by GCC.

Keywords: allostasis, global climate change, stressor

PHYSICAL DEVELOPMENT OF CHILDREN AS A REFLECTION OF THEIR HEALTH STATUS: GEOGRAPHIC VARIATIONS OF GROWTH PARAMETERS IN RUSSIA

Elena Godina

Institute and Museum of Anthropology, Lomonosov Moscow State University, Moscow, Russia
Email: *godina@antropos.msu.ru*

Total body dimensions such as height, weight, chest circumference, as well as some indices (e.g., Body Mass Index) can be considered a proxy of children's health status. The study focused on geographical variations of morphofunctional characteristics in children and adolescents of Russia and some neighbouring countries, and on some growth-influencing socioeconomic factors. Cross-sectional data on more than 70 populations of children from seven to 17 years of age from different ethnic groups and places of residence were summarized with a variety of statistical techniques: principal component analysis, multiple regression analysis, etc. Some slight West-East and North-South gradient in geographical variations of children's growth parameters was shown. For children of the same ethnicity (Russians), the major part of the variation in height was explained by social (rural-urban), not geographical (latitude, longitude) factors. Geographical distribution of menarcheal age was also studied, with no geographical gradient revealed but strong existing rural-urban differences. Urban girls always mature earlier, notwithstanding their ethnicity and geographical area. For some populations, detailed analysis of socioeconomic factors showed a strong influence of such factors as parental education and number of children per family. Most recent trends in the patterns of growth and development as influenced by the present-day social and economic situation in Russia were also analyzed. The results of the latest studies (2011–2016) of secular changes in growth parameters of Moscow schoolchildren (seven to 17 years old) were presented and discussed in terms of their health status and possible predictors of unfavourable health consequences.

Keywords: physical development, health status, children and adolescents, Russia

EVOLUTION, NUTRITION, OR ADAPTIVE PLASTICITY: THE WORLD-WIDE VARIATION IN HUMAN GROWTH

Michael Hermanussen[1], Christiane Scheffler[2]

[1] *Kiel University, Aschauhof, Altenhof, Germany*

[2] *Department of Human Biology, Institute of Biochemistry and Biology, University of Potsdam, Potsdam, Germany*
Email: *michael.hermanussen@gmail.com*

The world-wide variation in human growth is well-known. In 98 AD, Tacitus wrote that Germanic people were taller than Romans even though they grew up "naked and filthy", i.e., under poor socioeconomic conditions. In 1520, when Magellan discovered Patagonia, South American Tehuelche Indians were estimated "doce a trece palmos de altura" as "our heads just reached their hips". Also, modern population considerably differ in height. Today the shortest mean height has been measured in the Pygmy population of Congo with some 136 cm for adult women and 144 cm for adult men, and the tallest mean height was found among the modern Dutch with some 171 cm for young women and 184 cm for young men. Genetics has been claimed responsible for part of this variation, with evolutionary forces such as Bergmann's rule favouring tall phenotypes in the colder climates. But particularly the combination with abundant food supplies, modern health care, and sanitation in the economically more prosperous societies are meanwhile considered the major regulators of human growth and the final height.

This view has been challenged. Recent observations in social mammals suggest that growth rates vary in relation to the social environment. In humans, size appears to serve as a social signal of dominance or subordination. Historic and modern data suggest that community effects, strategic growth adjustments and competitive growth also interact with the human growth regulation. Particularly, the role of nutrition appears to be overrated. Recent data on height, weight, and body fat in 1715 rural and urban Indonesian schoolchildren further deny the role of food, and instead – also in stunted populations – highlight the social environment and its impact on the adaptive plasticity of growth.

Keywords: community effect, height, social environment

"PATHOGENS MAKETH MAN": PALEOGENETICS OF PLAGUE AND SMALLPOX

Rimantas Jankauskas

Department of Anatomy, Histology, and Anthropology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *rimantas.jankauskas@mf.vu.lt*

Evolutionary biology indicates that infectious activity of pathogens over history has left a mark in human genome. For example, data published over a decade ago suggest that the high frequency of the IL-4 polymorphism among human populations differs far more than would be expected on the basis of neutral gene drift, i.e. suggesting an effect of natural selection. Such diseases as plague and smallpox that devastated historical communities might be the cause.

Recent advances in paleogenetic research might shed light on the presence of these diseases in the past, their impact on human populations, and on the evolution of pathogens themselves.

Genetic traces of *Yersinia pestis*, the agent of plague, were first detected in 2015, in Siberian material as old as 5000 years. Recently they were found in a Lithuanian Late-Neolithic sample (c. 4500 years BP) as well. All European Late Neolithic-Bronze Age samples form a separate clade differing from both the samples of Justinian (6th century CE) and Black Death (14th century CE), with missing plasmid virulence factor ymt, important for passage through the digestive tract of fleas. This suggests a lower pathogenicity of this form of Yersinia, enabling its spread together with nomads from the Eurasian steppe. As this period coincided with increased human mobility, it might be that the threat of this infection was one of the causes of this mobility, and that, in turn, had an impact on the genetic structure of modern Europeans.

Smallpox was another disease causing very high mortality in medieval Europe. However, taking into account the "molecular clock", the evolution of *variola* virus is debatable. Examination of a strain that dates from c.1650 and was detected in a mummified body from the Dominican Church in Vilnius indicates it was basal to all other presently sequenced strains. The mutation rate of this virus was well modelled, and shows that diversification of strains occurred only in the 18th and 19th centuries, i.e., much later than historical sources suggest. This means that historical evidence about the smallpox age reaching as far back as 3500 years might be unreliable, or earlier epidemics were caused by extinct strains. On the other hand, other historical sources indicate the 17th century as the onset of the smallpox epidemic.

Keywords: human genome, plague, smallpox

THE AGEING PLANET: HUMAN SENESCENCE IN A CHANGING WORLD

Sylvia Kirchengast

Department of Anthropology, University of Vienna, Vienna, Austria
Email: *sylvia.kirchengast@univie.ac.at*

Background and aim. Human life expectancy has increased dramatically over the last 100 years. By 2050 it is expected that nearly 1.5 billion people will be older than 65 years worldwide. This demographic trend is a challenge not only for communities, economies, governments, social systems, and public health services, but also for families and individuals. Although nothing seems to be worthier than the fact that people can live longer, it is still a challenge to preserve a high health-related quality of life during old age. The aim of the recent study was the analyses of the impact of physical activity patterns on the bone structure and muscle strength on the one hand, and the impact of social contact frequency on health-related quality of life among the Austrian elderly.

Material and methods. More than 1000 Austrian women and men aged 60 years and above were enrolled in the studies. DEXA measurements were used to determine bone density, bone mass and lean body mass. Health-related quality of life was estimated by means of the standardized WHOQOL BREF questionnaire.

Results. Body composition changed with increasing age. As expected, bone mass and bone density decreased, and the prevalence of osteoporosis and sarcopenia grew with increasing age. Not only physical activity and physical fitness but also social contacts have a positive impact on health-related quality of life in old age.

Conclusions. In our changing world, life expectancy has increased and the proportion of the elderly in our societies continues to rise. However, recent life style patterns result in decreasing physical activity and decreasing number of offspring. Both may reduce health-related quality of life in old age.

Keywords: health-related quality of life, osteoporosis, population ageing, sarcopenia, social relations

GROWTH AND DEVELOPMENT OF CHILDREN EXPOSED TO PRENATAL MATERNAL STRESS CAUSED BY A NATURAL DISASTER

Sławomir Kozieł

Department of Anthropology, Hirszfeld Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw, Poland
Email: *slawomir.koziel@iitd.pan.wroc.pl*

Background and aim. Maternal stress during pregnancy may influence growth and health during childhood and even in later life. Natural disasters may provide opportunities for a natural experiment of the effects of pregnant women's exposure to stress on child development. A natural calamity exerts stress not only on individual but on a whole community. The aim of the study was to assess the effect of a severe cyclone called Aila on the development of children who were intrauterine on the very day of the disaster on 25 May 2009 in the Sunderban Islands of India.

Material and methods. Data of 378 children (182 girls) were analysed. Among them, 185 were from the worst affected islands and were intrauterine on the very day of the cyclone; the others (the controls) were from the area where there was no effect of the cyclone. Both populations underwent anthropometric examination. Two-way ANOVA with a generalised linear model (GLM) was employed to assess the significance of differences in the anthropometric parameters between the Aila children and the controls. Principal component analysis (PCA) was also used to summarise the fat distribution pattern.

Results. The children from the non-Aila region had higher mean age than the Aila group (8.33 and 7.98 years, respectively; $t = 12.42$, $p < 0.0001$). The Aila children had a lower body weight, body mass index, and the sitting height index independent of age and sex. Additionally, the Aila children accumulated more fat on the lower part of the trunk.

Conclusions. The overall results demonstrated that the children who were intrauterine during the cyclone had shorter trunks with a higher relative proportion of fat on the lower part of the trunk. This indicated a differential proportional development among these children in contrast to the controls, which might have implication to the development of obesity and cardiovascular complications in adult life.

Keywords: growth of children, intrauterine growth, prenatal stress

THE ROLE OF THE KIDNEYS IN A HYPERTENSION PANDEMIC: AN EVOLUTIONARY PERSPECTIVE

Marius Miglinas

Clinic of Gastroenterology, Nephro-Urology and Surgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *marius.miglinas@mf.vu.lt*

Hypertension affects billions of individuals worldwide. However, the definite cause of the disease cannot be found in the majority of the cases. There is a significant gene-environment interaction in the development of an increased blood pressure in modern societies. Recent progress in population genetics, genomics, and comparative genomics allows the evolutionary-based approach to understand mechanisms related to such human diseases as

hypertension. Gaining independence from water required the evolution of impermeable skin and water-retaining kidneys. Humans were genetically set up to survive under conditions of low Na and high K dietary intakes, which sharply contrasted the modern diets that are rich in Na and low in K. Recent evidence shows that kidneys play a crucial role in the development of hypertension by retaining both potassium and sodium.

The latter mechanisms are discussed in the context of evolutionary adaptation.

Keywords: human evolution, hypertension, kidney

COMPONENTS OF METABOLIC SYNDROME IN CROATIAN ADOLESCENTS

Saša Missoni

Institute for Anthropological Research, Zagreb, Croatia
Email: *sasa.missoni@inantro.hr*

The metabolic syndrome (MetS) is the most common metabolic disorder, a constellation of symptoms associated with the development of cardiovascular diseases and diabetes mellitus type 2 (DMT2). Its main components are atherogenic dyslipidaemia (i.e., an increased level of triglycerides and a lower level of HDL), hypertension, insulin resistance, and obesity. In recent years, significant concern has been expressed regarding the presence of MetS and its components in adolescents. The situation is even more complex when dealing with children, because of the lack of consensus about the MetS diagnosis in infancy that could be accepted by the whole scientific community. For example, the International Diabetes Federation does not recommend the diagnosis of MetS in children under the age of ten; however, it suggests monitoring its components as risk factors (primarily the abdominal circumference) in cases of family history with MetS, DMT2, dyslipidaemia, heart disease, hypertension, and/or obesity. On the other hand, according to the 2008 studies by Cook et al. and Lee et al., MetS was found in 24% to 51% of overweight young peoople in the developed countries. As well as the overall Croatian population, Croatian adolescents differ in their dietary and lifestyle habits depending on their place of living. Although the number of studies is rising, there is still a general lack of data on the frequency of MetS and its components among adolescents in Croatia. In 2011, a Croatian survey conducted by Jureša et al. detected increased waist circumference and increased blood pressure in 5.4% of boys and 4.1% girls aged 16 to 18 years. The importance of identifying MetS components as risk factors in infancy and adolescence is crucial, because its presence at this life stage remains "silent" for many years, probably due to the fact that its pathophysiological mechanisms are not yet fully developed.

Keywords: adolescents, metabolic syndrome, risk factor

THE SLIM FAT PARADOX: EVOLUTIONARY MISMATCH

Martin Musalek

Department of Kinanthropology and Humanities, Faculty of Physical Education and Sport, Charles University, Praha, Czech Republic
Email: *musalek.martin@seznam.cz*

Human evolution comprises many major and minor episodes that have shaped its development. These include phases when men were hunters and gatherers, later farmers, and most recently individuals able to control machines and mechanizing work in the vortex of industrial revolution. Consequently, the aforementioned milestones in human evolution are often interpreted as formative in the development of humans and affecting the level of knowledge and progress humans have reached. However, every coin has two sides, so when we look back at the history of the human species, it should not surprise us that "progress" has taken its toll.

Let us ask ourselves a simple question: what was and is the human actually adapted to? And let us take a closer look at two areas, in particular, the questions of what we eat and how we move. What diet did our ancestors consume in the time of hunters and gatherers? How has the composition of our diet changed to date? And how physically active did our ancestors have to be to survive?

When we look at these two basic areas through the lens of the human evolutionary process, it is interesting to note that currently we gravely disrespect the way our bodies have been evolving for thousands of years. And we also often

contribute to the evolutionary mismatch, whose consequences in the form of health problems are felt not only by the affected individual, but actually by the entire social system. One of the current problems of the evolutionary mismatch, which is associated with serious health risks and which, unfortunately, is not evident at first sight, is the so-called slim fat paradox – an oxymoron that could be loosely explained as a lean fatty and which would probably make our ancient ancestors laugh heartily as it is totally improbable.

The key takeaways from this lecture would be the following:

1) Physical and nutritional requirements in human evolution that we are adapted to

2) Changes that were brought about by agriculture and accelerated by the industrial revolution – quality or variety of nutrition cannot be substituted by quantity – health consequences

3) Slim fat paradox – hypokinesis and nutritional trends

a. slim fat paradox: why it is often invisible,

b. slim fat paradox: what is hidden in the BMI and when slim fat paradox begins

c. slim fat paradox: more dangerous than people think: health perspective (metabolic, orthopaedic and neurologic)

d. slim fat paradox: concrete research outcomes at children's populations from anthropometric and motor perspective that we should worry about

Keywords: hypokinesis, nutrition, slim fat paradox

ONGOING HUMAN EVOLUTION: OF CHANGING BODIES AND HUMAN PHYSIOLOGY

Frank Rühli[1, 2], Nicole Bender[1], Kaspar Staub[1], Patrick Eppenberger, Maciej Henneberg[1, 2]

[1] *Institute of Evolutionary Medicine, Medical Faculty, University of Zurich, Switzerland*

[2] *Discipline of Anatomy and Pathology, Medical School, University of Adelaide, Australia*
Email: *frank.ruehli@iem.uzh.ch*

Evolutionary medicine aims to combine principles of evolutionary biology and clinical medicine. A lot of research has been done on past evolution, however, most relevant current and potential future trends are often neglected. The aim of this keynote paper is to highlight the impact of the ongoing evolution from multiple angles.

Microevolutionary and secular trends can be found in human body morphology as well as in its physiological parameters. We present our current research focusing especially on changing human height and body weight, both in Switzerland (male conscripts since 1875) and on a global perspective. Also, we present our latest data on the impact of relaxed natural selection on major increase in the prevalence of disease, such as diabetes mellitus type I and II, and potentially cancer. Finally, socio-economic factors influencing the occurrence of major pathologies such as cancer and individual family size will be addressed.

Our results indicate that in future evolutionary medicine should focus primarily on ongoing evolutionary trends. Environmental and genetic changes might affect human morbidity and mortality to a vast extent. Subsequently, the implication of adequate public health strategies is of upmost importance.

Keywords: evolutionary medicine, secular trend, socio-economic factors

ADAPTING TO THE MODERN WORLD? CONTINUITY AND CHANGE IN MORBIDITY PATTERNS AMONG THE EIPO IN THE HIGHLANDS OF WEST-NEW GUINEA

Wulf Schiefenhövel

Human Ethology Group, Max Planck Institute for Ornithology, Starnberg–Seewiesen, Germany
Email: *schiefenh@yahoo.de*

Until 1974, the launch of the interdisciplinary research project "Man, Culture and Environment in the Central Highlands of West-New Guinea", funded by the German Research Foundation, the Eipo, as neolithic horticulturists, lived in marked isolation, had virtually no access to modern medicine, but were generally very healthy and athletic, despite the lack of animal protein in their daily diet. Approximately 90% of the patients consulting a Western medical doctor suffered from infections and infestations. Malaria, venereal diseases, HIV/AIDS, and tuberculosis, common

and dangerous conditions today, were not encountered then. Cardiovascular diseases (e.g., coronary heart disease and stroke) were also absent. The pattern has changed dramatically since the Eipo started to move out of their isolated highlands valley above the malaria-line to lower-lying areas, mostly to the big provincial capital Jayapura and its suburbs at the north coast. Not only have obesity and related diseases started to be a problem for quite a number of those who live or have lived under modern urban conditions, but also new infectious diseases like the ones mentioned above started to affect a sizeable portion of the population. The Indonesian health system is comparably efficient and provides free of charge health care, especially for HIV/AIDS and TBC, yet for various reasons only very few Eipo are able to use the diagnostic and therapeutic facilities properly. Usually, they discontinue long-term treatment required for HIV/AIDS and TBC because they feel better after some weeks. In the case of TBC, this non-compliance has very quickly led to resistant strains of *Mycobacterium tuberculosis* causing severe relapses, very difficult to treat under the prevailing conditions; and as for AIDS, a number of patients have died because therapy was discontinued. Another big problem is the persistent lack of understanding that death is brought about by material causes (infections, cancer, and other failures of the organic system): almost all Eipo believe that death before old age is brought about by "black magic". This leads to false accusations, discrimination, and prosecution of "witches", as well as occasional homicide, which has, in contrast to former times, otherwise become a rare event.

The case of the Eipo can serve as a model to understand historic situations of culture contact and its consequences on health.

Keywords: Eipo, HIV/AIDS, tuberculosis

PUBERTAL MATURATION IN CHANGING ENVIRONMENT: THE SECULAR TREND IN MENARCHEAL AGE DURING THE LAST 100 YEARS – AN EXAMPLE OF DEVELOPMENTAL PLASTICITY

Janina Tutkuvienė, Simona Šilovė

Department of Anatomy, Histology and Anthropology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *janina.tutkuvien@mf.vu.lt*

Evolutionary adaptation is based on physiologic plasticity: our organisms are continually reshaped to maximize adaptation and survival under changing environment. Specific strategies to allocate the energy towards growth, reproduction, raising the offspring, and avoiding death are crucial and maximize an individual's fitness in variable environments (Coall et al., 2018). The beginning and the speed of sexual maturation strongly depends on multiple internal and external factors, but a complex analysis of these factors is tricky because usually too many components are playing at the same time. Geographic adaptation, climatic, economic and social factors, individual biologic and psychosocial contributors should be considered at the same time (Richardson et al., 2018). Early or late maturation of particular populations might reflect variable adaptation to different environments at a particular time and space (Kyweluk et al., 2017). From an evolutionary point of view, it is important to follow the worldwide variation in pubertal timing and differences in secular trend over the same time period.

Taking into account the last 100 years, it is possible to partly elucidate the plasticity of the female reproductive system within constantly changing environment. For this purpose, the changes in menarcheal age (MeAge) from 28 countries for the years 1920 to 2015 were analysed using more than 40 references available at the PubMed. Different climatic, demographic, social, and economic indicators for those countries were drawn from officially available websites. Mean MeAge (for 28 countries) has been steadily declining as follows: 1920–1940 – 14.2, 1940–1960 – 13.7, 1960–1980 – 13.3, 1980–2000 – 12.9, and 2000–2015 – 12.7 years of age. Logistic regression (LR) and factor (principal components) analyses were applied with the purpose of revealing the factors that might be related to MeAge at different time periods. Variation in the factor structure of different environmental components, as well as differences in odds ratios for early or late menarche were observed in the course of the period from 1920 to 2015. The onset of menarche might be explained by many global and regional environmental factors (covering more than 80% of total variance), but these multiple interrelations require future investigations with respect to individual components (family-related, psychosocial factors, individual physiologic mechanisms, etc.). Therefore the question as to which time for maturation

might be optimal concerning a particular environment, and which timing might be the most beneficial for successful reproduction concerning prevention of life-threatening health risks remains open.

Keywords: developmental plasticity, environmental factors, evolutionary adaptation, menarcheal age, secular trend

ENVIRONMENTAL FACTORS IN THE PREHISTORIC HUMAN PAST: IMPLICATIONS FOR HUMAN HEALTH ISSUES

Marian Vanhaeren[1], Wulf Schiefenhövel[2]

[1] *Department of Social and Human Sciences, University of Bordeaux, Bordeaux, France*

[2] *Human Ethology Group, Max Planck Institute for Ornithology, Starnberg–Seewiesen, Germany*
Email: *marian.vanhaeren@u-bordeaux.fr*

Homo sapiens has been evolving for at least 300000 years, first in Africa, then expanding into the Eurasian, Australian and American continents. During this time lapse, *homo sapiens* survived changing natural environments that were often dramatic, other human species (i.e., *Homo erectus*, *Homo neanderthalensis*, *Homo altaiensis*, *Homo floresiensis*, and possibly not yet dated *Homo naledi*), and far-reaching cultural innovations.

Disciplines involved in the reconstruction of these natural and cultural environmental factors may provide clues to the understanding of which health challenges humans faced over time and how they adapted to changing conditions. Here we would like to provide a tentative overview of some available environmental and health factors that can be correlated over time. These range from palaeoenvironmental variables such as temperature and rainfall, to population dynamics and archaeological, palaeoanthropological and palaeogenetic data on the one hand, and from pathogen vectors to culturally-induced mismatches to physical and psychological human well-being on the other hand.

Keywords: diet, eco-cultural niche modelling, health behaviour, infectious desease, palaeoenvironmen

PHYSICAL GROWTH AND CARDIOVASCULAR HEALTH: A FOCUS ON STUNTING

Inês Varela-Silva

School of Sport, Exercise, and Health Sciences, Loughborough University, UK
Email: *m.i.o.varela-silva@lboro.ac.uk*

Stunting (very low height-for-age) is an indicator of chronic malnutrition and its nefarious effects linger for life. Stunting has been associated with a shorter lifespan, subcutaneous adiposity, and cognitive impairments among others, with confounder effects of gender and socioeconomic status.

The effects of stunting on cardiovascular health have been less explored. In this presentation, we will focus on markers of cardiovascular health and disease later in life and how they associate with stunting and short height-for-age. We present results from data collected in Mexico and Guatemala, among Mayan and non-Mayan populations (different samples assessed between 1960 and 2015). The results will be discussed using a culturally sensitive approach and some public health messages will be suggested.

Keywords: cardiovascular health, malnutrition, stunting

EVOLUTIONARY ETIOLOGY OF CONGENITAL ANOMALIES. IS IT TRUE?

Algirdas Utkus

Department of Human and Medical Genetics, Institute of Biomedical Sciences,
Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *algirdas.utkus@mf.vu.lt*

Every organism has two histories, one phylogenetic and the other ontogenetic. The phylogenetic histories of the amoeba and of humans can be safely assumed to be equally (some 3.5 billion years) long. The ontogenetic history is brief (minutes, hours) in the case of the former and very long in the case of the latter. The antiquity of the phylogenetic

history of higher organisms is well demonstrated on the basis of conservation of the genetic code, extraordinary antiquity of early development mechanisms, homology of structure and development plans and pattern (e.g., all vertebrates are metameric and have branchial arches), homology and antiquity of developmental mechanisms involving *homeobox* genes and retinoic acid (homeobox genes have been involved in metazoan development for at least one billion years). The rare capability of the body to revert to ancient developmental patterns is not usually a part of present-day ontogeny of the organism (*atavisms*, e.g., legs in whales and snakes, atavistic polydactyly in horses, and five-toed guinea pigs; in humans, particularly in muscle development but also tracheal bronchus, they have been demonstrated in aneuploid persons). Abnormal (in most cases incomplete) development in a higher organism may be comparable to a normal state in a lower organism (e.g., tails in humans, midline cleft of the upper lip in humans vs. normally cleft upper lip in cats, dogs, and ungulates; cleft palate in humans vs. normally cleft palate in birds and most reptiles, and webbing of digits in humans vs. normal webbing of toes in cats and dogs).

Congenital anomalies are known to have been found in skeletal remains of the prehistoric human. For evidence of congenital anomalies of tissues andorgans such as the face or heart, one must rely on written records. Among the earliest of such texts are the Babylonian cuneiform tablets from the 7th century BCE. Thus they may represent knowledge of 4,000 years ago.

Congenital heart anomalies can be a possible example of congenital anomalies in the evolutionary aetiology. The common cardiac anomalies have been recognized for hundreds of years and their occurrence is worldwide. These anomalies occur in at least six orders of the Mammalia; in three of these orders, they have been proved heritable. Hence the genes that code these anomalies must lie in that portion of the DNA which is common to all Mammalia. The common origin of the Mammalia dates back to the Palaeocene era, 60 to 70 million years ago. This means that these cardiac anomalies probably occurred at the time the Mammalia were evolving. It seems reasonable to believe that they are primeval hearts, the genes for which have survived to the present time, and are known to us as "anomalies" of the heart. The genes that code these primeval hearts have remained in the vast mammalian genetic pool. The incidence of these genes in the genetic pool of the human is sufficient to cause five to eight persons in every 1,000 births to have some type of primeval heart. The conception that the common "cardiac anomalies" are primeval hearts is applicable to many other congenital anomalies and may be applicable to some metabolic diseases and inborn errors of metabolism.

Keywords: congenital anomalies, evolution

MODERN MUMMY RESEARCH AND THE EVOLUTION OF PATHOGENS

Albert Zink

Institute for Mummies and the Iceman, EURAC Research, Bolzano, Italy
Email: *albert.zink@eurac.edu*

The molecular analysis of ancient pathogen DNA represents a unique opportunity for the study of infectious diseases in skeletal and mummified human remains. Recently a wide range of bacterial, protozoan, and viral infections have been detected in ancient tissue samples by the characterization of specific DNA fragments. The introduction of next generation sequencing (NGS) technologies in the study of ancient human remains has further improved the opportunity to study human evolution, population dynamics, and disease evolution. In several studies, new important findings regarding the evolution and spread of some major infectious diseases, such as plague, tuberculosis and leprosy, were revealed.

One of the first mummies in which this technology has been successfully applied is the Tyrolean Iceman, commonly known as Ötzi. By using metagenomic diagnostics and targeted genome capture, we determined the presence of the stomach pathogen *H. pylori* and reconstructed its complete genome. Subsequent sequence analysis has classified the ancient *H. pylori* as a virulent strain that is now associated with the inflammation of the gastric mucosa. Comparative analysis of ancient housekeeping gene fragments and comparative whole-genome analyses assigned the 5,300-year-old bacterium to a nearly pure representative of the bacterial population of Asian origin, suggesting that the African *H. pylori* population arrived in Europe within the past few thousand years, which is later than previously proposed.

In this presentation, the major results of the application of NGS for the study of pathogens are presented and discussed with regard to the perspectives and probable limitations in mummy research.

CLINICAL EFFECTIVENESS OF RUBBER DAM AND GINGIVAL DISPLACEMENT CORD WITH COPY ABUTMENT ON REDUCING RESIDUAL CEMENT FOR CEMENT-RETAINED IMPLANT CROWNS

Paulius Andrijauskas[1], Jonas Alkimavičius[2], Saulius Žukauskas[1], Tomas Linkevičius[1]

[1] *Institute of Odontology, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Faculty of Odontology, Lithuanian University of Health Sciences, Kaunas, Lithuania*
Email: *paulenasan@gmail.com*

Background and aim. Many clinicians prefer cement-retained suprastructures on implants. There are several methods suggesting how to reduce subgingival residual cement around implant retained restorations. The aim of this study was to evaluate the amount of undetected residual cement after cementation and cleaning on cement-retained implant crown surfaces using rubber dam (group 1) and gingival displacement cord with copy abutment (group 2).

Materials and methods. Fifteen single cement-retained metal-ceramic implant-supported restorations were delivered for nine patients. Crowns were luted with resin-reinforced glass-ionomer on customized abutments with the circular 1 mm subgingival margin. Cementation procedure was applied two times using different methods. The crown/abutment unit was dismounted for inspection of undetected excess cement. Cemented suprastructures were sent to a dental technician laboratory to separate crowns from abutments and to clean all the luting agent. Then a second cementing procedure was applied. All quadrants of specimens were photographed for calculation of the ratio between the cement remnants area and the total specimen area using Adobe Photoshop, resulting in 120 measurements.

Results. Comparing two different luting procedures, 60 measurements were taken in each group (15 crowns × 4 surfaces). The average ratios between the cement remnants area and the total area of specimen were as follows: group 1 (0.018 ± 0.015); group 2 (0.012 ± 0.008). Group 2 showed statistically significant better results ($p = 0.027$). Comparing mesial, distal, buccal, and lingual surfaces, resulting in 30 measurements per group (0.014 ± 0.009; 0.018 ± 0.013; 0.013 ± 0.009; 0.014 ± 0.016) showed no statistically significant difference ($p = 0.119$).

Conclusions. Crown cementation method using rubber dam reduced undetected excess cement statistically significantly comparing to the cementation method using gingival displacement cord with copy abutment. There were significant amounts of undetected cement left after cleaning in both used methods.

Keywords: excess cement, implant dentistry, prosthodontics

OLFACTORY DYSFUNCTION AS A BIOMARKER FOR THE EARLY DIAGNOSIS OF ALZHEIMER'S DISEASE

Eglė Audronytė, Gintaras Kaubrys

Clinic of Neurology and Neurosurgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *egle.audronyte@gmail.com*

Olfactory dysfunction (OD) is a common symptom in patients with Alzheimer's disease (AD). Its prevalence is as high as 85–96%. It is also one of the earliest symptoms, preceding cognitive decline by several years.

OD is a reliable predictor of episodic memory decline which is a hallmark of AD. Impairment of olfaction is associated with an increased risk of developing mild cognitive impairment (MCI, prodromal AD) in cognitively normal elderly adults. It is also associated with a higher risk of conversion to dementia in patients diagnosed with MCI.

Subjects with OD have more pronounced hippocampal atrophy, which is characteristic of early AD. Olfactory impairment is also associated with a higher amyloid-β load on positron emission tomography, which is a recognized biomarker of AD.

Not only is OD useful for identifying subjects at risk for AD and patients with prodromal stages of the disease, but it could also be useful in differential diagnosis. The profile of olfactory impairment differs in various neurodegenerative diseases. OD could also help differentiate cognitive decline caused by non-degenerative conditions, such as normal pressure hydrocephalus, depression, and vascular dementia.

However, despite the accumulated data, the exact mechanism by which olfactory dysfunction is related to AD remains unclear. Research is ongoing since the discovery of this mechanism could provide some insight into AD pathogenesis itself.

Central and peripheral structures associated with olfaction are early targets of AD pathology. It is hypothesized that cholinergic dysfunction, which is prominent in AD, might play an important role. Besides, the olfactory system is unique in several ways and that could also contribute to its vulnerability in AD. The development and anatomical features of the olfactory system, its association with adult neurogenesis, unique olfactory bulb microglia and distinct patterns of information processing in the primary olfactory cortex are all of great interest.

