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UNIVERSITY OF LATVIA
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OPENING & PLENARY SESSIONS

INTRODUCTION OF STATE MANDATORY HEALTH INSURANCE AS A STEP FORWARD OUT OF THE DEEP FINANCIAL CRISIS IN THE LATVIAN HEALTHCARE SYSTEM (*STATE-OF-ART*)

Romualds Ražuks[1]

[1] *MP, Chairman of the Public Health Committee of the Parliament of the Republic of Latvia*

After a delay of more than 20 years, on December, 2017, *Saeima* adopted the *Healthcare Financing Law*, an integral part of which is introduction of state mandatory health insurance in Latvia, stating that full amount of healthcare services is available only to the tax payers, while those who do not pay sufficient social tax have to insure themselves. Otherwise, only urgent medical aid and family doctor services will be available to them. The basis for this law was formed by changes in the tax paying system, accepted in July, 2017. The law states that 19 vulnerable social groups (children, pensioners, unemployed, handicapped, families and individuals deemed as needy and others) will be insured by the state. An amendment to the Law on Social Insurance increased social tax by 1%, allocating an expected 68 million euro to the needs of healthcare. Introduction of the new system in Latvia was not an experiment or the will of the government. The healthcare financing situation had reached its critical point due to the lack of physicians and medical nurses, who were unable to support their families with their low salaries, thus endangering the functioning of the system as a whole. In comparison with our neighbouring country Lithuania, the Latvian healthcare budget was 300 million euro short in 2017. Here it must be emphasized that for all of the so-called new initiatives, only 80 million euro was allocated for the 2018 budget. This included: education, culture, agriculture, etc. Clearly, such money will never be available in the state budget – the healthcare funding deficit is simply too large. In the summer of 2017, the Prime Minister, Māris Kučinskis, came to the conclusion that compensation of this amount from the state budget is impossible, and the government needs money in addition to the budget. This gave the decisive political momentum for the introduction of mandatory state health insurance in Latvia. The opponents usually express two main arguments against the new law: 1. the law is against human rights – everyone is entitled to all services of the healthcare system, and: 2. one percent of social tax is not enough. Here it must be mentioned that state mandatory healthcare insurance systems works in 16 European countries and, moreover, 11 of them are post-socialist, still developing countries with comparatively weak budgets. They cannot allocate as much money for their healthcare as the UK or Sweden. In Germany, this system exists since the times of Chancellor Bismarck and is known internationally as the Bismarck System. No one has reported these countries to the European Court of Justice. Obviously, 1% was not sufficient to cover the debt pit of 300 million euro, but that is the amount we were able to afford in a pre-election year, 20 years later, in comparison with the neighbouring countries. It has been essential to introduce the new system and the first step has been completed.

FROM BIOBANKING TO PRECISION MEDICINE: THE ESTONIAN EXPERIENCE *(STATE-OF-ART)*

Andres Metspalu[1]

[1] *Institute of Genomics, Estonian Genome Center, University of Tartu, Estonia*

In the advent of the precision medicine, more national biobanking, precision medicine or genomic medicine programs are announced globally. In Iceland, the whole country has been genetically characterized, in USA the new initiative "All of Us" is underway. One of the early biobanks, like the UK Biobank, the Estonian Biobank was founded in 2000 as a public, population-based biobank, and it is time to have a look at the results and the ways how this resource could be used in coming years for research, in precision medicine and in drug development. The Estonian Biobank includes a collection of health and genetics data of around 5 percent (n=52,000) of the adult population of Estonia, and after 7 years of intense research it is ready to return the research data back to the biobank participants and enter the large hospital lead precision medicine programs. All participants of the biobank have gone through a standardized health examination, signed the broad informed consent, and donated blood samples for purification of DNA, white blood cells, and plasma. A significant part of the cohort (n=5,000 equals 0.5% of the adult population of the country) has been sequenced (WGS and WES), all 52 000 subjects are genotyped using genome-wide genotyping arrays from *Illumina*. In 2018, additional 100 000 participants will be added to the biobank and all will be genotyped also. The Human Genes Research Act allows regular updating of data through linkage to national registries and electronic medical records, enabling long-term follow-up of the cohort and to re-contact the biobank participants. Pilot projects for returning the research data to the gene donors are underway. Currently, we are returning the genetic risk scores for FH, T2D, CAD, incidental findings and pharmacogenetics variants. Systems including ICD-10 diagnoses, prescriptions, lab data and EMR are included. The work on the Estonian Biobank demonstrates that genomic risks and potential drug response could be calculated (predicted!) from health (BMI, age, gender etc.) and genomic data (sequences and genotypes), and can have a long term positive effect on public health, as was demonstrated by the pilot study on familiar hypercholesterolemia.

ORAL SESSIONS

BASIC MEDICAL SCIENCE

(*STATE-OF-ART*) INVOLVEMENT OF PERSISTENT VIRAL INFECTIONS IN THE DEVELOPMENT OF NERVOUS SYSTEM DISEASES

Svetlana Chapenko[1], Santa Rasa[1], Sandra Skuja[2], Silvija Roga[3], Inara Logina[4], Angelika Krumina[5], Valerija Groma[2], ***Modra Murovska***[1]

[1] *A. Kirchenstein Institute of Microbiology and Virology, Rīga Stradiņš University, Riga, Latvia*
[2] *Institute of Anatomy and Anthropology, Rīga Stradiņš University, Riga, Latvia*
[3] *Study Department, Rīga Stradiņš University, Riga, Latvia*
[4] *Department of Neurology and Neurosurgery, Rīga Stradiņš University, Riga, Latvia*
[5] *Department of Infectology and Dermatology, Rīga Stradiņš University, Riga, Latvia*

Background. Around 95% of humans are exposed to herpes virus-6 and -7 (HHV-6, HHV-7) during early childhood. After the primary infection, viruses can establish life-long latency without visible clinical changes, however, the role of these beta-herpes viruses in the development of human diseases, as well as the factors reactivating viral infection from latency are not completely clarified.

Purpose. To investigate involvement of HHV-6 and HHV-7 infection in the development of unexplained nervous system disorders, like encephalopathy, fibromyalgia (FM) and myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS).

Materials and methods. Peripheral blood of 41 patient with FM, 200 patients with ME/CFS and 104 healthy persons, and brain tissue autopsy materials from 57 individuals with encephalopathy, as well as age matched 51 individuals without neurologic pathology were studied using methods of molecular virology, immunology and morphology.

Results. In patients with FM significantly more often were found concurrent HHV-6 and HHV-7 infection, its activation, higher viral loads and levels of pro-inflammatory cytokines. Among the patients with ME/CFS, the markers of persistent HHV-6 and HHV-7 infection in the active phase were detected significantly more frequently than among healthy individuals. In patients with HHV-6 reactivation viral load was almost seven times higher than in patients with persistent HHV-6 infection in latent phase, while in the case of HHV-7 reactivation viral load was only slightly higher. In case of encephalopathy, significantly higher frequency of beta-herpes virus infection markers, including expression of virus-specific antigens in the brain tissue, was detected. HHV-6B was dominant in all cases. Studies structural changes in the human olfactory tract (one of the pathways for infection in the brain) showed that HHV-6 mostly alters the oligodendrocytes and myelin they create, thus impulse transmission is expected to be impaired. By studying ME/CFS, it has been shown for the first time that HHV-7,

like HHV-6, can integrate into the genome of the cell, resulting in the infection being inherited from generation to generation.

Conclusion. Higher detection frequency of beta-herpes viruses infection reactivation markers in patients with FM, ME/CFS and in the brain tissue of individuals with encephalopathy compared to controls suggest the potential involvement of these viruses in development of above mentioned nervous system disorders.

Acknowledgements. The work was supported by the grant 478/2012 from Latvian Council of Sciences and the grant ZP 13/2013 from Rīga Stradiņš University. Chromosomal integration of HHV-7 was studied in a framework of 7IP BALTINFECT project in collaboration with University of Wurzburg, Germany (Dr. B. Prusty).

1. CLINICAL PHARMACOLOGIST IN THE FIELD OF POPULATION PHARMACOKINETICS

Aurelija Radzevičienė[1], *Silvijus Abramavičius*[1], *Edgaras Stankevičius*[1], *Franck Saint-Marcoux*[2], *Edmundas Kaduševičius*[1]

[1] *Institute of Physiology and Pharmacology, Medical Academy, Lithuanian University of Health Sciences*

[2] *INSERM UMR 850, Limoges, Department of Pharmacology and Toxicology, CHU Limoges, Limoges Cedex, University of Limoges, Limoges, France*

Background. Immunosuppressive drugs exhibit high variability in metabolism and pharmacokinetics that may result in drug toxicity or lack of efficacy. Low immunosuppressant drug exposure increases the risk of transplant rejection in the acute post-transplant period, while supratherapeutic drug concentration entails higher risk of adverse drug reactions. These issues may be resolved by population pharmacokinetic modeling.

Population pharmacokinetic modeling might be performed and researched by clinical pharmacologists, recently established clinical pharmacology residency in Lithuania may play a role in this area, as well.

Purpose. To broaden the competence of Lithuanian clinical pharmacologists by developing one-compartment model with first-order absorption of tacrolimus.

Materials and methods. Anonymized medical records of kidney recipients receiving immunosuppressant tacrolimus and hospitalized at Limoges University Hospital (France) were included in the study. Tacrolimus analyses were performed using a liquid chromatography-tandem mass spectrometry method. A one-compartment model with first-order absorption was used as implemented in the NLMIXED procedure, which fits nonlinear mixed models.

Data analysis was performed by using SAS University Edition software. Model parameter estimated are provided with p-values and confidence limits computed by NLMIXED procedure. The p-values and confidence limits were computed from approximate standard errors (using the delta method) for the estimates.

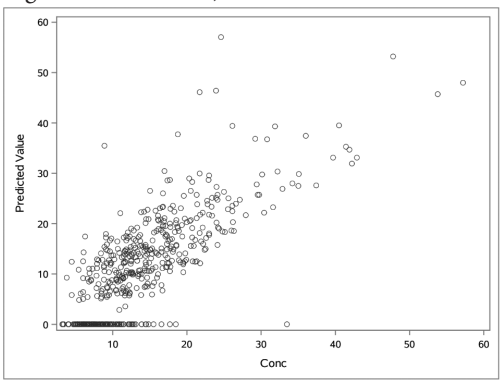

Figure. **Predicted vs. observed concentration (μg/L)**

Results. Anonymized medical records of 189 patients receiving immunosuppressant tacrolimus (2 – 20 mg/d BID regimen) were analyzed and a one-compartment model with first-order absorption was constructed. The population estimates in the final population model of tacrolimus were: clearance 14.64 L/h (CI 9.66; 19.62), p<0,0001, elimination rate 0.001657 min^{-1} (CI: 0.00098; 0.002336), p<0.0001 and absorption rate 2.7119 (CI: - 45,7083; 51,1321), p = 0.912. Mean value of concentration was 13.62 (SD 7.5) μg/L, predicted concentration 10.83 (SD 10.83) μg/L. Pearson correlation between measured and predicted concentrations was r = 0.79 (p<0.0001).

Conclusions. Population pharmacokinetic models should be developed in-house. Clinical pharmacologists should participate in pharmacokinetic modeling process.

Acknowledgements. This research was funded by a grant (No. P-MIP-17-445) from the Research Council of Lithuania. This research was performed in cooperation with the Limoges University Hospital, France.

2. HARMFUL AND POTENTIALLY HARMFUL EXCIPIENTS IN MEDICINES FOR HOSPITALIZED NEONATES

Inese Sviestiņa[1,2]*, Dzintars Mozgis*[3]

[1] *Faculty of Medicine, University of LatviaRiga, Latvia*
[2] *Children's Clinical University Hospital, Riga, Latvia*
[3] *Public Health and Epidemiology Department, Riga Stradiņš University, Riga, Latvia*

Background. Medicines used in neonates contain different excipients, which may not be safe in this age group.

Purpose. To analyse the frequency at which hospitalised neonates are exposed to harmful excipients (HE), potentially harmful excipients (PHE) and to identify substitution possibilities for medicines containing HE.

Materials and methods. This was a retrospective, observational study at a university paediatric hospital from September 1, 2015 to February 29, 2016. All the hospitalised neonates who received prescriptions for medicines and food supplements containing HE and PHE were included. Neonates were divided into four groups according to the gestational age (<28 weeks; 28 to <32 weeks; 32 to <37 weeks and >37 weeks). All the medicines and food supplements, except blood products, glucose and electrolyte solutions, vaccines, parenteral nutrition products and contrast agents, were analysed. The following HE were analysed: parabens, polysorbate 80, propylene glycol, benzoates, saccharin sodium, sorbitol, ethanol and benzalkonium chloride. Twenty seven PHE, e.g., benzethonium chloride, were analysed. Excipients were identified from the Summaries of Product Characteristics. Substitution was analysed according to Product substitution study by Nellis et al.(*Paediatr. Drugs,* 2016).

Results. During the study period, there was a total of 327 neonates hospitalised. Of these, 296 (102 (35%) preterm) included into the study received 1472 prescriptions for 106 medicines. The most often used formulations were intravenous (48/106; 45%), oral solid formulations (20; 19%) and topical formulations (16; 15%). The total number of different excipients was 169. In total, 29/106 (27%) of medicines contained at least one HE and 52 (49%) – at least one PHE. 19 medicines contained both at least one HE and PHE. There were 527 (36%) prescriptions (250;47% prescriptions for preterm and 277;53% for term neonates) of medicines containing at least one PHE. In total 82/102 (80%) preterm and 118/194 (61%) term neonates received medications with at least one HE. Substitution was possible for 9/29 (31%) HE containing medicines.

Conclusions. The usage of medicines containing HE and PHE was high in the hospital. However, the medicines' substitution was possible only in a small number of cases. The main focus should be on information and education of the hospital specialists, which HE and PHE are present in used medicines, what adverse reactions they may create and how to avoid the usage of these medicines. Therefore, the clinical pharmacist prepared recommendations in the hospital intranet warning doctors about currently used medicines with HE (number of HE excipients, the possible adverse reactions, etc.).

3. *IN VITRO* STUDY TO ASSESS THE SAFETY PROFILE OF CONIFER NEEDLE EXTRACTIVES FOR POTENTIAL TOPICAL APPLICATIONS

Ilona Vanaga[1,2,3], *Uģis Klētnieks*[2,3], *Jānis Ancāns*[4], *Ilze Blāķe*[4], *Jerzy Gubernator*[5], *Baiba Jansone*[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *SIA "Silv EXPO", Riga, Latvia*
[3] *AS "Biolat", Salaspils, Latvia*
[4] *Faculty of Biology, University of Latvia, Riga, Latvia*
[5] *Faculty of Biotechnology, University of Wroclaw, Wroclaw, Poland*

Background. Nutracosmetics are an emerging class of health and beauty aid products that incorporate natural extractives and have a low toxicity profile (Chanchal and Swarnlata, 2008). Conifer tree needles are an abundant source of biologically active lipophilic compounds such as polyprenols, Silbiol (epimanool and isoabienol) and provitamin complex (β-carotene, vitamins E and K, sterols). Polyprenols are known to exhibit antithrombotic, antibacterial, antitumor, antiulcer, immunomodulating, hepatoprotective and cognition-protective effects (Wang et al., 2014, Zhang et al., 2015). Although these compounds are used in oral medications, still, in topical forms they have been less studied.

Purpose. The objective of this *in vitro* study was to evaluate the safety profile of the conifer tree needle extractives, especially, polyprenols in the form of nanoemulsions as to their potential for topical applications in cosmetics.

Materials and methods. *Abies Sibirica* (~ 80% purity) and *Picea abies* (≥ 95 purity) polyprenols were acquired from JSC "Biolat". Polyprenols and corn oil (control) were used to prepare nanoemulsions of droplet size range of 120-160 nm. Immortalized human melanoma cells FM55, human keratinocyte line (HaCaT) and dermal fibroblasts (HDF) were resuspended in standard DMEM/10%FBS (Biochrom) medium and seeded in 96-well microplates (Sarstedt). Cells were imaged for up to 72 h by phase contrast imaging at magnification of 100x using an IncuCyte ZOOM microscope system (Essen Biosciences). Kinetics of cell growth was monitored using the IncuCyte integrated confluence algorithm and images were recorded once per hour.

Results. Significant differences were observed between emulsions of 80% and 95% pure polyprenols. Whilst 95% polyprenol emulsion did not influence cell proliferation rate for HaCaT and HDF cultures up to the concentration of 5% (v/v), the same cell cultures started to show significant reduction in the cell density already starting at 0.5% and 1% (v/v) with 80% polyprenol emulsion. Human melanoma cells FM55 were more sensitive to 80% polyprenol emulsions as well with growth rate reduction already at 0.1% (v/v). However, with the application of 95% polyprenol emulsion FM55 cells did not reduce growth rate up to the concentration of 5% (v/v).

Conclusions. An excellent safety profile of the 95% polyprenol nanoemulsion obtained from the *in vitro* study indicates its potential use in cosmetic formulations.

Acknowledgements. The research project N_0 1.2.1.1/16/A/005 "The incorporation of conifer needle extractives': polyprenols, silbiol and provitamin paste microemulsions into cosmetic formulations (P28)" in cooperation with SIA "Smart material and technology competence centre" and CFLA.

4. ANTIOXIDANT AND ANTIDIABETIC EFFECTS OF FIVE *VACCINIUM SPP.* BERRY EXTRACTS

Reinis Rembergs[1], *Kaspars Jekabsons*[1], *Kristine Saleniece*[1], *Zane Dzirkale*[1], *Linards Klavins*[2], *Maris Klavins*[2], *Ruta Muceniece*[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Department of Environmental Science, Faculty of Geography and Earth Sciences, University of Latvia, Riga, Latvia*

Background. *Vaccinium spp*. berry extracts have perspective to be used in modern medicine to treat and prevent diseases due to the described activities: antioxidant, anti-inflammatory, antimicrobial, antidiabetic, diuretic etc. Chemical composition of berry extracts is very complex and growing environment can influence the health-relevant potency of berries of wild and cultivated origin. In-depth studies of the pharmacologically valuable substances are necessary for wild and cultivated berries to develop a pharmaceutical product. Inhibition of α-glucosidase and α-amylase – required for starch and other complex dietary carbohydrate digestion – helps diabetics to reduce postprandial hyperglycaemia after food intake. However, research in this field and studies on the antidiabetic effects of flavonoids are limited.

Purpose. The objective of the current study was to compare antioxidant and antidiabetic effects of blueberry, highbush blueberry, cranberry, large cranberry, lingonberry extracts *in vitro* assays.

Materials and methods. Dry berry extracts were dissolved in methanol at concentration from 1 mg/ml to 0.0003 mg/ml and used in experiments. Total phenolic content (TPC) was measured using Folin-Ciocalteu's reagent and calculated as gallic acid (GA) equivalents, free radical scavenging effect was assessed by 2,2-diphenyl-1-picryhydrazyl (DPPH) assay and compared with that of ascorbic acid, superoxide dismutase (SOD) activity was measured with SOD determination kit (Sigma). Inhibition of α-glucosidase and α-amylase activity was measured in cell-free assays and evaluated against the pharmacological glucosidase inhibitor, acarbose. All chemicals were obtained from Sigma Chemical Co. (USA).

Results. TPC content in GA equivalents was following: for blueberry extract – mg 568 GA/g, highbush blueberry – mg 400 GA/g, cranberry – mg 720 GA/g, large cranberry – mg 280 GA/g, lingonberry – mg 546 GA/g. 50% of DPPH inhibition was reached at concentration diapason from 0.015–0.031 mg/ml. The effect of berry extracts exceeded that of ascorbic acid, which caused 50% DPPH inhibition at concentration 0.08 mg/ml. All extracts inhibited superoxide anion release approximately at concentration 0.025 mg/ml, showing SOD-like activity. All extracts strongly inhibited **α-glucosidase activity with IC50 approximately at concentration 0.01 to 0.035 mg/ml** with much higher potency than acarbose (0.09 mg/ml). Berry extracts showed less potent inhibition of **α-amylase activity. IC50 values were at concentration of 0.3**–0.5 mg/ml.

Conclusions. All investigated *Vaccinium spp.* extracts possess strong antioxidant and antidiabetic activity with some superiority of wild berries and effects are comparable to clinically-used antidiabetic drugs.

Acknowledgements. This work was supported by the European Regional Development Fund within the project No. 1.1.1.1/16/A/047 "Genus Vaccinium berry processing using 'green' technologies and innovative, pharmacologically characterized biopharmaceutical products".

5. IMPACT OF ANTHOCYANIDINS ON THE DIFFERENTIATON CAPACITY OF HUMAN ADIPOSE MESENCHYMAL STEM CELLS

Liga Saulite[1], *Kaspars Jekabsons*[1], *Una Riekstina*[1], *Maris Klavins*[2], *Ruta Muceniece*[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Faculty of Geography and Earth Sciences, University of Latvia, Riga, Latvia*

Background. Anthocyanidins are flavonoids responsible for the pigmentation in plants. Anthocyanidins are known for their anti-oxidative, anti-inflammatory and anti-tumor properties. The influence of anthocyanidins on the reduction of obesity and diabetes has been a subject of discussion in recent years. It has been reported that consumption of anthocyanidins lower the risk of obesity and type 2 diabetes. Moreover, anthocyanidins prevent bone loss through induced osteoblast differentiation and therefore are suggested as promising agents in bone-related. Additionally, it was recently reported that cyanidin regulates chondrocyte hypertrophic differentiation. Mesenchymal stem cells could be a valid model to elucidate anthocyanidin effect due to their ability to differentiate into three mesenchymal lineages, namely, adipocytes, chondrocytes and osteocytes.

Purpose. The objective of the current study was to evaluate the effect of anthocyanidins malvidin, cyanidin, delphinidin on the adipogenic, osteogenic and chondrogenic differentiation of human adipose mesenchymal stem cells (aMSCs).

Materials and methods. aMSCs (purchased from ATCC) were differentiated into adipocytes, osteocytes and chondrocytes by Gibco® StemPro® differentiation kits according to manufacturer's instructions. 25 μM malvidin, cyanidin and delphinidin (all from Sigma Aldrich) were added to aMSCs during the differentiation. aMSC tri-lineage differentiation was evaluated by cytochemical staining with Oil Red O, Alizarin Red, Alcian blue. The expression of adipogenesis related genes *Adiponectin, FABP4, LPL,* osteogenenesis related genes *ALPL, Col1a1, osteocalcin, Runx2* and *BMP-2* and chondrogenesis related genes *Sox9, Col2a1, Aggrecan* and *TGF-β1* were analyzed by qPCR. 10 and 100 nM Liraglutide (TRC Research) was used as a reference drug to compare anthocyanidin effects on adipogenesis, osteogenesis and chondrogenesis.

Results. Malvidin increased the accumulation of calcium deposits in aMSCs after osteogenic differentiation. Interestingly, osteogenesis gene expression was increased in the presence of Liraglutide during aMSCs *in vitro* osteogenesis. Delphinidin significantly induced the expression of *Col2a1* marker in aMSCs after chondrogenic differentiation.

Conclusions. Malvidin has the potential to promote osteogenesis of aMSCs, while delphinidin promotes the expression of chondrocyte structural markers.

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6. BIOSENSOR DEVELOPMENT FOR ONCOLOGIC MARKER DETECTION USING ZnO NANOPARTICLES

Karlis Pleiko[1], *Roman Viter*[2], *Andris Sutka*[3], *Una Riekstiņa*[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Institute of Atomic Physics and Spectroscopy, University of Latvia, Riga, Latvia*
[3] *Research Laboratory of Functional Materials Technologies, Faculty of Materials Science and Applied Chemistry, Riga Technical University, Riga, Latvia*

Background. Biosensors that measure predictive cancer biomarkers could significantly improve early stage diagnosis. 1D ZnO nanostructures (Nanowires, NW)) are good candidates for optical biosensor platform as they demonstrate intense photoluminescence at room temperature.

Purpose. The objective of the current study was to develop biofunctionalized 1D ZnO nanostructures for stage-specific embryonic antigen-4 (SSEA-4) positive cancer cell detection.

Materials and methods. Mouse anti-human SSEA-4 antibody (αSSEA-4, BioLegend, 330402), αSSEA-4 AlexaFluor647 (BioLegend, 330408), goat anti-mouse IgG AlexaFluor488 (Invitrogen, A11001), ZnO NW, Nikon eclipse Ti microscope, flow cytometer Guava Easycyte 8HT, Ocean Optics UV-NIR spectrometer USB4000-XR1-ES, toluene (Sigma-Aldrich, 244511), glutaraldehyde (Sigma-Aldrich, G5882), (3-Aminopropyl)triethoxysilane (APTES) (Sigma-Aldrich, A3648), tetramethylammonium hydroxide pentahydrate (TMAH) (Sigma, T7505), 20 mM Hoechst 33342 (Thermo Scientific, 62249), HeLa cell line, MDA-MB-231 cell line.

ZnO NW surface was silanized in mixture of 5 ml 0.1M APTES in toluene, 5 ml 0.1M TMAH in methanol, 10 ml toluene for 15 min at 80° C while stirring. Then, nanowire coated samples were washed with toluene for several times and subjected to secondary treatment in mixture of 5 ml 0.1M TMAH in ethanol, 15 ml toluene for 15 min at 80°C. After that ZnO NW surface was washed with toluene and dried in nitrogen gas.

Antibodies were attached to non-silanized ZnO NW by adding 10 µL of αSSEA-4 on surface, incubating the sample for 20 min at a room temperature and washing 3 times with phosphate buffered saline (PBS). 10 000 cells in 20 µL were applied on surface and incubated for 20 min at 37°C and gently washed with PBS. Cells were fixed with 10 µL of 4% formaldehyde for 15 min, washed with PBS, incubated with 10 µL 20 mM Hoechst solution, washed again with PBS and imaged under fluorescent microscope using DAPI filter.

Results. Successful immobilization of αSSEA-4 on ZnO surface was achieved using both covalent and non-covalent binding. Surface silanization resulted in lower αSSEA-4 binding to ZnO NW compared to unsilanized ZnO NW, however, IgG AlexaFluor488 binding at different concentrations was more robust to silanized surface samples. Based on microscopic evaluation, more Hoechst stained SSEA-4 positive cells bind to functionalized surface than SSEA-4 negative cells.

Conclusions. Anti-SSEA-4 antibody immobilization on ZnO NW surface creates more structured layer of antibodies than non-covalent binding. Created functionalized surface can distinguish SSEA-4 positive and SSEA-4 negative cell populations.

Acknowledgements. The study was funded by Ukraine – Latvia project No. LV-UA/2016/6.

7. HUMAN DENTAL PULP STEM CELL-DERIVED EXOSOMES ADMINISTERED INTRANASALLY CAN CROSS THE BLOOD-BRAIN BARRIER IN RATS

Karina Narbute[1], *Vladimirs Pilipenko*[1], *Augustas Pivoriunas*[2], *Baiba Jansone*[1], *Vija Klusa*[1]

[1] *Department of Pharmacology, Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Department of Stem Cell Biology, State Research Institute Centre for Innovative Medicine, Vilnius, Lithuania*

Background. Exosomes are extracellular nanoparticles (30–100nm) secreted by almost any type of cells. These nanoparticles are highly enriched with cholesterol, various proteins, coding and non-coding RNAs, surface markers and adhesion molecules. It is proven that exosomes are involved in immune processes, interneuron communication and cell to cell transport functions (Ha et al., 2015). Human dental pulp stem cells (DPSCs) originate from the neural crest, therefore it seems promising that exosomes, isolated from these tissues, might function as neurogenesis-enhancing and inflammation-reducing molecules in the CNS. *In vitro* study showed that exosomes derived from DPSCs suppressed 6-OHDA-induced apoptosis in dopaminergic neurons (Jarmalaviciute et al., 2015). However, it has not yet been studied *in vivo* whether exosomes derived from DPSCs can cross the blood brain barrier (BBB).

Purpose. The purpose of this study was to assess, whether intranasally (i.n.) administered exosomes (labelled with fluorescent lipophilic dye) can cross BBB of *Wistar* rats, as well as to determine the time necessary to reach their maximum fluorescence intensity in cortical, hippocampal and *substantia nigra* structures.

Materials and methods. Adult naïve male *Wistar* rats (200±50g) were randomly divided into 5 groups (n=5 per group). Control group received i.n. 10 μL of phosphated buffered saline (PBS), whereas four other groups received i.n. 10 μL of exosomes. Rats were sacrificed by transcardial perfusion with ice cold saline after 30 min, 1 h, 3 h and 24 h. To determine their BBB crossing ability, exosomes were labelled with fluorescent lipophilic Vybrant™ Dil dye. Fluorescence label intensity was assessed by using Nikon Eclipse Ti NIS-Elements microscopy system analysis. One-way ANOVA test was performed for statistical analysis using GraphPad Prism 6.0.

Results. The most significant Dil fluorescence was detected in the examined brain structures following 30 min and 1 h after i.n. exosome administration. Less fluorescence was observed after 3 h and 24 h.

Conclusions. Exosomes derived from human DPSCs can cross the BBB after i.n. administration and diffuse throughout the rat brain. That indicates usefulness for the further study to clarify the possible action of exosomes in animal models with pathological states of brain.

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8. LOW AND MODERATE DOSE OF DIAZEPAM IMPROVES LEARNING, PREVENTS NEUROINFLAMMATION AND NORMALIZES CHOLINERGIC ACTIVITY IN ALZHEIMER'S DISEASE MODEL-RATS

Vladimirs Pilipenko[1], *Karina Narbute*[1], *Juris Rumaks*[1], *Jolanta Pupure*[1], *Baiba Jansone*[1], *Vija Klusa*[1]

[1] *Department of Pharmacology, Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. Early changes in Alzheimer's disease (AD) include neuroinflammation, cognitive impairments and neurotransmitter imbalance. Gamma-aminobutyric acid (GABA), the main inhibiting brain neuro- and gliotransmitter, has a crucial role in all of the mentioned processes. We have previously shown that at very low doses GABA-A and GABA-B receptor specific agonists – muscimol and baclofen – enhanced spatial learning/memory and prevented neuroinflammation in a non-transgenic AD rat model (Pilipenko et al., 2017). Although diazepam (DZP), an agonist of GABA-A receptor benzodiazepine site, is known to possess memory-impairing effects at doses 2–16 mg (Raffa et al., 1990), we hypothesized that at low and moderate doses DZP might confer neuroprotection in a non-transgenic AD rat model.

Purpose. To examine the effects of a low (0.05 mg/kg) and moderate (1 mg/kg) dose of DZP on spatial learning/memory, neuroinflammation, GABA synthesis and acetylcholine breakdown in AD rat model.

Materials and methods. AD model-rats (280±20 g) were obtained by bilateral intracerebroventricular (icv) injections of streptozocin (STZ, 750 μg/10 μl aCSF/rat). DZP (0.05 and 1 mg/kg intraperitoneally) was administered for 18 days after STZ injection. Control animals received intraperitoneal saline and icv artificial cerebrospinal fluid (10 μl/rat). On the 14th day after STZ injection, spatial learning/memory performance was assessed in the water maze and locomotor activity in the open field test. Astroglial activation (glial fibrillary acidic protein, GFAP), GABA synthesis (glutamate decarboxylase-67, GAD67) and acetylcholine degradation (acetylcholinesterase, AChE) were determined in the anterior cortex and hippocampal CA1 regions.

Results. Administration of STZ produced significant impairments in spatial learning/memory, significantly increased GFAP and AChE, as well as decreased GAD67 density. Administration of DZP at both doses improved spatial learning and memory, significantly lowered GFAP and increased GAD67 density in both structures compared to the STZ group. DZP also decreased cortical AChE fiber density to the control group values in comparison to the STZ group.

Conclusions. DZP at both doses improved spatial learning/memory, prevented astrogliosis, normalized GABA synthesis and decreased acetylcholine degradation in STZ model-rats. These data indicate that DZP provided major neuroprotective effects via anti-inflammatory and neurotransmitter action-regulating pathways.