Keywords: Alzheimer's disease, early diagnosis, olfaction, olfactory dysfunction

LIFESTYLE OF LITHUANIAN ADULTS WITH CORONARY ARTERY DISEASE

Donatas Austys[1], Nomeda Valevičienė[2, 3], Rimantas Stukas[1]

[1] *Department of Public Health, Institute of Health Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Department of Radiology, Nuclear Medicine, and Medical Physics, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*
Email: *donatas.austys@mf.vu.lt*

Background. Coronary artery disease (CAD) is the leading cause of death globally. Lifestyle is the major factor for the development of this condition. However, the scientific concordance, controversy, and related evidence for key lifestyle targets are variable. Although the lifestyle of the general adult population is investigated repeatedly in Lithuania, there is a lack of studies on lifestyle of individuals with cardiovascular diseases, including strata of adults with CAD and related major adverse cardiac events.

The aim of the study. To assess the lifestyle of Lithuanian adults with CAD and compare it among those who had myocardial infarction (MI) and those who did not.

Materials and methods. The sample consisted of 211 Lithuanian adults aged 30–75 years. Each participant had CAD, 155 had MI and 69 did not. Accordingly, MI and non-MI groups were formed. Nutritional habits, consumption of alcohol beverages, smoking, physical activity, and emotional stress were analysed.

Results. The median age of the adults was 59 (53–67) years, 72% of them were males. Their distribution by age and sex in MI and non-MI groups was similar ($p > 0.05$). Consumption of vegetables, fruit, grain products, fish, meat, milk (and their products) was inadequate for 33.2%, 39.0%, 13.7%, 46.0%, 79.6% and 48.3% of the participants, respectively. Approximately 40% of the sample indicated frequent alcohol consumption, 12.3% frequent emotional stress, and 66.2% low physical activity at work. Distribution of participants by these variables was similar ($p > 0.05$) in MI and non-MI groups. Individuals with MI indicated lower leisure-time physical activity, and many of them were heavy smokers ($p < 0.05$).

Conclusions. The lifestyle of many Lithuanian adults with CAD does not follow healthy lifestyle recommendations. Nutritional habits, alcohol consumption, and emotional stress are similar among Lithuanian individuals with and without MI.

Keywords: coronary artery disease, lifestyle, myocardial infarction

QUANTATIVE ULTRASOUND ANALYSIS OF FETAL LUNG MATURITY TO PREDICT NEONATAL RESPIRATORY MORBIDITY

Greta Balčiūnienė[1, 2], Valerija Tutukova[3], Diana Ramašauskaitė[1, 2], Gražina Stanislava Drąsutienė[1, 2]

[1] *Clinic of Obstetrics and Gynaecology, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *greta.balciuniene@gmail.com*

Background. Neonatal respiratory distress syndrome is a serious issue associated with fetal lung prematurity in preterm delivery. Until recently, all the fetal lung maturity tests have required sampling of amniotic fluid, usually by amniocentesis. Recent studies report that non-invasive approaches such as quantitative ultrasound analysis are able to predict neonatal respiratory distress syndrome with an accuracy similar to that of invasive methods.

The aim of the study. To evaluate the feasibility of quantitative ultrasound analysis to predict neonatal respiratory distress syndrome.

Materials and methods. This study prospectively evaluated 72 images acquired from patients who gave birth from May to November 2017 at Vilnius University Hospital. Images were obtained from Voluson E8 ultrasound equipment. Patients were divided into three groups by gestational age (GA) at the time of delivery: 23^{+0} – 27^{+6}, 28^{+0} – 33^{+6} – 34^{+0}, and 40^{+6}. Moreover, the risk predicted by quantusFLM was stratified into seven groups in ascending order and its correlation with birth outcomes designated as neonatal respiratory distress syndrome was analysed. Statistical data analysis was performed using IBM SPSS 22.0.

Results. Among the 72 neonates, there were 32 cases of neonatal respiratory distress syndrome. The strong correlation between quantusFLM predicted risks and birth outcomes was observed (correlation strength coefficient 0.756, p value <0.005). Quantitative texture analysis predicted neonatal respiratory morbidity from fetal lung maturity image with sensitivity, specificity, positive predictive value, and negative predictive value of 75.0%, 92.5%, 88.9%, and 82.2%, respectively.

Conclusion. Quantitative ultrasound analysis of fetal lung maturity predicted the risks of neonatal respiratory distress syndrome with accuracy, similarly to previously reported studies about both invasive and non-invasive techniques, with the benefit of being a conservative diagnostic method.

Keywords: fetal lung maturity, quantitative ultrasound analysis, neonatal respiratory distress syndrome

THE LITHUANIAN VERSION OF THE WALKING IMPAIRMENT QUESTIONNAIRE

Rokas Baltušnikas[1], Tomas Baltrūnas[2], Kęstutis Ručinskas[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *tomas.baltrunas@gmail.com*

Background and aim. Currently, there is no validated questionnaire for evaluation of intermittent claudication in Lithuania. The Peripheral Artery Questionnaire, Edinburgh Claudication Questionnaire, Intermittent Claudication Questionnaire, Walking Impairment Questionnaire, and others are used for evaluation of peripheral artery disease and intermittent claudication in many countries worldwide. The Walking Impairment Questionnaire (WIQ) is widely used for this purpose in the USA, South Korea, the Netherlands, and other countries. It is an easy-to-fill and short questionnaire, helping to assess intermittent claudication and providing information about the patients' walking abilities. Our aim was to translate the WIQ into the Lithuanian language and prepare it for validation by performing a pilot study.

Materials and methods. The original English version of WIQ was translated into the Lithuanian language by two independent translators. The Dutch version of WIQ using the metric system was translated into Lithuanian for cultural adaptation. All the translations were compared, merged into one, and translated back into English for comparison with the original WIQ. Minor corrections were made. The questionnaire was given to five peripheral artery disease patients with intermittent claudication to assess the formulation and comprehensibility of the questions. The final version of the Lithuanian WIQ was formulated after several corrections; 39 patients with intermittent claudication and ABI<0.9 in Vilnius University Hospital were given the Lithuanian version of WIQ and the Lithuanian version of the EQ-5D-3L questionnaire. Walking distances were measured by a 6-minute walking test (6MWT). ABI was measured. Validity was determined by calculating correlations between WIQ, EQ-5D-3L, ABI, and 6MWT. Internal consistency of the Lithuanian WIQ was determined by calculating the Cronbach alpha.

Results. The WIQ scores correlated with ABI, 6MWT, and EQ-5D-3L results. Internal consistency results for individual subscales of WIQ and the total WIQ score was >0.7.

Conclusions. The translation of the WIQ into the Lithuanian language was successful and the questionnaire is suitable for a final validation study. The validation study is currently being performed.

Keywords: intermittent claudication, peripheral artery disease, walking impairment, validation studies

INFLUENCE OF MATERNAL UNDERNUTRITION ON THE BEHAVIOURAL PATTERNS OF TWO OFFSPRING GENERATIONS IN A RAT MODEL

Violeta Bartuškienė[1], Antanas Kairys[2], Roberta Šarvaitė[3], Valerija Tutukova[3], Janina Tutkuvienė[1]

[1] *Department of Anatomy, Histology and Anthropology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Laboratory of Applied Psychology, Institute of Psychology, Faculty of Philosophy, Vilnius University, Vilnius, Lithuania*

[3] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *violeta.araminaite@mf.vu.lt*

Background. As an early-life stressor, maternal undernutrition may have detrimental effects on further growth, development, cognitive functions, and social interactions of the offspring. The purpose of the present study was to investigate the influence of maternal nutrition (pre-conceptual and/or during pregnancy) on the behavioural patterns of two offspring generations at different periods of ontogenesis.

Materials and methods. We investigated the behavioural status of two rat offspring generations in an elevated plus-maze (at 6, 12, 18, and 24 months of age, n = 361) born to mothers (n = 30) that were food-restricted (FR) either during pre-pregnancy only (FR1) or during pre-pregnancy and pregnancy periods (FR2). FR rats received 50% less food compared to the control group. All offspring rats were fed normally. The behaviour was coded using

the Noldus Observer XT software. To identify behavioural patterns, principal component analysis with a varimax rotation was performed. To analyze the differences among groups, generations, and sexes, factorial ANOVA was used.

Results. Two behavioural factors were revealed: courage and activity. Courage included time spent in open arms and head dipping, whereas the activity factor was composed of standing on the wall, time spent walking, as well as freezing and grooming – both negatively related to the factor. Factorial ANOVA showed age-related differences in courage (carefulness at 12 months) and activity (younger rats and females were more active) ($p < 0.05$). Also, offspring rats from FR mothers exhibited different levels of courage ($p < 0.05$): offspring from the FR2 group were more prone to risk than those from the FR1 group. Moreover, there were significant interactions among independent variables.

Conclusion. Maternal caloric restriction might cause an alteration in the offspring behavioural parameters as an evolutionary adaptation to a food-restricted environment. The effect is age-dependent and differs between sexes and groups.

Keywords: behaviour, offspring, rat, undernutrition

MODIFICATION OF THE SYMPATHETIC NERVOUS SYSTEM IN TREATMENT OF HYPERTENSION, ONE OF THE BIGGEST EVOLUTIONARY DISEASES

Andrius Berūkštis, Aleksandras Laucevičius

Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine,
Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *andrius.berukstis@santa.lt*

Background and aim. Hypertension is a worldwide pandemic involving over 1.2 billion individuals. It has become the most critical and expensive public health problem globally. From an evolutionary perspective, hypertension is a disease of civilization with its abundance of processed foods and a long lifespan. Percutaneous renal artery denervation (RAD) is a new treatment method and its blood pressure-lowering effects are still debatable. We investigated the RAD effect on the sympathetic vascular and cardiac innervation.

Materials and methods. Between March 2012 and May 2017, 73 selected patients with resistant hypertension had RDN performed. Arterial stiffness and central hemodynamics were measured before the procedure, 24 to 48 hours following the procedure, and subsequently one, three, and six months after the RDN. A subgroup of patients underwent ^{123}I-metaiodobenzylguanidine (^{123}I-MIBG) scintigraphy before and six months after RAD.

Results. Within 48 hours, RDN significantly reduced AoPWV from 11.3 ± 2.7 to 10.3 ± 2.6 m/s ($p = 0.001$); after one, three, and six months the reduction sustained 9.4 ± 2.2 ($p < 0.001$), 10.3 ± 2.9 ($p = 0.013$), and 10 ± 2.6 ($p < 0.001$) m/s, respectively. The mean optimal initial AoPWV cut-off point for predicting the AoPWV value reduction after six months was 9.55 m/s (sensitivity 81%, specificity 58%). The changes in the AoPWV value did not correlate with office systolic or diastolic BP ($p = 0.45$; $p = 0.33$). In the subgroup of ^{123}I-MIBG scintigraphy, there was as an increase of late heart-to-mediastinum ratio, varying from 2.21 ± 0.47 to 2.35 ± 0.52 m/s ($p = 0.02$).

Conclusions. RAD significantly reduces arterial and cardiac sympathetic overdrive, independently of blood pressure changes.

Keywords: hypertension, sympathetic nervous system, renal artery denervation

VITAMIN D DEFICIENCY IN MODERN SOCIETIES: WHY AND HOW?

Andrius Bleizgys

Clinic of Internal Diseases, Family Medicine and Oncology, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *andrius.bleizgys@gmail.com*

Vitamin D deficiency is prevalent in many countries and there are many risk factors for this condition. In countries located far away from the equator, a reduced production of vitamin D3 in the skin due to naturally lower solar radiation plays the major role. In addition, unhealthy lifestyle habits, sunlight avoidance, comorbidities, e.g., obesity or the malabsorption syndrome, as well as low rates of vitamin D supplementation contribute to the development of a low vitamin D status. The understanding of vitamin D physiopathology might help in identifying the main risk groups. For patients in those groups, an analysis of serum 25-hydroxy-vitamin D – the best marker of a patient's vitamin D status – should be performed. In the case of a low vitamin D status, an appropriate supplementation should be recommended.

Keywords: humans, risk factors, seasons, vitamin D

ADIPOSE TISSUE DISTRIBUTION AND ITS IMPACT ON METABOLIC DISTURBANCIES IN OBESE PATIENTS

Bronius Buckus, Gintautas Brimas

Clinic of Gastroenterology, Nephro-Urology and Surgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *bronius.buckus@mf.vu.lt*

Background. The aim of the study was to establish the relation between ultrasonographic measurements of abdominal adipose tissue and the metabolic syndrome in obese patients.

Materials and methods. Seventy obese patients (48 women, 22 men) were recruited in a prospective study. The mean age was 42.7 years, the mean BMI 41.5 kg/m^2. Height (H), weight (W), waist (WC), and hip (HC) circumferences, the body mass index (BMI), the waist to hip ratio (WHR), systolic (SBP) and diastolic (DBP) blood pressures, fasting plasma glucose, and triglycerides (TAG) of all participants were measured. Subcutaneous (SAT) and visceral (VAT) adipose tissue thickness was assessed by ultrasonography.

Results. VAT thickness was different between men and women (7.23 cm vs 12.04 cm, $p < 0.001$). In the patients with the metabolic syndrome visceral fat thickness was higher compared with metabolically healthy individuals (7.01 cm vs 10.03 cm, $p < 0.001$).

There was a strong correlation between WHR and VAT ($r = 0.72$) in the group of patients without the metabolic syndrome. In the metabolic syndrome group there was a negative association between TAG ($r = –0.43$) and SAT thickness; VAT correlated with W ($r = 0.72$), BMI ($r = 0.55$), WC ($r = 0.73$), WHR ($r = 0.68$), SBP ($r = 0.48$), DBP ($r = 0.38$), and fasting plasma glucose ($r = 0.49$).

Conclusions. SAT and VAT thickness is related with metabolic diseases in obese patients. The ultrasonography may potentially provide additional data for the assessment of the adipose tissue, especially visceral, and its influence on the metabolic syndrome.

Keywords: ultrasound, adipose tissue, metabolic syndrome

EARLY OUTCOMES IN DEGENERATIVE MITRAL REGURGITATION SURGERY: CONVENTIONAL MITRAL VALVE REPAIR VERSUS TRANSAPICAL NEOCHORD IMPLANTATION

Mindaugas Budra[1], Artūras Lipnevičius[1], Kęstutis Ručinskas[1], Vilius Janušauskas[1], Aleksejus Zorinas[1], Giovanni Speziali[2], Agnė Drąsutienė[1], Diana Zakarkaitė[1], Audrius Aidietis[1]

[1] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *University of Pittsburgh Medical Center, Pittsburgh, PA, United States*
Email: *mindaugas.budra@santa.lt*

Background and aim. Conventional mitral valve repair (CMVR) using cardiopulmonary bypass is a standard treatment of degenerative mitral valve regurgitation (MR). Off-pump transapical NeoChord implantation (TA) is a new alternative approach. We compared early postoperative results between these two operations.

Materials and methods. In this retrospective observational study, we included 169 patients with degenerative mitral valve (MV) disease who underwent MV repair in the period from 2011 to 2016. Patients with leaflet restriction were excluded. Patients were divided into two groups: 91 patients underwent CMVR and 78 had TA Neochord implantation. Outcomes were compared at discharge or at 30 days.

Results. Preoperative STS risk score was 0.47% in the TA group vs 0.43% in CMVR patients (p = .142). Patients undergoing CMVR were older (59.5 ± 12.8 years vs 54.2 ± 11.1 years, p = .005) and had a higher rate of moderate tricuspid regurgitation (35% vs 14%, p = .002). Postoperatively, patients in the TA group required less red blood cell transfusion (7.8% vs 42.9%, p = .001), had a lower rate of postoperative atrial fibrillation (11.7% vs 25.3%, p = .031), and less frequent renal failure (2.6% vs 15.4%, p = .007). The median CMVR time was longer: 312 minutes vs 120 minutes (p = .001). One patient died in the TA group, and no deaths were reported in the CMVR group (p = .277). Following CMVR, two patients had a postoperative stroke, one developed a wound infection, but none had severe MR. In the TA group, nine patients had moderate or severe MR (p = .001).

Conclusions. Off-pump transapical MV repair is a feasible and safe procedure with a lower rate of complications. However, as compared to the conventional repair, it has a higher recurrence rate of significant MR. Therefore, a careful selection of patients by a highly experienced team is necessary.

Keywords: mitral valve, neochord, regurgitation, transapical

THE USE OF ORGANIC BIOMARKERS AS INDICATORS OF HUMAN DECOMPOSITION IN ANCIENT CRYPT CONDITIONS

Lorna Anne Dawson[1], Dario Piombino-Mascali[2], Svanlaug Elsa Steingrímsdóttir[1]

[1] *The James Hutton Institute, Aberdeen, UK*

[2] *Department of Anatomy, Histology and Anthropology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Lithuania*
Email: *dario.piombino@mf.vu.lt*

The aim of the study. This work tested and implemented a laboratory method to identify biomarkers indicative of human decomposition in archaeological samples. Archaeological samples were collected from a crypt containing mummies in Ferentillo, Italy, and were analysed using GC-MS to determine if the soil samples from the crypt could have been in contact with human remains at some point throughout history.

Materials and methods. The archaeological samples were collected from the soil surface at four different locations and lower depths at a further three different locations. Three negative controls were also collected from outside the crypt, which, as far as is known, were unaffected in the past by human remains. The crypt is open to the public and no restrictions are given on where people can walk; therefore, samples were taken from locations where contamination was unlikely. Samples that were taken at a depth and at the sides of the crypt were considered to be the least likely to have been affected by recent human contamination. Due to the crypt being located in a dry environment, leaching of cadaveric lipids was not expected to have occurred to any extent.

Results. The results of the study showed that the laboratory method developed could be used to identify key biomarkers of human decomposition. The main steroid biomarker for indication of human faecal matter (coprostanol) was detected in the lowest concentration in the negative controls. The highest concentration of the sterol was observed to be in samples from the sides of crypt. Cholesterol was found in the highest concentration within the same samples. The sample containing the lowest amount of cholesterol was one of the negative control samples. A few negative control samples had a relatively high concentration of cholesterol, which was explained by contamination, potentially by other animals such as rodents or compounds in the soil from plants, fungi, as well as other eukaryotes.

Conclusions. These results suggest that organic compounds can be used as indicators of previous human decomposition *in situ*, on ancient archaeological sites, although further work needs to be carried out to establish its general applicability under contrasting environmental conditions and over different time periods.

Keywords: soil, chemistry, taphonomy, decomposition

INTEROCEPTION AT ITS PSYCHOLOGICAL AND PHYSIOLOGICAL LEVEL: EMPHASIS ON WORRYING

Aida Grabauskaitė, Mindaugas Baranauskas, Inga Griškova-Bulanova

Institute of Biosciences, Life Sciences Center, Vilnius University, Vilnius, Lithuania
Email: *aida.grabauskaite@gf.vu.lt*

Background and aim. Interoception is a group of senses reflecting the physiological state of the body. However, the link between physiological and self-reported indices of interoception is not well established. Accordingly, our aim was to assess the relationship between self-reported interoceptive tendencies and the CNS representation of interoceptive processing.

Materials and methods. Thirty healthy participants took part in our study. We used the amplitudes of heartbeat evoked potentials (HEPs) at their latency of 400–600 ms for the physiological part, and the Multidimensional Assessment of Interoceptive Awareness (MAIA) for the psychological part. For the analysis, the cluster-based permutation tests on the *t*-values of Pearson correlation were employed.

Results. The HEP amplitudes were positively associated with individual scores on the not-worrying scale of MAIA at Cz in the time window from 400 ms to 545 ms after the R peak. However, the other seven MAIA scales were not related to the late HEP amplitudes.

Conclusions. Although not all of the psychological interoception aspects apperead to be related to physiological indices, worrying about bodily sensations did.

Keywords: bodily sensations, heartbeat evoked potentials, multidimensional assessment of interoceptive awareness

ATOPIC MARCH IN PRESCHOOL AGE: WHAT IS THE ROLE OF VACCINES?

Agnė Jagelavičienė[1], Justina Kučinskaitė[2], Agnė Krživickytė[2], Vytautas Usonis[1]

[1] *Clinic of Children's Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Faculty of Medicine, Lithuania*
Email: *agne.jagelaviciene@mf.vu.lt*

Background and aim. The data on the impact of vaccination with diphtheria-tetanus-acellular pertussis-inactivated polio-Haemophilus influenzae B (DTaP-IPV-Hib) vaccine to the development of atopic dermatitis, allergic rhinitis and asthma in preschool age is inconsistent. With the rapidly growing incidence of atopic disorders in the industrialized countries it is important to analyze any potentially provocative or protective factor for allergy evolution. The aim of this study was to analyze the influence of variations of vaccination time and doses of DTaP-IPV-Hib received in infancy to the development of atopic diseases during the first six years of children's life.

Materials and methods. We used a cohort of 1294 children born in 2009 and collected by using the health records system in an out-patient clinic. A retrospective analysis of a detailed vaccination status and diagnoses of atopic diseases until the age of six years was performed. According to the vaccination with DTaP-IPV-Hib starting

time, children were categorized into three groups: on time (at two months), slightly delayed (at three months), and delayed vaccination (at 4–6 months). According to the number of the vaccine doses received, classification was made as follows: completely (3 doses), partially (1–2 doses), and non-vaccinated until the 7th month.

Results. The time of the first DTaP-IPV-Hib dose had no influence on the diagnosis of atopic dermatitis at any age. However, the children who were vaccinated on time had a greater risk for asthma, RR = 1.48 (95% CI: 1.04–2.11) in comparison with those who were vaccinated with one month delay. The risk for atopic dermatitis was lower in the completely vaccinated as compared to the partially vaccinated children. The incidence of asthma and allergic rhinitis was similar in both the completely and non-vaccinated groups.

Conclusions. According to our study results, a higher vaccination coverage with DTaP-IPV-Hib is rather a protective factor than a risk for any atopic disease. The vaccination starting time might be a question of debates for an atopic march induction.

Keywords: atopic, asthma, DTaP, vaccination

EFFECTS OF FLUORINE AND BORON OVERDOSE CONCENTRATION IN DRINKING WATER ON THE RAT EMBRYO MASS, SKELETON FORMATION, AND TEETH STRUCTURE

Eglė Janušonytė[1], Edita Paulikaitė[2], Emilija Šermukšnytė[1] Virginija Bukelskienė[3], Grita Skujienė[2], Violeta Žalgevičienė[4]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Department of Zoology, Institute of Bioscience, Life Sciences Centre, Vilnius University, Vilnius, Lithuania*

[3] *Department of Biological Models, Institute of Biochemistry, Life Sciences Centre, Vilnius University, Vilnius, Lithuania*

[4] *Department of Anatomy, Histology, and Anthropology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *violeta.zalgeviciene@mf.vu.lt*

Background and aim. Part of Lithuanian water supplies provide drinking water that exceeds the acceptable daily intake of fluorine and boron. The aim of the study is to evaluate the effects of the overdose concentration of fluorine and boron in drinking water for the rat embryo mass, skeleton formation, and teeth structure.

Materials and methods. Fifteen Long Evans female rats were divided into five groups according to the drinking water: four groups of fluorine and boron concentration overdose and one control group. Two generations of 467 embryos were analysed. Pregnant female rats were euthanised on the 21st day of embryogenesis, the placenta and embryos were weighted and measured. The teeth of euthanised rats were dissected and prepared for hystological analysis, enamel was measured (1689 samples). The Kruskal–Wallis criterion was applied to test the hypothesis ($p < 0.05$).

Results. The length of first-generation boron (3 mg/L) overdose embryos was significantly greater; ossification centres of ulna, tibia and coxa formed at a faster rate in the first (3 mg/L) and second (12 mg/L) generations of boron overdose groups compared to control group. Smaller mass was observed in the second generation boron overdose group. Changes in teeth structure were observed in the fluorine overdose (12 mg/L) group: the width of enamel was greater. The length and mass of the second-generation fluorine overdose (12 mg/L) group were greater and the ossification centres of tibia, radius and scapula formed at a greater rate. Resorptions and placenta structure changes were observed in both boron and fluorine overdose groups.

Conclusions. Continuous consumption of boron overdose and fluorine drinking water can have a negative effect on the embryo size and formation of long bones as well as increases the number of placenta anomalies and embryo loss. Continuous consumption of fluorine overdose drinking water causes changes in teeth structure.

Keywords: boron, embryogenesis, fluorine

TRANSPOSITION OF THE GREAT ARTERIES: THE EVOLUTION OF TREATMENT IN A SINGLE LOW-CASE

Karolis Jonas[1], Virginijus Jakutis[2], Rita Sudikienė[1], Virgilijus Lebetkevičius[1], Virgilijus Tarutis[1]

[1] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Anaesthesiology and Intensive Care, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *karolismd@gmail.com*

Background and aim. From an evolutionary standpoint, the learning curve of any surgical procedure is an example of microevolution. Transposition of the great arteries (TGA) is a rare congenital heart defect (CHD) that can only be treated surgically. Currently, the golden standard for treating TGA is the arterial switch operation (ASO), though during the development of cardiac surgery atrial correction (AC) had better outcomes. The aim of this presentation is to describe the evolution of treating TGA in a single low-case load centre.

Materials and methods. The data of patients treated for TGA at our centre were gathered and analysed. The patients were divided into four groups: Group 1 (n = 47) was treated with an AC between 1986 and 2004. Group 2 (n = 18) was treated with ASO between 1977 and 1998. Group 3 (n = 24) was treated with ASO during an international experience exchange programme (1999–2003) between our centre and the Wessex Cardiothoracic Centre, Southampton General Hospital. Group 4 (n = 73) was treated with ASO from 2004. The transition from AC to ASO and the necessary precautions were evaluated.

Results. A total of 162 patients with TGA were operated. The perioperative mortality rate in Group 1 vs. Group 2 was 40.4% vs 66.7% (p-value = 0.05804, χ^2 = 3.5926). Until 1999, the majority of patients were treated by AC. During the programme more patients were treated with ASO, simultaneously the perioperative mortality rate in later ASO groups decreased (Group 2 vs. Group 3 vs. Group 4 = 66.7% vs 41.7% vs. 4.1%, p-value = 0.00000000178, χ^2 = 40.293). After 2004, the majority of patients were treated with ASO.

Conclusions. International experience exchange can facilitate the learning curve of complex surgical procedures. Treatment of complex CHD, such as TGA, in a low-case load centre can be safe and have good outcomes.

Keywords: arterial switch operation, atrial switch operation, learning curve in surgery, transposition of the great arteries

EPIDEMIOLOGY AND CLINICAL PRESENTATION OF TICK-BORNE ENCEPHALITIS (TBE) IN THE LIGHT OF THE HIGH AND LOW NUMBER OF INCIDENCE

Gabrielė Kalvelytė[1], Austėja Žibūdaitė[1], Daiva Radzišauskienė[2], Kęstutis Žagminas[3]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Infectious and Chest Diseases, Dermatovenereology, and Allergology, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Department of Public Health, Institute of Health Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *daiva.radzisauskiene@mf.vu.lt*

Background and aim. Tick-borne encephalitis (TBE) is the most common infection of the nervous system in Lithuania. Observing the increase in tick-borne encephalitis morbidity from 2011 to 2014 and lower morbidity from 2005 to 2008, we decided to analyse whether epidemiological and clinical manifestations change depending on the occurrence of a more frequent disease.The aim of this study was to describe the epidemiological patterns and clinical features of TBE in Lithuania in the light of the high and low number of incidence.

Materials and methods. In this retrospective study there were 548 adult patients hospitalized in the Centre for Communicable Diseases and the Centre for Neurology of Vilnius University. The research was defined on the basis of laboratory results and documented clinical characteristics. Two different samples were compared: those from 2005 to 2008 (low incidence) and 2011 to 2014 (high morbidity). Data were analysed by using MS Excel 2013 and R Commande programs; we also used ANOVA, t-test, Pearson chi-square, and Fisher exact test.

Results. When TBE was high, there was a lower level of clinical forms of meningitis ($p = 0.023$) and encephalitis ($p = 0.023$), but the more clinical form of meningoencephalomyelitis ($p = 0.054$) was recorded. There were fewer patients with neurological-meningitis symptoms ($p = 0.001$): neck rigidity ($p = 0.003$), and symptom of Kernig ($p < 0.05$). In the group with high morbidity of TBE, there were less disphasia ($p = 0.03$) and limb paresis ($p = 0.019$). From 2011to 2014, cerebellar symptoms ($p < 0.05$), cranial nerves damage ($p < 0.05$) and headache ($p = 0.026$) became more frequent. Moreover, during this period a higher number of residual effects was recorded: head dizziness ($p = 0.028$), ataxia ($p < 0.05$), and tremor ($p = 0.016$).

Conclusions. There is a direct correlation between the growing incidence of TBE and the changing forms of the disease in Vilnius County. With the increasing TBE incidence, meningoencephalitis is rising.

Keywords: encephalitis, epidemiology, meningitis

DIAGNOSTIC ACCURACY OF HEAT SHOCK PROTEIN-90 AND INTRAVENOUS CONTRAST-ENHANCED ULTRASONOGRAPHY IN ACUTE PANCREATITIS

Aistė Kielaitė-Gulla[1, 2], Julija Razumienė[3], Rima Budvytytė[3], Vidutė Gurevičienė[3], Tadas Penkauskas[3], Artūras Samuilis[2, 4], Kęstutis Strupas[1, 2]

[1] *Clinic of Gastroenterology, Nephro-Urology and Surgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Institute of Biochemistry, Life Sciences Center, Vilnius University, Vilnius, Lithuania*

[4] *Department of Radiology, Nuclear Medicine and Medical Physics, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

Email: *aiste.kielaite-gulla@mf.vu.lt*

Background and aim. Acute pancreatitis (AP) is an inflammatory and potentially life-threatening disorder that can trigger a systemic inflammatory response. The severity of the disease varies widely, and only limited clinical and radiologic severity scores are available to diagnose its severity. There is an urgent need to develop additional tools to improve the clinical course of AP and minimize mortality. This study aims at developing a new diagnostic biosensor tool based on heat shock proteins as specific biomarkers.

Materials and methods. Patient serum was obtained from four male acute pancreatitis patients with alcohol-related aetiology (median age of 40) within 24 h of presentation. Severity in acute pancreatitis patients was scored with a median APACHEII score of 5.5, and BISAP score of 4, indicating moderate to severe acute pancreatitis. All patients had contrast-enhanced computed tomography on day 5 after the admission, and modified computed tomography severity index was evaluated. In addition, bedside contrast-enhanced ultrasound for all patients was used. For early severity biomarker analysis, a novel heat shock protein (HSP-90) was chosen along with other clinical parameters. Further processing was performed by ELISA.

Results. Contrast-enhanced ultrasound and computed tomography data are being analysed comparing with proposed biomarkers of acute pancreatitis such as lipase, C-reactive protein, Heat Shock Protein-90. The detailed analysis is being examined.