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9. PRE-CLINICAL MODELS OF CLOSED HEAD INJURY

Baiba Zvejniece[1,2,4], *Liga Zvejniece*[1], *Baiba Svalbe*[1], *Gundega Vikmane*[1], *Edijs Vavers*[1,3], *Einars Kupats*[3], *Maija Dambrova*[1,3]

[1] *Latvian Institute of Organic Synthesis, Riga, Latvia*
[2] *University of Latvia, Riga, Latvia*
[3] *Rīga Stradiņš University, Riga, Latvia*
[4] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. Traumatic brain injury (TBI) is one of the leading causes of mortality and morbidity in people under the age of 45 years. According to World Health Organization published data, TBI is supposed to be the major cause of death in 2020. The weight-drop model is the most commonly used method to advance our understanding of the pathophysiology of closed head injury in rodents. Previous results showed that the incidence of skull fractures in the weight-drop model was more than 30%.

Purpose. The aim of the present study was to evaluate and compare potential risk factors of skull fractures and aspects of neuroinflammation between closed and open weight-drop induced TBI model.

Materials and methods. Fifty five *Swiss Webster* (SW) male mice, weighing 23–25 g were included in this study. These animals were housed under standard conditions (21–23 °C, 12 h light – dark cycle) with unlimited access to standard food and water. Interleukin (IL)-6, IL-1β–and tumor necrosis factor (TNF)-α gene expressions were detected by quantitative real time-PCR analysis in the hippocampus 12 h, 1 day and 3 days after TBI with and without fracture. Weight-drop TBI model with 2 mm and 5 mm cone tips was performed to compare the impact difference on neurological severity score (NSS) and skull fracture incidence. The neurobehavioral status of mice was obtained by the NSS consisting of 10 individual clinical parameters, including tasks on motor function, alertness and physiological behavior. Initial severity of the trauma was assessed 2 and 24 h after injury.

Results. Parietal bone fractures occurred in 10% using a 5 mm diameter teflon-tipped cone, while 2 mm diameter cone induced fractures in 33% of cases. Weight drop impact with fracture induced 3 to 10 fold difference in the expression levels of inflammatory genes IL-6, IL-1β and TNF-α compared to animals without fracture. The functional deficits on the NSS in mice 24 h after TBI were significantly higher than in sham-operated mice. Average score 24 h after trauma using 2 mm and 5 mm cone was 2.8 ± 0.3 and 3.6 ± 0.3 points, respectively.

Conclusions. The mice with and without skull fracture could not be included in the same experimental group. To produce homogenous type of injury and more reproducible NSS results, a 5 mm diameter cone should be used in the weight-drop induced TBI model.

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10. CTX-M PRODUCING *ESCHERICHIA COLI* SUSCEPTIBILITY TO TEMOCILLIN, NITROFURANTOIN, COLISTIN, AND FOSFOMYCIN

Laura Pereckaitė[1], *Marius Virgailis*[2], *Agnė Giedraitienė*[2]

[1] *Department of Laboratory Medicine, Hospital of Lithuanian University of Health Sciences, Kaunas, Lithuania*
[2] *Institute of Microbiology and Virology, Lithuanian University of Health Sciences, Kaunas, Lithuania*

Background. *Escherichia coli (E. coli)* resistance to antibiotics, including third generation cephalosporins, increases globally year by year. A lack of novel antimicrobials and limited use of last resort antibiotics revived researchers' interest in „old" antimicrobial agents. Temocillin, nitrofurantoin, colistin, and fosfomycin demonstrate a favourable *in vitro* activity against CTX-M producing *Enterobacteriaceae*. Information about local resistance to these antibiotics is very scarce, as temocillin is not registered in Lithuania, and other compounds are not widely used.

Purpose. The objective of this study was to evaluate the antimicrobial activity of temocillin, nitrofurantoin, colistin, and fosfomycin in CTX-M producing *E. coli* strains isolated in 2012–2014 at Kaunas Clinics, the Hospital of Lithuanian University of Health Sciences.

Materials and methods. A total of 72 *E. coli* isolates resistant to third generation cephalosporins were tested against temocillin, nitrofurantoin, colistin, and fosfomycin. Susceptibilities to these antibiotics were determined using disk diffusion test. Identification of ESBL encoding genes was performed using PCR, followed by Sanger sequencing with $bla_{\text{CTX-M}}$ gene sequence specific primers and conditions for confirmation of $bla_{\text{CTX-M}}$ genes.

Results. All isolates of *E. coli* were susceptible to colistin (100%, 99% CI 68-72%). The isolates also showed high susceptibility towards temocillin (93.1%, 99% CI 59-71%), nitrofurantoin (91.7%, 99% CI 58-70%) and fosfomycin (98.6%, 99% CI 66-72%). One of the investigated strains were resistant to both temocillin and nitrofurantoin (1.39%, 99% CI 0-6%). The predominant CTX-M genotype in *E. coli* was $bla_{\text{CTX-M-15}}$, followed by $bla_{\text{CTX-M-14}}$. It is worth noting that all the isolates resistant to investigated antibiotics were coding $bla_{\text{CTX-M-15}}$ genes.

Conclusions. Temocillin, nitrofurantoin, colistin, and fosfomycin showed high activity against CTX-M-15, producing *E. coli* isolates with susceptibilities varying from 91 to 100%.

11. METHOD DEVELOPMENT FOR THE DETERMINATION OF 1,1-DIMETHYLHYDRAZINE BY THE HPLC-MS/MS TECHNIQUE

Igors Susinskis[1,2]*, Peteris Mekšs*[2]*, Juris Hmeļnickis*[1]

[1] *University of Latvia, Riga, Latvia*
[2] *JSC "Grindeks", Riga, Latvija*

Background. Unsymmetrical dimethyl hydrazine (UDMH) is highly toxic, carcinogenic compound, widely used for organic synthesis and drug development. Therefore, due to its high reactivity, direct analysis is problematic. Current study proposes to use derivatization reaction to increase selectivity and sensitivity of HPLC/MS/MS method.

Purpose. Due to high toxicity and cancerogenic properties of UDMH, its content must be strictly controlled in drug forms. The developed method allows to control UDMH content in anti-ischemia drug meldonium. The high selectivity of method enables using it in other objects of interest.

Materials and methods. Derivatization via nucleophilic substitution provide non-reversible reaction with high yield. The study utilized four derivatization reagents. The following clean-up of reaction media was performed by simple centrifugation. Chromatographic separation occurs on reverse phase chromatography column with ion pair reagent, and following detection by mass spectral analyzer.

Results. Different derivatization agents were tested, and optimal reaction media have been found. Derivatization was performed by small amounts of reagents with the purpose to lower the cost of analysis. The performed full validation of the method allows to use it in routine control, in pharmaceutical analysis. Method sensitivity is 0.15 ppm, and linearity range is 0.15 ppm – 2.70 ppm.

Conclusions. The developed method allows to use high activity UDMH in an appropriate way for analysis by simple derivatization reaction. Methodology does not use concentration techniques like an evaporation, and allows to use centrifugation for purification of the reaction media. All the data obtained during validation allows to use the method in routine pharmaceutical control.

CARDIOVASCULAR MEDICINE

1. BIOCHEMICAL DIAGNOSTIC METHODS AS EARLY PREDICTORS OF ANTHRACYCLINE-CONTAINING CHEMOTHERAPY INDUCED LEFT VENTRICLE SYSTOLIC AND DIASTOLIC FUNCTION CHANGES ON ECHOCARDIOGRAPHIC FOLLOW-UP

Alla Chapule[1], ***Marina Berzina***[2,3], *Gustavs Latkovskis*[2,4,5]

[1] *MFD Healthcare group, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology, Riga, Latvia*
[3] *Rīga Stradiņš University, Riga, Latvia*
[4] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[5] *Institute of Cardiology and Regenerative Medicine, University of Latvia, Riga, Latvia*

Background. Echocardiographic monitoring and biochemical indicators, such as troponin I (TnI), creatine kinase MB (CK-MB) blood concentrations, may help identify patients at risk of anthracycline-induced heart failure development.

Purpose. To detect myocardial damage suggestive of early biochemical changes in patients receiving anthracycline based chemotherapy, to predict left ventricle (LV) systolic and diastolic function worsening on echocardiography at follow-up.

Materials and methods. First-time oncology patients receiving anthracycline based chemotherapy, at least 3 courses, without echocardiographic abnormalities were enrolled in the study. Transthoracic echocardiography performed before the start of, after the 1st and 4th courses, 3 weeks, 3 and 6 months after the end of chemotherapy. LV global longitudinal strain (GLS) analysed using PHILIPS QLAB software. Before and a day after every course, 3 weeks, 3 and 6 months after chemotherapy completion TnI with *ADVIA Centaur XP TnI-Ultra* (99th percentile 40 ng/l) or *ARCHITECT Stat High Sensitive TnI* test (99th percentile for women 15.6 ng/l), CK-MB with *ADVIA Centaur XP CK-MB* (normal range till 5 ng/ml) or CK-MB with ARCHITECT *Stat* (normal range for women till 3.4 ng/ml) were analysed. TnI test results standardized to 99th percentile, and CK-MB to the upper normal range. For predictors, identification *multiple linear regression* was used.

Results. 43 patients (35–74 years old, women 97.4%) enrolled (38 completed chemotherapy, 5 excluded) in the study. Mean received anthracycline dose – 260.7±10.8 mg/m^2. Baseline TnI and CK-MB concentrations were 0.13 (IQR 0.08-0.21) and 0.21 (IQR 0.09–0.40). Myocardial damage markers did not predict LV EF changes 6 months after the chemotherapy completion, only TnI next day after the 5th course [0.42 (IQR 0.32–0.58)] predicted LV EF decrease [62.0% (IQR 59.0–64.8) vs. 64.0% (IQR 60.0–66.5)] 3 months after the chemotherapy completion (p=0.039). At 6 months after the end of chemotherapy: GLS decrease [-20.0% (IQR -19.0 to -21.0) vs. -23.0% (IQR -21.5 to -24.5)] was predicted by TnI concentration before and next day after the 2nd course [0.19 (IQR 0.13–0.26), p=0.042 and 0.17 (IQR 0.13–0.25), p=0.027], the extension of LV isovolumetric relaxation time (IVRT) [85.0 (IQR 78.0–98.0) vs. 81.0 (IQR 67.0–95.0) ms] – by TnI before and next day after the 2nd course [0.19 (IQR 0.13–0.26) and 0.17 (IQR 0.13–0.25), p=0.002 for both], CK-MB 3 weeks after the chemotherapy completion [0.28 (IQR 0.15–0.48), p=0.006], E/E' increase (8.49±0.44 versus 8.08±0.31) – by TnI increase before the 6th course [0.58 (IQR 0.32–1.04), p=0.026].

Conclusions. Rise of TnI and CK-MB concentrations during chemotherapy predicted LV systolic and diastolic function worsening at 6 months after the chemotherapy completion.

2. LATVIAN CARDIOLOGY CENTRE EXPERIENCE OF SYROLIMUS COATED BIORESORBABLE SCAFFOLDS. REAL-LIFE REGISTRY DATA OF THREE MONTHS CLINICAL FOLLOW UP

Ieva Briede[1,2], *Inga Narbute*[1], *Indulis Kumsars*[1,2], *Karlis Trusinskis*[1], *Dace Sondore*[1], *Andis Dombrovskis*[1], *Sanda Jegere*[1,2], *Gustavs Latkovskis*[1,2], *Kristine Dombrovska*[1], *Ainars Rudzitis*[1], *Aigars Lismanis*[1], *Aleksandrs Jegorovs*[1], *Karlis Strenge*[1], *Agnese Strenge*[1], *Alona Grave*[1], *Andrejs Erglis*[1,2]

[1] *Latvian Centre of Cardiology, Pauls Stradiņš University Hospital, Riga, Latvia*
[2] *University of Latvia, Riga, Latvia*

Background. Syrolimus eluting bioresorbable scaffold received *CE* mark approval in June of 2016. Clinical data are limited to results from "BIOSOLVE-II" study, a single arm study enrolling 123 patients with low 12 months clinical event rate. No randomized clinical trial data are available to date.

Purpose. The objective of the current registry data was to evaluate three months' clinical outcomes after implantation of syrolimus eluting bioresorbable scaffolds.

Materials and methods. Between September 2016 and January 2018, 72 patients with stable angina and acute coronary syndrome were included in the real-life registry. All patients had percutaneous coronary intervention following at least one syrolimus bioresorbable scaffold implantation in target lesion. Of the 72 patients, 58 were selected for analysis of three months clinical follow-up data. All patient clinical and procedure, as well as follow-up data were collected in *Excel* file data base. Follow-up data were analysed by *SPSS* programme.

Results. 91.4% (53/58) patients reached three months clinical follow-up. Male patients constituted 81.0% (47/58). The mean age of patient group was 57.2±10.9 years. Arterial hypertension was in 82.8% (48/53) of patients, dyslipidaemia in 98.3% (57/58). The majority of patients were with stable angina 77.6% (45/58), acute coronary syndrome were in 22.4% (13/58) of cases. Multi-vessel coronary artery disease by angiographic estimation was diagnosed in 55.2% (32/58). Target lesion was localized mainly in left anterior descending artery 37.9% (22/58) and right coronary artery 39.7% (23/58). Proximal and middle parts of coronary arteries were involved, 39.7% (23/53) and 58.6% (34/53) respectively. Radial approach for scaffold implantation was used in 89.7% (52/58). Pre-dilatation of coronary lesion were used in all cases. The mean scaffold length was 21.52±8.73 mm. Scaffold optimization with post-dilatation balloon was done in 93.1% (54/58). There were no clinical events during hospital stay. At three months follow-up there were no events of myocardial infarction, cerebral infarction, scaffold thrombosis and death. Major bleeding appeared in one patient 1.7% (1/53). Target lesion revascularization and target vesel revascularization were done in two patients 3.4% (2/53).

Conclusions. Syrolimus bioresorbable scaffolds showed acceptable efficacy and safety (death, myocardial infarction, and scaffold thrombosis) results at three months follow-up in stable angina and acute coronary syndrome patients.

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3. EFFICIENCY OF CASCADE SCREENING TO DETECT ASYMPTOMATIC CORONARY ATHEROSCLEROSIS IN THE LATVIAN REGISTRY OF FAMILIAL HYPERCHOLESTEROLEMIA

Georgijs Nesterovics[1], *Vita Saripo*[1,2,3], *Ligita Zvaigzne*[3], *Dainus Gilis*[3], *Arta Upena-Roze*[3], *Andrejs Erglis*[1,2,3], *Gustavs Latkovskis*[1,2,3]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Institute of Cardiology and Regenerative Medicine, University of Latvia, Riga, Latvia*
[3] *Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology, Riga, Latvia.*

Background. Familial hypercholesterolemia (FH) is still underdiagnosed and undertreated in Latvia, often leading to premature acute coronary syndrome as first manifestation of the disease. Cascade screening of the first-degree relatives is the most cost-effective approach to diagnose new cases.

Purpose. To analyse efficiency of cascade screening in Latvian Registry of Familial Hypercholesterolemia (LRFH) in identifying FH affected first-degree relatives.

Materials and methods. First-degree relatives of FH probands (probable and definite FH according to the Dutch Lipid Clinic Network Criteria) were evaluated by age- and gender-specific percentiles for LDL-C (>95th percentile considered as diagnostic).

Results. By December 2017, one hundred seventy five patients (43.2% out of total 405 patients included in LRFH) met criteria for FH, out of these there were 40 (22.9%) first-degree relatives of probands with clinical FH. Familial hypercholesterolemia was found in 40 (58.8%) of all relatives. Number of probands (mean age 53.5±11.6 y.) and their relatives (mean age 44.3±18.9 y.) with documented coronary heart disease at inclusion were 66 (48.9%) and 8 (20.0%), respectively. After inclusion in the LRFH, nine (22.5%) out of 32 asymptomatic relatives with clinical FH underwent multi-slice CT coronary angiography, and in all these cases atherosclerotic changes in coronary arteries were detected. Three patients had coronary artery stenosis >50% (with maximal stenosis up to 95%), another three cases had 10–50% stenosis, and the remaining three patients had only initial atherosclerotic changes. Only three of these relatives were on previous lipid-lowering therapy, and none had achieved their LDL-C target at inclusion. Total number of asymptomatic relatives who were on lipid lowering therapy at inclusion was 5 (15.6%), and none had achieved their LDL-C goal.