Conclusions. This preliminary data suggest that contrast-enhanced computed tomography is the primary modality for evaluating the local complications of acute pancreatitis, while contrast-enhanced ultrasound could be an alternative modality. Further studies are needed to evaluate HSP-90 in the early stage of acute pancreatitis. For the development of new electrochemical biosensors detecting heat shock proteins, a novel approach for investigation of the damage of the membrane was proposed. We firmly believe that this biosensor could benefit the contrast-enhanced ultrasound method for diagnosis of AP.

Keywords: acute pancreatitis, heat shock proteins, contrast-enhanced ultrasonography

TEN-YEAR DYNAMICS OF SELF-POISONING: AN OVERWIEV OF CHILDREN'S RESCUCITATION AND INTENSIVE CARE UNIT AT VILNIUS CITY CLINICAL HOSPITAL

Odeta Kinčinienė[1, 2], Augė Lesinskaitė[2], Rokas Šambaras[2], Sigita Lesinskienė[3]

[1] *Clinic of Children's Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Clinic of Psychiatry, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *sigita.lesinskiene@mf.vu.lt*

The aim of the study was to evaluate the ten-year dynamics of the peculiarities and circumstances of deliberate self-poisoning between two groups: group 1 – self-poisoning with aim to get inebriated, group 2 – self-poisoning with a clear aim of suicide.

Materials and methods. A retrospective study that includes patients aged <18, with deliberate acute self-poisoning by medicaments, drugs, or alcohol (2008–2017) was performed at Paediatric Intensive Care Unit (ICU) of Vilnius City Clinical Hospital. Groups 1 and 2 were compared by sex, age, season of intoxication, severity of intoxication (GCS), length of hospitalization, and the substances used.

Results. A total of 1097 cases were analysed. There were 884 cases (74.1%) in group 1 and 309 (25.9%) cases in group 2. Sex distribution in group 1 was 59.6% boys and 40.4% girls ($p < 0.05$). In group 2, there were 13.6% boys and 86.4% girls ($p < 0.05$). In group 1, the average age was 14.77, and in group 2 – 15.22 ($p = 0.09$). In group 1, the dominant season was winter (30.4%), and in group 2 it was autumn (29.1%). Severity of intoxication was compared by GCS: in group 1 the average score was 11.00 ± 2.6, and in group 2 13.32 ± 2.0 ($p < 0.05$). The average length of hospitalization was 1.15 days. In the majority of cases of group 1 the cause of intoxication was alcohol 81.8%. In the majority of the cases of group 2 the main cause of intoxication were medications, most commonly benzodiazepines (22.18%).

Conclusions. Girls are more likely to self-poison with the aim of suicide, and boys to get inebriated. Most adolescents attempt suicide in autumn, while in winter most adolescents try to get inebriated. GCS scores were lower between adolescents who tried to get inebriated; the most commonly used substance was alcohol. The most commonly used medications to commit suicide were benzodiazepines.

Keywords: adolescents, self-poisoning, suicide

PACE-OF-LIFE SYNDROME: LIFE-HISTORY, RISK-TAKING, AND CARDIOVASCULAR PHYSIOLOGY IN ADOLESCENTS

Andreas Lehmann[1], Jana A. Eccard[1], Christiane Scheffler[1], Ralf H. J. M. Kurvers[2], Melanie Dammhahn[1]

[1] *Department of Animal Ecology, University of Potsdam, Potsdam, Germany*

[2] *Centre for Adaptive Rationality, Max Planck Institute for Human Development, Berlin, Germany*
Email: *andreleh@uni-potsdam.de*

Background and aim. The pace-of-life syndrome (POLS) hypothesis posits that life-history characteristics, among-individual differences in behaviour, and physiological traits have coevolved in response to environmental conditions. This hypothesis provides testable predictions concerning the association between the slow-fast life-history continuum and behavioural and physiological traits. The POLS hypothesis has not yet been directly applied to humans.

The aim of our study was to test predicted relationships between life-history, behaviour, and physiology in a human population. We assume covariation between life-history, health-related risk-taking behaviour, and cardiovascular physiology. Furthermore, we expect that fast-maturing individuals reveal more risk-taking behaviour and obtain higher values of cardiovascular parameters in comparison to slow-maturing individuals.

Materials and methods. For our study purposes, we used data of a representative sample of German adolescent boys ($n = 486$) and girls ($n = 791$) from the German Health Interview and Examination Survey for Children and Adolescents (KiGGS) and extracted maturation status (voice break/menarche) and a set of health-related risk-taking

behaviours and cardiovascular parameters. We calculated standardized mean differences (Hedges' g) and Pearson correlation coefficients and performed a confirmatory factor analysis in order to test our study predictions.

Results. Maturation status and cardiovascular physiology as well as maturation status and health-related risk behaviour co-varied in boys and girls. In comparison to same aged slow-maturing boys and girls, fast-maturing boys and girls had a higher blood pressure and expressed more risk-taking behaviour. Only some physiological and behavioural traits were positively correlated.

Conclusion. First, covariation between life-history, risk-taking, and cardiovascular physiology, and, second, increased risk-taking behaviour and higher scores on cardiovascular parameters in fast-maturing girls and boys support general predictions of the POLS hypothesis. Overall, the POLS hypothesis shares many similarities with other conceptual frameworks and these concepts should be united more thoroughly to stimulate the study of POLS in humans.

Keywords: adolescence, life-history, maturation, physiology, risk-taking

ADVANCES IN POST-PROCESSING OF PARACLINICAL DATA FOR DIAGNOSIS AND MANAGEMENT OF EPILEPSY

Tatjana Liakina[1, 2], Jörg Wellmer[3], Rūta Mameniškienė[4]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Ruhr-Epileptology, Department of Neurology, University Hospital Knappschaftskrankenhaus, Bochum, Germany*

[4] *Clinic of Neurology and Neurosurgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *tatjana.liakina@mf.vu.lt*

Today, clinicians no longer make decisions about diagnosis and treatment based on the clinical data alone as laboratory tests, electrophysiology, and imaging have become an integral part of modern health systems and high-quality healthcare. Particularly, the diagnosis of epilepsy, along with a detailed medical history, is based on electroencephalography (EEG) and magnetic resonance imaging (MRI). However, EEG traces and MRI contrast maps still have to be visually analysed by an experienced specialist. This approach is limited by many factors including high temporal and resource costs, substantial interrater variability, and low sensitivity, especially in subtle cases. Advances in computer data analysis offer powerful post-processing algorithms that can enhance clinical decision-making based on available paraclinical data, in which the visual inspection was inconclusive. This presentation focuses on two modalities of EEG and MRI data post-processing for the diagnosis and presurgical evaluation of refractory epileptic patients: neuroelectromagnetic source imaging (NSI) and voxel-based morphometry (VBM). NSI is a method that allows modeling and estimation of the spatiotemporal dynamics of neuronal currents in the brain that generate the EEG signal. VBM is a technique that amplifies deviations of an individual brain anatomy from the age-appropriate normal brain, which allows detecting potential aberrations. Both methods rely upon statistical modeling and require experienced users for interpretation in the context of individual cases. Advantages, limitations, and future perspectives of both techniques are discussed on the basis of concrete clinical examples.

Keywords: epilepsy, neuroelectromagnetic source imaging, voxel based morphometry

GENDER DIFFERENCES IN SOMATIC AWARENESS

Sigita Mėlynytė[1], Sidse Arnfred[2, 3], Inga Griškova-Bulanova[1]

[1] *Department of Neurobiology and Biophysics, Institute of Biosciences, Life Sciences Center, Vilnius University, Vilnius, Lithuania*

[2] *Psychiatric Hospital Slagelse, Denmark*

[3] *Faculty of Health Sciences, University of Copenhagen, Denmark*
Email: *sigita.melynyte@gmail.com*

Background and aim. Somatic awareness is person's ability to sense signals emerging from one's own body. The prevalence of disorders with somatic disturbances differs in manifestation between genders – females suffer more frequently from depression, anxiety, and eating disorders. These observations raise questions whether females differ from males in their ability to be more focused and sensitive to their own body sensations. Based on the set experimental data of both – subjective evaluation (questionnaire) and objective evaluation (by measuring the brain activity with electroencephalography, EEG) – collected by our group, we try to answer this question.

Materials and methods. Two different methods were applied in groups of young adults: (1) a self-reported Amsterdam Resting State Questionnaire (ARSQ) with parallel evaluation of resting state EEG markers, known as microstates (94 subjects; 45% males), and (2) Proprioceptive evoked potential paradigm (PEP) to measure the brain activity to passive proprioceptive stimulation (20 subjects; 50% males).

Results. Experimental results revealed gender differences in all groups. First, during the resting state evaluation (ARSQ) females had more thoughts about themselves, their feeling and behaviour (self-dimension). Moreover, the EEG microstate C (representing saliency) and microstate D (representing one's interoceptive-automatic processing) correlated to Somatic Awareness scores in females only. Second, PEP results showed that females possess stronger brain activity in response to unexpected applied weight to the arm resulting in a better evaluation in sensation of one's body position in space.

Conclusions. We suggest that females are better in recognizing their somatic state.

Keywords: EEG, gender, interoception, proprioception, resting-state, somatic awareness

GENOME EDITING IN MEDICINE: STATE OF THE ART AND PERSPECTIVES

Violeta Mikštienė

Department of Human and Medical Genetics, Institute of Biomedical Sciences,
Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *violeta.mikstiene@santa.lt*

Background. Despite the rapid advances in technology and science, sometimes our knowledge is still fragmented, especially when performing functional characterization of the cell on the molecular level in order to predict precisely the impact of various external and internal factors on subcellular processes. Knowledge and molecular bioengineering technologies are widely used in various fields: plants, microorganisms, and domestic animals are modified and animal models are created to explain the pathogenesis of human diseases. Finally, the advanced technologies were approved for some therapeutic applications.

Genetic biotechnology in medicine. Stem cell therapy (bone marrow transplantation in 1969) was the first step towards the replacement of damaged, pathological cells. In the 1990s, gene therapy was initiated in order to insert the gene encoding the protein into the cell; antisense oligonucleotides were also applied. Cellular processes were exploited for genome editing and experiments with endonuclease (meganuclease, ZNF and TALEN, CRISPR-Cas9 nucleases) were carried out. The possibilities of clinical application for the treatment of infectious diseases (inactivation of the CCR5 gene in HIV), malignant tumours (transfection of tumour cell-expressed chimeric protein receptor genes into T lymphocytes), and hereditary diseases (by inactivation or insertion of a donor DNA) are also analysed. It is important to anticipate and resolve all issues related to new technologies in order to introduce a new therapeutic approach to clinical practice. The main challenges of genomic editing are (1) the effectiveness of biomanipulation, (2) the safety of patients, relatives, and medical staff, and (3) bioethical contradictions. The effectiveness depends on (1) the technology chosen, (2) the system's location and mode of cell

transfer, and (3) the viability of the cells with the edited genome. The safety of genome editing is important in terms of carcinogenesis, immunogenicity, and viral infection. In 2017, the American Society for Human Genetics published an expert opinion on the issue of human embryonic genome editing.

Conclusion. Genome editing tools provide hope for their future adjustment in medicine when the technology is improved and bioethical issues are addressed.

Keywords: clinical application, CRISPR-Cas9 nucleases, effectiveness, safety and bioethical contradictions of human genome editing

THE DISTRIBUTION OF NEWBORN HEAD CIRCUMFERENCE: AN EXAMPLE FOR THE EVOLUTIONARY FIXED DEVELOPMENTAL MECHANISMS?

Rūta Morkūnienė[1], Jelena Isakova[2], Eglė Marija Jakimavičienė[1], Nijolė Drazdienė[3], Vytautas Basys[4], Janina Tutkuvienė[1]

[1] *Department of Anatomy, Histology and Anthropology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Health Information Centre, Institute of Hygiene, Vilnius, Lithuania*

[3] *Clinic of Obstetrics and Gynaecology, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[4] *Lithuanian Academy of Sciences, Vilnius, Lithuania*

Email: *janina.tutkuviene@mf.vu.lt*

Background. Of all the changes in human evolution, the most impressive is brain enlargement. The human brain at birth is 25% of its adult weight and with further tangent postnatal growth is almost full-sized by six or seven years of age. Head circumference (HC) is one of the measurements that directly reflect the brain size and in the auxological literature is usually described as almost normally distributed. The aim of the present study was to evaluate the distribution of HC at birth for both preterm and term newborns.

Materials and methods. A retrospective cohort analysis of Lithuanian Medical data of the Birth Register of 319,430 singleton newborns of 22–42 weeks of gestational age (GA) was performed. The major statistical parameters, the skewness and kurtosis coefficients for HC by GA and sex were calculated using standard statistical programs. The histograms were presented as a graphical visualization of the distribution of data set. The Kolmogorov-Smirnov and Shapiro-Wilk normality tests were used to determine if the data were normally distributed.

Results. The computed skewness and kurtosis coefficients revealed that the distribution of newborn HC was slightly right-skewed and platykurtic until the 28th gestational week (skewness ranged from 0.178 to 0.06, kurtosis ranged from –1.011 to –0.135), and left-skewed and leptokurtic at 29–42 weeks of GA (the range of skewness was from –0.418 to –0.010, the range of kurtosis from 0.270 to 0.036). The distribution of the data for every gestational week and sex group lacks normality according to the Kolmogorov–Smirnov and Shapiro–Wilk tests ($p < 0.05$).

Conclusions. Slightly right-skewed distribution of HC at the very early stages of development represents an evolutionary-fixed developmental mechanism to reach the optimal brain size, preferably as big as possible; however, a short right tail at the late stages of fetal development creates a protective condition for the natural birth. A more complex analysis of both tails of HC distribution shall be provided.

Keywords: distribution, head circumference, kurtosis, newborn, skewness

ATAXIA: FROM SUBJECTIVE TO OBJECTIVE EVALUATION

Agnė Ovčinikova[1,2], Rasa Kizlaitienė[2,3], Gintaras Kaubrys[2, 3], Gytė Pakulaitė-Kazlienė[1, 2], Jurgita Žižienė[4], Julius Griškevicius[4], Kristina Daunoravičienė[4]

[1] *Faculty of Medicine, Vilnius University, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Department of Neurology and Neurosurgery, Faculty of Medicine, Vilnius University, Lithuania*

[4] *Department of Biomechanics, Vilnius Gediminas Technical University, Vilnius, Lithuania*
Email: *agne.ovcinikova@gmail.com*

Ataxia is a term used to describe a number of abnormal movements that may occur during the execution of voluntary movements. As a symptom, ataxia can arise from disorders that involve the cerebellum, spinal cord, brainstem, vestibular nuclei, thalamic nuclei, cerebral white matter, cortex, and peripheral sensory nerves. The quantification of ataxic signs is usually realized through a visual examination of motor tasks performed by a patient and assignment of scores using various clinical scales. Although clinical scales show good reliability, subjective differences between ratings may be present. Furthermore, ordinal scales suffer from their limited ability to describe ataxia characteristics in terms of direction, frequency, amplitude, and the like. In this context, there is a need for additional quantitative methods providing an objective and more accurate evaluation of ataxia. Kinematic methods seem to be a good tool for the instrumented analysis of the coordination tests, as in clinical settings they can directly provide an objective assessment of the movement. Additional temporal and spatial parameters might significantly improve clinical evaluation of motor functions and ataxia.

Keywords: ataxia, objective evaluation, kinematic methods

DEVELOPMENT OF PSA-BASED PROSTATE CANCER EARLY DETECTION PROGRAMME IN LITHUANIA BETWEEN 2006 AND 2009

Aušvydas Patašius[1, 2], Albertas Ulys[3], Robertas Adomaitis[4], Giedrė Smailytė[1, 2]

[1] *Laboratory of Cancer Epidemiology, National Cancer Institute, Vilnius, Lithuania*

[2] *Department of Public Health, Institute of Health Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Department of Onco-urology, National Cancer Institute, Vilnius, Lithuania*

[4] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*
Email: *ausvydas.patasius@nvi.lt*

Background and aim. According to the WHO, the prostate is the second leading cancer site worldwide. Prostate specific antigen (PSA)-based cancer screening remains debatable and currently focuses on shared decision making between patient and doctor, for high risk patients. More than ten years ago, a population-based prostate cancer early detection programme started in Lithuania, with a PSA cut-off value of 3 ng/ml. The early detection programme underwent several modifications during the whole period: during the first round of the early detection programme testing was done annually, and in 2009 it was replaced by bi-annual testing. The aim of our study was to give an overview of the first round of the Lithuanian prostate cancer early detection programme and PSA testing between 2006 and 2009.

Materials and methods. We conducted analysis of the Lithuanian National Health Insurance Fund data covering the period from the 1 January 2006 to 31 December 2009 on outpatient services provided by the Lithuanian prostate early detection programme for men between 50 and 75 years of age.

Results. During the study period, 232091 PSA tests were performed. During the first year of prostate cancer screening, 94681 PSA tests were made with a screening coverage of 24.73% of the target population. The coverage during the whole study period was 25.51%. During the entire study period, 73.55% of the population of the target men were tested at least once. Within the PSA >3 ng/ml. arm, 9095 (27.18%) prostate biopsies were made and 3571 cancer cases were detected out of 33456 PSA tests. Within the PSA <3 ng/ml. arm, 1154 (0.57%) prostate biopsies were made, and 398 cancer cases were detected out of 200801 PSA tests.

Conclusions. The results of our study showed that the early detection programme contained features of opportunistic screening and was also used for diagnostic purposes.

Keywords: prostate cancer, screening, implementation

BREAST VOLUME CHANGES IN RELATION TO SKINFOLD THICKNESS DURING PREGNANCY AND ONE YEAR POST-PARTUM PERIOD

Indrė Sakalauskaitė, Arūnas Barkus, Jonas Drąsutis, Janina Tutkuvienė

Department of Anatomy, Histology and Anthropology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *janina.tutkuviene@mf.vu.lt*

Background. There is a lack of studies on breast volume changes in relation to other body parameters during the pregnancy and lactation period. The aim of the study was to evaluate breast volume changes in relation to body skinfold thickness during the 1st and the 3rd pregnancy trimesters, and also during the 6th and the 12th month postpartum.

Materials and methods. This longitudinal study was held between 2013 and 2017 at the Vilnius Maternity Hospital. Standard anthropometric methods and instruments were used. Body circumferences, skinfolds, and different breast parameters were investigated. The data on breast volume and anthropometric body indices of 88 women (22–37 years old) were analysed. Breast volume was calculated according to the Kramer & Drexler (1981) formula. Breast size was classified as small, medium, and large (considering the medium size between the 25 and the 75th percentiles of the breast volume). Pearson's correlation coefficients between breast volume and anthropometric indices were calculated and compared for all periods of investigation. Standard statistical programs (Excel; SPSS) were used for data calculation.

Results. (1) During the 1st pregnancy trimester, breast volume correlated mostly with the skinfolds located on the upper body part (r = 0.56–0.33; $p < 0.05$), whereas a mild correlation was found between breast volume and skinfolds located on the lower body part (r = 0.28–0.26; $p < 0.05$). (2) During the 3rd pregnancy trimester, breast volume correlated with skinfolds randomly located at different sites of the body, but the relation was weaker than that at the beginning of pregnancy (with subscapular skinfold r = 0.40; with thigh skinfold r = 0.35; $p < 0.05$). (3) At the 6th month postpartum, breast volume mostly correlated with the skinfolds located on the trunk (r = 0.54–0.47; $p < 0.05$). (4) At the 12th month postpartum, the relation between breast volume and different skinfolds almost returned to the initial situation and was stronger for the upper body part skinfolds (r = 0.64–0.55; $p < 0.05$) than for the lower body part skinfolds (r = 0.52–0.38; $p < 0.05$).

Conclusions. (1) All in all, breast volume was mostly related to skinfolds located on the upper trunk and upper arms. (2) The strength and mode of relation between breast volume and skinfold thickness was changing during all investigated periods being stronger at the beginning and at the end of investigation, while around parturition the breast size was less related to the skinfold thickness of the body. This shows a different nature of factors influencing the breast size at its different functional stages.

Keywords: breast volume, lactation period, pregnancy, skinfolds

ARTERIAL HYPERTENSION AND MARKERS OF EARLY VASCULAR AGING IN CHILDREN WITH COARCTATION OF THE AORTA

Skaistė Sendžikaitė[1, 2], Rita Sudikienė[2], Mieczyslaw Litwin[3], Agata Rybak[4], Lukasz Obrycki[3], Inguna Lubaua[5], Pauls Silis[5], Augustina Jankauskienė[1]

[1] *Clinic of Children's Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Department of Nephrology and Arterial Hypertension, Children's Memorial Health Institute, Warsaw, Poland*

[4] *Department of Cardiology, Children's Memorial Health Institute, Warsaw, Poland*

[5] *Clinic for Pediatric Cardiology and Cardiac Surgery, University Hospital for Children, Riga, Latvia*
Email: *skaiste.sendzikaite@gmail.com*

Background and aim. Hypertension-related morbidity persists in 42–70% of patients after repair of coarctation of the aorta (CoA). The aim of the study is to define the frequency of arterial hypertension (AH) and some vascular markers after successful surgical or interventional isolated CoA treatment in a pediatric patient group.

Materials and methods. Seventy-seven patients (63.6% boys) aged 12.8 ± 3.5 years (from 6 to 18 years old) and 4 ± 4.45 years after CoA repair were included into the study; 24-hour ambulatory blood pressure measurement (ABPM), non-invasive oscillometric central blood pressure (CBP) measurement, left ventricular mass index (LVMi), carotid (cIMT) and femoral intima-media thickness (fIMT) were assessed in all patients. Endothelial function was estimated by right brachial flow mediated vasodilatation (FMD).

Results. AH was diagnosed in 56 patients (72.7%): 34 (44.2%) patients had a previous diagnosis of AH and received treatment with one to three antihypertensive agents. Out of all hypertensive patients, systolic central BP above the 95th percentile was observed in 38 patients. Left ventricular hypertrophy was diagnosed in 51 patients (66.2%). The average right cIMT was 0.53 mm, CI (0.52; 0.55), while the mean of normative cIMT values was 0.46 mm. Right cIMT SDS was 3.3 ± 1.6. The average right fIMT was 0.27 mm, CI (0.26; 0.28), while the average of normative fIMT values was 0.32 mm, fIMT SDS –1.6 ± 1.43. The right brachial artery FMD value was 5% ± 4.9 and 61 patients (79.2%) had a FMD of less than 10.0%.

Conclusions. Our results indicate a high frequency of AH in children after CoA correction in spite of the antihypertensive therapy with more than one antihypertensive agent. This patient group presents signs of subclinical arterial injury and disturbed endothelial function. Lower fIMT might suggest a disturbed pattern of blood flow in the aorta despite a CoA repair.

Keywords: hypertension, early vascular aging, coarctation of the aorta

ON THE EVOLUTION OF HOBBITS FROM MIDDLE-EARTH

Andrej Suchomlinov

Department of Anatomy, Histology and Anthropology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *andrej.suchomlinov@mf.vu.lt*

Hobbits are a fictional species created by John R. R. Tolkien. According to this author, they are a variety of *Homo sapiens*; however, they are about only half of our height. The plausible mechanism of dwarfing of the hobbits might have been a fixation of a genetic mutation that perhaps changed the pattern of normal growth and prevented the adolescent growth spurt, possibly affecting the IGF-1 level. The smaller size of the hobbits might have had some positive evolutionary effects, especially on the survival of the offspring. Some features (food cult, delayed maturity) of the hobbits are indicators for an isolated and indigent population. During their maturation, the hobbits are good examples of a slow life-history strategy. John R. R. Tolkien's legendarium is characterized by a great number of well-thought details regarding every character; moreover, their ontogenesis (growth, maturation, etc.) is also affected by real biological mechanisms.

Keywords: height, hobbit, Tolkien

SURVIVAL OUTCOMES AFTER PERCUTANEOUS CORONARY INTERVENTION *VERSUS.* CORONARY ARTERY BYPASS SURGERY FOR OCTOGENARIANS WITH LEFT MAIN CORONARY ARTERY DISEASE

Rokas Šerpytis[1, 2], Lina Puodžiukaitė[3], Saulius Petrauskas[3], Pranas Šerpytis[1, 2]

[1] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Vilnius University Faculty of Medicine, Vilnius, Lithuania*

[2] *Centre for Cardiology and Angiology, Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *rserpytis@gmail.com*

Introduction. There are limited data on long-term outcomes for elderly patients with significant left main coronary artery (LMCA) disease who undergo percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG). This study aimed to assess the outcomes for patients over 80 years old who underwent one of the procedures.

Materials and methods. This retrospective study included patients (≥80 year-old) who had significant left main coronary artery disease and underwent revascularization at Vilnius University Hospital Santaros Klinikos within a two-year period. Out of 590 patients, 114 patients with significant (≥50%) LMCA stenosis were selected in the study.

Results. Of the selected patients, 58.5% were males; mean age was 83 ± 3 years (range, 80–89 years). Ninety (78.9%) patients underwent PCI and 24 (21.1%) had CABG; 40.4% had STEMI, and 24.6% NSTEMI, 17.5% unstable angina, and 17.5% stable angina. Patient age was 83.6 ± 2.7 in the PCI group, and 82.3 ± 2.4 years in the CABG group; $p = 0.027$. The mean number of stents used per patient was 1.86 ± 1.05, and the average number of grafts per patient was 2.79 ± 1.25. Patients who underwent CABG had a significantly higher history of dyslipidemia (PCI – 56.7% vs CABG – 79.2%; $p = 0.044$), while patients with PCI had previous CABG (PCI – 18.9% vs CABG – 0%; $p = 0.021$) significantly more frequently. The average length of hospital stay was 9.9 ± 7.2 days in the PCI group and 22.5 ± 11.1 days in the CABG group; $p < 0.001$. Hospital mortality in the PCI group was 14.4%, and in the CABG group 12.5%; $p = 1.00$. There were long-term survival rates (PCI – 55.6%, CABG – 66.7%; $p = 0.32$).

Conclusions. Among elderly patients, there was no significant difference in hospital mortality or survival between PCI and CABG. Patients who underwent PCI appeared to have shorter hospital stay than those who underwent CABG. Patients were more likely to be selected for CABG if younger and with a significantly higher history of dyslipidemia.

Keywords: coronary artery bypass grafting, coronary artery disease, percutaneous coronary intervention, octogenarians

CLINICAL HETEROGENEITY OF THE LITHUANIAN RETINITIS PIGMENTOSA GROUP

Rasa Strupaitė[1, 2], Laima Ambrozaitytė[2, 3], Raimonda Meškienė[2, 3], Loreta Cimbalistienė[2, 3], Ieva Strupaitė-Šakalienė[4], Algirdas Utkus[3]

[1] *Clinic of Ear, Nose, Throat, and Eye Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Department of Human and Medical Genetics, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[4] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *rasa.strupaite@santa.lt*

Background and aim. Retinitis pigmentosa (RP) (MIM# 613731) represents a clinically and genetically heterogeneous group of progressive inherited retinal dystrophies characterized by the primary degeneration of rod photoreceptors, followed by the loss of cone photoreceptors. Its prevalence is 1:3000 to 1:5000. RP is inherited in autosomal dominant, autosomal recessive, X-linked or simplex manner. RP may be in isolation or in

association with a systemic disease. The symptoms of RP are nyctalopia, progressive peripheral visual field loss, and a reduction of the visual acuity in the final stage. The classical features of RP are arteriolar attenuation, peripheral pigmentation, and waxy disc pallor. RP is caused by pathogenic variants in more than 50 genes, changes in rhodopsin gene (RHO) account for 20–30%.

Materials and methods. In this overview, data from Lithuanian RP patient group of 68 collected at the Centre for Medical Genetics of Vilnius University Hospital during the period of 2015 to 2017 are presented.

Results. After a comprehensive ophthalmological investigation, the RP group included 60 typical and eight atypical forms of RP: six RP *sine pigmento*, one sectoral, and one unilateral RP case. Five syndromic RP cases were also presented. The visual acuity ranged from hand motion to 1.0. RHO and PRPH2 (RDS) genes were Sanger sequenced and molecular diagnosis confirmed two cases with CM930659 mutation, one case with CM900200 in RHO, and one case with CM910324 in PRPH2.

Conclusions. The study describes the heterogeneity of this Lithuanian RP group. There is a need of careful ophthalmological examination to identify possible RP complications and offer their treatment to achieve the maximal visual functions. The overall mutation detection rate in the Lithuanian RP group is 6–8% for the most common genetic causes. The need to identify a molecular diagnosis for retinal dystrophies is particularly important in the era of developing novel gene-editing therapies.

Keywords: inherited retinal dystrophies, PRPH gene, retinitis pigmentosa, RHO gene

DO PATIENT FACTORS INFLUENCE THE OUTCOMES OF A TOTAL KNEE ARTHROPLASTY?

Tomas Sveikata[1], Paulius Kanopa[2, 3], Martyna Sveikataitė[2], Dalius Klimas[2], Narūnas Porvaneckas[1]

[1] *Clinic of Rheumatology, Orthopaedy-Traumatology and Reconstructive Surgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Vilnius University Hospital, Vilnius, Lithuania*
Email: *tomassveikata@gmail.com*

Background and aim. Osteoarthritis (OA) is one of the most disabling diseases in the developed countries. In later stages of the disease, surgical treatment becomes the main alternative. Total knee arthroplasty (TKA) has proved to be a successful and cost-effective treatment for reducing pain and improving the function in patients with arthritis. However, up to 20% of patients are not satisfied with the surgery. The aim of this study was to prospectively evaluate the influence of pre-operative patient factors on patient-reported outcomes after a TKA.

Materials and methods. A total of 314 patients who underwent TKA in Vilnius University Hospital were included in a study. The influence of preoperative patient factors on the TKA outcome according to the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) change score was analysed.

Results. The preoperative WOMAC pain score was the strongest determinant of the WOMAC pain change score one year after TKA. The preoperative WOMAC function and SF-12 mental health scores were the strongest determinants of the WOMAC function change score one year after TKA.

Conclusions. Lower preoperative knee pain, function scores, and better mental health function result in greater change.

Keywords: osteoarthritis, total knee arthroplasty, WOMAC

POPULATION HEALTH IN THE CONTEXT OF CLIMATE CHANGE

Vaida Taminskienė

Department of Public Health, Institute of Health Sciences, Vilnius University, Vilnius, Lithuania
Email*: vaida.taminskiene@mf.vu.lt*

Background. Climate change can be observed worldwide. Global warming, weather extremities, floods, droughts, and other consequences of climate change have direct and indirect adverse effects on a population's health condition.

Materials and methods. A literature review was performed to overview health conditions and diseases attributable to climate change and trends in their prevalence.

Results. The burden of climate change on the population's health condition is increasing worldwide. Millions of people suffer from floods, droughts, and other environmental disasters each year. Heat- and cold-related morbidity and mortality have increased during the last decades. Climate change impacts the prevalence of infectious, vector-borne diseases, and allergies. Environmental and human health effects of climate change result in economic losses. The number of these effects will increase during the coming years if adaptation measures are not taken.