Conclusions. Cascade screening in the LRFH effectively identifies previously undiagnosed FH cases among the first degree relatives. Moreover, incorporation of multi-slice CT coronary angiography in evaluation of asymptomatic relatives with FH is an effective tool to identify individuals with subclinical coronary lesions, being at very high risk for developing acute coronary events if left undiagnosed and thus untreated. Considering the autosomal dominant inheritance pattern of FH and estimated high prevalence of 1:250 of affected individuals in the population, effective screening programme can help identify FH patients and initiate treatment earlier, before major complications can occur.

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4. ISCHEMIA MODIFIED ALBUMIN AS BIOMARKER OF CARDIAC ISCHEMIA

Tatiana Timercan[1], *Artiom Jucov*[2]

[1] *Chair of Biochemistry and Clinical Biochemistry, Nicolae Testemitsanu State University of Medicine and Pharmacy, Kishinev, Moldova*
[2] *Department of Family Medicine, Nicolae Testemitsanu State University of Medicine and Pharmacy, Kishinev, Moldova*

Background. Acute coronary syndrome (ACS) is still a leading cause of death. Cardiac ischemia remains the key-mechanism of ACS. Prolonged ischemia leads to cellular necrosis, known as acute myocardial infarction (AMI). The challenge for emergence medicine is to identify cardiac ischemia before irreversible cell damage occurs. Ischemia modified albumin (IMA) can be used as possible biomarker of cardiac ischemia. IMA is produced due to the oxidative modifications of the N-terminal end of serum albumin in ischemic conditions.

Purpose. The objective of our study was to examine serum IMA and homogenate ischemia modified proteins (IMP) levels in isoproterenol-induced myocardial infarction. Ethics Committee of Nicolae Testemitsanu SUMPh approved the research protocol.

Materials and methods. Forty healthy adult male rats (*Rattus albicans*) were divided into five groups: L1 – intact (n=11); L2 – control animals which were administrated NaCl 0.9% (n=11); L3 (n=6), L4 (n=6) and L5 (n=6) included the animals with experimental myocardial infarction, induced by subcutaneous injection of isoproterenol 100 mg/kg (one dose) and sacrificed at 6 h, 24 h, and 7 days respectively. Serum IMA and homogenate IMP content was assessed by Gudumac et al. method (2009). The results were analyzed by Kruskal-Wallis nonparametric test.

Results. The investigated groups have shown statistically significant difference in serum IMA levels ($p < 0.05$), and no statistically significant difference in homogenate IMP levels ($p < 0.2$). Higher levels of serum IMA were registered in experimental groups compared to intact and control group (Table 1).

Table 1. Serum IMA and homogenate IMP levels

Groups	Serum IMA (%)	Homogenate IMP (%)
L1/L2	100	100
L3	120*	107.7**
L4	108.6*	93.6**
L5	108.9*	108.2**

Note: *= $p < 0.05$; **= $p < 0.2$

Conclusions. Being a biomarker of cardiac ischemia, serum IMA and homogenate IMP contents were supposed to rise at the onset of ischemic attack. Our study confirms the utility of IMA usage as a marker for cardiac ischemia identification. The obtained results are treated with caution, since a limited number of samples were assessed and the research is still ongoing.

5. CLINICAL CHARACTERISTICS AND 6-MONTH OUTCOMES OF ACUTE CORONARY SYNDROME PATIENTS

Alberts Bērziņš[1], *Elizabete Tērauda*[1], *Kārlis Trušinskis*[2]

[1] *Faculty of Medicine, Rīga Stradiņš University, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology, Riga, Latvia*

Background. Despite available treatment acute coronary syndrome (ACS) patients still have a high cardiovascular mortality rate. About 1 in 4 patients who are discharged from hospital after an ACS will experience acute myocardial infarction, stroke, or cardiovascular death within the following 5 years. The risk of experiencing one of these events is particularly high in the first year.

Purpose. To assess clinical outcomes in acute coronary syndrome patients 6 months after discharge.

Materials and methods. A prospective study includes patients with ACS, hospitalized in Pauls Stradiņš Clinical University Hospital. 78 patients were interviewed during the period from September 2016 until March 2017. Data from medical records were collected. 6-month follow-ups were conducted by telephone interview. The obtained data were analysed by IBM SPSS.

Results. Out of 78 patients, 62.8% had ST-elevation myocardial infarction (STEMI). Mean patient age was 64.9 years (SD=11.6), 66.7% were men. Mean duration of hospitalization was 6.7 days (SD=3.8).

Most of the patients (53.8%) had left anterior descending artery (LAD) stenosis and 15.4% had LAD occlusion. 87.2% of patients underwent revascularization and 76.5% out of those patients received drug-eluting stent.

89.7% of patients had arterial hypertension, 19.2% had diabetes and 26.9% of patients had a previous history of myocardial infarction. 43.6% were current or previous smokers.

Clinical outcomes 6 months after discharge: 5 patients (6.4%) were lost to follow-up, 6 patients (7.7%) had died – 5 (6.4%) from cardiac complications and 1 from cancer, 3 patients (3.8%) had recurrent ACS, 2 (2.6%) had stroke, 2 (2.6%) had hypertensive crisis, 3 (3.8%) had arrhythmia.

Overall, 26 patients (38.8%) had been hospitalized during the 6-month period. There was an association between diabetes and rehospitalization rate, as 78.6% of patients with diabetes were admitted to hospital during the 6-month period (p=0.001).

Conclusions. 10 major adverse cardiac events (5 cardiac deaths, 2 strokes, 3 myocardial infarctions) were observed during a 6-month period after the acute event.

There was a statistically significant association between diabetes mellitus and all-cause rehospitalization in the studied patient subgroup.

6. HOSPITAL OUTCOMES OF PATIENTS UNDERGOING BIFURCATION LESION PERCUTANEOUS CORONARY INTERVENTION

Evija Camane[1], *Arnis Laduss*[2], *Andrejs Erglis*[1,3], *Karlis Trusinskis*[1,2], *Gustavs Latkovskis*[1,3], *Dace Sondore*[1,3], *Inga Narbute*[1,3], *Kristine Dombrovska*[3], *Andis Dombrovskis*[3], *Ieva Briede*[1,3], *Aigars Lismanis*[3], *Ainars Rudzitis*[1,3], *Sanda Jegere*[1,3], *Indulis Kumsars*[1,3]

[1] *University of Latvia, Faculty of Medicine, Riga, Latvia*
[2] *Riga Stradins University, Faculty of Medicine, Riga Latvia*
[3] *Pauls Stradins Clinical University Hospital, Latvian Center of Cardiology, Riga, Latvia*

Background. In percutaneous coronary interventions (PCI) the treatment of bifurcation lesions is a challenge to the interventional cardiologist. The technical difficulties inherent in the treatment of bifurcation lesions, associated with their lower success and higher complication rates compared with non-bifurcation lesions, have always been the object of intense research activity. Bifurcation lesions and bifurcation stenting have been reported to be risk factors of stent thrombosis, bleeding, stroke and death.

Purpose. The aim of the study was to assess the hospital outcomes of patients undergoing bifurcation lesion percutaneous coronary intervention.

Material and Methods. We retrospectively analysed the incidence of intra hospital major adverse cardiac and cerebrovascular events in patients undergoing percutaneous coronary bifurcation treatment. Death, myocardial infarction (MI), stent thrombosis, target lesion revascularisation, bleeding, stroke, transistor ischemic attack were analysed. Data were collected from Latvian Center of Cardiology Coronary Bifurcation Treatment registry started in January 2017.

Results. A total of 89 patients without acute ST elevation myocardial infarction were included in this retrospective study. For 46 patients, creatine kinase MB (CK-MB) measurements were performed before and after the procedure. Mean age was 67±7 years and 69.7% of the patients were male. The incidence of patients undergoing a prior percutaneous coronary intervention was 41.6% 36% of patients had history of prior myocardial infarction (> 30 days) and 1.1 % of coronary artery bypass graft (CABG). There were 89.9% of the patients with stable angina., 2.2% with unstable angina and 7.9% with non-ST-elevation myocardial infarction. 78.7 of patients undergoing coronary bifurcations treatment had dyslipidemia and 14.6% – diabetes. 13.8 of patients were current smokers In this retrospective analysis were not observed cases of in-hospital death, in-stent thrombosis and in-hospital stroke and transistor ischemic attack. One case of Non-Q MI was detected. Howerver, in 10.9% of cases after PCI, an increase in CK-MB was observed 3 times the norm. Only one case of bleeding according to *Bleeding* Academic Research Consortium (*BARC*) type 2 occurred in woman patient with hypertension, positive family history and dyslipidemia.

Conclusions. In our study coronary bifurcation treatment with percutaneous coronary intervention was associated with low incidence of in-hospital major adverse cardiac and cerebrovascular events.

7. LIMITED AVAILABILITY OF FAMILIAL AND PERSONAL HISTORY IN PROBANDS OF THE LATVIAN REGISTRY OF FAMILIAL HYPERCHOLESTEROLEMIA AS A POTENTIAL OBSTACLE TO CORRECT DIAGNOSIS

Georgijs Nesterovics[1], *Muhammad Faraz Syed*[1], *Vita Saripo*[1,2,3], *Ligita Zvaigzne*[3], *Dainus Gilis*[3], *Arta Upena-Roze*[3], *Andrejs Erglis*[1,2,3], *Gustavs Latkovskis*[1,2,3]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Institute of Cardiology and Regenerative Medicine, University of Latvia, Riga, Latvia*
[3] *Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology, Riga, Latvia*

Background. The diagnosis of Familial Hypercholesterolemia (FH) in probands is made on basis of the Dutch Lipid Clinic Network Criteria (DLCNC) consisting of set of 10 questions clustered in 5 groups. Every proband is evaluated in scale from 0 to 26 points, and clinical FH diagnosis is assumed in patients scored ≥ 6 points. Criteria based on family history and personal history of premature cardiovascular disease (CVD) both add 1 or 2 points. Lack of such information (such as asymptomatic clinical course of coronary atherosclerosis) may influence the final DLCNC score and thus clinical approach.

Purpose. To analyse availability of information on family history for DLCNC score in probands included the Latvian Registry of FH (LRFH).

Materials and methods. Availability of family history (high low-density lipoprotein cholesterol (LDL-C) levels, premature coronary events and tendon xanthoma and/or corneal arcus in first-degree relatives), patient's personal history of premature subclinical atherosclerosis assessed by visual diagnostics and highest ever documented LDLC information was evaluated in probands included in LRFH.

Results. By December 2017 three hundred thirty seven probands were included in LRFH, Availability of family history in first-degree relatives is shown in the Table below.

Criterion on family history in first-degree relatives	Probands with clinical FH (n=135)	Probands without clinical FH (n=202)	*p* value
Premature CHD (n,%)	108 (80.0%)	159 (78.7%)	0.635
LDL-C > 95 percentile (n,%)	77 (57.0%)	80 (39.6%)	0.005
Tendon xanthoma and/or arcus cornealis (n,%)	55 (40.7%)	100 (49.5%)	0.051
Children LDL-C levels (n,%)	106 (78.5%)	149 (73.8%)	0.966

At inclusion, coronary arteries had been evaluated in 61 (45.2%) and 36 (17.8%) probands with and without FH, respectively ($p<0.001$), of which in 27 and 12 patients ($p<0.001$) coronary angiography was performed due to acute coronary syndrome. Imaging of brachiocephalic arteries was performed in 86 (63.7%) and 96 (47.5%) probands, respectively ($p=0.010$).

Conclusions. Lack of family history and imaging studies evaluating for premature atherosclerosis is common and may lead to inappropriate DLCNC score in a significant proportion of index patients. The least available family history data are on tendon xanthomas and/or arcus cornealis and LDL-C levels. Many probands without clinical FH could possibly be reclassified as clinical, if further familial history research and visual studies had been performed.

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8. PREVALENCE OF FAMILIAL HYPERCHOLESTEROLEMIA AMONG PATIENTS WITH CORONARY ARTERY ATHEROSCLEROSIS

Marita Tīmane[1], *Fabian Wieser*[1], *Gustavs Latkovskis*[1,2,3]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Institute of Cardiology and Regenerative Medicine, University of Latvia, Riga, Latvia*
[3] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. Familial hypercholesterolemia (FH) is an autosomal dominant disorder with prevalence of 1:200-250. The presence of FH is generally identified with a premature atherosclerosis in coronary arteries which is caused by significantly increased levels of low density lipoprotein cholesterol (LDL-C) in bloodstream. The main issue of FH is that it often remains underdiagnosed due to lowered LDL-C (< 5 mmol/l) concentration, especially among patients who have been treated with lipid lowering medications.

Purpose. Determine the potential prevalence of FH among patients who are hospitalised with coronary artery atherosclerosis.

Materials and methods. In the screening phase, data from patients with coronary artery atherosclerosis medical histories were collected. Patients whose actual or calculated LDL-C > 5 mmol/l were chosen for the interview phase. These patients were then rated based on Dutch lipid clinic criteria (DLCC): (1) family history; (2) anamnesis; (3) physical examination; and (4) LDL-C concentration. The diagnose of FH was determined from both the actual data and the calculated reduction of LDL-C due to lipid-lowering medications (LLM).

Results. Data from 131 patients were included in the screening phase. Possible FH phenotype was detected in 19 (14.5 %) patients, 9 of whom had LDL-C > 5 mmol/l. One of these 9 patients used LLM, 6 – did not use LLM, 2 – were not approachable. Based on the calculations, 10 patients are predicted to have LDL-C > 5 mmol/l. 16 out of 19 patients agreed to be interviewed.

Statistics obtained from the actual LDL-C concentration: 1 patient (male) (0.8 %) with probable FH, 8 patients (6 males and 2 females) (6.1 %) with possible FH and 7 patients (3 males and 4 females) (5.3 %) with no FH. Statistics obtained from the calculated LDL-C concentration: 2 patients (1 male and 1 female) (1.5 %) with definite FH, 4 patients (3 males and 1 female) (3.1 %) with probable FH and 10 patients (6 males and 4 females) (7.6 %) with possible FH.

Conclusions. The results so far show that 14.5 % of the screened patients have FH phenotype. Although, based on DLCC, none of the patients have been identified as having definite FH, calculations show that 1.5 % of patients have definite FH. To obtain a more reliable estimation of the patients being ill with FH, a larger population of patients must be screened.

9. INFLUENCE OF ANTHRACYCLINE-CONTAINING CHEMOTHERAPY ON THE RIGHT VENTRICLE SYSTOLIC FUNCTION, USING TWO-DIMENSIONAL ECHOCARDIOGRAPHY

Alla Chapule[1], *Marina Berzina*[2,3], *Gustavs Latkovskis*[2,4,5]

[1] *MFD Healthcare group, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology, Riga, Latvia*
[3] *Rīga Stradiņš University, Riga, Latvia*
[4] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[5] *Institute of Cardiology and Regenerative Medicine, University of Latvia, Riga, Latvia*

Background. Due to the cardiotoxic effects of anthracycline-containing chemotherapy, dysfunction of the right ventricle (RV) may occur, which can cause heart failure symptoms. RV has a unique semi-circle shape that increases the complexity of quantification of its size and function.

Purpose. To assess the impact of anthracycline-containing chemotherapy on the right side of the heart, using basic two-dimensional echocardiographic measurements.

Materials and methods. First-time oncological patients with indications to anthracycline based chemotherapy, at least 3 courses, without echocardiographic abnormalities were enrolled. Transthoracic echocardiography using supplemented standard protocol performed before the start of chemotherapy, after the 1st and 4th courses, 3 weeks, 3 and 6 months after the end of chemotherapy. SPSS Statistics 22 version was used for the statistical analysis of data. For normal distribution parameters, parametric *T* test was used, while to abnormal distribution parameters nonparametric *Wilcoxon signed-rank* test was applied.

Results. 43 patients were enrolled (38 completed chemotherapy, 5 excluded). Included patients were 35–74 years old, women made up 97.4%. The average dose of anthracycline group chemistries received was 260.7±10.8 mg/m^2. Right heart chamber dimensions statistically significantly enlarged after the 1st course of chemotherapy: right atrial area (RAA) [12.0 (IQR 10.0-13.0) versus 10.0 (IQR 8.5-12.5) cm^2, p<0.0001], basal diameter of RV (RVD) [30.0±0.5 versus 28.8±0.5 mm, p=0.001] and remained increased 6 months after the end of chemotherapy: RAA [11.0 (IQR 9.2-13.0) versus 10.0 (IQR 8.5-12.5) cm^2, p=0.039], RVD [30.8±1.0 versus 28.8±0.5 mm]. Tricuspid valve (TV) annulus plane systolic excursion (TAPSE) statistically significantly decreased after the 4th course [21.5 (IQR 18.0-26.0) versus 25.0 (IQR 20.5-29.5) mm, p=0.022] and 3 months [21.0 (IQR 19.0-25.0) versus 25.0 (20.5-29.5) mm, p=0.002] after completion of chemotherapy. The TV annulus peak systolic velocity (s') significantly decreased 3 weeks after the end of chemotherapy (12.88±0.36 versus 13.84±0.37 cm/s, p=0.031). No statistically significant differences in RV fractional area change (FAC) were found during the study in patients receiving anthracycline containing chemotherapy. RV systolic pressure (RVSP) considerably increased after the 1st course [30.0 (IQR 22.5-30.0) versus 25.0 (IQR 20.0-30.0) mmHg, p=0.002] and remained statistically significantly higher 6 months after the end of chemotherapy [27.5 (IQR 25.0-30.0) versus 25.0 (IQR 20.0-30.0) mmHg, p=0.011].

Conclusions. RAA, RVD and RVSP increased after the 1st course and remained increased 6 months after the end of chemotherapy. Considering complexity of RV, three dimensional echocardiography, which is a better reproducible method for quantification of the RV size and function, should be considered for better RV evaluation in such patients.

10. SUBJECTIVE PATIENT DATA AND OBJECTIVE CLINICAL PARAMETERS RELATED TO RECEIVING ANTHRACYCLINE-CONTAINING CHEMOTHERAPY

Alla Chapule[1], *Marina Berzina*[2,3], *Gustavs Latkovskis*[2,4, 5]

[1] *MFD Healthcare group, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Latvian Centre of Cardiology, Riga, Latvia*
[3] *Rīga Stradiņš University, Riga, Latvia*
[4] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[5] *Institute of Cardiology and Regenerative Medicine, University of Latvia, Riga, Latvia*

Background. Chemotherapy can cause cardiovascular side effects. Evaluation of signs and symptoms, if diagnosed early, may decrease its severity and improve the prognosis.

Purpose. To evaluate subjective patient complaints due to cardiovascular system changes, indicating myocardial damage and subsequent heart failure.

Materials and methods. First-time oncological patients receiving anthracycline based chemotherapy, at least 3 courses, without echocardiographic abnormalities were enrolled. Patients filled questionnaire about their complaints before the start of, after the 1st and 4th courses, 3 weeks, 3 and 6 months after completion of chemotherapy. On every visit, patients' clinical data – heart rate (HR) by an electrocardiogram, arterial blood pressure (BP) with an electronic tonometer *Microlife BP3AC1-1* measured, troponine I (TnI) with *ADVIA Centaur XP TnI-Ultra* (99th percentile 40 ng/l) or *ARCHITECT Stat High Sensitive TnI* test (99th percentile for women 15.6 ng/l) and creatine-kinase MB (CK-MB) with *ADVIA Centaur XP CK-MB* (normal range till 5 ng/ml) or CK-MB with ARCHITECT *Stat* (normal range for women till 3.4 ng/ml) were analysed. TnI test results were standardized to 99th percentile, CK-MB to the upper normal range. For data statistical analysis *T* test, *Wilcoxon signed-rank, McNemar* test, *Spearman* correlation coefficient used.

Results. 43 patients (35–74 years old, women 97.4%) enrolled (38 completed chemotherapy, 5 excluded). The average anthracycline dose – 260.7±10.8 mg/m^2. Shortness of breath at normal physical activity and fatigue noted on each visit statistically significantly increased (all $p<0.05$). 3 weeks, 3 months and 6 months after chemotherapy completion heart rhythm disturbances became more frequent ($p=0.004$; $p=0.021$; $p=0.004$, consequently). HR statistically significantly increased 3 (77.5±2.4 versus 74.3±1.8 times per minute, $p=0.006$) and 6 months (80.5±2.8 versus 74.3±1.8 times per minute, $p=0.005$) after the end of chemotherapy. Systolic BP decrease tendency during chemotherapy ($p>0.05$) and gradual return to baseline after completion observed. Palpitations 3 weeks after the chemotherapy completion correlated with increased HR ($p=0.033$, $r=0.346$). Physical activity intolerance correlated with systolic and diastolic BP decrease at the same visits after the 1st course ($p=0.018$, $r=-0.397$ and $p=0.019$, $r=-0.395$, respectively), 3 weeks ($p=0.035$, $r=-0.342$ and $p=0.048$, $r=-0.323$, respectively), with diastolic BP 6 months ($p=0.027$, $r=-0.494$) after the chemotherapy completion. After the chemotherapy completion pressing chest pain in 3 weeks at rest correlated with TnI concentration ($p=0.042$, $r=0.331$); during daily and prominent physical activity in 6 months correlated with CK-MB concentration increase, ($p=0.024$, $r=0.514$ for both).

Conclusions. Anthracycline-containing chemotherapy related patients' complaints correlated with objective clinical parameters, consequently, these are of special clinical importance.

GASTROENTEROLOGY, GASTROINTESTINAL MICROBIOTA & *H.PYLORI* ENDORSED BY *EUROPEAN HELICOBACTER AND MICROBIOTA STUDY GROUP (EHMSG)*

1. ASSOCIATION BETWEEN PEPSINOGEN LEVEL AND *H. PYLORI* STATUS: A POPULATION-BASED STUDY

Olga Sjomina[1,2], *Jelizaveta Pavlova*[1,2], *Ilva Daugule*[1,2], *Pavel Janovic*[2], *Alina Ivanova*[2], *Alise Lielause*[2], *Ilze Kikuste*[1,3], *Aigars Vanags*[3], *Ivars Tolmanis*[3], *Dace Rudzite*[1,2], *Inese Polaka*[1,6], *Ilona Kojalo*[1,2], *Inta Liepniece-Karele*[1,2,5], *Sergejs Isajevs*[1,2,5], *Daiga Santare*[1,2], *Valdis Pirags*[1,6], *Jelena Pahomova*[6,7], *Vilnis Dzerve*[6,7], *Lilian Tzivian*[1], *Andrejs Erglis*[1,6,7], *Marcis Leja*[1-4]

[1] *Institute of Clinical and Preventive Medicine, University of Latvia, Riga, Latvia*
[2] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[3] *Department of Research, Riga East University Hospital, Riga, Latvia*
[4] *Digestive Diseases Centre "GASTRO", Riga, Latvia*
[5] *Academic Histology Laboratory, Riga, Latvia*
[6] *Institute of Information Technology, Riga Technical University, Riga, Latvia*
[7] *Pauls Stradiņš Clinical Hospital, Riga, Latvia*
[8] *Institute of Cardiology and Regenerative Medicine, University of Latvia*

Background. Serum pepsinogen (PG) levels are evaluated as a non-invasive and non-endoscopic blood test, which might predict gastric atrophy – the first specific recognizable step in the precancerous process. It is fairly supposed that PG test results directly correlate with *H. pylori* status in patients, based on the fact, that *H. pylori* is the main etiological factor for atrophic changes of gastric mucosa and, respectively, PG level negative changes. *H. pylori* eradication is the basis of the treatment of gastric atrophy and intestinal metaplasia as precancerous states.

Purpose. To evaluate the relationship between PG levels and *H pylori* status, as well as influence of eradication on the PG level changes.

Materials and methods. Participants from a cross-sectional population-based study of cardiovascular risk factors in Latvia were invited to participate in the current study. In all blood samples, *H. pylori* IgG with cut-off value 24 U/ml and PG I, PGII and PGI/II ratio levels using the Eiken (Eiken Chemical Co., Tokyo, Japan) test system were determined At follow-up PG I and II were measured; upper endoscopy and biopsy with *H. pylori* approval were performed (updated Sydney system).

Results. Altogether, 259 individuals aged between 22 and 88 years with middle age 61.3 and median age 58.0, where 82 (31.7%) patients were men, and 177 (68.3%) women, participated in the research. The overall *H. pylori* positivity was found in 171 (66.0%) patients. In patients with normal PG test it was positive in 60.3%, and in 71.4% of those with decreased PG. Three different groups based on *H. pylori* essence were made – without *H. pylori*, with active *H. pylori* and after eradication. Those with *H. pylori* infection, who

had not undergone eradication procedure, had negative ratio progression, respectively, the atrophy progressed. However, patients who underwent eradication, had ratio rate improvement ($p<0.05$).

Conclusions. Study showed the association between PG level and *H. pylori* status; that could be used in PG test result interpretation, as well as again proves the negative infection influence on the gastric mucosa. All high-risk gastric precancerous lesions at follow-up were observed in patients with decreased PG test at baseline. It supports the opinion that test could predict atrophic changes, especially, if used in combination with *H. pylori* positivity.

2. PREVALANCE OF *HELICOBACTER PYLORI* INFECTION IN KAZAKHSTAN

Linda Mežmale[1], *Anna Krīgere*[1], *Dace Rudzīte*[1], *Aiga Rūdule*[1], *Ilze Kikuste*[1], *Sergejs Paršutins*[1], *Agris Tolčanicins*[5], *Altynbek Tazedinov*[2], *Niyaz Malayev*[6], *Dmitrij Musinksij*[2], *Darhan Samentaev*[3], *Ramis Samsutdinov*[3], *Tatjana Belihina*[3], *Nurbek Igissinov*[4], *Mārcis Leja*[1]

[1] *Institute of Clinical and Preventive Medicine and Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Regional Diagnostic Centre, Almaty, Kazakhstan*
[3] *Regional Oncology Centre, Semey, Kazakhstan*
[4] *Central Asian Cancer Institute, Kazakhstan, Astana, Kazakhstan*
[5] *Stockholm School of Economics in Riga, Riga, Latvia*
[6] *Astana Medical University, Astana, Kazakhstan*

Background. *H.pylori* is a worldwide infection. In South and East Europe, South America, and Asia, the prevalence of *H. pylori* is often higher than 50%. *H. pylori* infection is an important etiological factor for the occurrence of non-cardia gastric adenocarcinoma.

Purpose. To evaluate the prevalence of *H. pylori* positivity and the affecting factors in general population sample from Semey and Almaty cities in Kazakhstan.

Materials and methods. 39–65 years old healthy individuals were recruited according to the GISTAR regional pilot protocol. None of the respondents included in the study had received *H. pylori* eradication therapy before. Data were collected using standardized questionnaires, blood samples were obtained and stored frozen until analysed. The antibodies to *H. pylori* were analysed in plasma by latex agglutination method (*LZ – Helicobacter Pylori Antibody Test Kit = LZ-HP kit, Eiken Chemical Co., Ltd., Japan*). The cut off for *H. pylori* positivity > 24 U/mL.

Specially designed standardized online data capture platform was used (GISTAR data management system) for recording information on the study participants.

Statistical analysis was performed with Microsoft Excel and SPSS 22.0 by using Pearson's chi-squared test. The level of statistical significance was set at $p<0.05$.

Results. Data from altogether 166 individuals were available for the current analysis; of those 24% (n=40) were from Almaty and 76% (n=106) from Semey; 59% (n=98) were male and 41% (n=68) were female participants.

The overall *H. pylori* seropositivity was 62.7% (104/166); *H. pylori* seropositivity was in 66.3% (65/98) of the male and 57.4% (n=39/68) of the female participants. No correlation was identified between *H. pylori* positivity and gender (p=0.257).

Out of all respondents, 67% (n=112) were Kazakhs, 28% (n=46) were Russians and 5% were (n=8) from other ethnic groups. The *H. pylori* positivity was found in 66.1% (74/112) of the Kazakh population, 50% (23/46) of the Russians and 87.5% (7/8) from the other ethnic groups. The prevalence of *H. pylori* positivity was higher in the Kazakh population than in the Russian population (p=0.05).

The *H. pylori* positivity within the age groups was found, as follows: ≤40 years – 83.3% (5/6), 41–50 years – 68.4% (52/76), 51–60 years – 56.3% (36/64), and >60 years – 55% (11/20). No correlation was identified between increasing age and *H. pylori* positivity (p=0.283).

Conclusions. High prevalence of *H. pylori* was revealed in a general population sample from Kazakhstan. In Kazakhstan, the population age and gender did not have an effect on the prevalence of *H. pylori* infection, but the Kazakhs were more likely to get *H. pylori* than Russians.

3. STUDY ON LOCAL PREVALENCE OF *HELICOBACTER PYLORI* INFECTION IN RESIDENTS OF KYRGYZSTAN WITH RISK FACTORS OF GASTRIC CANCER

Moldobaeva Mariia[1,2]

[1] *University Kyrgyz State Medical Academy, Kyrgyzstan, Bishkek*
[2] *National Hospital, Kyrgyzstan, Bishkek*

Background. Gastric cancer takes the third place (14, 6%) in prevalence structure and the 2nd place (19.3%) in structure of mortality of all cancers in Kyrgyzstan [International Agency for Research of Cancer, 2012]. There are no studies on the relationship between gastric cancer and Hp infection in Kyrgyz residents at the national level. In another study carried out by ourselves, in patients with peptic ulcer of the duodenum in residents of Kyrgyzstan, from the risk factors (RF) of the Hp infection dominated low socio-economic status, low education, pollution, or limited access to water. These RF are more expressly found in the Batken region.

Purpose. To study the infection with Hp infection in patients with chronic gastritis and the resistance of Hp infection to clarithromycin and metronidazole of Kyrgyzstan residents.

Materials and methods. 100 patients from the regions of the republic, provided endoscopy of the stomach with biopsies of the mucous membrane, Hp-infection is determined by the bacteriological method, sensitivity to antibiotics with disk-diffusion method.

Results. In 74 (74%) of patients Hp-infection was found. Of the 74 infected, strains resistant to metronidazole were found in 44.6% (3 of these (4.0%) were previously treated with metronidazole), clarithromycin accounted for 16.2% (8 of these (10.8%) were previously treated macrolides). In patients with peptic ulcer disease, residents of Kyrgyzstan, the RF of Hp infection dominated in relation with low socio-economic status, low education, pollution, or limited access to water. These RF were more explicit in the Batken region.

Conclusions. The study established a high (74%) infection with Hp infection in the group of patients with chronic gastritis and resistance to antibiotics: to clarithromycin in 16.2% (non-permanently sensitive variant and exceeding the limiting value of sensitivity) [Malfertheiner P, Megraud F, O'Morain C et al. Management of *Helicobacter pylori* infection – the Maastricht V / Florence Consensus Report. Gut 2017; 66 (1): 6–30] and to metronidazole – 44.6%. These data sound the alarm regarding the high risks to develop gastric cancer in residents of Kyrgyz and require consideration of individual sensitivity to antibacterial drugs and, at least, an anamnesis of the patient on taking antibiotics. The predominant RF of Hp-infection is the level of life below the average, low level of education, contamination, or limited access to water.

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4. PREVALENCE OF DECREASED PEPSINOGENS IN KAZAKHSTAN

Anna Krīgere[1], *Linda Mežmale*[1], *Dace Rudzīte*[1], *Aiga Rūdule*[1], *Ilze Kikuste*[1], *Sergejs Paršutins*[1], *Agris Tolčanicins*[5], *Altynbek Tazedinov*[2], *Niyaz Malayev*[6], *Dmitrij Musinksij*[2], *Darhan Samentaev*[3], *Ramis Samsutdinov*[3], *Tatjana Belihina*[3], *Nurbek Igissinov*[4], *Mārcis Leja*[1]

[1] *Institute of Clinical and Preventive Medicine and Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Regional Diagnostic Centre, Almaty, Kazakhstan*
[3] *Regional Oncology Centre, Semey, Kazakhstan*
[4] *Central Asian Cancer Institute, Kazakhstan, Astana, Kazakhstan*
[5] *Stockholm School of Economics in Riga, Riga, Latvia*
[6] *Astana Medical University, Astana, Kazakhstan*

Background. Serum pepsinogen (Pg) I and the ratio between PgI and PgII (PgI/PgII) are related to the histological and functional status of the gastric mucosa. Low serum PgI and PgI/PgII values are biomarkers for atrophic gastritis.