Conclusions. Climate change has a significant impact on health. Morbidity and mortality related to climate change are increasing globally. Health impacts of climate change may be controlled through adaptation measures.

Keywords: climate change, global warming, health, health effects

CHANGING ENVIRONMENTS AND ALLOSTATIC LOAD: MODELING EXPERIENCES OF MEXICAN MIGRANTS IN THE UNITED STATES

Alexandra C. Tuggle, Jeffrey H. Cohen, Douglas E. Crews

Department of Anthropology, Ohio State University, Columbus, OH, USA
Email: *tuggle.26@osu.edu*

Background and aim. Deteriorating health among immigrants following migration intertwines with stressors they experience before, during, and following their travel to a new environment. In addition to migration-related stressors, migrants often experience changing environmental settings. Jointly, these multiple stressors may adversely influence migrants' health, leading to systemic physiological dysregulation – allostatic load. Elevated allostatic load associates significantly with deterioration of internal regulatory systems, cognitive function, physical performance, and, ultimately, chronic disease. Extensive research on stressors and stress among migrants is available. However, only recently have researchers estimated allostatic load using biomarker indices of physiological function among migrants. Here, we present a model based on the assessment of allostatic load, cultural narratives of migration, and self-reports of health, depicting how migrants may process migration stressors.

Materials and methods. We obtained personal data, narratives of migration, self-reports of health, and self-reported discrimination using interview methods. We also assessed four physiological biomarkers to estimate allostatic load. In total, narratives, interviews, and biometric analyses for 28 individuals were completed.

Results. These four data sources are not significantly associated. Neither narratives nor health self-reports provide significant proxies for participants' physiological health.

Conclusions. We show the lack of significant associations among narratives, self-reports, and allostatic load. While this pattern is common among migrants, it is a result of the different nature of the data. Measuring different aspects of the migration experience through narratives, while also defining complex biological dynamics associated with migration and changing environments reveal the multiple ways by which people adapt to and cope with the multidimensional challenges associated with mobility.

Keywords: acculturation, health, immigration, stress

COMPARATIVE ANALYSIS OF ANTHROPOMETRIC AND RADIOGRAPHIC METHODS FOR THE EVALUATION OF THE TIBIOFEMORAL ANGLE ALIGNMENT: A PILOT STUDY

Andrius Vaitiekus[1], Artur Versocki[2], Mindaugas Kvietkauskas[2], Janina Tutkuvienė[1]

[1] *Department of Anatomy, Histology, and Anthropology, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *andrius.vaitiekus@gmail.com*

Background and aim. The golden standard for measuring the knee angle alignment is obtained by a full lower extremity X-ray: firstly evaluating the mechanical axis and afterwards establishing the anatomic knee axis angle. There is a lack of data for the comparative assessment of the knee angle alignment by using radiologic and anthropometric methods. Our aim was to evaluate the tibiofemoral angle alignment by using a goniometer and full weight-bearing anteroposterior lower extremity radiographs for comparison of the anatomic knee axis angle measurements.

Materials and methods. The anthropometric tibiofemoral angle was measured by a goniometer in 358 knees of 179 young adults (18–25 years), and in 29 of these subjects the anatomical knee axis on full limb radiographs was also evaluated. Each parameter was measured three times and the average result was recorded.

Results. The average anatomic knee axis angle obtained on the radiographs was: M ± SD = 3.86° ± 1.33°, while the anthropometric knee angle measured by goniometer was: M ± SD = 4.48° ± 1.38°. The average difference between the knee alignment angle measured by goniometer and the knee angle measured via full limb radiographs varied widely within the range of eight degrees: from –4 up to +4 degrees (min-max), being on average M (SD) = –0.621 (2.194). There was no statistically significant correlation between the radiographic anatomic knee axis angle and the tibiofemoral angle measured by goniometer ($r = 0.34$; $p > 0.05$).

Conclusions. (1) The tibiofemoral angle established by both methods showed less genus valgus deviation than is usually assumed as "the norm". (2) The goniometer-measured tibiofemoral angle was slightly bigger in comparison with the one measured on the radiographs. (3) There was a very wide variation in differences between the angles measured for the same individual using these two methods. (4) Goniometer-measured angles weakly correlated with the knee angles obtained on full weight-bearing lower limb radiographs. (5) Further analysis is necessary to fully confirm the results of this pilot study. A more detailed analysis of subjects for whom the largest differences between the two measurements of the knee angle have been established would be valuable in order to understand the reasons of such a wide variation.

Keywords: anthropometry, knee angle, lower extremity alignment, radiographs

TRANSLATION AND VALIDATION OF THE LITHUANIAN VERSION OF THE DIZZINESS HANDICAP INVENTORY

Domantas Valančius[1], Rytis Masiliūnas[2, 3], Aistė Paškonienė[3, 4], Kristina Ryliškienė[2, 3]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Neurology and Neurosurgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Lithuania*

[3] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[4] *Centre for Ear, Nose, and Throat Diseases, Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*
Email: *rytis@olimpiados.lt*

Background and aim. The Dizziness Handicap Inventory (DHI) is a self-reported questionnaire that is widely used in evaluating a balance dysfunction and the handicapping impact it has on a person. While DHI is available in other languages, there was no validated Lithuanian version to date. We aimed to examine the validity, internal consistency, and test-retest reliability of our Lithuanian translation of DHI (DHI-L).

Materials and methods. A standard protocol of translation for psychometric instruments was followed. A number of 108 patients (75.9% women), mean age 51.9 years, with either peripheral or central dizziness, or vertigo were involved. The internal consistency (Cronbach's α coefficient) and concurrent validity (Pearson's

correlation *r*) were determined. Out of the total number, 65 of the recruited patients filled out DHI-L repeatedly after one week to ascertain test-retest reliability (intraclass correlation-ICC). External validity was tested by Pearson correlation between the total score and subscales of DHI-L, and the eight scales of SF-36 scores, as well as the total SF-36 score.

Results. The Cronbach's α coefficient for the total scale was very high (0.91) and acceptable (0.82, 0.70, 0.83) for the functional, physical, and emotional subscales, respectively. The corrected item-total correlations (CI-TCs) for DHI-L total scale was from 0.33 to 0.67. The total score of DHI-L, as well as the functional, physical, and emotional subscales correlated with the total score of SF-36 with statistical significance, correlation coefficients being –0.433, –0.366, –0.420, –0.392 ($p < 0.01$), respectively. The reliability of DHI-L test-retest was satisfactory as the ICC was proven to be excellent for the total score (0.90), as well as for functional (0.88), physical (0.84), and emotional (0.86) subscales individually.

Conclusions. Our translated Lithuanian DHI has shown good reliability and external validity. We suggest it can be used to evaluate the burden that dizziness has on the quality of life in the Lithuanian population.

Keywords: DHI, Dizziness Handicap Inventory, SF-36, reliability, validity

URBAN-RURAL DISPARITIES IN CANCER INCIDENCE AND MORTALITY IN LITHUANIA, 2001–2009

Ieva Vincerževskienė[1], Domantas Jasilionis[2, 3], Giedrė Smailytė[1, 4]

[1] *Laboratory of Cancer Epidemiology, National Cancer Institute, Vilnius, Lithuania*

[2] *Centre for Demographic Research, Vytautas Magnus University, Kaunas, Lithuania*

[3] *Laboratory of Demographic Data, Max Planck Institute for Demographic Research, Rostock, Germany*

[4] *Department of Public Health, Institute of Health Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *ieva.vincerzevskiene@nvi.lt*

Background and aim. Differential patterns of cancer incidence and mortality have been observed in rural versus urban populations around the world. The aim of this study was to determine the influence of a place of residence on cancer incidence and mortality during the period of 2001 to 2009 using population-based census-linked registry data covering the entire population of Lithuania.

Materials and methods. The study was based on a linkage between all records of the 2001 population census and all records from the Lithuanian Cancer Registry (cancer incidence) and Statistics Lithuania (deaths) for the period of 6 April 2001 to 31 December 2009.

Results. A place of residence showed statistically significant effect on incidence and mortality for most of the cancer sites. In females, lower incidence rates were found for the rural population for cancer of all sites. Mortality risk for cancer of all sites was higher in the rural population for both sexes. The large rural incidence excess was observed for cancer of the esophagus, lip, and the larynx. Statistically significant lower incidence risk in the rural population was found for non-melanoma skin cancer, skin melanoma, thyroid gland, colorectal, kidney cancer, and non-Hodgkin lymphoma in both sexes, also prostate cancer in males, breast cancer and corpus uteri cancer in females.

Mortality risk for all cancer sites was significantly higher in the rural population for both sexes. The highest mortality risk was observed for cancer of the lip, the nasal cavity and sinuses, and esophagus in males and of the cervix in females.

Conclusions. The study shows that large rural and urban inequalities in cancer incidence and mortality exist in Lithuania. Mortality differences by place of residence may reflect differences in access to health care facilities, as well as differences in the exposure to risk factors.

Keywords: socioeconomic inequalities, urban-rural population, cancer

FACTORS ASSOCIATED WITH REMOVAL OF THE CEMENT EXCESS IN IMPLANT-SUPPORTED RESTORATIONS

Eglė Vindašiūtė-Narbutė, Tomas Linkevičius

Institute of Odontology, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *egle@vicklinika.lt*

Background and aim. Implant-supported cement-retained restorations have become a restoration of choice. The main problem overlooked in those restorations is the cement excess and a potential risk for it to remain undetected after cementation. The aim of the study was to determine and evaluate the factors that influence the removal of cement remnants after cementation.

Materials and methods. A total of 65 patients were treated with metal-ceramic restorations on implants. Location of the cementation margin and implant undercut were measured mesially, distally, buccally, and lingually. Sixty-five metal-ceramic restorations were fabricated with occlusal openings and cemented on standard abutments with resin-reinforced glass-ionomer cement. A radiograph was taken to evaluate if all the cement had been removed. Then the crown/abutment unit was unscrewed for evaluation. All quadrants of the specimens and peri-implant tissues were photographed and analysed using Adobe Photoshop. The ratios between the total restoration area/peri-implant tissue, area and the area covered with cement remnants were calculated in pixels. Significance was set to 0.05.

Results. Sixty-five implants were 39 molars, 22 premolars and four anteriors. Twenty-one implants had a diameter of 3.5 mm, 34 of 4.0 mm, and ten of 5 mm. Implant depth: equally with soft tissue level (16 samples), 1 mm subgingivally (58), 2 mm subgingivally (90) and 3 mm subgingivally (96). An undercut <1 mm in 118 sites, <2 mm in 96, <3 mm in 46. The relation between the amount of cement remnants and implant location and the diameter was insignificant ($p > 0.05$), but significant with depth and undercut ($p < 0.05$).

Conclusions. The deeper position of the margin, the greater the amount of undetected cement was discovered. Undercuts should be reduced to a minimum for a better removal of excess cement, irrespective of the diameter and location of the implants.

Keywords: cementation depth, cement excess, cement-retained implant-supported restorations, dental implants

EVOLUTIONARY THOUGHTS IN JĘDRZEJ ŚNIADECKI'S WORK *O FIZYCZNYM WYCHOWANIU DZIECI* (ON THE PHYSICAL EDUCATION OF CHILDREN)

Aistis Žalnora

Department of Medical History and Ethics, Institute of Health Sciences,
Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *aistis.zalnora@mf.vu.lt*

Background. The aim of the study was to examine some of Śniadecki's ideas that were close to evolutionary thinking in his time.

Materials and methods. This study was based on the analysis of primary historical sources such as Śniadecki's original paper *O Fizycznym Wychowaniu Dzieci* (1840).

Results and conclusions. The study revealed that the works of Śniadecki (1768–1838) were typical of the periods of the Enlightment and Romanticism. The main goal of Śniadecki's papers was to educate society in order to fight against superstitions and negative habits that were widespread among both the labouring classes and the upper classes. He focused his attention on the preventive measures that would help maintain good physical and mental health in a family and in the society. Talking about romantic ideas, Śniadecki believed that the modern way of living was unnatural and artificial. Some of the inventions of human culture and technology were useful from a practical viewpoint; however, they had a negative impact on human health. As an opposite of modern lifestyle, he suggested a naturalistic way of living.

Keywords: Śniadecki, education, children, evolutionary thought

THE ASSOCIATION OF PREOPERATIVE INTRASAC ABDOMINAL AORTIC ANEURYSM THROMBUS WITH OUTCOME FOLLOWING EVAR

Rūta Žulpaitė[1], Arminas Skrebūnas[2], Urtė Builytė[1, 3], Givi Lengvenis[4], Germanas Marinskis[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[4] *Department of Radiology, Nuclear Medicine and Medical Physics, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

Email: *arminas.skrebunas@gmail.com*

Background and aim. Despite being a minimal invasive intervention with comparable mortality outcomes, endovascular aneurysm repair (EVAR) is associated with a higher rate of re-interventions than open surgery. Sac growth without visible endoleak remains unpredictable after EVAR, necessitating surveillance imaging, including computed tomography angiography (CTA). This study investigates the value of aneurysm sac volume versus diameter measurements for follow-up after EVAR and the association of preprocedural intraluminal thrombus volume with aneurysm sac growth following EVAR.

Materials and methods. CT scans of 28 abdominal aortic aneurysms (AAA) treated with EVAR from January 2007 to July 2015 at the Vilnius University Hospital Santaros Klinikos were retrospectively analysed. Preoperative and postoperative aneurysm sac maximum diameter and volume, and intrasac thrombus volume were evaluated. Aortic diametric and volumetric changes during the follow-up period were estimated.

Results. The mean follow-up time was 635.3 days. Maximum diameter increased in ten (35.7%) out of 28 cases. Volumetric aneurysm growth was detected in ten (35.7%) out of 28 scans. Significant correlation between measurements ($r = 0.757$, $p < 0.0001$) was estimated. In all cases, the intrastent-graft lumen volume increased by the mean of 5.26 milliliters, which was insignificant to the growth of AAAs. The mean increase of intrasac thrombus volume was 26.27 milliliters in the cases with a growing AAA sac. No evident endoleaks were registered in that group. In stable/shrinking AAAs, the intrasac thrombus volume decreased by the mean of 55.42 milliliters. A significant difference ($p < 0.0001$) between those groups was found. The means of preoperative proportion of thrombus in AAA sac were 0.61 and 0.51 in growing and stable/shrinking AAAs, respectively. The difference between the groups was insignificant ($p = 0.165$).

Conclusion. Measurements of maximum aneurysm diameter on CTA images are a reliable method for follow-up after EVAR. Intrasac thrombus growth may be predictive for the need of re-intervention. The preoperative proportion of the thrombus in AAAs is not associated with the aneurysm growth following EVAR.

Keywords: abdominal aortic aneurysm, aneurysm sac diameter, aneurysm sac volume, endovascular aneurysm repair, intraluminal thrombus

PREDICTION OF CHOLEDOCHOLITHIASIS PRIOR TO LAPAROSCOPIC CHOLECYSTECTOMY USING AN ORIGINAL PROGNOSTIC INDEX

Aušra Aleknaitė, Gintaras Simutis, Juozas Stanaitis

Clinic of Gastroenterology, Nephro-Urology and Surgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Lithuania

Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania
Email: *ausra.aleknaite@gmail.com*

Background and aim. Accurate risk evaluation of possible choledocholithiasis prior to planned laparoscopic cholecystectomy (LC) is essential in determining a patient's management strategy and avoiding unnecessary invasive procedures. At Vilnius University Hospital Santaros Klinikos, an original prognostic index (Vilnius University Hospital index, or VUHI) is used for the evaluation of choledocholithiasis risk before planned LC (VUHI = A/30 + 0.4 × B; A – total bilirubin concentration (μmol/l), B – CBD diameter (mm) measured by ultrasound). The aims of our study were to evaluate the accuracy of separate choledocholithiasis predictors and the VUHI, and to determine the thresholds of index values for intermediate choledocholithiasis risk.

Materials and methods. A retrospective study was performed. We analysed medical data of 350 patients admitted to the tertiary care centre at Vilnius University Hospital Santaros Klinikos from 2012 to 2015 for LC due to cholecystolithiasis, who were investigated for concomitant choledocholithiasis. The study was approved by Vilnius Regional Biomedical Research Ethics Committee.

Results. Choledocholithiasis was diagnosed in 182 (76.2%) cases in the high risk group (VUHI value > = 4.7) and 44 (39.6%) in the low risk group, and the odds ratio was 4.86 (95% CI: 3.00–7.88). VUHI sensitivity was 80.5%, specificity 54.0%, and accuracy 71.1%. Dilated CBD had the highest sensitivity (92.5%) predicting choledocholithiasis, its specificity was 32.2% and accuracy 71.1%. Sensitivity of CBD stones found by ultrasound was 51.3%, specificity was 84.6%, and accuracy 63.0%. A new model to calculate the predicted probability of finding a CBD stone was established. The intermediate risk of choledocholithiasis (probability for CBD stones from 25% to 75%) corresponds to VUHI values from 2.6 to 6.9.

Conclusions. The prognostic index has good diagnostic accuracy but dividing patients into two risk groups is insufficient for deciding on the best management approach. The suggested model allows determining an intermediate risk group, which requires additional investigation.

Keywords: cholecystolithiasis, choledocholithiasis, gallstone disease, laparoscopic cholecystectomy

PRESCRIPTION OF ANTIBIOTICS BY THE MEMBERS OF THE LITHUANIAN SOCIETY OF ENDODONTOLOGY: A PILOT STUDY

Giedrė Baliūnienė, Rasmutė Manelienė

Institute of Odontology, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *gjuknyte@gmail.com*

Background and aim. Inappropriate use of antibiotics is a problem and may lead to the development of antibiotic-resistant bacteria. In dentistry, antibiotics should be prescribed if patient has systemic symptoms, fast-spreading infection, or immunosuppression. The information on prescription of antibiotics among Lithuanian dentists is insufficient. The aim of this study was to assess prescription of antibiotics in the management of endodontic infections by the members of the Lithuanian Society of Endodontology.

Materials and methods. A total of 918 members of the Lithuanian Society of Endodontology completed an online questionnaire. It consisted of six clinical situations. Respondents established diagnosis and reported if they would prescribe antibiotics or not after chemomechanical treatment of the root canal. If chosen, the dentists specified the dosage of antibiotics prescribed and the duration of treatment. Data were analysed using descriptive statistics.

Results. The response rate was 17% (n = 157). Amoxicillin was the most prevalent choice (51%). The majority (72%) of these dentists would choose 1000 mg twice a day (89%). The duration of such treatment would vary from seven days (28%) to six (42%) or five days (30%). The second-choice antibiotic was amoxicillin with clavulanic acid (42%) with a dosage of 1000 mg (63%). The majority of respondents (97%) would prescribe antibiotics twice a day for seven days (62%). In the case of pulpitis, only 0.6% of dentists prescribe antibiotic, and in the case of apical periodontitis – 17%. Antibiotics are prescribed by 16% of dentists for apical periodontitis and sinus tract, by 42% for local swelling, by 43% for uncontrolled diabetes, and by 96% for extraoral or intraoral swelling.

Conclusions. Results of this online survey showed that many dentists prescribe antibiotic without appropriate indications. The duration of antibiotic administration is too long and the dosage is inappropriate. Overall, the dentists' knowledge about prescription of antibiotics was poor, which means that dentists should be taught rational use of antibiotics.

Keywords: antibiotics, endodontic infections, prescription

DISASTROUS COMPLICATIONS AFTER TRACHEOSTOMY IN ONE PATIENT: IS SURVIVAL POSSIBLE?

Vytenis Bertašius[1, 2], Žymantas Jagelavičius[2, 3], Ričardas Janilionis[2, 3]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Clinic of Infectious and Chest Diseases, Dermatovenereology and Allergology, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *zymant@yahoo.com*

Background. Tracheoarterial and tracheoesophageal fistulas are disastrous complications after tracheostomy. We present the first successfully managed case of both complications in a single patient.

Case history. A 30-year-old male was admitted to the intensive care unit with advanced acute pancreatitis, so artificial lung ventilation was started. Percutaneous dilatational tracheostomy was performed six days later. On day 6 after tracheostomy, the first episode of arterial bleeding occurred from the collar wound. The wound was revised, however, no bleeding source was found. On day 20 after tracheostomy, massive arterial bleeding occurred. Partial sternotomy was performed immediately. Tracheal fistula with the innominate artery was found, and the innominate artery was ligated. On day 34 after tracheostomy, bronchoscopy revealed a tracheoesophageal fistula. Surgical repair was attempted, tracheal and esophageal defects were closed, and feeding jejunostomy was performed. However, six days later the tracheoesophageal fistula reopened. Thus, the tracheostomy tube was reinserted. The condition of the patient had stabilized and started to get better.

Six months later, transsternal circular tracheal resection and esophageal repair were performed. For safety purposes tracheostomy was performed two rings distal to the tracheal suture. In one month the patient was discharged breathing through natural airways without any tube. Bronchoscopy showed neither tracheal defects nor stenosis. The patient developed only a transitional neurological deficit following innominate artery ligation. One year after discharge the patient is fully back to normal life.

Conclusion. The combination of tracheoarterial and tracheoesophageal fistulas is an extremely rare situation. Despite the advance in medicine, it is impossible to avoid such disastrous complications after tracheostomy, yet it very likely increases the chance to survive.

Keywords: tracheoarterial fistula, tracheoesophageal fistula, tracheostomy, surgical management

THE RELATIONSHIP BETWEEN FATTY ACID COMPOSITION OF PLATELET MEMBRANE, BLOOD SERUM MALONDIALDEHYDE, AND BODY MASS INDEX IN HEALTHY MEN

Inga Bikulčienė, Orinta Golubevaitė, Dovilė Karčiauskaitė, Vaiva Hendrixson, Arvydas Kaminskas, Zita Aušrelė Kučinskienė

Department of Physiology, Biochemistry, Microbiology and Laboratory Medicine, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *inga.bikulciene@mf.vu.lt*

Background and aim. The peroxidation process in the platelet membrane provides a variety of lipid peroxides including malondialdehyde, which has been implicated in the aetiology of cardiovascular diseases as well as the elevation of the body mass index (BMI). The aim of this study was to evaluate the relationship between the composition of platelet membrane fatty acids, blood serum malondialdehyde concentration, and the BMI.

Materials and methods. Fatty acid methyl esters of platelet membrane of 79 apparently healthy men (aged 40.2) without any acute clinical conditions at the time of the study were identified by GC/MS, while malondialdehyde was measured by HPLC in blood serum. Individuals were divided into quartiles according to the blood serum malondialdehyde concentration and the BMI. The concentration of blood serum malondialdehyde and the BMI were compared to the composition of platelet membrane fatty acids of apparently healthy individuals.

Results. The total sum in percentage of saturated and monounsaturated fatty acids compared to the lowest and the highest blood serum malondialdehyde concentration was decreased (M = 69.78 *versus* M = 68.20, p = 0.607; M = 18.62 *versus* M = 16.53, p = 0.77, Mann-Whitney), while the level of polyunsaturated fatty acids (PUFA) increased (M = 11.58 *versus* M = 15.25, p = 0.33, Mann-Whitney). The ratio of 20:4n6/18:2n6 was observed to have a statistically significant reduction (M = 10.32 *versus* M = 7.44, p = 0.03, Mann-Whitney). Comparing the ratio of 20:5n3/18:3n3 and the BMI between the first and the third quartiles, a statistically significant reduction was also observed (M = 1.96 *versus* M = 0.35, p = 0.027, Mann-Whitney).

Conclusions. With the increase of blood serum malondialdehyde concentration, the level of PUFA rose as well due to intensified activation of PUFA synthesis and peroxidation.With the rise of the BMI, the level of PUFA decreased, due to the increased production of triglycerides.

Keywords: body mass index, fatty acids, malondialdehyde

AETIOLOGY OF DEAFNESS AND THE EFFECT ON PAEDIATRIC COCHLEAR IMPLANTATION OUTCOMES

Jekaterina Byčkova[1], Gabrielė Černytė[2], Margarita Gromova[3], Silvija Kiverytė[4], Vaiva Mickevičienė[4], Violeta Mikštienė[5], Eugenijus Lesinskas[1]

[1] *Clinic of Ear, Nose, Throat, and Eye Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Department of Physiology, Biochemistry, Microbiology and Laboratory Medicine, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[4] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[5] *Department of Human and Medical Genetics, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *jekaterina.byckova@gmail.com*

Background and aims. Congenital sensorineural hearing loss (SNHL) has an incidence of approximately 0.1% in live births. Pathogenic variants of GJB2 gene are the major causes of non-syndromic SNHL. Congenital CMV infection is the most important prenatal etiological factor. Auditory performances in deaf children have been significantly improved after cochlear implantation (CI). However, post-implant outcomes are highly variable. The aims were to determine the aetiologic profile of SNHL in deaf children CI users and to compare speech perception performance after CI in children with different aetiologies.

Materials and methods. The data of 123 deaf children with CI were analysed. Sequencing of the genes associated with SNHL was performed to 99 children. CMV DNA was extracted from DBS on Guthrie cards and detected using RT-PCR to 113 children. Patients' medical records were analysed for identification of other aetiological factors. The outcomes with CIs were assessed using speech perception tests. For the analysis of the outcomes, children with developmental difficulties were excluded.

Results. GJB2 gene mutations were determined in 56 individuals (46% of the study group), alterations in other genes causing non-syndromic SNHL were identified in five (4%) participants. Ten children (8%) were diagnosed with syndromic HL. CMV DNA was revealed in 14 (11%) samples. Perinatal and postnatal events caused HL to 15 (12%) and four (3%) children, respectively. The cause of hearing loss remains unknown only for 21 (17%) children. The difference between speech perception scores in GJB2-related deafness and deafness due to environmental aetiologies (CMV, prematurity, meningitis) was statistically significant and favoured GJB2-related deafness only among children who received CIs before 3.5 years of age.

Conclusions. The major causes of SNHL in our study were GJB2 gene alterations followed by cCMV infection. GJB2-related deafness associates with significantly better CI outcomes when compared with deafness due to environmental aetiologies among children who received CIs before 3.5 years of age.

Keywords: cochlear implantation, deafness, etiology

GENDER DIFFERENCES IN BODY IMAGE AND SELF-ESTEEM PASSING FROM ADOLESCENCE TO ADULTHOOD

Eglė Brokartaitė[1], Ieva Strupaitė-Šakalienė[1], Greta Bukelytė[1], Janina Tutkuvienė[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Department of Anatomy, Histology and Anthropology, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *janina.tutkuviene@mf.vu.lt*

Background. There is a lack of studies related to gender differences in the perception of the body image, in particular, judging about different body parts. Besides, gender-related factors of the body image are not fully understood. The aim of the present study was to evaluate gender differences in body perception in relation to actual body size and self-esteem during transition from adolescence to adulthood.

Materials and methods. Body size and different components of body image were investigated in 455 girls and 401 boys aged 15–20 years. Two subgroups of different age for each gender group were composed: 15–17 years and 18–20 years. Body image was tested using the original questionnaire of 50 questions. Body parts were evaluated by the five-point Likert scale. Body size perception was investigated by Stunkard's figure rating scale (1983), self-esteem by Rosenberg's scale (1965). The BMI was used to establish the actual body size. Student's t-test and chi-square test were used to detect significant differences between different age subgroups.

Results. (1) Older girls and all boys evaluated their facial parts better than younger girls ($p < 0.05$), though younger girls scored their thighs and hips better than the elder ones. The face was rated significantly better than other body parts in all age groups of boys and girls ($p < 0.01$); (2) In both age groups of girls, the desirable body silhouette was significantly slimmer than the self-perceived body size ($p < 0.001$), however, the opposite situation was true for all boys, who wished to have more muscular bodies ($p < 0.05$), and (3) As for self-esteem, younger girls had a higher self-esteem than the older ones ($p < 0.05$), however, boys had a similar self-esteem regardless of their age group. Younger girls with normal weight had the best self-esteem ($p < 0.01$), but the highest self-esteem was among younger overweight boys. Both older girls and boys had a better self-esteem when underweight.

Conclusions. A different body size perception, a dissimilar breakthrough in the body image and self-esteem were established in boys as compared to girls during transition from adolescence to adulthood.

Keywords: adolescence, body image, self-esteem, young females, young males

A COMPARISON OF ANALGESIA METHODS AFTER KNEE JOINT ARTHROPLASTIC SURGERY: INTRATHECAL MORPHINE VERSUS LOCAL INFILTRATION WITH ROPIVACAINE

Greta Bukelytė[1], Greta Bružytė[1], Tomas Strainys[2], Eglė Kontrimavičiūtė[2, 3]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Clinic of Anaesthesiology and Intensive Care, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *tstrainys@yahoo.com*

Background and aim. To analyze the effectiveness and side effects of postoperative analgesia methods using intrathecal morphine or local infiltration of ropivacaine 24 hours after knee joint arthroplasty surgery with spinal anaesthesia.

Materials and methods. From 2016 to 2018, a prospective study was conducted at Vilnius University Hospital. Sixty-one patients who underwent knee joint arthroplasty surgery with spinal anaesthesia (heavy bupivacaine 0.5% 2–3 ml), were classified into two groups according to the postoperative analgesia method: group 1 (n = 35) – local knee soft tissue infiltration anaesthesia with ropivacaine (ropivacaine 225–300 mg, ketorolac 30 mg, adrenaline 0.2 mg), group 2 (n = 26) – intrathecal morphine sulfate (0.1–0.2 mg). Patients were examined 1, 2, 4, 6, 12, 18, and 24 hours postoperatively. Pain intensity was assessed at rest and in motion using VAS and patient satisfaction levels. Side effects (nausea, vomit, itch) were monitored and registered if noticed. Data were considered statistically significant if p was <0.05.

Results. Twelve hours after the surgery, mean values of VAS at rest were 1.4 ± 1.7/1.5 ± 1.3 in group 1 and group 2, respectively (p > 0.05). After 24 hours, the values were 1.7 ± 0.9/1.5 ± 1.3 (p > 0.05). Examining pain in motion 12 hours after surgery, pain intensity values were 2.5 ± 1.7/2.9 ± 1.9 (p > 0.05). After 24 hours, in both groups pain intensity was 3.2 ± 1.0/3.3 ± 1.5 (p > 0.05); 11.4% (n = 4) episodes of nausea were registered in group 1; 34.6% (n = 9) of group 2 patients experienced nausea and five of them also vomited (p = 0.0056). No patients of group 1 had itching, while 42.3% (n = 11) patients in group 2 indicated this side effect (p = 0.0001). Patients of both groups indicated similar satisfaction levels after 24 hours: 8.6 ± 1.2/8.5 ± 1.0 (p > 0.05).

Conclusions. VAS values at rest and in motion were similar in both groups 24 hours postoperatively, but patients with ropivacaine analgesia experienced fewer side effects.

Keywords: analgesia, arthroplasty, intrathecal morphine, local infiltration analgesia

MICRO-COMPUTED TOMOGRAPHY ASSESSMENT OF DENTINAL MICRO-CRACKS AFTER ROOT CANAL PREPARATION WITH ROTARY, HYBRID, AND RECIPROCATING NICKEL TITANIUM INSTRUMENT SYSTEMS

Ieva Buzytė[1], Saulius Drukteinis[1], Vytautė Pečiulienė[1], Hagay Shemesh[2]

[1] *Institute of Odontology, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Academic Centre for Dentistry Amsterdam (ACTA), Amsterdam, The Netherlands*
Email: *buzyieva@gmail.com*

Background and aim. Several studies have reported a causal relationship between preparation of the root canal with nickel-titanium (NiTi) instruments and the formation of dentinal micro-cracks. However, some studies have not revealed a causal relationship between instrumentation with rotary or reciprocating instruments and the formation of new dentinal defects.

The aim of this study was to evaluate and compare *ex vivo* the incidence of micro-cracks in root dentine after canal preparation with rotary, hybrid, and reciprocating NiTi endodontic instruments in extracted mandibular first molars using micro-computed tomography (MCT).

Materials and methods. Forty mandibular first molars were selected and assigned to four experimental groups (n = 10), according to the instrument system used for preparation: ProTaper NEXT (PTN), BioRace (BR), Genius

(GN), or WaveOne (WO) systems. Root canals were accessed in a conventional manner and instrumented using crown-down technique according to the manufacturer's protocol. MCT at an isotropic resolution of 22.8 μm was used to scan the specimens before and after instrumentation. Dentinal micro-cracks were assessed through a comparison of the pre- and post-instrumentation MCT scans at the coronal, middle, and apical thirds. One-way analysis of variance was performed to determine any significant differences between groups; significance was set at $p < 0.05$.

Results. No new micro-cracks were observed after root canal instrumentation with the hybrid GN instrument system. Rotary (PTN, BR) and reciprocating (WO) instrument systems caused dentinal micro-cracks, predominantly in the middle third of the root canals; however, no significant difference was found between them in the incidence of crack formation ($p > .05$).

Conclusions. Within the limitations of this study, root canal preparation with the hybrid Genius system did not induce the formation of dentinal micro-cracks, while root canal shaping with rotary and reciprocating file systems produced micro-cracks on the root canals of mandibular first molars.

Keywords: dentin micro-cracks, hybrid movement, microcomputed tomography, reciprocation, rotary

THE PREVALENCE AND TYPES OF IRON DEFICIENCY IN CARDIO-ONCOLOGY CLINIC PATIENTS

Eglė Čiburienė[1], Joaquim Cevallos[2], Nilesh Pareek[2], Vicki Chambers[2], Stuart Rosen[2], Alexander Lyon[2, 3]

[1] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Royal Brompton Hospital in London, London, UK*

[3] *Imperial College London, London, UK*

Email: *egle.ciburiene@gmail.com*

Background and aim. Iron deficiency is common in both heart failure (HF) and cancer patients and is associated with increased symptoms, reduced quality of life, and survival. Anaemia is also a common complication of iron deficiency in cancer patients. The Cardio-Oncology clinic assesses and treats cancer patients with various cardiac problems including cancer therapy-induced left ventricle (LV) impairment and heart failure (HF). The aims of this study were to evaluate the prevalence of iron deficiency in patients with cancer and cardiac disease, to identify the association between iron parameters and cancer type, cardiovascular risk factors, left ventricle ejection fraction (LVEF), and relation to survival.

Materials and methods. Data was collected retrospectively in Cardio-Oncology clinic at Royal Brompton Hospital between 1 February 2011 and 31 May 2017 (599 patients). We assessed iron, TSAT, ferritin and haemoglobin concentrations and analysed their association with BNP, LVEF, kidney function, and cardiovascular risk factors (arterial hypertension (AH), diabetes (DM), hypercholesterolemia, smoking).

Results. The incidence of iron deficiency was 46% of the cardio-oncology clinic patients. ID rates were highest in lung (67%), melanoma (67%), gastrointestinal (52%), gynaecological (52%), and breast cancer (48%). AID was determined in 31% and FID in 15% of the patients. Approximately half (54%) of the patients with absolute and functional ID were related to presence of anaemia.

Conclusion. There were more patients diagnosed with absolute iron deficiency (AID) than with functional iron deficiency (FID). FID was associated with more frequent positive BNP, anaemia, diminished LVEF, and higher mortality, whereas AID was related with diabetes and impaired kidney function.

Keywords: anaemia, cardio-oncology, iron deficiency

PREVALENCE OF NARCOLEPSY SYMPTOMATOLOGY AMONG LITHUANIAN PEOPLE

Dovilė Geštautaitė[1], Greta Jankutė[1], Evelina Pajėdienė[2]

[1] *Lithuanian University of Health Sciences, Kaunas, Lithuania*

[2] *Department of Neurology, the Hospital of LSMU Kauno Klinikos, Kaunas, Lithuania*
Email: *evelinaprei@gmail.com*

Introduction. Narcolepsy is a sleep disorder characterized by excessive sleepiness, and in some cases by episodes of cataplexy (partial or total loss of muscle control, often triggered by a strong emotion such as laughter). There is a great demand for epidemiological and clinical studies into the prevalence of narcolepsy and its clinical features in the Lithuanian population. The aim of this study was to determine the prevalence of narcolepsy symptoms in the population of Lithuania.

Materials and methods. Overall, 264 randomly selected subjects (age range 18 to 64) were interviewed. Participants were given questionnaires structured by sociodemographic questions, Pittsburgh Sleep Quality Index, Epworth Sleepiness Scale, and questions about the symptoms of narcolepsy. The study protocol was approved by the Bioethics Centre of the Lithuanian University of Health Sciences (No. BEC-MF-167). The SPSS software package was used for statistical analysis.

Results. A total of 264 accidental subjects of a mean age of 30.30 (S.D. 13.006, range 18 to 64, median 23) were interviewed. Of these, 61.98% were females (mean age 31.71, SD 13.785) and 38.02% were males (mean age 27.99, SD 11.317). The most common symptoms of cataplexy were knee unlocking (monthly 4.9%, weekly 1.1%, daily 0.8% of the participants) and head nodding (1.9%, 1.9%, 1.5%, respectively). The most common symptoms of hypersomnia were falling asleep during the day while reading (monthly 9.1%, weekly 1.5%, daily 1.1% of the participants) or travelling (3.4%, 2.7%, 0%, respectively). At least one symptom of cataplexy was reported by 35.4% of the participants, and 56.8% had at least one symptom of hypersomnia.

Conclusions. This was the first epidemiologic study that estimated the prevalence of the symptoms of narcolepsy in the Lithuanian population. More than one-third of the participants had at least one symptom of cataplexy, and more than half of the participants had at least one symptom of hypersomnia.

Keywords: excessive sleepiness, narcolepsy, sleep disorder

EPIDEMIOLOGY OF ACUTE HEPATITIS C VIRUS INFECTION IN LITHUANIA FROM 2005 TO 2017

Samanta Grubytė, Kęstutis Žagminas

Department of Public Health, Institute of Health Sciences, Faculty of Medicine, Vilnius University
Email: *samanta.grubyte@mf.vu.lt*

Background. Viral hepatitis remains an important public health concern in Europe, and Lithuania is not an exception. Data about viral hepatitis C is limited.

The aim of the study. To describe epidemiological patterns of acute HCV infection in Lithuania from 2005 to 2017.

Materials and methods. A descriptive method was applied for all laboratory-diagnosed cases of acute HCV officially registered via the national surveillance system during 2005 to 2017. The Mantel test was used for the trend of 2005–2017 estimation. The incidence ratio (IR) of hepatitis C was defined as the number of new infections per 100,000 people in a specific region during a particular time period. IR in terms of sex, age group, place of residence (urban or rural) were then estimated.

Results. From 2005 to 2017, 547 new cases of acute HCV were reported. The IR ranged from 2.04 cases per 100,000 people in 2005 to 0.56 in 2016. A decreasing and statistically significant ($p < 0.001$) trend in the IR was determined. The IR for men was 1.55 (CI: 0.85–2.85) times greater compared with women; the IR for urban residents was 1.82 (CI: 0.87–3.80) times greater than for rural residents. Almost 70% of the people diagnosed with acute HCV were aged between 18 and 44 years. In most of the reported cases in Lithuania, no risk factors were identified.

Conclusion. Being male, aged 18 to 44, and living in the city could be important factors for understanding the HCV patterns in Lithuania. Estimations of the risk factors should be improved by case investigations. The decreasing number of HCV cases diagnosed and registered in Lithuania differs from the data collected across the European Union. This shows that additional sources of data about HCV infection are needed in order to estimate the burden of the disease and to plan for its effective prevention and control.

Keywords: epidemiological patterns, hepatitis C virus, incidence

INFLUENCE OF HYPOXIA ON ALTERNATIVE APP AND TAU SPLICING

Eglė Jakubauskienė, Laurynas Vilys, Arvydas Kanopka

Department of Immunology and Cell Biology, Institute of Biotechnology, Life Sciences Centre, Vilnius University, Vilnius, Lithuania
Email: *egle.jakubauskiene@bti.vu.lt*

Background and aim. One of the most wide-spread neurological disorders, Alzheimer's disease, is characterized by progressive loss of the brain cognitive function. There are several identified causes of Alzheimer's disease: accumulation of beta amyloid (Aβ) peptides produced from amyloid precursor protein (APP) and accumulation of microtubule-associated protein Tau. The newest data state that a lack of oxygen in the brain cells (hypoxia) is involved in the development of neurodegenerative diseases. The initial step for cellular adaptation to reduced oxygen level is the stabilization of hypoxia-inducible factors (HIF) that activate the transcription of genes needed for cell survival in unfavourable environmental conditions. Apart from transcription activation under hypoxic conditions, changes in alternative pre-mRNA splicing occur when mRNA isoforms are formed and proteins translated from them promote cell survival under unfavourable conditions. We aim to analyze the influence of hypoxia on the formation of Tau and APP mRNA isoforms, since proteins translated from them are associated with neurodegenerative diseases.

Material and methods. U-87 and SK-N-Be cells were cultured under normoxic (21% O_2) and hypoxic (1% O_2) conditions. Endogenous APP and Tau pre-mRNAs were used for cDNAs synthesis. Further RT-PCR reactions were performed.

Results. Our results showed that hypoxic conditions promoted formation of Tau mRNA isoform, causing microtubule aggregation. We did not find any hypoxia-influenced changes in APP mRNA isoform formation.

Conclusions. Tau but not APP pre-mRNA splicing is regulated by cellular hypoxia. This research is funded by the European Social Fund under the No. 09.3.3-LMT-K-712 "Development of Competences of Scientists, Other Researchers, and Students through Practical Research Activities".

Keywords: Alzheimer's disease, alternative splicing, APP, hypoxia, Tau

ANXIETY AND DEPRESSION IN PATIENTS WITH PAROXYSMAL ATRIAL FIBRILLATION

Jonas Jarašūnas[1], Goda Jakovlevaitė[2], Audrius Aidietis[1]

[1] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Faculty of Medicine, Medical Academy, Lithuanian University of Health Sciences, Kaunas, Lithuania*
Email: *jonasjar@gmail.com*

Background and aim. Atrial fibrillation (AF) is the most common type of arrhythmia in the general population that is primarily caused by arterial hypertension. It is known to be associated with increased morbidity, mortality and decreased quality of life. Recent trials indicate that depression and anxiety play a major role in the patients' perception of AF symptoms and quality of life. We decided to determine the level of depression and anxiety in patients with uncomplicated paroxysmal atrial fibrillation presumably caused by arterial hypertension.

Material and methods. We assessed 60 patients with grade I or II primary arterial hypertension and at least one ECG confirmed episode of paroxysmal AF within last year. Patients with other known causes of AF, such as coronary heart disease, thyroid dysfunction, prior heart surgery, structural heart disease, reduced left ventricular ejection fraction, or renal failure with glomerular filtration rate <60 ml/min, were excluded from the study. Only the ones with hypertension as a possible causative factor for atrial fibrillation were included in the study. All patients completed hospital

anxiety and depression scale, which is composed of two subscales for depression and anxiety, ranging from 0 to 21 with higher scores indicating a more severe disorder.

Results. Seventy-five per cent of patients had anxiety levels greater than 7, which shows a probable anxiety disorder. The mean level of anxiety in all the patients was 9.33 (+/–2.72). Surprisingly, 100% of the patients had depression levels greater than 7, which is a proposed cut-off value for probable depression. The mean level of depression was 12.23 (+/–1.57).

Conclusions. Patients with paroxysmal AF and primary arterial hypertension have high levels of anxiety and depression.

Keywords: atrial fibrillation, hypertension, anxiety, depression

COLONIZATION OF CRITICALLY ILL ONCOHEMATHOLOGICAL PATIENTS WITH MULTIRESISTANT MICROORGANISMS AND THEIR DYNAMICS

Šarūnas Judickas[1], Greta Stanevičienė[2], Jūratė Šipylaitė[1]

[1] *Clinic of Anaesthesiology and Reanimatology, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

Email: *sarunas.judickas@mf.vu.lt*

Background and aim. Microbiota of oncohaematological patients undergoes changes due to long hospitalization and treatment with antibiotics. Patients become colonised with multiresistant microorganisms, which increases the chances of systemic infections caused by them. The aim of our study was to analyse the frequency of epidemiological cultures taken from oncohaemathological patients admitted to a critical care unit and to assess multiresistant microorganisms that are colonising patients.

Materials and methods. Retrospective analysis was made at Vilnius University Hospital Santaros Klinikos during the year 2016. Study included oncohaemathological patients admitted to Critical Care Unit 3. Data were collected from electronic records. We assessed the latest epidemiological stool cultures taken before transfer to Critical Care Unit and identified patients who had at least one positive epidemiological stool culture for multiresistant microorganisms. Microsoft Excel and SPSS were used for statistical analysis of the data.

Results. In total, 76 patients had 86 admissions to Critical Care Unit 3 during 2016. In 88.4% of the cases, at least one epidemiological stool culture was taken before transfer to the critical care unit. Analysis included 186 epidemiological stool cultures of which 42 (11.4%) were negative. The mean number of multiresistant microorganisms in one sample was 1.5 ± 1.2 and in 87 cases (38.2%) the patients were colonised with more than one microorganism. The most common coloniser was *Candida* spp. (123, or 35.2%); multiresistant microorganisms included *K. pneumoniae* ESBL (43, or 11.7%), *E. faecium* VRE (32, or 8.7%), *E. coli* ESBL (25, or 6.8%), *A. baumannii* (17, or 4.6%), *E. faecium* VRE + LRE (7, or 1.9%), *K. pneumoniae* CARBA (5, or 1.4%), and *P. aeruginosa* CARBA (5, or 1.4%).

Conclusions. High proportion of oncohaemathological patients who were admitted to the critical care unit had epidemiological stool cultures taken. The most common multiresistant microorganisms were *K. pneumoniae* ESBL, *E. faecium* VRE, and *E. coli* ESBL.

Keywords: oncohaemathology, colonisation, multiresistant microorganisms

SUICIDE RISK AMONG LUNG CANCER PATIENTS IN LITHUANIA

Augustė Kačėnienė[1], Edvardas Danila[2, 3], Saulius Cicėnas[1], Giedrė Smailytė[1, 4]

[1] *National Cancer Institute, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Clinic of Infectious and Chest Diseases, Dermatovenereology, and Allergology, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[4] *Institute of Public Health, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *auguste.kaceniene@nvi.lt*

Background and aim. Several large studies based on cancer registry data have demonstrated an increased risk of suicide among cancer patients as compared with the general population. In this study, we explored whether the suicide risk was affected by a lung cancer diagnosis among cancer patients in Lithuania in relation to demographic and disease-related characteristics.

Material and methods. In total, 19,781 primary lung cancer cases diagnosed between 1998 and 2012 were included in the analysis. The mortality codes for suicide were defined as X60–X84. Sex, age, and calendar period-standardized mortality ratios (SMRs) were calculated by dividing the observed numbers of suicides among lung cancer patients by the expected number of deaths calculated using national rates.

Results. An increased suicide risk was found for men (SMR 2.24; 95% confidence interval (CI) 1.64–3.05), but not for women (SMR 0.98; 95% CI 0.14–6.93). Compared with the general population, the risk of suicide among lung cancer patients was three times higher during the first three months after diagnosis (SMR 3.02; 95% CI 1.57–5.84) and the 7th and the 9th months after diagnosis, with the highest observed SMR (5.23; 95% CI 2.62–10.47). The risk of suicide was not significantly elevated in men with localized or with local spread tumours, but there was a three-fold increase in risk in patients with regional spread and advanced tumours (SMR 2.91; 95% CI 1.83–4.62 and 2.85; 95% CI 1.36–5.98).

Conclusions. We found an increased suicide risk in men with lung cancer, especially shortly after diagnosis, and presumably during disease recurrence or progression. There was an increased risk of suicide for men with advanced and metastatic disease, which is important to acknowledge in order to focus on the need to identify signs of depression and optimize treatment among this category of patients.

Keywords: lung cancer; population-based study; suicide risk

DISPLACEMENT OF *LAMINA CRIBROSA* AFTER GLAUCOMA SURGERY

Aistė Kadziauskienė[1, 2], Ernesta Jašinskienė[2], Rimvydas Ašoklis[1, 2], Eugenijus Lesinskas[1, 2], Leopold Schmetterer[3, 4, 5, 6, 7]

[1] *Clinic of Ears, Nose, Throat, and Eye Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Singapore Eye Research Institute, Singapore National Eye Centre, Singapore*

[4] *Ophthalmology and Visual Sciences Academic Clinical Program, Duke-NUS Medical School, Singapore*

[5] *Lee Kong Chian School of Medicine, Nanyang Technological University, Singapore*

[6] *Department of Clinical Pharmacology, Medical University of Vienna, Vienna, Austria*

[7] *Centre for Medical Physics and Biomedical Engineering, Medical University of Vienna, Vienna, Austria*
Email: *aistedam@gmail.com*

Background and aim. The biomechanical paradigm of glaucoma postulates that elevated IOP (intraocular pressure) causes *lamina cribrosa* (LC) compression, stretch and shear, which lead to LC deformations, strains on glial cells, and subsequent damage of retinal ganglion cell axons. Hence, all morphological parameters describing the biomechanics of LC in relation to IOP have a great importance for improving knowledge about the pathogenesis of glaucoma. The aim of this study was to evaluate changes of LC depth (LCD) after glaucoma surgery.

Materials and methods. The prospective observational study included 112 patients (118 eyes) with open- or closed-angle glaucoma undergoing trabeculectomy. The LC was imaged using spectral domain optical coherence tomography preoperatively and at six follow-ups during the first postoperative year. Anterior LC surface and Bruch's membrane opening were marked in each of the serial horizontal B scans. Mean and sectoral LCD parameters were calculated using Morphology 1.0 software.

Results. The mean and sectoral LCD decreased at all follow-ups after the trabeculectomy ($p < 0.001$). LC shallowed until the sixth month. The trend of temporal sequence of LCD was consistent for all LCD parameters. However, at 35 follow-ups (28 patients) an increase of mean LCD was observed. Most of the cases with posterior LC movement occurred during the first postoperative month and reduced significantly over time ($p < 0.001$). There was an association between greater decrease of the mean LCD with younger age and IOP reduction. The eyes with decreased LCD were associated with greater LCD shallowing in response to IOP reduction than the eyes with increased LCD ($p = 0.002$).

Conclusions. In most eyes, trabeculectomy induces a long-term shallowing of the LC. IOP reduction plays an important role for the magnitude and direction of LC displacement. However, LC remodeling should also be considered since the LC changes proceed with stable IOP.

Keywords: intraocular pressure, *lamina cribrosa*, *lamina cribrosa* depth, trabeculectomy

THE ONSET OF ATOPIC DERMATITIS IS NOT RELATED TO THE DOSES OF VACCINES RECEIVED DURING THE FIRST SEVEN MONTHS OF LIFE

Justina Kučinskaitė[1], Agnė Krživickytė[1], Agnė Jagelavičienė[2], Vytautas Usonis[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Children's Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *agne.jagelaviciene@mf.vu.lt*

Introduction. Evolution can be understood not only as natural selection and a change in the heritable characteristics of biological populations over successive generations, but also as a change in our lifestyle and healthcare system. Although availability and spread of information is growing, the opinion in modern society that routine vaccination could exacerbate or even promote allergy is still alive.

The aim of the study. To analyze the association between received doses of Hepatitis B (HB) and Diphtheria, Tetanus, acellular Pertussis, Poliomyelitis, *Haemophilus influenzae* (DTaP-IPV-Hib) vaccines until 7 months of age and the time of the onset of atopic dermatitis.

Materials and methods. A retrospective case-control study was conducted. An electronic database of an outpatient clinic was used for the selection of atopic children. Health records of 242 children born in 2009 and diagnosed with atopic dermatitis were analysed. Participants were classified into three groups according to HBV and DTaP-IPV-Hib vaccination accomplishment until the end of the 7th month.

Results. The study sample consisted of 128 boys (52.9%) and 114 girls (47.1%). Of all these children, 174 were ranked as fully vaccinated by the end of the 7th month, 57 as partially vaccinated, and 11 as not vaccinated. The average time for the onset of atopic dermatitis was 10.36 ± 2.69 months in the group of the fully vaccinated children, 14.08 ± 2.01 months in the partially vaccinated group, and 13.69 ± 0.86 months in the non-vaccinated children. The relationship between the time of the onset of atopic dermatitis and the number of the received doses of the vaccines failed to yield statistical significance.

Conclusion. Our results indicate that the number of doses of the HB and DTaP-IPV-Hib vaccines received during the first seven months of life has no influence on the time of the onset of atopic dermatitis. The information that children vaccination is not a risk factor for the evolution of atopy could be a supportive for parents and paediatricians.

Keywords: atopic dermatitis, children, vaccination

PROTEOMIC ANALYSIS OF CANCEROUS, INFLAMMATORY, AND HEALTHY PANCREATIC TISSUES: DISCOVERY OF A POTENTIAL BIOMARKER TO IMPROVE DIAGNOSTICS OF PANCREATIC CANCER

Benediktas Kurlinkus[1, 2], Audrius Šileikis[1, 2], Mindaugas Valius[3], Jonas Cicėnas[3, 4], Algirdas Kaupinis[3], Marija Ger[3], Marius Petrulionis[1, 2], Kęstutis Strupas[1, 2]

[1] *Clinic of Gastroenterology, Nephro-Urology and Surgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Proteomics Centre, Institute of Biochemistry, Life Sciences Centre, Vilnius University, Vilnius, Lithuania*

[4] *MAP Kinase Resource, Bern, Switzerland*
Email: *benas_kurlinkus@yahoo.com*

Background and aim. Evolution of pancreatic cancer has led to a dramatic increase of its incidence rates during the last few decades, in contrast to the stable or even declining trends for most of the other cancer types. It is a lethal disease characterized by a usual late diagnosis and sequential poor prognosis. Scientists are still trying to find new strategies for early diagnostics of pancreatic cancer. Improved imaging capabilities have not led to any expected advances. Therefore, biomarker research appears to be a promising option. The aim of this study was to find a potential biomarker in order to improve diagnostics of pancreatic cancer.

Materials and methods. We performed liquid chromatography-mass spectrometry and quantitative proteomic analysis of four tissue sample groups, with five samples for each type: pancreatic cancer with a diameter of 2 cm or smaller, pancreatic cancer larger than 2 cm, as well as inflamed and healthy pancreas.

Results. Among the proteins found, P01892, Q95365, Q562R1, Q9TQE0, Q562R1, A6NMY6, Q6GPI1, Q96E17, Q8NHP1, Q8NHW5, and Q8NHM4 could potentially assist in the diagnostics of small tumours, and most of them were not over- or underexpressed in pancreatitis. These proteins could improve differential diagnostics between pancreatitis and pancreatic cancer, which is a real clinical issue at the moment.

Conclusions. Although our findings seem promising, these proteins have to be validated in a larger group of patients and cross-validated using other protein detection methods.

Keywords: biomarker, pancreatic cancer, proteomic analysis

DEMOGRAPHIC, CLINICAL, AND COGNITIVE PREDICTORS OF THE RESPONSE OF ALZHEIMER'S DISEASE TO TREATMENT WITH DONEPEZIL

Jurgita Kuzmickienė, Gintaras Kaubrys

Clinic of Neurology and Neurosurgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *jurgitakuzmickiene@gmail.com*

Background and aim. Demographic, clinical, and cognitive predictors of treatment efficacy in Alzheimer disease (AD) may be useful in clinical practice. The aim of this study was to establish whether demographic, clinical, and cognitive characteristics may predict the efficacy of treatment with donepezil in AD.

Materials and methods. Sixty-two de novo AD patients and 30 healthy controls (HC) were enrolled in the study. Participants were assessed with the Cambridge Neuropsychological Test Automated Battery (CANTAB). Episodic memory was assessed with Paired Associates Learning (PAL), recognition memory with Pattern Recognition Memory delayed (PRMd), and working memory with Spatial Working Memory (SWM). The measure of overall dementia severity was Mini-Mental State Examination (MMSE). Depression level was assessed with Geriatric Depression Scale (GDS). The efficacy measures were changes in scores of PAL, SWM, PRMd from baseline to maximum improvement after four months of treatment.

Results. For analysis of age effect, the patients were divided into those aged <77 years (<median) and those aged ≥77 years (≥median). Our study found donepezil to be more efficacious in younger patients on PAL Total errors adjusted (PAL_TEA) score ($U = 321$; $p = 0.026$). For the analysis of education effect, participants were divided into

those with education <11 years (<median) and those with ≥11 years (≥median). The AD patients with higher education showed greater improvement on SWM Total errors (SWM_TE) (U = 246; p = 0.001). Women improved more than men on PAL_TEA (U = 320; p = 0.027). The patients without depression (GDS = 0–9) responded to therapy better than those with mild depression (GDS = 10–19) on SWM_TE (U = 20.5; p < 0.001). Mild dementia participants (MMSE = 21–23) improved more than moderate dementia patients (MMSE = 18–20) on PAL_TEA (U = 280; p = 0.007) and PRMd Number correct (U = 316; p = 0.031).

Conclusions. The demographic, clinical, and cognitive characteristics may predict the efficacy of AD treatment with donepezil in different domains of cognitive function as assessed with CANTAB. Our study supports treatment benefits in early AD.

Keywords: Alzheimer's disease, CANTAB, cholinesterase inhibitors, dementia, treatment efficacy predictor

MORPHOLOGICAL CHANGES OF THE AGING RETINA IN AN EXPERIMENTAL MODEL OF MATERNAL NUTRITIONAL RESTRICTION

Guoda Laurinavičiūtė[1], Violeta Bartuškienė[1], Agnė Žiniauskaitė[2], Symantas Ragauskas[2], Giedrius Kalesnykas[2], Violeta Žalgevičienė[1], Renata Šimkūnaitė-Rizgelienė[1], Ramunė Čepulienė[1], Eglė Marija Jakimavičienė[1], Saulius Galgauskas[3], Janina Tutkuvienė[1]

[1] *Department of Anatomy, Histology and Anthropology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Experimentica Ltd, Kuopio, Finland*

[3] *Department of Ophthalmology, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *janina.tutkuviene@mf.vu.lt*

Background and aim. Negative body image and cultural expectations of thinness often trigger young women to diet and to lose weight. It is known that maternal nutritional stress during pregnancy may diversely impair postnatal health of the offspring. The purpose of our study was to evaluate the impact of maternal nutritional restrictions during sensitive periods of growth on morphological changes of the aging retina.

Materials and methods. The experiment was conducted from 2013 to 2016; 27 rat eyes (nine of the first and 18 of the second generation of 20-month-old offspring) were analysed. The offspring were born to mothers that were 50% food-restricted (FR) either before pregnancy only (group 1), or before and throughout the pregnancy periods (group 2). FR rats received 50% less food as compared to the control group. The control group, as well as all the offspring, were fed normally. Following the whole-body perfusion, fixation, dissection, and isolation of the retinas, cryo and paraffin sectioning was performed; 60 samples from each eye were collected, stained with H&E and immunostained with IBA 1 (1:500), GFAP (1:1000), and RBPMS (1:200). In each sampling field, the number of RBPMS-positive cells in ganglion cells layers, retinal microglia (active and silent) in the inner plexiform layer were counted. The photoreceptor layer and Müller cells were also evaluated.

Results. The 1st and 2nd groups had a significant loss of the photoreceptor layer as well as a statistically significant thinning of the outer nuclear layer (p < 0.05) as compared to the control group (p < 0.05). The retinal microglial cells were active in all the groups. In 77.8% of Müller cells an increased activity was observed, with no difference among the groups (p > 0.05). No significant difference in the amount of retinal ganglion and microglial cells among the groups was found (p > 0.05).

Conclusions. Dietary restriction during sensitive periods of growth may induce significant photoreceptor degeneration and thinning of the outer nuclear layer of the aging retina. These findings suggest that the damage caused by nutritional deprivation may be distributed across all organ systems including those significant for survival. Further studies of a greater extent are needed.

Keywords: Müller cells, nutritional restriction, photoreceptors, retina

TEACHERS' PARTICIPATION IN SCHOOLCHILDREN'S HEALTH PROMOTION PROCESS: RESULTS OF A PILOT STUDY

Rūta Maceinaitė, Genė Šurkienė

Department of Public Health, Institute of Health Science, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *ruta.maceinaite@gmail.com*

Background and aim. Health promotion provides more opportunities of taking care of health and improving it. The school is the best place for children's health promotion process (HPP). The whole school community should be involved in it. Information about the participation of the school community in HPP is instrumental when planning measures to improve the situation. The shortage of information about teachers' participation in schoolchildren's health promotion leads to the aim of this study, which was to determine the participation of teachers in schoolchildren's HPP.

Materials and methods. Cross-sectional study was performed in 2015: 684 parents from 28 school communities were surveyed by an anonymous questionnaire. Chi square test and logistic regression models were used for the data analysis.

Results. Sixty-nine per cent (95% CI: 65.4; 72.4) of teachers participated in HPP. Participation was significantly related to work at a health promoting school (HPS) (ORa = 4.06 (95% CI: 2.84; 5.81) and teaching such subjects as art, music, or physical education (ORa = 2.21 (95% CI: 1.44; 3.38)). Participation in health promoting events (71.4% (95% CI: 67.2; 75.3)), assistance in organizing events (50.6% (95% CI: 46.1; 55.1)) were the most common ways of teachers' participation. More than half of teachers (55.5% (95% CI: 51.0; 60.0)) evaluated their participation in HPP as good or very good and only 6.1% (95% CI: 4.3; 8.7) of them evaluated their participation as bad or very bad. Evaluation of participation was significantly related to work at a HPS and the subject taught. 84.9% (95%. CI 81.0; 88.5) of health promotion schools teachers knew that their school is HPS.