Purpose. To evaluate the prevalence of decreased Pg levels in plasma, and the affecting factors in general population sample from Semey, Almaty cities in Kazakhstan, as well as to correlate decreased Pg levels to *H. pylori* serology.

Materials and methods. 39–65 years old healthy individuals were recruited according to the GISTAR regional pilot protocol. Data were collected using standardized questionnaires, blood samples were obtained and stored frozen until analysed. Pg and antibodies to *H. pylori* were analysed in plasma by latex agglutination method (*Eiken Chemical Co.,* Tokyo, Japan). The cut off for decreased Pg was set at PgI/PgII ≤ 3 and PgI ≤ 70 ng/mL, but for severely decreased Pg – PgI/PgII ≤ 2 and PgI≤30 ng/mL; for *H.pylori* positivity > 24 U/mL.

Specially designed standardized online data capture platform was used (GISTAR data management system) for recording information on the study participants.

Statistical analysis was performed with Microsoft Excel and SPSS 22.0 by using Pearson's chi-squared test. The level of statistical significance was set at $p<0.05$.

Results. Data from altogether 166 individuals were available for the current analysis; of those 24% (n=40) were from Almaty, 76% (n=106) from Semey; 59% (n=98) were male and 41% (n=68) – female participants.

From all respondents 16% (n=27) had decreased plasma Pg values, 9% (n=15) had severely decreased plasma Pg values. The overall *H. pylori* positivity was 63% (n=104). From those respondents who had decreased plasma Pg values, 70% (n=19) were *H. pylori* positive.

We did not find correlation between *H. pylori* positivity and decreased Pg values (p=0.661), but correlation was present with participants with severely decreased Pg levels (p=0.023). Altogether 5 of 15 (9%) subjects with severely decreased Pg were *H. pylori* positive.

There was a correlation identified between increasing age and decreased and severely decreased Pg levels (p=0.020), but no correlation was identified between sex and decreased and severely decreased Pg levels (p=0.587).

Conclusions. The proportion of study participants with decreased Pg levels in Kazakhstan was similar to other countries with high incidence of gastric cancer. Decreased Pg levels were more likely in subjects at higher age. Additionally, it was observed that severely decreased Pg levels were associated with *H. pylori* positivity, but the gender was not related to severely decreased Pg levels.

5. EVALUATION OF AZATHIOPRINE THERAPY RISK FOR PATIENTS DIAGNOSED WITH INFLAMMATORY BOWEL DISEASE

Polina Zalizko[1,2], *Inese Jargane*[2], *Viktorija Mokricka*[1,2], *Evija Tropina*[1], *Zane Dzirkale*[2], *Ineta Popena*[2], *Karina Narbute*[2], *Tatjana Jirgensone*[1], *Ulrika Beitnere*[2], *Aldis Pukitis*[1,2]

[1] *Pauls Stradiņš Clinical University Hospital, Gastroenterology, Hepatology and Nutrition Centre, Riga, Latvia*
[2] *University of Latvia, Riga, Latvia*

Background. Therapeutic drug monitoring is a guideline for the future medical treatment. It considers the interindividual variability of pharmacokinetics and thus enables personalized pharmacotherapy. Individual thiopurine metabolism analysis affects treatment outcomes in patients with inflammatory bowel diseases (IBD), as well as therapy efficiency and drug toxicity. In adult patients with IBD being started on thiopurines, the American Gastroenterological Association Institute Guideline on Therapeutic Drug Monitoring suggests routine thiopurine S-methyltransferase (TPMT) testing to guide thiopurine dosing [Joseph D Feuerstein et al, 2017].

Purpose. The aim of the present study was to evaluate the pretreatment TPMT status in IBD patients as part of therapeutic drug monitoring.

Materials and methods. A prospective pilot study included 20 patients (55% female n=11 and 45% male n=9) having an age ranging from 22 to 79 years. All participants where admitted to Pauls Stradiņš Clinical University Hospital (Riga, Latvia) from January 2017 to May 2017. All included patients received standard treatment of 5-aminosalicylic acids, steroids or azathioprine. The expression of TPMT in each blood sample was analyzed using enzyme-linked immunosorbent *assay* (MyBioSource, USA) method.

Results. All patients were previously diagnosed with IBD and were admitted to hospital due to of exacerbation of IBD. 70% of patients (n=14) was diagnosed with ulcerative colitis (UC), 30% (n=6) with Crohn disease (CD). 75% (n=15) of patients had not previously received azathioprine. 15% (n=3) had received azathioprine therapy, but stopped using it due to side effects. 10% (n=2) were still receiving azathioprine therapy. Activity of TPMT was low (<5.5 U/mL) in 10% of patients (n=2), average (5.6-15.5 U/mL) in 5% (n=1), normal (15.6-29.9 U/mL) in 35% (n=7) and too high (>30.0 U/mL) in 50% (n=10). Reduced TPMT activity is associated with thiopurines induced adverse effects like myelosuppresion, hepatotoxicity, opportunistic infections, allergies, pancreatitis and *Epstein-Barr virus* associated lymphomas, which are leading to life threatening complications. The very high TPMT activity is showing decreased response on thiopurine therapy.

Conclusions. The results of this study confirmed the important role of the TPMT enzyme activity in the therapeutic drug monitoring and managing life threatening complications. Monitoring the thiopurine metabolite levels can help to optimize immunomodulator therapy, minimize adverse events and possible achieve remission and histological healing for IBD patients. Further studies in combination with TPMT genotyping are necessary for additional evaluation of treatment risks.

6. FIRST CASE SERIES OF FECAL MICROBIOTA TRANSPLANTATION FOR RECURRENT *CLOSTRIDIUM DIFFICILE* INFECTION IN BALTIC COUNTRIES

Rolandas Gedgaudas[1,2], Vytenis Petkevicius[1,2], Gediminas Kiudelis[1,2], Laimas Jonaitis[1,2], Juozas Kupcinskas[1,2], Limas Kupcinskas[1,2], ***Mindaugas Urba***[1,2]

[1] *Lithuanian University of Health Sciences, Kaunas, Lithuania*
[2] *Hospital of Lithuanian University of Health Sciences Kauno klinikos, Kaunas, Lithuania*

Background. *Clostridium difficile* infection (CDI) is one of the most common hospital-acquired infections. The rise in CDI incidence is seen in many countries, including Lithuania. Faecal microbiota transplantation (FMT) is efficiently used to treat recurrent CDI (rCDI), however, to date there is no published data on the efficacy of this method in Eastern Europe.

Purpose. The objective of our study was to assess effectiveness of FMT for rCDI therapy in the hospital of Lithuanian University of Health Sciences *Kauno klinikos* (LUHS KK, Kaunas, Lihuania).

Materials and methods. Clinical data of patients who were treated for recurrent (>2times) CDI using FMT in the Department of Gastroenterology of LUHS KK during 2015–2017, were analysed. All the patients were monitored for disease relapse for six months.

Results. Study included 29 patients with rCDI: 16 men and 13 women. Mean age of patients was 61.89 (13.23) years. 35 FMTs were performed in 29 patients. 26 patients received primary FMT via naso-enteral tube, 2 patients via enema and 1 patient via oral capsules. 6 secondary FMTs were performed via naso-enteral tube in 6 patients, that received primary FMT via naso-enteral tube. The primary and secondary FMT cure rates were 79.3% and 100%, respectively. All cured patients were symptom free at 6 months of follow up.

Conclusions. Our data in comparison with other studies suggest that FMT is an effective therapy for recurrent CDI infection in short and long term follow-up.

7. CORRELATION OF FAECAL MICROBIOTA WITH LIVER STEATOSIS RISK FACTORS IN PATIENTS WITH NON-INSULIN DEPENDENT DIABETES MELLITUS

Semanur Gündogdu[1], *Ilze Birka*[1], *Valdis Pīrāgs*[1], *Linda Zaharenko*[2], *Ilze Elbere*[2], *Vita Rovīte*[2], *Jānis Kloviņš*[2]

[1] *University of Latvia, Faculty of Medicine, Internal Medicine Department*
[2] *Latvian Biomedical Research and Study Centre, Riga, Latvia*

Background. Approximately two thirds of type two diabetes (T2DM) patients have non-alcoholic fatty liver disease (NAFLD). T2DM is a well-known risk factor for the progression of NAFLD to steatohepatitis, liver fibrosis and cirrhosis. Progression of NAFLD is more prevalent in patients with higher BMI, ALAT and triglyceride (TG) levels. It has been postulated that changes in faecal microbiota may serve as inflammation inducer in liver in this patient population.

Purpose. To analyse an association between faecal microbiota and serum ALAT levels, triglycerides, BMI and waist circumference (WC) in T2DM patients.

Materials and methods. Data were collected retrospectively from newly diagnosed T2DM patients included in OPTIMED study from June 2015 – May 2016. Exclusion criteria: use of antibiotics, antidiabetics, probiotics, immunosuppressants or corticosteroids in the past two months, allergies to the prescribed antidiabetic treatment, chronic gastrointestinal, autoimmune, oncological diseases, kidney or liver function impairment, alcoholism, and diarrhoea during the previous week. Anthropometric measures, blood samples (triglycerides, cholesterol, ALAT) and faecal samples for microbiota analysis were taken. 16S rRNA gene analysis was performed for detecting phyla and genera of the bacteria.

Results. 11 patients were included in the study, seven of them had increased ALAT (≥29 IU/l for males, ≥22 IU/l for females). No significant differences were detected between the groups (anthropometric measures, cholesterol), as well as no significant differences in faecal microbiota composition. At phylum level Shannon diversity index (SDI) correlated negatively with triglycerides (TG) (*Spearman's rho* r=-0,800; p=0,003), but not with ALAT, WC and BMI. *Bacteroidetes* correlated negatively with WC (r=-0,793; p=0,004) and TG (r=-0,709; p=0,02). *Firmicutes* – with WC (r=0,706; p=0,01) and TG (r=0,755; p=0,01). At genus level SDI correlated negatively with BMI (r=-0,691; p=0,019), but not with ALAT, WC and TG. The TG significantly correlated with *Ruminococcaceae_UCG*-002 (r=-0,618; p=0,04) and *Subdoligranulum* (r=-0,86 p=0,001). The BMI – with *Ruminococcaceae*_UCG-004 (r=-0,67; p=0,02), *Butyricimonas* (r=-0,73 p=0,01), *Flavonifractor* (r=0,62 p=0,04), *Holdemania* (r=0,715; p=0,013). The WC – with *Holdemania* (r=-0,779; p=0,005), *Bacteroides (*r=0,688; p=0,019), *Parvibacter (*r=-0,646; p=0,032), *Lactobacillus (*r=0,623; p=0,04) and *Ruminococcus_2 (*r=-0,679 p=0,022). ALAT positive to [Erysipelotrichaceae] (r=0,61; p=0,04) *Romboutsia* (r=0,7; p=0,01) and negative to *Blautia* (r=-0,75; p=0,01) and *[Eubacterium]_hallii_group* (r=-0,62; p=0,04).

Conclusions. No significant differences in faecal microbiota were found in patients with increased ALAT, which could be due to small patient numbers. Bacterial diversity is reduced in patients with higher BMI and TG levels. At the taxonomic level of the genera several significant correlations with the bacteria have been detected.

GASTROENTEROLOGY & GASTROINTESTINAL ONCOLOGY ENDORSED BY EUROPEAN SOCIETY OF DIGESTIVE ONCOLOGY (ESDO)

1. EPIDEMIOLOGY OF GASTRIC CANCER IN LATVIAN POPULATION

Jelizaveta Pavlova[1], *Olga Sjomina*[1], *Evita Gasenko*[1], *Guntis Ancans*[2], *Ilze Kikuste*[1,3], *Aigars Vanags*[3], *Ivars Tolmanis*[3], *Dace Rudzite*[1,2], *Inese Polaka*[1,5], *Ilona Kojalo*[1,2], *Lilian Tzivian*[2], *Inta Liepniece-Karele*[1,2,4], *Sergejs Isajevs*[1,2,4], *Daiga Santare*[1,2], *Marcis Leja*[1-3]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Department of Research, Riga East University Hospital, Riga, Latvia*
[3] *Digestive Diseases Centre GASTRO, Riga, Latvia*
[4] *Academic Histology Laboratory, Riga, Latvia*
[5] *Institute of Information Technology, Riga Technical University, Riga, Latvia*

Background. Eastern Europe has a high gastric adenocarcinoma (GC) incidence and mortality rates. We gathered data about current GC epidemiology in Latvia, suggesting it demonstrative for Eastern Europe as a region of very high GC incidence.

Purpose. To gather epidemiological data about GC in Latvian population.

Materials and methods. Patients with histologycally approved GC and admitted in Oncology Centre of Latvia were enrolled in the study. They filled questionnaire about age, sex and *H. pylori* eradication status. In blood samples, taken prior to the treatment, *H. pylori* IgG levels with ELISA test system were analyzed. *H. pylori* IgG > 30 EUI were considered positive. GC was classified by TNM, Lauren and ICD classifications.

Results. Results from 481 GC patients were available. Men-to-women ratio in group was 1.5:1, mean and median age 63.9 and 65.0 years. The largest age group was over 70 years with 33.7% patients in it. *H. pylori* was positive in 74.0% of patients, equally in men and women, different age groups, GC stages and types. One fourth of GC cases were diagnosed in stage IV, 12.6% in stages 0-IA. The most often T stage diagnosed was T4a (32.1%). Intestinal GC was in majority (45.5%) of cases. Its proportion increased from 29.1% in patients before 50 years to 54.7% after 70 years ($p<0.05$). Men-to-women ratio for intestinal GC was 1.5:1, for diffuse 1:1.3 ($p<0.05$). The main localizations were gastric corpus (43.1%) and antrum (28.8%). Cardia GC was in 10.1% patients, equally men and women.

Conclusions. Overall GC epidemiology in Latvian population coincides with world literature data, however cardia cancers are equal in both sexes. *H. pylori* infection is present in majority of GC patients and majority of GC cases are diagnosed in late stages. Data indicate importance of early gastric cancer detection.

2. TRENDS OF STOMACH CANCER INCIDENCE IN KAZAKHSTAN

Nurbek Igissinov[1], *Mārcis Leja*[2], *Niyaz Malayev*[3]

[1] *Central Asian Cancer Institute, Astana, Kazakhstan*
[2] *Institute of Clinical and Preventive Medicine and Faculty of Medicine, University of Latvia, Riga, Latvia*
[3] *Astana Medical University, Astana, Kazakhstan*

Background. According to IARC in the world annually about 951 thousand cases of stomach cancer (SC), around 73.6% of the cases occur in Asia. The age-standardised rate (world standard) (ASR) SC, in the world amounted to $12.1^0/_{0000}$ and high incidence of diseases set in Korea ($41.8^0/_{0000}$), Mongolia ($32.5^0/_{0000}$) and Japan ($29.9^0/_{0000}$).

Purpose. The purpose of the study to examine trends in the incidence of SC in Kazakhstan.

Materials and methods. The research is based on data of oncological institutions of the Republic of new cases SC (C16) for 2009–2016. The crude rate (CR), age rate and ASR (world standard) on 100 000 ($^0/_{0000}$) all, male and female population are calculated. Trends in incidence were determined by the method of least squares and the rate of growth/loss (T) calculated. The calculated average value, error, 95% confidence interval (CI).

Results. In Kazakhstan there were registered new cases 21,966 SC, from them men – 13,841 (63.0%) and women 8,125 (40.0%). The average age of SC patients was, as follows: total population 68.7±0.1 years (T=+0.2%), for males 68.1±0.1 years (T=+0.3%) and women 69.8±0.1 years (T=+0.2%). Age incidence rates had a unimodal growth with a peak at 70 years of age and older – $171.3^0/_{0000}$, a similar pattern was among men ($298.2^0/_{0000}$) and women ($107.5^0/_{0000}$) (see Table below).

Table – Incidence of Stomach Cancer in Kazakhstan

Age groups	Incidence, $^0/_{0000}$ (*T, %*)			the ratio m÷f
	both sex	male	female	
< 30	0.1±0.0 (*–16.8*)	0.05±0.01 (*–17.3*)	0.08±0.01 (*–16.5*)	0.7÷1.0
30-39	1.6±0.1 (*–3.1*)	1.55±0.07 (*–3.5*)	1.64±0.08 (*–2.8*)	0.9÷1.0
40-49	6.0±0.2 (*–3.3*)	7.8±0.3 (*–5.1*)	4.3±0.2 (*–0.3*)	1.8÷1.0
50-59	24.4±0.9 (*–5.2*)	36.6±1.5 (*–5.6*)	14.2±0.5 (*–4.8*)	2.6÷1.0
60-69	87.1±1.8 (*–2.0*)	145.5±2.2 (*–1.3*)	46.1±1.6 (*–3.6*)	3.2÷1.0
70+	171.3±2.7 (***+0.9***)	298.2±6.2 (***+2.5***)	107.5±2.1 (*–0.8*)	2.8÷1.0
GR	16.3±0.1 (*–0.5*)	21.3±0.1 (*+0.1*)	11.7±0.1 (*–1.6*)	1.8÷1.0
ASR	19.1±0.2 (*–1.5*)	32.8±0.2 (*–1.0*)	11.4±0.2 (*–2.6*)	2.9÷1.0

CR of SC amounted to $16.3^0/_{0000}$ (95% CI=16.1-16.5) and was different from the ASR – $19.1^0/_{0000}$ (95% CI=18.7-19.5). Men GR ($21.3^0/_{0000}$, 95% CI=21.1-21.5) was lower ASR ($32.8^0/_{0000}$, 95% CI=32.3-33.3), whereas women have CR ($11.7^0/_{0000}$, 95% CI=11.4-12.0) did not differ from ASR – 11.7 (95% CI=11.0-11.8). Trends in the incidence of SC has declined in almost all populations, the exclusion of men 70 years and older, where they grew up, and the average annual growth rate amounted to T=+2.5% (table).

Conclusions. Analysis of the incidence of SC has identified features that require further epidemiological studies of this form of cancer in Kazakhstan.

3. GASTROESOPHAGEAL REFLUX DISEASE COMPLICATED BY BARRETT'S ESOPHAGUS IN YAKUTIA

Elena Verkhoturova[1,2], *Aitalina Golderova*[1], *Anna Romanova*[1]

[1] *Federal State Budgetary Scientific Institution (FSBSI), Yakutsk Scientific Center of Complex Medical Problems, Yakutsk, Russia*

[2] *Federal Government Health Institution (FGHI), Medical Room of the Interior Ministry of the Russian Federation for the Republic of Sakha, Yakutsk, Russia*

Background. Gastroesophageal reflux disease (GERD) is a risk factor for the development of oesophageal adenocarcinoma and its precursor, Barrett's oesophagus. Disturbance of hormonal regulation, the activity of the autonomic nervous system, the immune system, infection and the influence of psychological factors are the main causes which affect the function of the gastroesophageal sphincter.

Purpose. Evaluation of risk factors for Barrett's oesophagus in male police officers.

Materials and methods. The results of a observation of 46 patients – police officers (mean age 41.5 ± 5.9) who were on the screening with a diagnosis of GERD, including erosive and non-erosive forms, are analysed. The group of Mongoloids (Yakut) consist of 22 men, and Europeoids (Russian) – 24 men. Diagnosis was exhibited by standard clinical, endoscopic and morphological methods of investigations. Biopsy material was taken from the mucosa of the distal part of oesophagus by a 4-quadrant method at intervals of 2 cm, as well as from all the suspicious segments.

Results. The subjects were divided into 4 groups. Group 1 included 6 patients with unchanged mucous membrane (13.3%); group 2 – 9 patients with reactive changes of the squamous epithelium (17.8%); group 3 – 17 patients with squamous and intestinal metaplasia (37.8%); group 4 – 14 patients with dysplasia and Barrett's oesophagus (31.1%). There were no significant differences depending on race and age. However, only Mongoloids dominated in the group 4. Analysis of the distribution of patients depending on the work status revealed that 100% of the heads of departments have the lesions of the distal part of the oesophagus, 40% were assigned to group 4. The significant differences are established in the time of passive smoking . The greatest number of hours was indicated by persons of group 4 (5.9 ± 2.2). Hiatal hernia was established in 24 (53.2%) of all examined individuals. A significant relationship was established between hiatal hernia and erosive reflux ($\chi 2 = 6.43$, $p = 0.013$), erosive reflux was noted in 20 patients (83.3%) among 24 cases with hiatal hernia. It should be noted that group 4 consisted of patients with erosive reflux 85.7%

Conclusion. Thus, the obtained data are indicated a high incidence of Barrett's oesophagus among police officers with GERD (31.1%). Risk factors for Barrett's oesophagus according to the results of our study are: belonging to the leadership position, Mongoloid race, passive smoking, erosive oesophagitis, hiatal hernia.

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4. FIRST RESULTS OF ENDOSCOPIC SURVEILLANCE OF GASTRIC PRECANCEROUS LESIONS IN LATVIA

Zane Dzērve[1], *Ilze Kikuste*[1,2,3], *Ivars Tolmanis*[2,3], *Arnis Kiršners*[2], *Inese Poļaka*[2], *Aigars Vanags*[2,3], *Dans Stirna*[3], *Olga Sjomina*[1,2], *Mārcis Leja*[1,2,3]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Institute of Clinical and Preventive Medicine, University of Latvia, Riga, Latvia*
[3] *Centre of Digestive Diseases "GASTRO", Riga, Latvia*

Background. Gastric adenocarcinoma is preceded by a cascade of precancerous lesions: atrophic gastritis, intestinal metaplasia and dysplasia, and it is triggered by the infection with *H. pylori.* Several studies have showed that certain forms of atrophy and intestinal metaplasia are not reversible. Surveillance strategy and methods are based on MAPS (Management of precancerous conditions and lesions in the stomach) guidelines.

Purpose. To evaluate the progression of gastric precancerous lesions and the rationale of the current surveillance strategy.

Materials and methods. Data were analysed from patients, who underwent upper endoscopy at Centre of Digestive Diseases GASTRO in 2013. Patients were classified into groups with different risk level according to MAPS and OLGA/OLGIM recommendations and selected for surveillance endoscopy in 2017.

Results. According to inclusion criteria, 79 from 303 patients were enrolled into the study.

Stages and risk groups	2013	2017
Very high risk:	**11,4% (n=9)**	**7,6% (n=6)**
High grade dysplasia	1,3% (n=1)	1,3% (n=1)
Low grade dysplasia	10,1% (n=8)	6,3% (n=5)
High risk:	**40,5% (n=32)**	**10,1% (n=8)**
OLGA/OLGIM III/IV	8,9% (n=7)	1,3% (n=1)
OLGA IV	0% (n=0)	0% (n=0)
OLGA III	12,7%% (n=10)	0% (n=0)
OLGIM IV	2,5% (n=2)	1,3% (n=1)
OLGIM III	16,5 % (n=13)	7,6% (n=6)
Moderate risk:	**48,1% (n=38)**	**34,2% (n=27)**
OLGAII	5,1%% (n=4)	1,3% (n=1)
OLGIM II	25,3% (n=20)	24,1% (n=19)
OLGIM I	17,7% (n=14)	8,9 (n=7)
Low risk:	**0% (n=0)**	**48,1% (n=38)**
OLGA/OLGIM I/0	0% (n=0)	48,1% (n-38)

Conclusions. More than a half of the patients require consecutive follow-up endoscopy, however, the improvement of gastric mucosa status has also been noted and risk groups decrease.

5. CHARACTERISTICS OF EPSTEIN-BARR VIRUS-POSITIVE GASTRIC CANCER IN LATVIA

Evita Gasenko[1-3], *Sergejs Isajevs*[1-4], *M. Constanza Camargo*[5], *G. Johan Offerhaus*[6], *Inese Polaka*[1,2,8] *Margaret L. Gulley*[7], *Roberts Skapars*[1-3], *Armands Sivins*[1-3], *Ilona Kojalo*[1-3], *Arnis Kirsners*[1,3,8], *Daiga Santare*[1-3], *Jelizaveta Pavlova*[1], *Olga Sjomina*[1], *Elina Liepina*[9], *Liliana Tzivian*[1,2], *Charles S. Rabkin*[5], *Marcis Leja*[1-3]

[1] *Institute of Clinical and Preventive Medicine, University of Latvia, Riga, Latvia*
[2] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[3] *Riga East University Hospital, Riga, Latvia*
[4] *Academic Histology Laboratory, Riga, Latvia*
[5] *Division of Cancer Epidemiology and Genetics, National Cancer Institute, Rockville, Maryland, USA*
[6] *Department of Pathology, University Medical Center Utrecht, Netherlands*
[7] *Department of Pathology and Laboratory Medicine, University of North Carolina, Chapel Hill, North Carolina, USA*
[8] *Institute of Information Technology, Riga Technical University, Riga, Latvia*
[9] *The Centre of Disease Prevention and Control of Latvia, Riga, Latvia*

Background. Epstein-Barr virus (EBV)-associated gastric cancer (GC) has been proposed to be a distinct GC subtype. The prognostic significance of EBV infection in GC remains unclear and needs further investigation.

Purpose. To analyse EBV-positive and EBV-negative GC patients regarding their personal and tumour-related characteristics, and to compare their overall survival.

Materials and methods. GC patients treated at the Riga East University Hospital in 2009–2016 were analysed retrospectively. Tumour EBV status was determined by *in situ* hybridization for EBV-encoded RNA (EBER). Information about age, sex, smoking status, body mass index, subsite, histology and personal history of other cancers was obtained from patient questionnaires and/or hospital records. Data on overall survival until July 30, 2017 were analysed. Cox proportional hazard regression models adjusted for personal and tumour-related covariates were performed to compare survival between EBV-positive and EBV-negative patients.

Results. 302 patients (60.6% males) with mean age 63.6 ± 11.5 years were investigated. EBER positivity was present in 8.6% of tumours. EBV-positive GC patients had better survival at 80 months (hazard ratio, HR=0.35; 95% confidence interval, CI 0.17; 0.68) compared to EBV-negative patients. Better survival was also associated with female gender (HR=0.67; CI 0.45; 0.95) and for overweight patients (HR=0.7; CI 0.49; 1.00,) compared with normal weight. There was no effect on survival regarding patients' age, Laurens classification, grade, local recurrence and other cancer in personal history. Worse survival was observed for underweight patients (HR=2.13 (CI 0.99; 4.6,), stage III (HR=3.08 CI 1.81; 5.23) and stage IV (HR=10.71; CI 5.81; 19.74,) compared to stage I, and for anatomically overlapping and unspecified tumor localisation (HR=1.77; CI 1.7; 2.92) compared to proximal and distal.

Conclusions. Tumor EBV-positivity is a favorable prognostic factor in GC. Observed survival differences between EBV-positive and -negative GC could be useful analysing results of ongoing clinical trials, focusing on targeted therapy and potentially influence treatment options in the future.

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6. GASTROPANEL RESULTS IN CAUCASIAN PATIENTS WITH GASTRIC CANCER

Jelizaveta Pavlova[2], *Olga Sjomina*[2], *Evita Gasenko*[2], *Guntis Ancans*[1,2], *Armands Sivins*[1-3], *Ilze Kikuste*[1,3,4], *Aigars Vanags*[3], *Ivars Tolmanis*[4], *Dace Rudzite*[1,2], *Inese Polaka*[1,6], *Ilona Kojalo*[1,2], *Lilian Tzivian*[2], *Inta Liepniece-Karele*[1,2,5], *Sergejs Isajevs*[1,2,5],*Daiga Santare*[1,2], *Marcis Leja*[1,2,4]

[1] *Institute of Clinical and Preventive Medicine, University of Latvia, Riga, Latvia*
[2] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[3] *Riga East University Hospital, Riga, Latvia*
[4] *Digestive Diseases Centre "GASTRO", Riga, Latvia*
[5] *Academic Histology Laboratory, Riga, Latvia*
[6] *Institute of Information Technology, Riga Technical University, Riga, Latvia*

Background. GastroPanel (Biohit, Oyj, Finland) is a test system used for detecting gastric atrophy. More evidence is needed about the performance of test in individuals with already developed gastric cancer (GC).

Purpose. To evaluate GastroPanel test system results in Caucasian patients with GC.

Materials and methods. Blood samples were obtained in patients with gastric adenocarcinoma in Latvian Oncology Center prior to the treatment. Pepsinogen I/II ratio (PG I/II), gastrin-17 (G-17) levels and *H. pylori* IgG in blood samples were detected. PG I/II < 3, G-17 < 1 pmol/L, HP IgG > 30 EUI were defined as positive tests. In all patients GC was approved histologically by expert pathologist. Positive test proportions were analyzed in different sex, age groups, Lauren and ICD types, stages.

Results. Results from 481 patients with GC were available. PG I/II test was positive in 32.7%, G-17 in 12.8%, *H. pylori* IgG in 74.0% of patients. Two, PG I/II and *H.pylori* IgG tests, were positive in 22.5% of patients with men-to-women ratio 2:1 ($p<0.05$) and mostly these were intestinal GC (54.7%). All three tests were positive in 6 (1.3%) cases. Positive PG I/II test proportion was larger in men (35.1%) than in women (28.5%) and in intestinal (36.8%), than in diffuse (22.0%) GC ($p<0.05$). G-17 test was equally positive in antral (10.1%) and GC of other ICD types (12.1%). *H. pylori* IgG test results did not differ in different sex, age and GC type groups. GastroPanel test results did not differ in different TNM stages.

Conclusions. Decreased pepsinogens are present only in the minority of patients with gastric cancer. Decreased G-17 is present in a small proportion of patients with antral cancer. Most of the patients are *H. pylori* infected.

7. REPEATABILITY OF MEASUREMENTS AND CONFOUNDING FACTOR STUDY OF SNIFFPHONE E-NOSE DEVICE PROTOTYPE

*Edgars Vasiļjevs[1,2], **Liene Zvaigzne**[3], Ance Ozola[3], Inese Poļaka[1,4], Lelde Lauka[1], Carsten Jaeschke[5], Mārcis Leja[1,6], Hossam Haick[7]*

[1] *Institute of Clinical and Preventive Medicine and Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Traumatology and Orthopedics Hospital, Riga, Latvia*
[3] *Rīga Stradiņš University, Riga, Latvia*
[4] *Institute of Information Technology, Riga Technical University, Riga, Latvia*
[5] *JLM innovation, Tuebingen, Germany*
[6] *Digestive Diseases Centre "GASTRO", Riga, Latvia*
[7] *Technion – Israel Institute of Technology, Haifa, Israel*

Background. E-nose is a device to detect volatile organic compounds in exhaled breath. Volatiles may be used as potential diagnostic biomarkers, but they also change in profile after food ingestion, physical activity, smoking and many other influences.

Purpose. The objective of this study was to determine test-retest reliability of Sniffphone over weeks and in relation to food ingestion, their influence on "Sniffphone" project e-nose prototype measurements, developed for potential cancer screening.

Materials and methods. Ten healthy non-smokers were invited once a week for 3 repeated measurements over a month, with week interval between first and second occasion and two weeks between second and third occasion. Two breath tests were performed each time: first was done after 10 h fasting, while the second was done 2 h later by random assignment, either after food ingestion (influence group) or without food ingestion (control group). Three features were extracted from readings of eight e-nose sensors: maximum, average and minimum relative resistance changes, which gave 24 features in total. Statistical analysis was done with IBM SPSS Statistics version 20 using Friedman's test for repeatability, Wilcoxon signed rank test for comparison between first measurement and the assigned groups. The significance threshold was set at $p<0.05$.

Results. In total, 60 successful measurements were performed. A half (n=30) of them were first fasting measurements and another half were second measurements, which consisted of 56.7% influence group (n=17) and 43.3% control group (n=13). The median age of volunteers was 25 years (IQR=2), 40% of them were females (n=4). There was a statistically significant difference in the initial measurements among weeks, which showed in 17 out of 24 extracted features ($p\leq0.04$). The second breath test showed no statistically significant difference after food ingestion, however, in the control group, a statistically significant difference was found in 3 out of 24 extracted features ($p_{minS1}=0.039$, $p_{minS2}=0.046$, $p_{minS6}=0.023$).

Conclusions. Weekly variability may be due to intra-individual physiological variability and sensor response shifts from day specific external factors like temperature or humidity. Reported changes in control group e-nose reading might be due to prolonged fasting period. Whereas results after food ingestion, which normally causes volatile organic compound concentration pattern changes, remain unclear to the authors in conjunction with control group results.