Conclusions. The majority of teachers participated in HPP and more than half of the respondents evaluated their participation as good or very good. Participation and evaluation of participation were significantly related to work at a HPS and the subject taught. Participation in health promoting events is the most common way of teachers' participation.

Keywords: health promotion, health promoting school, teachers' participation

SMOKING CESSATION SUPPORT FOR MENTALLY ILL PATIENTS. A CLINICAL CASE

Domantė Mačiulytė[1], Viktorija Andrejevaitė[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Internal Diseases, Family Medicine and Oncology, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *viktorija.andrejevaite@gmail.com*

Introduction. In 2015, over 1.1 billion people smoked tobacco. Although smoking is declining worldwide and in many countries, the prevalence of tobacco smoking appears to be increasing in some regions. About half of the regular smokers die from tobacco-induced diseases and live about ten years shorter than never smokers. Research shows that depending on the disease and its severity, patients with mental illness smoke more often than the general population, so the risk of tobacco-related illnesses is higher for them. Those patients want to quit smoking as much as non-psychiatric patients, but their dependence on nicotine is often stronger because of the association of smoking with psychiatric disorders. It becomes harder for them to quit smoking; they are more likely to experience unsuccessful attempts.

Clinical case. A 48-year-old man regularly smoked since the age of 16, on average 22 cigarettes a day, sometimes even at night. The patient is alcohol-dependent, treated for depression three times, and has an anxiety disorder. He has a moderate dependency on nicotine and an average risk of health and other problems due to tobacco use. He tried to quit smoking ten times. During the first quitting attempt, he used only nicotine chewing gum and did not smoke for one month. Smoking friends had the strongest impact on him smoking again. Other attempts were

similar. In 2015, he repeated cycles when he did not smoke for about three weeks and then smoked five cigarettes a day for two weeks. At that time, he used nicotine chewing gum, a nicotine patch, and attended group therapy sessions. Continuation to smoke provoked stress and the wish to feel better.

Conclusion. Due to a lack of specialized help in smoking cessation in Lithuania, the role of the family doctor is important, especially in helping mentally ill patients due to their higher dependence. The most effective method of supported smoking cessation is a combination of smoking cessation medication and cognitive behavioural therapy.

Keywords: mental health, smoking, smoking cessation, nicotine replacement therapy, cognitive behavioural therapy

RETURN TO SPORT COULD BE FASTER AFTER OPEN REPAIR OF ACUTE ACHILLES TENDON RUPTURE

Aleksas Makulavičius[1, 2], Matas Urmanavičius[2], Giedrius Mazarevičius[2], Mindaugas Klinga[2], Valentinas Uvarovas[1, 2], Xavier Martin[3], Narūnas Porvaneckas[1, 2]

[1] *Clinic of Rheumatology, Orthopaedics Traumatology and Reconstructive Surgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Republican Vilnius University Hospital, Vilnius, Lithuania*

[3] *Department of Embryology and Human Anatomy, Medical faculty, University of Barcelona, Barcelona, Spain*
Email: *makulaviciusa@gmail.com*

Background and aim. The optimal treatment of acute Achilles tendon rupture (AATR) in active adults is still controversial. Different treatment protocols may be effective and all have some advantages and complications. The purpose of this study was to compare short-term functional results and return to sport in young healthy adults after open modified "crown" type Achilles tendon repair and pure percutaneous Bunnell type repair.

Materials and methods. One hundred patients suffering from acute Achilles tendon rupture were enrolled in our prospective randomized study on the method of surgical treatment. The sample was randomly selected using sealed opaque envelopes. Patients in group 1 were treated with an open "crown" type repair and those in group 2 with a percutaneous Bunnell type technique. Resorbable material was used in both repair techniques. Three surgeons – one senior and two senior residents – performed all procedures. Functional results after the first year, with emphasis on the return to sport, were compared between the two groups.

Results. The mean patient age was 36.9 years, 88 being males, and 12 females. No statistically significant difference in functional results (ATRS, single heel rise) or return to sport and days off work was seen between groups. There were four re-ruptures (two in each group). No statistically significant difference in the rate of complications was detected between the groups except for the sural nerve entrapments. All three cases were reported in the group treated with percutaneous repair. Return to sport was a bit faster in the open repair group (192 vs. 215 days), but did not reach a statistically significant difference. There was no statistically significant difference in the rate of complications.

Interpretation. Return to sport may be faster in open repair but no statistically significant difference was observed.

Keywords: acute rupture, Achilles tendon, open repair, percutaneous repair

DEONTOLOGICAL EXAMINATION AS A CRITERION FOR THE ASSESSMENT OF PROFESSIONAL QUALITY IN PERSONAL HEALTH CARE

Sandra Mažeikienė[1], Sigitas Laima[1], Sigitas Chmieliauskas[1], Dmitrij Fomin[2], Rokas Šimakauskas[1], Jurgita Stasiūnienė[1]

[1] *Department of Pathology, Forensic Medicine, and Pharmacology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *s.matickaite@gmail.com*

Background and aim. Improvement of health care quality is one of the top-priority long-term strategies in the European Union. Professional quality is an important factor of personal health care quality. Medical errors arising due to the lack of professional quality are not uncommon in practice. In Lithuania, cases of suspected medical malpractice are assessed by deontological examination (DE). The aim of this study was to evaluate medical errors by analyzing DE reports.

Materials and methods. Retrospective analysis of 1007 DE reports (State Forensic Medicine Service, period 1990–2016) was performed. SPSS 22.0 was used for data analysis.

Results. Most DEs were performed in 2011 (73), and fewest in 1991 (2). Patients were males in 600 (60%) cases, and females in 407 (40%) cases. The highest number of DEs among males was in the age group of 41–50 (152), and the lowest in the age group of 6–15 (17). The highest number of DEs among females was in the age group of 31–40 (68), and the lowest in the age group of 2–5 (9). The largest numbers of suspected malpractice cases were found in the following departments: surgery 211 (21%), emergency 126 (13%), obstetrics-gynaecology 100 (10%), intensive care 94 (9%), and neurosurgery 65 (6%). In 715 (71%) cases, DEs were ordered due to the patient's death. Clinical and forensic medical diagnoses matched in 79% of the cases, a partial diagnostic discrepancy was observed in 7% of the cases, and an absolute discrepancy in 13% of the cases. Diagnostic discrepancies were less prevalent among younger patients. Intracranial injuries were most commonly misdiagnosed (15%). In 684 (68%) cases, medical negligence was disproved.

Conclusions. (1) DEs were most commonly performed due to the cases of suspected malpractice in surgery, emergency, obstetrics-gynaecology, intensive care, and neurosurgery departments; (2) Diagnostic discrepancies were less prevalent among younger patients. (3) Intracranial injuries were most commonly misdiagnosed. (4) A unified database of DE reports would contribute to the improvement of professional quality in personal healthcare.

Keywords: deontological examination, diagnosis discrepancy, medical error

METHODOLOGICAL CONSIDERATIONS FOR MEASURING HAIR CORTISOL LEVEL AS A BIOLOGICAL MARKER OF CHRONIC STRESS

Eglė Mazgelytė, Dovilė Karčiauskaitė, Aušra Linkevičiūtė, Zita Aušrelė Kučinskienė

Department of Physiology, Biochemistry, Microbiology, and Laboratory Medicine, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *egle.mazgelyte@mf.vu.lt*

Background and aim. Chronic increase of cortisol level is hypothesized to contribute to the development of metabolic and cardiovascular disease. Investigation of saliva, serum, and urine provides information about cortisol production of a period up to 24 h. However, long-term integrated hormone secretion can be assessed by measuring cortisol concentration in scalp hair. The aim of this study was to develop and adapt a method for cortisol extraction and analysis from human scalp hair.

Materials and methods. Hair samples of 163 healthy men (aged 25–55 years) participating in the ATEROSTRES study were collected. Hair cortisol concentrations (HCC) were determined from the most proximal segment of the 3 cm scalp hair which represents three months prior to sampling grown hair. Samples were finely cut with scissors and washed twice in isopropanol followed by the incubation in Soerensen buffer and solid-phase extraction procedure. Identification and quantitative determination of cortisol was performed using high performance liquid chromatography with ultraviolet-visible spectrophotometry (HPLC-UV/Vis) detection.

Results. The median HCC was 46.182 ng/g (range 0.633–858.314 ng/g). Results indicate good linear responses in the ranges 5–150 ng/g with correlation coefficient 0.9998. The limit of detection (LOD) and limit of quantification (LOQ) for cortisol were 15.6 ng/g and 47.2 ng/g respectively.

Conclusions. Hair cortisol analysis is a promising tool for evaluating long-term cortisol exposure and chronic stress in a variety of health conditions. However, the sensitivity of the HPLC-UV/Vis method is limited as the LOQ value was higher than the content of analytes in some hair samples. More sensitive and specific methods such as HPLC coupled with mass spectrometry or HPLC-tandem mass spectrometry for determination of cortisol in human hair should be considered.

Keywords: chronic stress, hair cortisol concentration, HPLC-UV/Vis

SURVIVAL AFTER LOWER-LIMB AMPUTATION

Greta Mickevičiūtė[1, 2], Tomas Baltrūnas[2, 3], Kęstutis Ručinskas[2, 3]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *tomas.baltrunas@gmail.com*

Introduction. Peripheral artery disease caused by atherosclerosis is a major healthcare problem. Lower limb amputation is a widely practised procedure with severe morbidity and mortality rates even in hospitals where it may be avoided through surgery.

The aim of the study. To determine the life expectancy of the patients who underwent amputation of a lower extremity and to determine the risk factors that result in shorter life expectancy such as the level of the amputation, age, sex, and other comorbidities.

Materials and methods. A restrospective multicentre research was performed: 1402 patients who underwent lower extremity amputation from 2005 to 2010 were included. All operations were performed in three different hospitals: Vilnius City Clinical Hospital, Vilnius University Hospital and State Vilnius University Hospital.

Results. The mean age at the time of procedure was 71 years. The mean death rate was 20% within the first 30 days, 40%within one year, 60% within three years, and it reached 70% after five years. A statistically relevant death rate difference was found when comparing sex-based groups, different comorbidities, as well as considering whether the procedure was performed above the ankle or below the ankle. There was no significant difference regardless of whether the amputation was bilateral, or whether any vascular surgeries were performed before the major amputation, or regardless of the number of minor amputations or the reamputation rate.

Conclusions. This research has shown that amputation of the lower extremity is mostly performed on elderly patients who have one or more comorbidities. We have found that women have a much higher morbidity rate as compared with men according to Kaplan-Mayer survival curves. Very high death rates suggest that new strategies for the procedure and aftercare are needed.

Keywords: amputation, critical limb ischemia, lower extremity amputation, survival after lower extremity amputation

THE 110TH BIRTH ANNIVERSARY OF PROFESSOR VLADAS KVIKLYS, THE INITIATOR OF SCHOOL HYGIENE IN LITHUANIA

Vitalija Miežutavičiūtė

Department of Medical History and Ethics, Institute of Health Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *vitalija.miezutaviciute@mf.vu.lt*

In 2018 we are celebrating the 110th birth anniversary of Professor Vladas Kviklys, a well-known Lithuanian hygienist, *doctor habilis*, a journalist, and the initiator of school hygiene in Lithuania.

He was born in 1908, into a farmer's family in the Utena county. In 1928 he finished the gymnasium in Rokiškis, entered the Medical Faculty at Vytautas Magnus University, and graduated in 1934.

In 1934, Vladas Kviklys received a grant from the Ministry of Education and Science of Lithuania and continued his studies at the Higher Academy of Physical Culture in Rome. At the same time he worked at the Physical Culture Palace where he edited its periodical publications. In 1935, Vladas Kviklys moved to Austria and continued his studies at the Medical Faculty of Graz University. In 1936, he was appointed as an official Lithuanian press journalist for the Garmisch-Partenkirchen Winter Olympics. When Germany occupied Austria in 1938, Vladas Kviklys returned to Lithuania and started to work at Vytautas Magnus University. He initiated his research on sanitation conditions in Lithuanian schools and pupils' health. The results of his studies were published in the journal *Medicina* in 1939. From 1945, Vladas Kviklys worked as a lecturer at the Faculty of Medicine of Vilnius University. He taught physical education theory and sport hygiene. In addition, he gave lectures on school hygiene at the Vilnius Pedagogical Institute.

From 1945 to 1962, Professor Vladas Kviklys was the director of the Sanitation and Hygiene Institute in Vilnius. Under his management the Institute grew as a scientific and practical institution where sanitation consequences of the war, the problems of rural population, occupational health, nutrition, and child and teenager hygiene were researched. PhD projects, scientific-practical conferences, and seminars for the physicians based on these themes were organized and run in various regions of Lithuania. Considerable attention was paid to hygiene in the schools and child and teenager health that were Prof. Vladas Kviklys' main and favourite research objects. In 1949, Vladas Kviklys defended his doctoral thesis "Application of Basic School Hygiene During the Post-war Rebuilding of Schools".

Professor Vladas Kviklys was a honorary member of the Vilnius Medical Society. In remembrance of this great Lithuanian physician, the Vladas Kviklys Award for the best hygiene-related research work was established by his son, Gediminas Kviklys.

THE IMPACT OF NUTRITION ON THE MORTALITY RATE IN INTENSIVE CARE UNITS

Ignas Milkevičius[1], Jonas Tutkus[1], Erika Šalčiūtė[1, 2], Eduardas Ambrasas[1, 2], Andrius Klimašauskas[2, 3]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Department of Anaesthesiology and Intensive Care, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *andrius.klimasauskas@mf.vu.lt*

Background and aim. The lack of sufficient nutrition to critically ill patients might result in higher mortality rates. The purpose of the study was to evaluate the impact of the amount of received proteins and calories on the mortality rate of critically ill patients.

Materials and methods. A prospective study was conducted in three intensive care units at Vilnius University Hospital for 130 days. Inclusion criteria were adult critically ill patients receiving mechanical ventilation and enteral or parenteral nutrition. The caloric and protein needs were calculated as advocated by the latest ASPEN guidelines. Nutritional risk was assessed using NRS 2002 and NUTRIC scores. Statistical analysis was performed with SPSS. The study was approved by the Vilnius Regional Biomedical Research Ethics Committee.

Results. Out of 67 patients, 47 were men (70.1%): 47 patients (70.1%) were of high nutritional risk. The overall mortality was 35.82%. The non-survivors and survivors did not differ in: average age (65 ± 13 and 64 ± 13 years,

respectively; $p = 0.711$), APACHE II score (19 ± 6 and 19 ± 8; $p = 0.844$); SAPS3 score (64 ± 13 and 61 ± 13; $p = 0.384$); nutritional risk (percentage of high risk patients: 70.8% and 69.8%; $p = 0.384$); received calories (18.32 ± 6.348 and 17.567 ± 5.708, $p = 0.488$ kcal/kg); caloric deficit (–3.55 ± 5.50, and –4.95 ± 5.75 kcal/kg, $p = 0.339$); % of goal calories (85.6 ± 23.51 and 83.41 ± 23.93, $p = 0.718$%), and the amount of received proteins (0.84 ± 0.417 and 0.81 ± 0.33 g/kg; $p = 0.726$). After the adjustment for covariates, there was no influence of nutrition on the mortality rate: received calories (OR 1.185; 95% CI [0.92–1.526], $p = 0.188$), % of calories goal (OR 0.932, 95% CI [0.855–1.017], $p = 0.115$), and the amount of received proteins (OR 1.27, 95% PI [0.051–31.576], $p = 0.884$).

Conclusion. According to this study, the amount of received calories and proteins had no influence on the mortality rate of patients in an intensive care unit.

Keywords: calories, critical care, nutrition, proteins

EFFECTS OF SODIUM VALPROATE ON CHICKEN EMBRYO CHORIOALLANTOIC MEMBRANE AFTER SMALL CELL LUNG CANCER TUMOUR TRANSPLANTATION

Raminta Mozūraitė[1], Lina Šlekienė[1], Donatas Stakišaitis[2], Ingrida Balnytė[1], Angelija Valančiūtė[1]

[1] *Department of Histology and Embryology, Medical Faculty, Lithuanian University of Health Sciences, Kaunas, Lithuania*

[2] *National Cancer Institute, Vilnius, Lithuania*

Email: *raminta.mozuraite@gmail.com*

The aim of the study. To test the angiogenic changes in chicken embryo chorioallantoic membrane (CAM) and the proliferating cell nuclear antigen (PCNA) expression in small cell lung cancer (SCLC) cell line NCI-H146 tumours under the influence of sodium valproate (NaVP).

Materials and methods. Lung cancer tumour cells were investigated in different groups of: non-treated, and treated with a 2 mM, 3 mM, 4 mM, 6 mM, or 8 mM concentration of NaVP. 3D tumours were transplanted on the CAM. The number and area of blood vessels in the CAM under the transplanted tumour and in the neighbouring areas were calculated. SCLC tumour cells positive for PCNA and the correlation between their expression and the number of blood vessels were calculated.

Results. Significant differences in the number of blood vessels were observed between non-treated and NaVP-treated with a 3, 4, 6 ($p < 0.05$), and 8 ($p < 0.001$) mM concentration groups. The 2 mM NaVP group significantly differed only when compared with the NaVP groups of 6 and 8 mM ($p < 0.01$). The number of blood vessels in the intact control group significantly differed from all other investigated groups ($p < 0.005 – p < 0.0001$). The area of blood vessels differed mainly in the part under the implant (non-treated vs 6 mM and 8 mM NaVP, $p < 0.05$; 2 mM vs 6 mM NaVP, $p < 0.01$; and 8 mM NaVP, $p < 0.05$). The blood vessels in the neighbouring areas differed significantly only comparing the 6 mM NaVP group with the groups of intact control and 4 mM NaVP ($p < 0.05$). PCNA expression was the highest in the non-treated tumours. The correlation between blood vessel number and PCNA expression was $r = 0.70$ ($p < 0.001$).

Conclusions. NaVP showed an anti-angiogenic effect only if the concentration reached 3 mM. The high expression of PCNA indicates a highly proliferative capability of the SCLC tumours. High concentrations of NaVP (6 and 8 mM) reduced PCNA expression.

Keywords: chicken chorioallantoic membrane (CAM), proliferating cell nuclear antigen (PCNA), sodium valproate (NaVP)

EFFECT OF FBW7 ACTIVATOR ORIDONIN AND MDM2 INHIBITORS NUTLIN-3/RITA ON HUMAN MELANOMA CELL LINES

Julija Mozūraitienė[1], Aistė Petrovaitė[2], Kristina Bielskienė[3], Živilė Gudlevičienė[3]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Institute of Biosciences, Life Sciences Centre, Vilnius University, Vilnius, Lithuania*

[3] *National Cancer Institute, Vilnius, Lithuania*
Email: *julija.mozuraitiene@gmail.com*

Background and aim. We speculate that FBW7 and MDM2 are attractive therapeutic targets for malignant melanoma. Oridonin, the activator of FBW7 and MDM2 inhibitors nutlin-3 and RITA can restore wild type p53 function and positively modulate Notch pathway. The aim of this study was to establish the effect of oridonin and nutlin-3/RITA and their combination to the viability of melanoma cell lines FM-94 and FM-3.

Materials and methods. The object of this research were human FM-94 and FM-3 metastatic melanoma cell lines. The cells were affected with different concentrations of inhibitors: nutlin-3 (30 μM, 20 μM, 16 μM), RITA (1.6 μM, 1 μM, 0.5 μM); with activator oridonin (120 μM, 60 μM, 30 μM), as well as their combinations (20 μM nutlin-3 + 0.5 μM RITA, 30 μM oridonin + 0.5 μM RITA, 30 μM oridonin + 20 μM nutlin-3, 30 μM oridonin + 20 μM nutlin-3 + 0.5 μM RITA). The vitality of cancer cells was determined by MTT method.

Results. Summarizing the received viability data for the FM-94 and FM-3 cell lines at intervals of 24, 48, and 72 h, it was determined that after a 24 h- and 48 h-incubation there was a significant reduction of the vitality of FM-3 cells. The most effective inhibition was with 120 μM (after 24 h) and 30 μM (after 48 h) of oridonin concentrations. The decrease of FM-94 cell viability was the strongest after 72 h of incubation with 30 μM oridonin concentration. However, 60 μM and 120 μM oridonin concentrations also had a good effect. There was a strong inhibition of FM-94 cell viability after 72 h-incubation with combinations of oridonin (30 μM oridonin and 0.5 μM RITA, 30 μM oridonin, 20 μM nutlin-3 and 0.5 μM RITA).

Conclusion. The most effective inhibitory effect was obtained on 30 μM oridonin concentrations for both FM-94 and FM-3 cell lines.

Keywords: melanoma, Notch, Nutlin-3, RITA, oridonin, p53

GUT MICROBIOTA PROFILE OF HEALTHY LITHUANIAN INFANTS AND YOUNG CHILDREN: A PILOT STUDY

Audronė Mulevičienė[1], Federica D'Amico[2], Silvia Turroni[2], Marco Candela[2], Augustina Jankauskienė[1]

[1] *Clinic of Children's Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Unit of Microbial Ecology of Health, Department of Pharmacy and Biotechnology, University of Bologna, Bologna, Italy*
Email: *audrone.muleviciene@santa.lt*

Background and aim. In recent years an increasing attention is being paid to the role of the human gut microbiome in health and disease. It is well recognized that the microbiome develops in the first years of life and remains stable throughout adulthood, but differences across the globe have been shown. Actinobacteria (represented by *Bifidobacteriaceae*) and Firmicutes are the dominant phyla in the guts of a breastfed infant in Europe. At weaning, Actinobacteria are replaced by Bacteroidetes and major changes in phylum Firmicutes are observed. Proteobacteria, Verrucomicrobia, Cyanobacteria and others are less abundant. The aim of this study was to describe the gut microbiome in healthy Lithuanian infants and young children, and to compare data with profiles from other European countries.

Materials and methods. Ten healthy infants and young children (aged 7–34 months) were recruited in the Vilnius area. Faecal samples were collected from the diapers, immediately frozen, and analysed by next-generation sequencing of the V3-V4 hypervariable region of the 16S rRNA gene on Illumina MiSeq platform in the laboratory of the Unit of Microbial Ecology of Health, Department of Pharmacy and Biotechnology, the University of Bologna.

Results. All children were term, vaginally delivered and exclusively breastfed for an average of four months. At the enrolment, they all were receiving complementary food, and seven were still breastfed. Firmicutes (55% average

proportion of total detectable bacteria), Actinobacteria (28%, dominated by *Bifidobacteriaceae* and *Coriobacteriaceae* families), and Bacteroidetes (7%, represented by *Bacteroidaceae*) accounted for 90% of the gut microbiota community. Proteobacteria, Verrucomicrobia, Cyanobacteria, and others were less abundant.

Conclusions. Despite the low sample size, the analysis of the gut microbiota profile in Lithuanian infants and young children shows results similar to those of other European countries.

Keywords: gut microbiota, infants, children

EVALUATION OF CEREBRAL OXYGENATION USING NEAR-INFRARED SPECTROSCOPY IN PRETERM INFANTS WITH NATURAL EVOLUTION OF *DUCTUS ARTERIOSUS*

Jūratė Navikienė, Arūnas Liubšys, Augustina Jankauskienė

Clinic of Children's Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *navikiene.jurate@gmail.com*

Background and aim. Clear understanding of cerebral hemodynamic effects of ductus arteriosus (DA) patency is still lacking. Near-infrared spectroscopy (NIRS) helps to evaluate the regional perfusion and oxygenation of the brain tissue ($CrSO_2$). The aim of the study was to interlink $CrSO_2$ and the cranial sonography Doppler resistive index of the anterior cerebral artery (RI ACA) for the patients with persistent DA (PDA) and closed DA (CDA).

Materials and methods. Preterm infants <1500 g birth weight (BW), <32 weeks of gestation, and >72 hours of age were included. NIRS was used to assess $CrSO_2$ for 12 h, and echocardiography – for the DA and ACA RI – was used to assess the perfusion of ACA. To investigate the effect of PDA on NIRS and RI, the mean value of the $CrSO_2$ during the first 10 minutes was set as a reference and further measurements were classified as a decrease of $CrSO_2$ below 0 SD, (–1) SD and (–) 2SD of the mean value.

Results. Seventeen patients were recruited: six with PDA, and 11 with CDA. The mean ACA RI was higher in the PDA group (0.8 ± 0.06 vs 0.7 ± 0.03 $p = 0.01$). There was no difference in mean $CrSO_2$ (77.5 ± 1.6 vs 78.1 ± 2.4 $p > 0.05$) between the groups. In the PDA group, there were more cases with low $CrSO_2$ with higher RI (regression coefficient from –0.48 (0SD) to 0.04 (–1SD) and 0.19(–2SD)), though it was not statistically significant.

Conclusions. It is still unclear whether $CrSO_2$ using NIRS is associated with RI ACA. There is a tendency of $CrSO_2$ to be associated with RI ACA, but the measurements are too vivid during the disturbed oxygenation states in patients with PDA. More patients are clearly needed.

K**eywords:** near-infrared spectroscopy, persistent *ductus arteriosus*, preterm infant

DIAGNOSTIC FEATURES OF THE MENIERE'S DISEASE

Aistė Paškonienė[1, 2], Vėtra Markevičiūtė[3], Givi Lengvenis[2, 4], Renata Baltagalvienė[2, 4], Eugenijus Lesinskas[1, 2]

[1] *Clinic of Ear, Nose, Throat and Eye diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[4] *Department of Radiology, Nuclear Medicine, and Medical Physics, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

Email: *aiste.paskoniene@santa.lt*

The aim of the study. To assess the reliability of diagnostic tests to differentiate Meniere's disease into types: probable and definite Meniere's disease.

Materials and methods. In 2017, a retrospective study was conducted at the Department of the Ear, Nose and Throat Diseases of Vilnius University Hospital Santaros Klinikos. It included 50 patients with Meniere's disease. Patients were divided into two groups – probable and definite Meniere's disease based on the Barany Society criteria (2015). All the subjects were evaluated by clinical exposure, duration of the disease, audiometry, videonystagmography (VNG) caloric test, posturography, and 3T temporal MRI with a gadolinium contrast for endolymphatic hydrops.

Results. Twenty-six patients were diagnosed with probable and 24 patients were diagnosed with definite Meniere's disease. By assessing the intensity of the symptoms and the duration of the disease, we did not find statistical reliability among the types of the disease ($p > 0.05$). The average risk of the falling index is not statistically significantly different between the probable and definite Meniere's disease ($p > 0.05$). VNG caloric test (measurement of unilateral weakness (UW%)) is not statistically significant for differentiating Meniere's disease into types ($p > 0.05$). VNG caloric test (measurement of directional preponderance (DP%)) is statistically significant for differentiating Meniere's disease into types ($p < 0.05$). Usage of the MTR method (3T temporal MRI with gadolinium contrast for evaluation of edolymphatic hydrops) for differentiation of Meniere's disease into types was statistically significant ($p < 0.05$). The mean of the dB of the right and the left ears of the auditory test did not differ statistically significantly between the groups ($p > 0.05$).

Conclusions. The following studies are statistically significant for the differentiation of Meniere's disease into types: VNG caloric test (directional preponderance (DP%)) and evaluation of endolymphatic hydrops in the 3T temporal MRI with the gadolinium contrast.

Keywords: Meniere's disease, endolymphatic hydrops, temporal MRI, audiometry, videonystagmography caloric test

DYNAMICS OF HUMAN MILK MACRONUTRIENT COMPOSITION DURING A 24-HOUR PERIOD

Ieva Jūra Paulavičienė, Arūnas Liubšys, Vytautas Usonis

Clinic of Children's Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *ieva.paulaviciene@gmail.com*

Background and aim. The uniqueness of human milk is in constant change in its composition depending upon various factors. It is likely that changes in human milk composition are essential for health, growth, and development of newborns. The purpose of this study was to evaluate diurnal variation in human milk macronutrients and energy content.

Materials and methods. A total of 180 human milk samples from 45 mothers (27 preterm and 18 full-term newborn carrying mothers) were collected at 6:00, 12:00, 18:00, and 24:00 (± 1 hour). Milk samples were collected on the 14th–16th lactation days from each woman, obtained by emptying breasts with an electric or manual breast pump. 5 ml milk samples were taken for analysis immediately after expression and stored in a refrigerator at +4°C in closed plastic containers. Macronutrient composition and energy count of milk were evaluated by mid-infrared spectrophotometry analysis within 48 hours.

Results. Protein, fat, and energy content changed significantly during the 24-hour period ($p < 0.05$). Higher protein, fat, and energy content in human milk was observed during day expressions (at 12:00 and 18:00) and lower during night expressions (24:00 and 6:00). The average content of carbohydrate did not change significantly during the 24-hour period. Both preterm and term milk samples revealed similar circadian variation.

Conclusions. In our study, fat, protein, and energy content in human milk revealed significant diurnal variation reaching highest levels in afternoon samples. According to the literature, it has been known for many years that fat content of human milk displays circadian changes, but the data regarding other macronutrients are conflicting. Future research should determine whether circadian variation of certain components in human milk has a potential to provide beneficial outcomes in regard to the development and well-being of high-risk infants.

Keywords: human milk, composition, circadian changes

THE LATE MONSIGNOR ANTONIO FRANCO (1585–1626): COMPUTERIZED FACIAL RECONSTRUCTION OF A NEAPOLITAN BLESSED

Dario Piombino-Mascali[1], Sarah Shrimpton[2], Caroline M. Wilkinson[2]

[1] *Department of Anatomy, Histology, and Anthropology, Institute of Biomedical Sciences, Vilnius University, Vilnius, Lithuania*

[2] *Face Lab, Liverpool John Moores University, United Kingdom*
Email: *dario.piombino@mf.vu.lt*

Although generally employed for forensic identification purposes, facial depiction from human remains has often been utilized to evaluate the *in vivo* appearance of historic figures. While manual methods have been developed since the late 19th century, most notably by Russian, American, and English researchers, the advent of computerized systems in the late 20th century has allowed more effective and objective procedures. This paper presents the investigation into the facial appearance of a religiously significant individual, the blessed Antonio Franco of Naples, who spent much of his life in the Sicilian town of Santa Lucia del Mela, Italy. Within the framework of a survey carried out by the local Archdiocese prior to Antonio Franco's beatification, which took place in Messina in 2013, the over-modeled head of the blessed was CT-scanned in order to produce a virtual replica and create a computerized facial reconstruction. The cranio-facial reconstruction involved interpretation of the preserved soft tissues using anthropological assessment, as well as digital sculpting software (Geomagic FreeForm Modelling Plus) to predict how the face may have appeared in life. The finer details, such as hair and skin texture, were added using 3D modelling software (Pixologic Z-Brush). Bioanthropological data, along with historic documents and portraits of the subject, were taken into account in order to provide his most likely appearance.

Keywords: anthropology, face, modelling, mummy, relics

SPONTANEOUS AND ANTHROPOGENIC MUMMIFICATION METHODS IN SICILY (1600–1900)

Dario Piombino-Mascali

Department of Cultural Heritage and of Sicilian Identity, Palermo, Italy

Department of Anatomy, histology and Anthropology,
Institute of Biomedical Sciences, Vilnius University, Vilnius, Lithuania
Email: *dario.piombino@mf.vu.lt*

The island of Sicily is home to a large number of mummified remains, dating from the 16th–20th centuries of the current era, most of which are located in the renowned Capuchin Catacombs of Palermo. The oldest mummy in the collection is that of Brother Silvestro da Gubbio, who died in 1599, but recent 20th-century examples, including the popular 'sleeping beauty' Rosalia Lombardo, are also present. Beyond the Palermo Catacombs, other important mummy collections include those at Savoca, Piraino, Gangi, Santa Lucia del Mela, Novara di Sicilia, and Burgio. Since 2007, the author of this paper has headed the "Sicily Mummy Project" aimed at scientifically investigating this important bio-cultural heritage and understanding local mummification practices. In this context, historical sources were also collected in order to gain a deeper view on the mummification phenomenon, its roots, and its significance. This overview will summarize the techniques of bodily preservation employed to obtain mummies, together with the related architectural structures located in crypts and subterranean chapels. Findings will be supported by radiological and computer tomographic data which enabled direct inspection and gathering of an amount of bio-anthropological data; and will be additionally supplemented by archival sources and hitherto unpublished evidence describing in detail how cadavers were treated in order to be preserved. This study will shed new light on mortuary practices and funeral variability in the region, as well as provide examples of the excellent embalming skills achieved in the 19th and 20th centuries. An interpretative pattern will be provided through comparison with the anthropological and sociological literature.

Keywords: anthropology, embalming, history, mummies, taphonomy

COMPARISON OF TWO NON-INVASIVE NEONATAL CARDIAC OUTPUT MEASUREMENTS

Aušrinė Pliauckienė, Arūnas Liubšys, Vytautas Usonis

Clinic of Children's Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania

Children's Hospital, Vilnius, Lithuania
Email: *ausrinemerkyte@gmail.com*

Background. The understanding and assessment of the newborn's hemodynamics is still challenging for neonatologists. Traditional methods for monitoring and identifying hemodynamic compromise in newborn infants lack in accuracy and reliability, and are unhelpful in making decisions during intensive treatment. Most of the methods used for adults have no applicability or validity for newborns. Continuous-wave Doppler (CWD) ultrasound through the left ventricular outflow tract is one modality used for non-invasive cardiac output measurement in the neonatal population, but there is a lack of studies comparing different devices. The aim of the study was to assess the level of agreement between cardiac output in neonates using two different non-invasive measuring modalities.

Materials and methods. Twenty term and near-term neonates with a mean postconceptual age of 37.8 ± 3.7 weeks, and a mean weight of 2.608 ± 0.907 kg were enrolled for a prospective observational study. After excluding patients with infection, cardiovascular disorders, and congenital heart diseases, any patient undergoing cardiac ultrasound examination also underwent a subsequent USCOM study. Two devices – GE LOGIQ S8 XDclear 2.0 ultrasound machine, and USCOM®1A- non-invasive advanced hemodynamic monitor – were used for comparison.

Results. We found a strong correlation between cardiac output (CO) as measured by the USCOM and by echocardiography (ECHO). There was no difference between mean CO measured with USCOM and ECHO (238 ml/kg/min (95% CI [214–263]) vs. 248 ml/kg/min (95% CI [223–273]), $p < 0.05$).

Conclusions. Cardiac output measured with USCOM® correlates very well with echocardiographic cardiac output measurement. USCOM® monitor is simple to use, easier to interpret in terms of results, and can be a valuable instrument for the assessment of neonatal cardiac output at the bedside.

Keywords: echocardiography, neonatal hemodynamics, ultrasonic cardiac output monitoring (USCOM)

IMPACT OF TRAINING ON THE QUALITY OF CARDIOPULMONARY RESUSCITATION

Lina Puodžiukaitė[1], Karolina Kaunaitė[1], Lukas Balčiūnas[2], Jūratė Šipylaitė[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Department of Anaesthesiology and Intensive Care, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

Email: *lukas.balciunas@mf.vu.lt*

Background and aim. Sudden out-of-hospital cardiac arrest is a frequent cause of death that requires immediate bystander cardiopulmonary resuscitation (CPR). Repeated training helps to retain knowledge and skills in CPR. The aim of this study was to evaluate the impact of basic life support (BLS) training on practical skills and knowledge of BLS, including the use of an automated external defibrillator (AED).

Materials and methods. A prospective study of 90 students (43.3% males, median age 18 [IQR, 16–19] years) was conducted. Participants were divided into three groups: students who had not previously received any BLS training (group 1, $n = 30$), students who only had attended a non-practical BLS course (group 2, $n = 30$), and students who had just attended a BLS–AED course (group 3, $n = 30$). Each participant completed CPR on a manikin that tracked chest compressions, lung ventilation and compression time in percentage. The total CPR result was calculated based on these measures. Both resuscitation knowledge (questionnaire) and practical skills (compression (%), ventilation (%), total CPR score (%), mistakes, use of AED) were analysed. Set resuscitation time was 2 min. Data analysis was performed with SPSS 24.0 software.

Results. Mean total CPR score: 28.0 (SD 13.1) % in group 1, 40.8 (SD 18.2) % in group 2, and 50.7 (SD 19.4)% in group 3; ($p < 0.001$). Median chest compression results: 1% [IQR, 0–10] in group 1, 9% [IQR, 0–47] in group 2, and 51% [IQR, 21–79] in group 3; ($p < 0.001$). Nineteen (21.1%) people did not ventilate. Median amount of practical mistakes by groups (12 criteria): 9 [IQR, 7.8–10] in group 1, 5 [IQR, 2–7] in group 2, and, 3 [IQR, 2–6.3] in group 3; ($p < 0.001$). Mean use of AED score in groups (total 4 points): group 1 – 2.8 (SD 0.9), group 2 – 3.3 (SD 0.8), and group 3 – 3.8 (SD 0.41). Mean score for test (total 10 points) was: group 1 – 4.8 pts (SD 1.5), group 2 – 5.7 pts (SD 1.3), and group 3 – 8.9 pts (SD 0.9); ($p < 0.001$).

Conclusions. The results of this study showed that better resuscitation results are achieved with both prior hands-on and theoretical courses. BLS-AED training should be a standard part of school education.

Keywords: basic life support, cardiopulmonary resuscitation, training

PARAMETERS OF BIOELECTRICAL IMPEDANCE ANALYSIS AS RISK FACTORS FOR POSTOPERATIVE HAEMOGLOBIN DECREASE IN CARDIAC SURGERY PATIENTS

Lina Puodžiukaitė[1], Donata Ringaitienė[2, 3], Vaidas Vicka[1, 3], Jūratė Šipylaitė[2, 3]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Department of Anaesthesiology and Intensive Care, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*
Email: *donata.ringaitiene@mf.vu.lt*

Background and aim. Cardiac surgery patients are at risk of developing coagulopathy, excessive blood loss, and postoperative anemia. The aim of this study was to evaluate whether bioelectrical impedance analysis (BIA) could be used to predict the postoperative decrease of haemoglobin.

Materials and methods. This was a single centre retrospective study of 642 cardiac surgery patients who underwent elective cardiac surgery during a one-year period at the University Hospital. The patients' demographic and clinical variables, preoperative BIA measurements, and postoperative data were analysed. Linear regression analysis was used to identify bioelectrical impedance parameters of postoperative anaemia. Statistical analysis was performed with IBM SPSS v24.

Results. Among the 642 patients included in the study (67.8% males, median age 66 [range, 59–73]), the median EuroSCORE II was 1.78 [IQR, 1.07–2.49]. The median parameters of BIA were: intracellular water (ICW) – 25L [IQR, 21.5–28.9], extracellular water (ECW) – 16.1L [IQR, 13.8–18.3], total body water (TBW) – 41.1L [IQR, 35.3–47], as well as extracellular and total body water ratio (ECW/TBW) – 0.39 [IQR, 0.38–0.40]. ICW, ECW, TBW, and ECW/TBW were included in the multivariate regression analysis. A change of ECW/TBW per 0.1 produced a risk of 42.1 g/l lower haemoglobin (95% CI: –55.15 – –29.14; $p < 0.001$), and a standardized risk of 0.26 per unit change.

Conclusions. BIA parameters could be used to predict the decrease of postoperative haemoglobin in cardiac surgery. Further analysis is needed to identify whether this factor is independent of other predictors.

Keywords: bioelectrical impedance analysis, risk factors, cardiac surgery

EVALUATION OF PATIENTS AFTER TRANSIENT LOSS OF CONSCIOUSNESS IN THE EMERGENCY DEPARTMENT

Kristijonas Puteikis[1], Rūta Mameniškienė[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinics of Neurology and Neurosurgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *ruta.mameniskiene@mf.vu.lt*

The aim of the study. To determine the causes of transient loss of consciousness (TLoC) in the emergency department, to analyse patients' clinical characteristics, and to estimate the level of care they receive according to the international guidelines.

Materials and methods. A cross-sectional retrospective analysis of patients with TLoC consultated by a neurologist at the emergency department was performed. The data were analysed using Fisher's exact and Mann-Whitney U tests.

Results. In all, 315 patients (mean age 53.5 ± 20.8 years, 52.7% males) were evaluated for TLoC. Syncope as a cause of TLoC was in 134 (42.5%) cases, epilepsy in 54 (17.1%), other convulsions in 32 (10.2%). The number of males consulted after epileptic or unspecified seizures was larger (OR = 1.7, 95% CI = 1.0–2.9, $p = 0.042$). Those with epileptic seizure were younger in comparison with others (mean age 47.6 ± 15.7 years; $p = 0.014$). Patients after a seizure received computed tomography scans more often ($p < 0.001$), but electrocardiography and a troponin test were performed more frequently in those after a syncope ($p < 0.001$). More patients after epileptic seizure were hospitalised ($p = 0.002$). The first episode of TLoC was mostly coded as unspecified (22 or 68.8%), or generalised (6 or 18.8%), patients with epilepsy received a diagnosis of focal (32 or 59.3%) or metabolic (alcohol-related) seizures

(8 or 14.8%). Patients with epilepsy mostly received alcohol use-related (16 or 44.4%) and general recommendations (13 or 36.1%), and 14 patients (38.9%) had their treatment started or modified. Patients with unspecified TLoC were advised a neurologist's consultation and electroencephalography (19 or 76.0% and 11 or 44.0%, respectively).

Conclusions. Predominant causes of TLoC were syncope, epileptic and unspecified seizures. Patient evaluation and consulting complied with selected international guidelines.

Keywords: emergency department, transient loss of consciousness

SUBTHRESHOLD HIGH-FREQUENCY ELECTRICAL FIELD STIMULATION INDUCES VEGF EXPRESSION IN CARDIOMYOCYTES

Gediminas Račkauskas, Germanas Marinskis, Audrius Aidietis

Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Vilnius University Hospital Santaros Klinikos
Email: *gediminas.rackauskas@santa.lt*

Subthreshold electrical stimulation (SES) has been shown to induce an improvement of angiogenesis in ischemic and nonischemic skeletal muscles mediated by increased vascular endothelial growth factor (VEGF) expression. VEGF plays a key role in physiological and pathological angiogenesis. Cardiomyocytes possess the ability to synthesize and secrete VEGF. Thus, we thought to investigate the effect of SES on VEGF regulation in cultured neonatal rat ventricular myocytes (NRVMs), with the aim of revealing new techniques for therapeutic angiogenesis in ischemic heart disease. Cell cultures of NRVMs were electrically stimulated with field strengths below the myocyte depolarization threshold (0.5 V/cm with 1 ms bipolar impulse duration). Frequencies ranging from 5 Hz up to 25, 50, and 99 Hz were applied over a period of 48 h. The expression of VEGF and its receptor KDR was determined with Western blot and ELISA. To reveal the biological activity of the secreted VEGF amount, cultured human coronary artery endothelial cells (HCAECs) were treated with the cell culture supernatant of NRVMs exposed to SES. A dominant effect of SES was observed at 25 Hz. Within this particular frequency the VEGF protein amount in the cytoplasm as well as in the cell culture supernatant increased significantly. In parallel, the protein expression of the KDR receptor decreased in a significant manner. Moreover, cell culture supernatant of NRVMs exposed to SES augmented the growth of HCAECs. Cardiomyocytes respond to SES with an increase in biologically active VEGF expression that promotes cell proliferation of HCAECs. This mechanism may provide new approaches to develop therapeutic angiogenesis in the ischemic heart.

Keywords: electrical stimulation, angiogenesis, VEGF

COULD WE USE AN INTRAOPERATIVE VOCAL CORD ULTRASONOGRAPHY IN IDENTIFYING MOVEMENTS OF VOCAL CORDS AND REDUCING THE RISK OF BILATERAL PALSY? DATA OF A PROSPECTIVE TRIAL

Andrius Rybakovas[1], Virgilijus Beiša[1], Gintautas Tamulevičius[2], Kęstutis Strupas[1]

[1] *Clinic of Gastroenterology, Nephrourology, and Surgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Institute of Data Science and Digital Technologies, Faculty of Mathematics and Informatics, Vilnius University, Vilnius, Lithuania*
Email: *andrius.rybakovas@santa.lt*

Background and aim. The negative impact of laryngeal nerve injury is well known in thyroid surgery with the most serious ill effects in bilateral cases. Identifying the functional status of recurrent laryngeal nerve (RLN) during the thyroidectomy is of paramount importance in avoiding these complications. The aim of the study was to assess the validity of a completely new method (intraoperative vocal cord ultrasonography).

Materials and methods. A prospective trial was launched in March 2016 and finished in December 2017; 112 patients with known thyroid pathology were prospectively enrolled in this study and were operated on at Vilnius

University Hospital by a single surgeon. The study protocol included laryngeal examination in all patients preoperatively and postoperatively by a qualified ENT specialist, intraoperative neurostimulation of the vagal nerve and RLN, palpating the postricoid region of the larynx and sensing the posterior cricoarytenoid muscle contraction, as well as intraoperative neurostimulation with laryngeal ultrasonography for vocal cord movement evaluation. Laryngoscopy was regarded as the gold standard procedure.

Results. Six cases of temporary vocal cord palsy were diagnosed on postoperative examination (5.4% injury rate per patient and 3% per nerve at risk) with no cases of permanent or bilateral vocal cord palsy. Sonoscopic response sensitivity counted per nerve at risk and per patient was 83.3% (83.3%), specificity 98.5% (97.2%), accuracy 98% (96.4%), positive predictive value 62.5% (62.5%), and negative predictive value 99.5% (99%). The sensitivity, specificity, accuracy, positive predictive and negative predictive value using palpation method, both in the vagus and RLN group, were 100% (100%); 96.9% (95.3%); 97% (95.5%), 50% (54.5%) and 100% (100%), respectively.

Conclusions. Intraoperative vocal cord ultrasonography and laryngeal palpation are both reliable and safe methods that correlate well with postoperative vocal cord function. Both methods could be used in conjunction, but further studies with a larger sample size should be conducted.

Keywords: thyroidectomy, laryngeal nerve injury, vocal cords ultrasonography

COR TRIATRIATUM SINISTRUM WITH OBSTRUCTION: A RARE PRESENTATION IN AN ADULT

Virginija Rudienė[1, 2], Sigita Glaveckaitė[1, 2], Diana Zakarkaitė[1, 2], Lina Gumbienė[1, 2, 3], Audrius Aidietis[1, 2]

[1] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Centre of Cardiology and Angiology, Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Centre of Cardiac and Thoracic Surgery, Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*
Email: *vr.rudiene@gmail.com*

Introduction. *Cor triatriatum sinistrum* (CTS) is a rare cardiac anomaly with an incidence of 0.1–0.4% of all congenital heart defects. The clinical course and management of this pathology is influenced by the degree of obstruction between the two left atrial chambers. The aim of this study was to analyze the complications caused by obstructive membrane physiology in adults.

Materials and methods. We performed a search for '*cor triatriatum sinistrum* in adults' in Medline/PubMed for literature published from 2005 to 2016, identifying around 400 publications. Included patients were divided in two groups: A – patients with obstructive membrane physiology, and B – patients with non-obstructive membrane.

Results. A total of 171 published cases along two new adult cases were included in this review. Obstructive membrane physiology was described in 40.9% (n = 70) of the patients. Patients with obstructive physiology (Group A) were younger at presentation compared to the patients without obstructive membrane (Group B) (median age 39 years [IQR] 28–52 years vs. 50 years [IQR] 32–64 years, p = 0.003). Patients in group A more frequently had associated cardiac defects (58.6% vs 42.4%, p = 0.039) and a significantly higher occurrence of congestive heart failure, pulmonary hypertension, haemorrhage episodes, and infections (44.3% vs. 15.2%, p = <0.001; 27.1% vs. 6.1%, p = <0.001; 8.6% vs. 0%, p = 0.004 and 8.6% vs. 0%, p = 0.004, respectively). The predominant infection was pneumonia and occurred in 5.7% (n = 4) of the patients with obstructive membrane physiology. Patients in group B more frequently had comorbidities, such as coronary artery disease (CAD) 11.1% (n = 11) vs. 4.3% (n = 3), p = 0.032, systemic arterial hypertension 18.2% (n = 18) vs. 5.7% (n = 4), p = 0.018 and type 2 diabetes mellitus 7.1% (n = 7) vs. 2.9% (n = 2), p = 0.035, respectively.

Conclusions. Patients with obstructive membrane physiology most often have associated cardiac defects and a higher risk of such complications as congestive heart failure, pulmonary hypertension, haemorrhage episodes, and infections. Higher comorbidity rates in patients with non-obstructive membrane physiology could be associated with an older age at diagnosis.

Keywords: *cor triatriatum sinistrum*, congenital heart disease, obstructive membrane, left atrium

RECEPTION OF ANIMAL MAGNETISM IN NINETEENTH-CENTURY VILNIUS

Viltė Gabrielė Samsonė[1], Žustina Bezliapovič[1], Eglė Sakalauskaitė-Juodeikienė[2, 3], Dalius Jatužis[2, 3]

[1] *Faculty of Medicine, Vilnius University*

[2] *Clinic of Neurology and Neurosurgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*
Email: *vilte.samsone@gmail.com*

Background and aim. Animal magnetism (or mesmerism) is a theory based on the observations and ideas of the Austrian physician Franz Anton Mesmer (1734–1815). Doctor Mesmer believed that an invisible fluid is flowing between the planets and the living, the patient and his doctor; interruption of this magnetic flow is the main cause of various diseases, especially disorders of the nervous system. We aimed to review the historical origins of animal magnetism, the practice and criticism of mesmerism in Vilnius, and to analyse the presentation of that new theory in the press in the beginning of the 19th century.

Materials and methods. A literature review was carried out using the PubMed information system and in cooperation with the Vilnius University Library Rare Book and Manuscript Departments. Data were collected in English, French, Latin, Polish, and Lithuanian.

Results. Mesmerism was studied by Joseph Frank (1771–1842), a professor of clinical medicine at Vilnius University. He postulated that animal magnetism is a very important pathological phenomenon in which the nerves are extremely sensitive to internal and external stimuli that cause illusions and delusions. A special newspaper called the *Pamiętnik Magnetyczny Wileński* (Vilnius Magnetism Diary) was devoted to the followers of animal magnetism, and was published in Vilnius between 1816 and 1818. However, the *Pamiętnik Magnetyczny Wileński* was criticized and satirized in the newspaper *Wiadomości Brukowe* (Pavement News). The history of animal magnetism was also presented in three issues of the *Dziennik Wileński* (Vilnius Daily) in 1816.

Conclusions. Our study showed that after becoming a popular treatment method in the late 18th-early 19th century in Western Europe, animal magnetism had also attracted the attention of professors at the Imperial University of Vilnius, local physicians, and especially of local quacks and charlatans.

Keywords: animal magnetism, Franz Anton Mesmer, Joseph Frank, mesmerism, Vilnius University

COHERENCE BETWEEN ARTERIAL STIFFNESS AND LEFT VENTRICULAR DIASTOLIC FUNCTION IN PATIENTS WITH METABOLIC SYNDROME: A LONGITUDINAL STUDY

Svetlana Solovjova[1], Roma Puronaitė[1, 2], Milita Stuopelytė[3], Ligita Ryliškytė[1, 4]

[1] *Centre of Cardiology and Angiology, Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[2] *Institute of Data Science and Digital Technologies, Faculty of Mathematics and Informatics, Vilnius University, Vilnius, Lithuania*

[3] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[4] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *svetlana.kuzmiciute@gmail.com*

The aim of the study. To evaluate the relationship between arterial stiffness and left ventricular diastolic dysfunction (LVDD) in patients with metabolic syndrome (MetS).

Materials and methods. A study was carried among 573 MetS subjects (aged 53.4 ± 6 years, 63% female) who were participants in the Lithuanian High Cardiovascular Risk Primary Prevention Programme, without overt atherosclerotic disease and systolic LV dysfunction. The average duration of observation was 3.8 years. Arterial stiffness parameters (carotid-to-femoral pulse wave velocity (cfPWV)), aortic augmentation index (AIxHR75), mean aortic pressure (mAP), and central pulse pressure (cPP) were assessed by applanation tonometry. Cardio-ankle vascular index (CAVI) was calculated using VaSera VS-1000 system. Diastolic dysfunction was defined according to 2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure.

Results. According to the cardioechoscopy, most of the study subjects in the cohort, had LVDD at the first visit (N = 480, n = 325 with impaired relaxation, n = 92 with pseudonormalization, n = 1 with restrictive LVDD). During the observation period we found significant alterations in the arterial and mean LV diastolic function parameters: cf-PWV 8.55 ± 1.4 vs. 8.7 ± 1.6 m/s; AIxHR75 22.8 ± 10.4 vs. 24.3 ± 10.8%; mAP 105.3 ± 10.4 vs. 101.5 ± 14.8 mmHg; cPP 42.6 ± 9.9 vs. 43.3 ± 10.6 mmHg; E/A ratio 1 ± 0.3 vs. 0.93 ± 0.2; E/e' mean ratio 10.4 ± 3.5 vs. 9.4 ± 2.9; E/e' septal ratio 11.9 ± 4.1 vs. 10.9 ± 3.2 ($p < 0.05$ for all). Weak but significant correlations were found between the analysed alterations in parameters such as the E/A ratio (rcfPWV = –0.154, rAP = –0.115), e' (rcfPWV = –0.11, rAP = –0.11; $p < 0.05$ for all).

Conclusions. Parameters of arterial stiffness tended to be associated with LV diastolic dysfunction in patients with metabolic syndrome.

Keywords: arterial stiffness, diastolic dysfunction, metabolic syndrome

IN VITRO EVALUATION OF ANTISEPTICS AGAINST *STAPHYLOCOCCUS AUREUS* BIOFILMS FORMED IN DIFFERENT SURROUNDINGS

Elvyra Staneviči ūtė[1], Povilas Kavaliauskas[2], Rūta Prakapaitė[3], Martynas Ridziauskas[4], Agnė Kirkliauskienė[5], Vaidotas Zabulis[6], Jurgita Urbonienė[6], Vytautas Triponis[1], Vytautas Sirvydis[1]

[1] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Animal Research Centre, Lithuanian University of Health Sciences, Kaunas, Lithuania*

[3] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[4] *Life Sciences Centre, Vilnius University, Vilnius, Lithuania*

[5] *Department of Physiology, Biochemistry, Microbiology, and Laboratory Medicine, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[6] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*
Email: *elvyra.staneviciute@gmail.com*

Background and aim. Bacterial biofilms have been studied widely and found to account for most of antibiotic-resistant and recurrent infections. Prosthetic vascular graft infection is one of the conditions when biofilms form on an implant and cause persistent infection that is extremely difficult to eradicate without removing the graft itself. Currently many conservative treatment options are being explored to preserve the graft. One of these options is local wound irrigation with antiseptic solutions that so far has not been investigated widely enough. Our aim was to test the efficacy of several popular antiseptic solutions against *Staphylococcus aureus* biofilms *in vitro* as these bacteria are responsible for the majority of prosthetic vascular graft infections in early postoperative period.

Materials and methods. Three series of experiments were performed to test the efficacy of 0.1% octenidine dihydrochloride, 10% povidone-iodine, and 0.02% chlorhexidine digluconate solutions against *Staphylococcus aureus* biofilms. Biofilms were grown on glass coverslips, in well-plates with Lubbock's medium, mimicking the surroundings of the wound, and on woven vascular grafts. Biofilms were then treated with antiseptics and their efficacy towards the structure and antimicrobial activity of the biofilm was evaluated.

Results. Chlorhexidine digluconate showed outstanding results in destroying the structure of *Staphylococcus aureus* biofilm grown on a glass coverslip (p = 0.02). In simulated wound conditions, octenidine dihydrochloride and povidone-iodine eradicated biofilm-associated bacteria, while the efficacy of chlorhexidine digluconate was poor. All antiseptics showed positive antimicrobial effects against *Staphylococcus aureus* biofilms grown on woven vascular grafts in simulated wound conditions (p = 0.02). Additionally, octenidine dihydrochloride showed statistically significant superior effects compared to povidone-iodine (p = 0.009) and chlorhexidine digluconate solution (p = 0.041).

Conclusions. Chlorhexidine digluconate was most effective on glass coverslips. Both octenidine dihydrochloride and povidone-iodine eradicated biofilm-associated bacteria in simulated wound conditions. Octenidine dihydrochloride showed the strongest antimicrobial activity against *Staphylococcus aureus* biofilms formed on vascular grafts.

Keywords: antiseptic, biofilm, *Staphylococcus aureus*, vascular graft infection

RELATIONSHIP BETWEEN SOCIODEMOGRAPHIC FACTORS AND THE ATTITUDE TOWARDS EMIGRATION AMONG HEALTHCARE PERSONNEL IN LITHUANIA

Austėja Stankutė[1], Lukas Aranauskas[1], Aušra Deksnytė[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Psychiatry, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *ausra.deksnyte@gmail.com*

Background and aim. For the past few years, emigration has become a serious issue in Lithuania. According to the Department of Statistics to the Government of the Republic of Lithuania, 50,333 (1.75% of the entire population) inhabitants emigrated from the country in 2016.

The main aim of this study was to assess the attitude of medical personnel towards emigration and socioeconomic factors linked with this process.

Materials and methods. In November 2017, an online survey was conducted, targeting medical staff. SPSS v.24 was used for statistical analysis. To analyse demographic data, descriptive statistics were used. The connection between age, wage, and attitude towards emigration was calculated using ANOVA test. Data were assumed to be significant, when p was <0.05.

Results. A number of 2932 participants filled in the questionnaire; 106 questionnaires were not included in the analysis due to improper completion. The questionnaire was filled in by 2393 (84.4%) females and 433 (15.6%) males. Answers pointing to the attitude towards emigration showed that 500 (17.6%) respondents did not intend to emigrate, 201 (42.3%) would emigrate if they had a possibility, 814 (28.7%) respondents regretted not emigrating earlier, 56 (2%) were considering emigration, 260 (9.2%) decided to emigrate, and five (0.2%) had emigrated before. Participants who were considering emigration or decided to emigrate were on average six years younger than those who decided to stay, and eight years younger than those who regretted not having emigrated earlier (p = 0.001).

Participants who decided to emigrate earned on average €92 less than those who decided to stay (p = 0.001). Participants who would emigrate if they had a possibility earned €64 less than those who decided to stay (p = 0.001). Doctors who would emigrate if they had a possibility earned €70 less than those who decided to stay (p = 0.003).

Conclusions. Younger participants are more likely to consider emigration than older participants, while the older ones are more likely to regret not having emigrated earlier. Respondents who earn less are more likely to emigrate or to think about emigration.

Keywords: emigration, Lithuania, medical personnel

GENERAL HEALTH STATUS, SELF-ESTEEM, AND THE FEELING OF DISTRESS IN SOCIAL ENVIRONMENTS IN PATIENTS WHO FOR DIFFERENT REASONS UNDERWENT NASAL RECONSTRUCTION

Giedrė Stundžaitė-Baršauskienė[1], Janina Tutkuvienė[2], Rūta Venciūtė[1], Jolanta Dadonienė[1]

[1] *Clinic of Rheumatology, Orthopedics, Traumatology, and Reconstructive Surgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Department of Anatomy, Histology and Anthropology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University*
Email: *stundzaite@gmail.com*

Background. The aim of this research was to determine the general health status and self-esteem of and feeling distressed when attending social events by patients who underwent nasal reconstruction surgery due to traumatic injuries, cancerous diseases and aesthetic needs.

Materials and methods. In total, 90 patients (aged 18–70 years) treated at the Department of Plastic and Reconstructive Surgery of Vilnius University Hospital and the National Cancer Institute during 2007–2017 were involved in this prospective study. Four groups of patients were created: 1. After surgery for nasal injuries, n = 30 (TRAUM); 2. After surgery for nasal cancerous diseases, n = 30; 3. After aesthetic nasal surgery (ONKO), – n = 30; 4. Relatively healthy people with no facial surgery (CONTROL), n = 30. Patients who underwent facial surgery filled in

questionnaires and answered questions on their general health status (from very bad to very good), self-esteem (according to the Rosenberg scale, 1965), and their feeling distressed (using a five-point scale).

Results. In total, 83% of CONTROL, 90% of ESTET, and only 43% of patients from ONKO and TRAUM rated their general health status as very good or perfect ($p < 0.05$) as compared to CONTROL. High self-esteem was reported by 30% of ESTET ($p < 0.05$), 23% of ONKO and TRAUM ($p < 0.05$), and only by 10% of the CONTROL group. Low self-esteem was found in 10% of ONKO and TRAUM ($p < 0.05$) patients and was absent in the CONTROL or ESTET groups. Having no stress at all or low stress was reported by 30% of TRAUM patients ($p < 0.05$), by 33% of ONKO patients ($p < 0.05$), but by 83% of ESTET ($p > 0.05$) and the CONTROL group. Being rather distressed was noted by 20% of TRAUM patients ($p < 0.05$) and by 27% of ONKO patients ($p < 0.05$), but was not observed in the CONTROL and ESTET groups.

Conclusions. (1) The general health status by the CONTROL and ESTET groups was evaluated much more positively than by the TRAUM and ONKO patients; (2) Facial aesthetics after reconstructive surgery, despite different reasons, seems to be very important with regard to self-esteem; (3) Patients who had undergone operations due cancerous diseases and injuries felt more distressed in social environments than the control sample after aesthetic nose surgery.

Keywords: nasal reconstruction, self-esteem, stress

ROLE OF NUTRITIONAL IMMUNOMODULATION IN IMMUNE RESPONSES IN MALNOURISHED PATIENTS UNDERGOING CARDIAC SURGERY

Marija Svetikienė[1, 2], Donata Ringaitienė[1, 2], Jevgenija Vėželienė[2], Dainius Trybė[3], Vaidas Vicka[2, 3], Radvilė Malickaitė[4], Laima Jurgauskienė[4], Jolita Norkūnienė[5], Mindaugas Šerpytis[1, 2], Jūratė Šipylaitė[1, 2]

[1] *Department of Anaesthesiology and Intensive Care, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[4] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[5] *Department of Mathematical Statistics, Faculty of Fundamental Sciences, Vilnius Gediminas Technical University, Vilnius, Lithuania*
Email: *marija.svetikiene@santa.lt*

Background and aim. A substantial part of patients undergoing cardiac surgery are malnourished and therefore immunocompromised. During cardiac surgery, patients suffer an excessive systemic inflammatory response. It is considered that nutritional supplements alter the immune response by acting on different targets of the immune system. The aim of the study is to determine the effect of immunonutrition on the immune function during the postoperative period following cardiac surgery.

Materials and methods. This randomized control study included malnourished and low operative risk patients who underwent elective cardiac surgery. The patients were randomized into immunomodulation (IM) and control groups. The IM group was supplemented with immune nutrients (Glutamine Plus) for five postoperative days. The immune function was tested before the surgery and on the 6th postoperative day. The immune response was characterized by the absolute and by the activated (activated *in vitro* by the phytohemagglutinin) number of lymphocyte subpopulations CD3+, CD4+, and CD8+. Differences between the groups were evaluated with the Independent Samples *t*-test. Statistical analysis was performed with IBM SPSS v21.

Results. Fifty-five patients were enrolled in the study, 27 (49.1%) of them in the IM group and 28 (50.9%) in the control group; 28 (50.9%) of them were male, and the mean age was 69.7 ± 6.3. There were no statistical differences in the demographic profile, co-morbidities, and immunological status among the groups before surgery. On the 6th postoperative day, the absolute count of lymphocyte subpopulation was bigger in the IM group, but a significant difference between the groups was not observed. However, on the 6th postoperative day the counts of activated lymphocytes in the IM and in the control groups were as follows: CD3+ (1422.93 ± 487.59 vs. 1115.71 ± 561.70, $p = 0.035$), CD4+ (1020.82 ± 363.37 vs. 801.87 ± 434.75, $p = 0.048$), CD8+ (396.93 ± 212.27 vs. 297.27 ± 180.33, $p = 0.066$).

Conclusions. The early postoperative nutritional immunomodulation leads to greater activation of the lymphocyte subpopulations, which grounds the presumption of a better immune response.

Keywords: cardiac surgery, immune response, immunonutrition

MEASURED VS. CALCULATED ENERGY EXPENDITURE IN PATIENTS WITH ACUTE SEVERE PANCREATITIS

Erika Šalčiūtė[1, 2], Julita Liučvaikytė[2], Andrius Klimašauskas[1, 2], Gintautas Kėkštas[1, 3], Jūratė Šipylaitė[1, 3]

[1] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[2] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Department of Anaesthesiology and Intensive Care, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *erika.salciute@gmail.com*

The aim of the study. According to the guidelines of both ESPEN and ASPEN energy expenditure should be measured with indirect calorimetry (IC) for the critically ill patients. If unavailable, validated equations are advised. The aim was to compare the performance of the equations in comparison with IC in patients with severe acute pancreatitis.

Materials and methods. A prospective observational study was conducted after the approval of the Regional Committee of Bioethics. Inclusion criteria: acute severe pancreatitis, above 18 years of age, mechanical ventilation.

Measurements of indirect calorimetry (IC) were obtained three times per week and compared to 11 equations: (1) Harris-Benedict; (2) Penn State; (3) Faisy; (4) Swinamer; (5) Ireton – Jones; (6) Mifflin – St. Joer; (7) Mifflin × 1.25; (8) Harris Benedict × 1.25; (9) Harris Benedict adjusted for obesity; (10) ASPEN recommendation of 25 kcal/kg; (11) ASPEN recommendation of 30 kcal/kg.

Results. Twenty-two patients were included in the study and 346 IC measurements were compared to the results of the validated equations. The median value of IC (24.89 ± 4.76 kcal/kg) was close to ASPEN 25 kcal/kg estimation and the results of some formulas: Penn State: 24.44 ± 3.08 kcal/kg and Harris Benedict × 1.25: 24.36 ± 2.45 kcal/kg, $p > 0.05$. The Bland-Altman plot of IC and Harris Benedict × 1.25, ASPEN 25 and Penn State equations revealed a lack of agreement for all three cases. The correlation coefficient between IC measurements and ASPEN 25 kcal/kg estimation was only 0.234 ($p < 0.01$). The highest correlation was found between IC and Faisy equation (0.538, $p < 0.01$), Harris Benedict adjusted (0.512, $p < 0.01$) and Swinammer (0.510, $p < 0.01$). Penn State equation resulted in correlation coefficient of 0.481, $p < 0.01$.

Conclusion. Predictive equations are unfit for guiding nutrition for acute severe pancreatitis patients; however, if indirect calorimetry is unavailable, the best alternative according to our results is the dynamic Penn State equation.

Keywords: acute severe pancreatitis, energy expenditure, indirect calorimetry

NUTRITION THERAPY FOR PATIENTS WITH SEVERE ACUTE PANCREATITIS

Erika Šalčiūtė[1, 2], Julita Liučvaikytė[2], Andrius Klimašauskas[1, 2], Gintautas Kėkštas[1, 3], Jūratė Šipylaitė[1, 3]

[1] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[2] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Department of Anaesthesiology and Intensive Care, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *erika.salciute@gmail.com*

Background and aim. Patients with acute severe pancreatitis have a high risk of inadequate nutrition during intensive care unit (ICU) stay due to high catabolism and feeding intolerance. The aim of this study was to evaluate if the amount of received calories and protein are related to better outcomes.

Materials and methods. Prospective observational study with adult mechanically ventilated acute severe pancreatitis patients was conducted after obtaining the approval of the Regional Committee of Bioethics. Demographic, outcome data and clinical nutrition records were collected. Energy expenditure (EE) of patients was measured by using indirect calorimetry (IC).

Results. Twenty-two patients were enrolled in the study: 13 patients survived. Average energy expenditure (EE) was 26 ± 4 kcal/kg (mean ± SD). There was no difference in the average EE between the patients who survived and those who died: 27 ± 1 and 25 ± 1 kcal/kg (mean ± SD), respectively ($p > 0.05$). The energy deficit (computed by subtracting

caloric intake from EE measurement) was similar among survivors and non-survivors, 5.5 ± 1 vs 6.5 ± 2 kcal/kg, respectively (mean ± SD) ($p > 0.05$). Mean value of caloric intake was 79 ± 14% of the measured EE. Survivors and non-survivors had received 81 ± 10% and 77 ± 19%, respectively ($p > 0.05$). The provision of protein was also similar for both groups: 1.1 ± 0.3 g/kg for survivors and 1 ± 0.2 g/kg for non-survivors (mean ± SD) ($p > 0.05$). There was no statistically significant correlation between provision of calories and protein and outcomes such as length of hospital and ICU stay or duration of mechanical ventilation.

Conclusion. Outcomes such as survival, length of hospital and ICU stay and duration of mechanical ventilation were unaffected neither by caloric nor protein provision in this sample.

Keywords: acute severe pancreatitis, energy expenditure, indirect calorimetry, nutrition, outcomes

VALIDATION OF THE LITHUANIAN ARTHROPLASTY REGISTRY

Eglė Tertelienė[1], Kazimieras Grigaitis[2], Narūnas Porvaneckas[1], Jolanta Dadonienė[1], Algirdas Venalis[1]

[1] *Clinic of Rheumatology, Orthopaedics, Traumatology, and Reconstructive Surgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Department of Orthopaedics, Medical Academy, Lithuanian University of Health Sciences, Kaunas, Lithuania*
Email: *egle.terteliene@gmail.com*

Background and aim. The aim of our study was to validate the registration of knee arthroplasty revisions in the Lithuanian Arthroplasty Registry (LAR) and thus give an indication of the accuracy of the published revision rates.

Materials and methods. A total of 4269 primary TKAs registered in LAR between 1 September 2013 and 1 September 2015 were included. Two years after surgery, the patients were contacted by phone in order to inquire if they had been subject to revision. The information from the patients was then cross-checked against what had been registered in the LAR and if a revision had not been registered the patient hospital charts were investigated. Thus, the patients were followed up with regard to revision and/or death until 1 September 2017.

Results. Nine small hospitals out of 22 were not able to provide contact details (telephone numbers) for 533 (549 knees) patients. Thus out of the 3536 (3723 knees) included patients, contact details were available for 3098 (3158 knees), 67 of whom had died. A further 438 (565 knees) patients appeared to have a wrong or non-valid telephone number leaving 3031 (3091 knees) patients available for contact. As 262 (266 knees) of those contacted refused to answer, we were left with 2769 responders (2825 knees). Sixty-one patients said that reoperation had been performed in the index knee within two years since their primary surgery. After checking with the clinics, ten were surgical procedures on the knee but not true revisions by our criteria. Out of 51 true revisions, we found that 46 were registered in the LAR as revised, while five (9.8%) revisions were missing.

Conclusion. The Lithuanian Arthroplasty Registry is fairly complete in terms of registered revisions of TKA.

Keywords: arthroplasty, register, knee, revision

CYTOTOXICITY AND PRIMARY MECHANISMS OF CELL DEATH INDUCED BY COMMONLY USED DENTAL LUTING CEMENTS

Rita Trumpaitė-Vanagienė[1], Alina Čebatariūnienė[2], Virginijus Tunaitis[2], Alina Pūrienė[1], Augustas Pivoriūnas[2]

[1] *Institute of Odontology, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Department of Stem Cell Biology, State Research Institute Centre for Innovative Medicine, Vilnius, Lithuania*
Email: *rita.vanagiene@odontalis.lt*

Background and aim. To examine cytotoxicity of luting cements on primary human gingival fibroblasts (HGFs), and to identify pathways of cell death induced by different cements.

Materials and methods. The commonly used luting cements were tested: Hoffmann's Zinc Phosphate (ZPC), GC Fuji Plus Resin Modified Glass Ionomer (RMGIC), and 3M ESPE RelyX Unicem Resin Cement (RC). The HGFs were exposed to different concentrations of ZPC, RMGIC and RC extracts. The cytotoxicity was assessed with the PrestoBlue Cell Viability Reagent. Viable cells were counted with a hemocytometer using the trypan blue

exclusion test. In order to determine the primary mechanism of cell death induced by different luting cements, the real-time monitoring of caspase-3/-7 activity and membrane integrity of cells were employed.

Results. All cements expressed cytotoxic effects, while the mechanisms for different cements varied. The extracts from RMGIC and ZPC decreased the metabolic activity and numbers of viable cells. The extracts from the RC evoked only small effects on the metabolic activity of HGFs with a decreasing number of viable cells in a dose-and time-dependent manner. The live cell imaging revealed that the apoptosis was the primary mechanism of cell death induced by the RMGIC, whereas the RC and ZPC induced cell death through a necrotic and caspase-independent pathway.

Conclusions. All cements were cytotoxic. The primary mechanism of cell death induced by the RMGIC was apoptosis, whereas RC and ZPC induced cell death via a necrotic pathway.

Keywords: cytotoxicity, gingival fibroblasts, luting cements

NUTRITION IN AN INTENSIVE CARE UNIT: ADHERENCE TO GUIDELINES

Jonas Tutkus[1], Erika Šalčiūtė[1, 2], Ignas Milkevičius[1], Eduardas Ambrasas[1, 2], Andrius Klimašauskas[2, 3]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Department of Anaesthesiology and Intensive Care, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *andrius.klimasauskas@mf.vu.lt*

Background and aim. Critically ill patients are often reliant on mechanical ventilation followed by enteral and/or parenteral nutritional therapy. Although the latter often seems elementary, sufficient caloric and protein intake is integral to optimal outcome. The purpose of our study was to evaluate the quality of nutritional therapy in intensive care units (ICU).

Materials and methods. A prospective study of 73 patients who required mechanical ventilation for longer than 48 h and were receiving enteral or parenteral nutrition was conducted in the main ICUs of our clinics. All data were collected from December 2017 to March 2018. The caloric needs were calculated as advocated in the latest guidelines of the American Society of Parenteral and Enteral Nutrition (ASPEN). Statistical analyses were performed using (SPSS). Our study was approved by the regional biomedical research ethics committee of Vilnius.

Results. Of 73 participants, 73% were males, and the mean age of the sample population was 64 ± 12.8 years. Mean scores of NUTRIC and NRS 2002 were 4.6 ± 1.92 and 3 ± 1, respectively. On average, the patients received 65.2% and 57.3% of their caloric and protein needs. Mean protein intake was 0.92 ± 0.5 g/kg/d, while recommended values are 1.2–2.0 g/kg/d. Early nutritional therapy (<48 h) was initiated for 80.8% patients. The causes for late induction of enteral feeding were hemodynamic instability (71.4%), dynamic ileus (14.3%), and unknown (14.3%). For 83% of patients who were at high nutritional risk (NRS 2002 ≥ 4, NUTRIC ≥ 5), nutrition was initiated in less than 48 h.

Conclusion. Nutritional therapy was usually initiated early, with most patients receiving enteral and/or parenteral therapy in less than 48 hours. However, the incidence of undernutrition (both caloric and protein) is high throughout the ICU stay.

Keywords: ASPEN, critical care, energy deficit, enteral nutrition

HEALTH LITERACY OF THE 11TH-12TH-GRADE SCHOOLCHILDREN, THEIR PARENTS, AND TEACHERS

Olga Ubartienė, Genė Šurkienė

Institute of Health Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
Email: *olga.ubartiene@mf.vu.lt*

The aim of the study. To assess the health literacy level and the influencing factors of 11th–12th-grade schoolchildren, their parents, and teachers.

Materials and methods. Schoolchildren, their parents, and teachers were questioned using an anonymous survey method. The HLS-EU-Q47 comprehensive health literacy questionnaire of 47 items, translated into the Lithuanian language, was used to assess health literacy level. The respondents were also asked about socio-demographic characteristics and other factors, which can be associated with health literacy. Statistical analysis was performed using the statistical data processing program SPSS, Microsoft Excel, and WinPepi. The reliability coefficient of the survey was $p < 0.05$.

Results. The data showed that more than half of the schoolchildren manifested sufficient and excellent levels of health literacy. Boys scored lower in health literacy than girls, and 11th graders scored lower than 12th graders. The leading motivation for seeking health information was the fear of pain. Almost all students used internet to seek online health support. Almost half of the children assessed their health status as good. Girls more often than boys assessed their health status as bad. The most common health problems at school were headache and stomach ache. Approximately one-third of the parents manifested a problematic or inadequate health literacy level. Smoking, less educated, and unemployed respondents with low health literacy showed a worse self-assessment of their health status. Limited health literacy is associated with poorer health outcomes. The results showed that a majority of the teachers belonged to the "sufficient" and "excellent" levels of health literacy. Older teachers assessed their health status worse than the younger do.

Conclusions. More than half of the schoolchildren manifested sufficient and excellent level of health literacy. Limited health literacy is associated with poorer health outcomes and inferior health status self-assessment. In general, the level of health literacy was significantly associated with the level of education and health behaviour.

Keywords: health literacy, schoolchildren, health, parents, teachers

EVALUATION OF ENDOSCOPIC AND ENDOSCOPIC ULTRASOUND FEATURES FOR DIFFERENTIAL DIAGNOSIS OF GASTROINTESTINAL STROMAL TUMOURS AND LEIOMYOMAS IN THE UPPER GASTROINTESTINAL TRACT

Rolandas Vaicekauskas[1], Jurgita Urbonienė[2], Juozas Stanaitis[1], Jonas Valantinas[1]

[1] *Clinic of Gastroenterology, Nephro-urology and Surgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Infectious and Chest Diseases, Dermatovenereology and Allergology, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *rolandas.vaicekauskas@santa.lt*

Background and aim. The term of subepithelial lesions (SELs) in the upper gastrointestinal tract (UGT) is applied to a mass or bulge covered by normal-appearing mucosa identified during upper endoscopy. Differentiation between benign and malignant lesions leads to far-reaching clinical consequences. An accurate diagnosis can be challenging because of the insufficient diagnostic yield of the upper endoscopy, endoscopical ultrasound (EUS) and different types of biopsy. Our aim was to reveal the efficacy of endoscopic and endoscopic ultrasound (EUS) features for differential diagnosis of hypoechogenic SELs (gastrointestinal stromal tumours (GISTs) and leiomyomas) in the UGT.

Materials and methods. The research covers a study of case series of 27 hypoechogenic SELs in the UGT between 2012 and 2015 at Vilnius University Hospital: 12 GISTs and 15 leiomyomas were histologically confirmed after a deep biopsy via the endoscopic submucosal dissection technique. Upper gastrointestinal endoscopy and EUS were carried out. Endoscopical and EUS features of SELs were recorded. In order to standardize the diagnostic approach of GIST and leiomyomas, we assigned scores for seven endoscopic and EUS features.

Results. Echogenicity and tumour shape demonstrated good predictive features (area under ROC > 0.8); heterogeneous EUS image showed a satisfactory predictive feature (area under ROC > 0.7). Mean total score in the case of GIST was significantly higher than the one in the leiomyomas group: 6.08 ± 2.57 and 1.80 ± 1.27 ($p < 0.0001$), respectively. Increment by one score increased the odds ratio for GIST 4.50 times (95% CI 1.36–14.87) ($p = 0.014$). The total score demonstrated very good discriminatory features of GIST against leiomyomas with area under ROC = 0.964. The cut-off value of 2.5 total score indicated 100% sensitivity and 80.0% specificity in diagnosing GIST.

Conclusions. Upper gastrointestinal endoscopy and EUS are useful methods in making a definite diagnosis of SELs. Its diagnostic accuracy for differential diagnosis of GISTs and leiomyomas is sufficient.

Keywords: gastrointestinal stromal tumour, leiomyoma, endoscopy, endoscopical ultrasound

CHANGES IN THE INCIDENCE OF MULTIPLE SCLEROSIS IN LITHUANIA FROM 2001 TO 2015

Daiva Valadkevičienė[1], Andrius Kavaliūnas[2], Rasa Kizlaitienė[1], Mykolas Jocys[3], Dalius Jatužis[1]

[1] *Department of Neurology and Neurosurgery, Institute of Clinical Medicine, Vilnius University, Faculty of Medicine, Vilnius, Lithuania*

[2] *Department of Clinical Neuroscience, Karolinska Institute, Stockholm, Sweden*

[3] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *daiva.valadkeviciene@gmail.com*

The aim of the study. To evaluate the development of rates in frequency and sex ratio of multiple sclerosis (MS) during a period of 15 years in Lithuania with trend extending to 2020. In addition, to assess female-to-male ratio and its adjustment among MS patients.

Material and methods. A descriptive incidence study was carried out. We calculated the crude incidence rates (CIR) by the use of 15-year period, gender, 5-year age groups and an amount of newly entered MS patients. The European standard was used to determine the standardised incidence rates (SIR) in order to appraise the effect of resident structure changes tied to the incidence of MS during the latest 15-year period. Minitab set was a the primary tool to process to estimate a linear trend mode for the rate development with 16 parameters.

Results. Significant growth in the frequency rate of MS was highly evident in Lithuania during a period between 2001 and 2015. In 2001, MS was diagnosed to 162 new individuals, whereas 343 new cases of MS were diagnosed

in 2015. During a period between 2001 and 2015, the incidence of MS was on average 6.5 cases per 100,000 residents, 4.9 and 8.1 per 100,000 male and female, respectively. Female-to-male sex ratio in incidence rate in MS in Lithuania showed a tendency to increase over the period. Females were affected from 1.5 to 2 times more often than males.

Conclusions. Assuming that the trend persists, the frequency rate of MS will reach 13 cases per 100,000 cases by 2020, and females are set to be diagnosed with MS twice as often as males.

Keywords: demography, epidemiology, forecasting, incidence, multiple sclerosis, population dynamics, sex ratio

FACTOR ANALYSIS OF THE LITHUANIAN VERSION OF THE DIZZINESS HANDICAP INVENTORY

Domantas Valančius[1], Rytis Masiliūnas[2, 3], Aistė Paškonienė[3, 4], Kristina Ryliškienė[2, 3]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Neurology and Neurosurgery, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Lithuania*

[3] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[4] *Centre for Ear, Nose, and Throat Diseases, Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*
Email: *rytis@olimpiados.lt*

Background and aim. The Dizziness Handicap Inventory (DHI) is a widely used, validated, 25-item, self-reported questionnaire that measures disabling effects of dizziness. In conjunction with the total score, DHI has three subscales – emotional, functional, and physical. Even though multidimensionality of the scale was apparent, previous studies did not support the original subscale structure. Our goal was to explore the different dimensions of the Lithuanian version of DHI (DHI-L).

Material and Methods. Patients with dizziness or imbalance of vestibular or non-vestibular origin were recruited from Vilnius University Hospital Santaros Klinikos between January and March 2017. They filled out the DHI-L. We opted to use Principal component analysis (PCA) with oblimax rotation, which is suitable for confirming the structure of the data in questionnaires of a multidimensional nature, such as the DHI.

Results. The study group consisted of 108 patients (78% women) with a mean age of 51.9 (±16.1) years. Bartlett's test was highly significant ($p < 0.0001$), and the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.83. We investigated several different solutions based on eigenvalues greater than one on the screen plot. The two-factor solution, which was also supported by a parallel analysis, was the most reliable and clinically relevant. It explained 44.5% of the variance. The first factor consisted mainly of both the original functional and emotional subscale items, and indicated the effect of dizziness on daily activities and psychological well-being. The second factor comprised of items that pertained to postural instability and the difficulties associated with it.

Conclusions. Our results did not support the original subscale structure of the DHI. As multidimensionality of the scale was clear, more studies need to address the means of possible restructuring of the DHI.

Keywords: DHI, Dizziness Handicap Inventory, factor analysis

MEDICAL TERMINATION OF PREGNANCY AS AN ALTERNATIVE TO SURGICAL ABORTION. APPLICABILITY OF TELEMEDICINE IN MEDICAL ABORTION SERVICE

Diana Vasiljevaitė[1], Rūta Žulpaitė[1], Sigitas Laima[2], Rokas Šimakauskas[2],

Sigitas Chmieliauskas[2], Dmitrij Fomin[3], Jurgita Stasiūnienė[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Department of Pathology, Forensic Medicine, and Pharmacology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[3] *Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *jurgita.stasiuniene@mf.vu.lt*

Background and aim. Improvement of access to all evidence-based healthcare services in all regions is the priority of strategic planning for healthcare. Abortion services should not be an exception. In 1988, France and China were the first countries to legalize medical abortion (MA). Other European, North American and some developing countries soon followed. Currently, only surgical abortion is available in Lithuania, while MA is illegal.

We analysed and compared the experience of MA service in different countries.

Materials and methods. PubMed, official websites of the World Health Organization (WHO), "Women on Web", "Gynuity", and "Women Help Women" organizations were scrutinized for scientific-methodological literature regarding medical abortions. Out of 102 publications, 50 were included in this review.

Results. MA is legally available in more than 60 countries. The regimen of 200 mg mifepristone followed by 400–800 μg misoprostol is recommended by the WHO. Nevertheless, dosages and medicines differ among countries. The advantages of MA include the following: unnecessity of intervention and analgesia, no risk of uterine or cervix injury, greater privacy. Side effects include pelvic pain, gastrointestinal symptoms, severe haemorrhage, incomplete abortion or ongoing intrauterine pregnancy requiring a surgical abortion for completion. Telemedicine was obtained by five non-governmental organizations to provide MA service for those countries with restrictive abortion laws. The results based on self-reports displayed acceptable rates of complications; however, 22.4–45.2% of users were lost to follow-up. Successful telemedicine adoption for MA was reported in the USA, Canada, and Australia, where on-request abortion is legal but other barriers exist. A telemedicine project was approved in Lithuania in 2011; however, usage has so far been limited to cardiology, ophthalmology, radiology, and dermatology.

Conclusion. MA is a safe and effective alternative to surgical abortion. Telemedicine improves the access to qualified abortion service, especially in settings with existing barriers. MA and the development of the telemedicine service in this area should be discussed in health politics.

Keywords: medical abortion, mifepristone, telemedicine

BIOELECTRICAL IMPEDANCE ANALYSIS-DERIVED PHASE ANGLE IN CARDIAC SURGERY PATIENTS: IMPLICATIONS FOR PROGNOSIS OF LATE MORTALITY

Vaidas Vicka[1, 2], Dalia Zokaitytė[1], Lina Puodžiukaitė[1], Dalia Gineitytė[1, 2], Daiva Gražulytė[1, 2],

Donata Ringaitienė[3], Jūratė Šipylaitė[3]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

[3] *Department of Anaesthesiology and Intensive Care, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *donata.ringaitiene@santa.lt*

Background and aim. Increasing age and frailty of the patients undergoing cardiac surgery complicate the selection of patients. The aim of this study was to determine whether bioelectrical impedance analysis (BIA) phase angle is linked to long-term results after cardiac surgery and could be used as predictor.

Materials and methods. This observational retrospective study included all of the patients who underwent any of the STS defined elective cardiac surgery type from 2013 to 2014 at Vilnius University Hospital. Patients who died in hospital within the first postoperative month were excluded. Demographic and comorbidity data were gathered and BIA was performed in the perioperative period. We evaluated 3–5-year all-cause mortality rate. Patients were categorized by the BIA-provided phase angle (PhA) value, which was standardized for age and sex; long-term predictors were determined by Cox regression analysis.

Results. Among the cohort of 642 patients undergoing cardiac surgery, the median age was 67.8 [59–73] years; most of them were men (67.8%). Long-term mortality rate was 12.3% (n = 79). Most of the cases were low risk with median EuroSCORE II value of 1.78 [1.07–2.49]. The rates of standardized PhA were as follows: <5th 10.4% (n = 67), <10th 17.3% (n = 111), <15th 22.7% (n = 146), <20th 27.6% (n = 177), <25th 35.5% (n = 228), <30th 42.2% (n = 271), <35th 47.4% (n = 304), <40th 52% (n = 334), <45th 58.6% (n = 386). The Cox regression analysis of all percentiles revealed the most potent predictor – a phase angle value below 25th of the reference range (OR 2.42, 95% CI: 1.49–3.94, $p < 0.001$), with a mean difference in survival of 13.22 months (64.60 vs. 51.38 $p < 0.001$). This relation persisted after adjustment with EuroSCORE II value.

Conclusions. BIA-provided phase angle value can be used for long-term survival estimation before cardiac surgery. However, further studies need to prove the independent effect of these assumptions.

Keywords: bioelectrical impedance analysis, cardiac surgery, phase angle, post-operative outcomes

TREATMENT OF RESTLESS LEGS SYNDROME BY A GENERAL PRACTITIONER: A CASE REPORT

Audra Vyšniauskaitė[1], Viktorija Andrejevaitė[1, 2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Internal Diseases, Family Medicine, and Oncology, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

Email: *viktorija.andrejevaite@gmail.com*

Background. Restless legs syndrome (RLS) is an increasing cause of referral to the general practitioner (GP) in modern society. This condition causes uncomfortable creeping feelings in the legs, an urge to move them, and is strongly linked to sleep disturbances, anxiety, and depression.

Case report. A 73-year-old woman complained of symptoms of RLS for about 40 years. Family history: her father had Parkinson's disease. Symptoms: an urge to move legs while sitting and before sleep. The symptoms were facilitated by walks. Fatigue and headaches were also reported from the age of 30 years. Diagnosis of the neurologist: RLS, based on the diagnostic criteria of the International RLS Study Group. Treatment: (1) Pramipexolum 0.18 mg induced an improvement, but it was changed to Ropinirolum due to strong itching and headache; (2) Ropinirolum 1mg provoked strong somnolence, dizziness, instability of blood pressure, and restless dreams. A 1/4 tablet was used for 1.5 years but was discontinued because of renewed itching; (3) Gabapentinum 100 mg was stopped after one week because of strong dizziness; (4) Magnesium, vitamins B and D brought about a light improvement; (5) Bromazepamum 3 mg or Clonazepamum 2 mg improved night sleep; (6) Rehabilitation programme: physiotherapy, baths, magnet, and compression therapy caused regression of the symptoms. Although anxiety and depression were present, the patient has been symptom-free for two months now. She is mainly on nonmedical treatment: she dances, practices Nordic walking, and uses the massage chair.

Conclusions. Evolutionary medicine has brought various drugs to relieve the symptoms of RLS. However, their effectiveness tends to wear off and what works for one patient may harm another. It is crucial for the GP to enhance the knowledge about the syndrome in order to prescribe relevant doses of proper drugs and not to forget alternative methods.

Keywords: nonmedical treatment, restless legs syndrome

PRIMARY PULMONARY MENINGIOMA: WHAT TO EXPECT?

Rūta Žulpaitė[1], Žymantas Jagelavičius[2], Ugnius Mickys[3], Ričardas Janilionis[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

[2] *Clinic of Infectious and Chest Diseases, Dermatovenereology, and Allergology, Institute of Clinical Medicine, Faculty of Medicine, Vilnius, Lithuania*

[3] *Department of Pathology, Forensic Medicine and Pharmacology, Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
Email: *zymant@yahoo.com*

Background. Primary extracranial meningiomas are very rare tumours. Primary pulmonary meningiomas (PPM) are even more uncommon. Up to 50 cases have been reported in the literature so far and only six cases of malignant PPM have been described. In the histological Classification of Tumours of the Central Nervous System of the World Health Organization (WHO), meningiomas are divided into grades I–III, with an increasing risk of aggressive behaviour. A rare case of primary pulmonary meningioma with rhabdoid features is presented herein.

Case history. A 43-year-old asymptomatic woman presented with a 4.5 cm pulmonary nodule in the left upper lobe detected on computed tomography scan. The transthoracic needle biopsy suggested the provisional diagnosis of tumour of low malignancy. Brain magnetic resonance imaging showed no evidence of primary intracranial tumour. A thoracoscopic wedge resection of the well demarcated nodule was performed. Histologically, the tumour consisted of solid sheets of eosinophilic epithelioid cells with oval, focally eccentric nuclei with occasional small nucleoli, forming nodular or pseudoangiomatous structures, whorl formation, and focal calcification. Focal areas had rhabdoid appearance. Mitotic activity was inconspicuous. Immunohistochemically, the tumour was positive for vimentin, CD56, progesterone receptor, epithelial membrane antigen; negative for cytokeratins AE1/AE3, desmin, smooth muscle actin, CD34, CD117, chromogranin A. Ki-67 index was ~2%. The final diagnosis was primary extrameningeal meningioma with rhabdoid features and intrabronchial, intraalveolar, and intravascular invasion (WHO grade III). The patient is doing well after 1.5 years of follow-up without evidence of the disease recurrence.

Conclusions. Although the grading of intracranial meningiomas was applied to PPM, there is no certainty about the real behaviour of this tumour due to the rarity of such cases. Because of possible malignancy, a vigilant follow-up is crucial.

Keywords: extracranial meningioma, primary pulmonary malignant meningioma, pulmonary tumour, thoracoscopic surgery