Acknowledgments. The study was conducted within the project "Sniffphone", which receives funding from the EU Horizon 2020 Programme for research, technological development and demonstration under grant agreement No. 644031.

8. INFLUENCING FACTORS OF PAIN IN CHRONIC PANCREATITIS PATIENTS

Alise Lielause[1], *Imanta Ozola-Zālīte*[1], *Agnese Ūdre*[2], *Aldis Puķītis*[1,3]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Emergency Department, Pauls Stradiņš Clinical University Hospital, Riga, Latvia*
[3] *Gastroenterology, Hepatology and Nutrition Therapy Centre, Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. Chronic pancreatitis (CP) is a disease characterized by a reduced quality of life, partly due to the pain syndrome. Also, abdominal pain is often the main reason of hospitalization. Early recognition of risk factors is crucial as their prevention or possible modification can delay pain syndrome development.

Purpose. The aim of the study was to determine, if there was an association between CP pain and such factors as etiology, endocrine, exocrine insufficiency, body mass index, serum albumin and haemoglobin level and changes of CT scan.

Materials and methods. The prospective study was conducted during the period of 2016–2017 in Pauls Stradiņš Clinical University Hospital. 91 patients with CP were included. The data were collected and systematized based on the M-ANNHEIM classification, results of CT scans were systematized by the Cambridge classification. Patients were asked to report the type of pain and were divided into three groups: no pain (group I), recurrent pancreatitis (group II), with abdominal pain (group III). For statistical analysis were used Chi square, Kruskall-Wallis test, results were considered statistically significant at $\rho<0.05$.

Results. Overall, 22(24%) were patients with no pain (group I), 37(41%) were with reported recurrent pancreatitis (group II), 32(35%) with pain (group III).

Males were 12(10%) in I, 30(47%) in II, 22(34%) in III; females 10(37%) in I, 7(26%) in II, 10(37%) in III ($\rho = 0.09$).

As etiology factors, alcohol consumption was reported in 49%, smoking 9%, both factors in 11%, others 31% ($\rho = 0.28$). No significant results in association with pain were found by dividing in groups patients with or without endoscopic or surgical treatments, serum albumin, hemoglobin levels.

10(46%) patients in group I, 4(11%) in II and 8(25%) in III had endocrine insufficiency ($\rho = 0{,}01$). Accordingly, 6(27%) patients in I, 16(43%) in II and 21(66%) in III had exocrine insufficiency ($\rho = 0{,}02$).

No significant result was found of CT data, probable association could be between the pain and pseudocysts, and pancreas structural changes (like heterogeneity of parenchyma) ($\rho = 0.32;0.36$).

Conclusions. The presence of endocrine insufficiency is associated with a lower frequency of pain. The exocrine insufficiency more often is found in patient with recurrent pancreatitis and pain syndrome related to CP. No significant association was found with a BMI, age, gender, etiology, disease duration, albumin and hemoglobin level, surgical and endoscopic treatment. For more significant results, the study must encompass a greater count of patients.

9. POST ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY PANCREATITIS PREVENTION IN DAILY PRACTICE

Aldis Puķītis[1], *Imanta Ozola-Zālīte*[1], *Veit Phillip*[2], *Alexey Epstein*[4], *Alexander Hapfelmeier*[2], *David Haf*[2], *Miriam Schwab*[2], *Jonas Rosendahl*[3], *Albrecht Hofmeister*[3], *Andreas Weber*[2], *Ekin Demir*[2], *Hana Algül*[2]

[1] *University of Latvia, Riga, Latvia*
[2] *Klinikum rechts der Isar, Technische Universität München, Germany*
[3] *Klinik für Gastroenterologie und Rheumatologie, Universitätsklinikum Leipzig, Germany*
[4] *Northern State Medical University, Arkhangelsk, Russia*

Background. The most used prophylactic approaches of post endoscopic retrograde cholangiopancreatography (ERCP) pancreatitis (PEP) include anti-inflammatory drugs and pancreatic duct stents. Although there are several studies showing that non-steroidal anti-inflammatory drugs (NSAID) reduce the risk of PEP and routine rectal administration of 100 mg of diclofenac or indomethacin. Studies leading to the recommendation of prophylactic NSAIDs included only high risk patients and none of these studies represent the cross section of ERCPs typically performed in the daily practice. In addition to this medication based prophylactic approach, ESGE guidelines recommend to highly consider a prophylactic pancreatic stent in patients at high risk to this condition.

Purpose. Our aim was to investigate the effect of prophylactic pancreatic duct stenting in an unselected patient population undergoing ERCP with inadvertent cannulation of the pancreatic duct in a multicenter, prospective, randomized trial.

Materials and methods. This study was a multicenter, prospective, randomized controlled trail conducted between July 2010 and April 2016 at four European centers. The study was conducted in accordance with the Declaration of Helsinki and was approved by the local ethics committees (project number 2625/09). The study was registered at Clinicaltrails.gov (ClinicalTrials.gov Identifier: NCT01673763)

Results. The primary outcome of PEP occurred in 31 of 167 patients (18.6%). 29/31 (93.5%) were classified as having mild pancreatitis and 2 (6.5%) cases were classified as having moderate severe pancreatitis. Of these events, 11 of 87 (12.6%) occurred in the pancreatic stent group and 20 of 80 (25.0%) occurred in the non-stent group, corresponding to a significantly reduction of PEP by prophylactic stent insertion (odds ratio 0.434; 95% confidence interval 0.193–0.976; p=0.040). In 87 patients (52.1%) a stent was placed into the main pancreatic duct and accordingly, 80 patients (47.9%) did not receive a prophylactic stent. Two additional patients were randomized for a prophylactic stenting but placement of the stent was not successful due to technical difficulties.

Conclusions. In a multicenter study for unselected patient population with inadvertent cannulation of the pancreatic duct during first-time ERCP risk for PEP were significantly reduced by prophylactic pancreatic stenting.

10. FACTORS ASSOCIATED WITH BEING UP-TO-DATE WITH COLORECTAL CANCER SCREENING IN THE LATVIAN POPULATION

Danute Razuka-Ebela[1], *Irisa Zile*[1,2], *Daiga Santare*[1,3], *Inese Polaka*[3], *Sergei Parshutin*[1,3], *Inguna Ebela*[1], *Raul Murillo*[4], *Lilian Tzivian*[1,3], *Jin Young Park*[4], *Rolando Herrero*[4], *Marcis Leja*[1,3]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Centre for Disease Prevention and Control of Latvia, Riga, Latvia*
[3] *Institute of Clinical and Preventive Medicine, University of Latvia*
[4] *International Agency for Research on Cancer, Lyon, France*

Background. 10.6% of the Latvian population was screened for colorectal cancer (CRC) in 2014, which remains far below the recommended goal of 45% in European guidelines. In more than half of cases, colorectal cancer is diagnosed late in Latvia. Identifying factors determining participation in cancer screening programmes is necessary for developing population tailored approaches for increasing response rates.

Purpose. To identify factors associated with having had a faecal occult blood test (FOBT) in the past 3 years.

Materials and methods. A total of 3455 participants ages 40 to 64 years (50% male) were enrolled in the "Multicentric randomised study of *Helicobacter pylori* eradication and pepsinogen testing for prevention of gastric cancer mortality: the GISTAR study" in Latvia from 2013 to 2016. Participants completed a detailed questionnaire covering socio-demographic characteristics, lifestyle and medical history.

Pearson chi-square and Mann Whitney U tests were used to identify differences between participants with and without a history of FOBT in the past 3 years by age, sex, country of birth, nationality, level of education, income level, employment status, smoking status, alcohol consumption, BMI, and a family history of any cancer. Logistic regressions were built to calculate odds ratios (OR) for associations between the performance of FOBT and the factors mentioned above.

Results. Of the 3423 respondents included in the analysis with a mean age of 51.5 ± 6.7 years (52.8% male), 5.5% reported having had a FOBT in the past 3 years. When grouped by CRC risk according to guidelines of the American College of Gastroenterology, 5.8% of those above the age of 50 (1995 respondents) and 8% of those above the age of 40 at increased CRC risk report a FOBT in the past 3 years.

Male gender (OR 0.60; 95% confidence interval, CI 0.41; 0.89), having smoked at least 100 cigarettes in one's lifetime (OR 0.56; CI 0.38; 0.81) and having had at least 200 g of liquor in one sitting in the past year (OR 0.63; CI 0.42; 0.94) was associated with decreased odds, while increasing age (OR 1.11; CI 1.08; 1.14), reporting ever having consumed alcohol (OR 2.59; CI 1.18; 5.68) and a family history of cancer (OR 1.67; CI 1.22; 2.29) was associated with increased odds of having had a FOBT in the past 3 years.

Conclusions. Psychosocial factors (gender, education, family history of cancer) seem to play a greater role for having had FOBTs than economic factors (income level, employment status).

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INTERNAL MEDICINE & INFECTIOUS DISEASE

1. FACTORS ASSOCIATED WITH ACHIEVEMENT OF GUIDELINE-DEFINED TREATMENT TARGETS IN LATVIAN PATIENTS WITH TYPE 1 DIABETES

Sabīne Skrebinska[1,2], *Leonora Pahirko*[5], *Zane Dzērve*[1,4], *Laura Sviklāne*[1,3], *Jānis Valeinis*[5], *Valdis Pīrāgs*[1,2], *Jeļizaveta Sokolovska*[1,3]

[1] *Faculty of Medicine, Ubiversity of Latvia, Riga, Latvia*
[2] *Riga East University Hospital, Riga, Latvia*
[3] *Pauls Stradiņš University Hospital, Riga, Latvia*
[4] *Madona Hospital, Madona, Latvia*
[5] *Faculty of Physics and Mathematics,University of Latvia, Riga, Latvia*

Background. Blood pressure, Hb1Ac and lipid control allows to reduce morbidity and mortality in type 1 diabetic patients. General targets for patients with diabetes are: HbA1c<7%, low-density lipoprotein <2,6 mmol/l, triglycerides 1,7 mmol/l, blood pressure <140/90. More stringent of relaxed targets are applicable to several patient groups (patients with albuminuria or history of hard cardiovascular event (CVD), patients with short life expectancy, etc.). Lifestyle changes such as smoking cessation and regular physical activity are also recommended.

Purpose. To analyse how guideline-defined treatment targets for HbA1c%, blood pressure and lipids are achieved in Latvian type 1 diabetic patients. Association of depression, metabolic syndrome, and physical activity on diabetes control was also assessed.

Materials and methods. Data of 315 patients from "LatDiane: Latvian Diabetic Nephropathy Study" were analysed. HbA1c%, blood pressure and lipid goals were assessed in accordance with EASD/ADA guidelines. Albuminuria was estimated *via* spot urine albumin/creatinine ratio. GFR was calculated with CKD-EPI equation. Depression was identified based on Beck's depression inventory (BDI) test. Metabolic syndrome was defined due to IDF/AHA 2009 statement's criteria. Physical activity was assessed with Minnesota leisure time physical activity questionnaire.

Results. The mean HbA1c% was 8,86 ± 1,88%. Only 12% of patients had HbA1c<7%. 46% of patients had arterial hypertension, of these 26% did not use antihypertensive medications. LDL cholesterol and triglyceride goals were achieved in 10–33% and 60–70% of patients respectively, depending on the risk group. Insufficient statin and ACEI/ARBs usage was observed in certain patient groups. Depression was observed more often in patients with HbA1c%>8. 28% of patients reported active smoking. Achievement of treatment guidelines was associated with socio-economic status, metabolic syndrome, physical activity and depression.

Conclusions. Only a minority of type 1 diabetic patients from LatDiane cohort achieve guideline-defined treatment targets. Lifestyle factors are associated with results of diabetes treatment.

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2. IMPACT OF WEIGHT GAIN, HbA1c, ARTERIAL PRESSURE ON TYPE 1 DIABETES IN PREGNANCY

Unda Kaļķe[1], *Kristīne Ducena*[1,2], *Jānis Jukonis*[1]

[1] *University of Latvia, Riga, Latvia*
[2] *SIA Latvijas Universitātes Medicīniskās pēcdiploma izglītības institūts, Riga, Latvia*

Background. Type 1 diabetic women experience a greater weight gain during pregnancy than the average population. The most important problems are related to premature birth, the risk of macrosomia, hypoglycaemia of the neonate. It is essential to plan pregnancy and to achieve optimal glycemic target (HbA1c <6.5%), which could reduce complications during the pregnancy.

Purpose. The objective of the current study was to show how weight gain, HbA1c and arterial blood pressure affects the pregnancy and its outcomes for the patients with T1DM.

Materials and methods. A retrospective study was performed. 32 medical histories of pregnant women with T1DM were analysed. Data was processed by the SpSS program.

Results.

1. Positive correlation was found between the maternal weight before pregnancy and the weight before delivery (r=0.754; p=0).
2. Out of 32 pregnancies, 37.5% of births occurred in the 37th week of pregnancy (Moda=37; n=12); and 18.8% (n=6) children were born prematurely (<36 weeks of gestation).
3. Out of 32 pregnancies, 18 were planned, 14 were not. In cases of unplanned pregnancy, the mean HbA1c before pregnancy was 8.21%, while for planned pregnancy, the mean HbA1c was 6.8% (p=0.037).
4. For women who had the mean weight increase of 14.57 kg before pregnancy, the HbA1c was ≤7, however, women who had the mean weight increase of 19.7 kg before pregnancy were found to have the average HbA1c of >7.
5. Of women with preeclampsia, the mean weight gain was 18,4 kg, compared to women without preeclampsia – 14,7 kg (p>0,05). In neonates, who experienced postnatal hypoglycaemia, their mothers' weight increased by an average of 20.78 kg during pregnancy, but in neonates who had no hypoglycaemia, their mothers' weight gain increased by 14.8 kg (p=0.033).

Conclusions.

1. In T1DM patients with overweight before pregnancy, weight gain increases more than in common population during pregnancy.
2. In T1DM pregnancies, 56.3% of cases delivery occurs earlier than in 40 weeks. The risk of preterm delivery is 18.8%, it is higher than in common population
3. The average HbA1c is lower in the case of planned pregnancy, which means that planning is very important, because elevated HbA1C is associated with pregnancy associated complications.
4. If HbA1c ≤7% before pregnancy, then the mean weight gain during pregnancy is lower than for pregnant women with HbA1c >7 and is associated with lower risk of complications.
5. Patients with higher weight gain have increased preeclampsia risk and increased hypoglycaemia in their new-borns.

3. MISDIAGNOSIS OF TYPE 2 DIABETES MELLITUS FOR PATIENTS WITH LATENT AUTOIMMUNE DIABETES IN ADULTS IN LATVIA

Jūlija Zavorikina[1], *Vita Rovīte*[2], *Liene Ņikitina-Zaķe*[2], *Jānis Kloviņš*[2]

[1] *Rīga Stradiņš University, Riga, Latvia*
[2] *Latvian Biomedical Research and Study Center, Riga, Latvia*

Background. Latent autoimmune diabetes in adults (LADA) is also non-officially called "type 1,5 diabetes mellitus" and is known for its onset in the early adulthood, and several types of autoantibodies are found in the serum of the patients. Immunologically, glutamic acid decarboxylase 65 (GAD65) autoantibodies are by far the most common. Increased body mass index is not typical for LADA patients. LADA patients generally have worse HbA1c levels than type 2 diabetes patients.

In Latvia, diabetes is diagnosed using World Health Organization's clinical criteria, whereas detection of the autoantibodies is not funded by the National Health Service. This may be the reason why LADA is likely to be missed and diagnosed as type 2 diabetes. As a result, patients are treated incorrectly with oral hypoglycemic drugs, not with insulin, so the complications of the diabetes progress.

Purpose. To find out, if there are many misdiagnosed as having type 2 diabetes LADA patients in Latvia, and if it is effective to recommend autoantibody screening for better LADA diagnostics in Latvia.

Materials and methods. Using the Genome Database of Latvian Population, patients with the diagnosis of type 2 diabetes mellitus aged between 20 and 60 years and BMI <30 were selected.

Serum test for GAD65 autoantibodies, using indirect immunofluorescence method, was performed for those individuals, who were selected as most likely to be with LADA, at a laboratory of the Clinical Center of Immunology at Pauls Stradiņš Clinical University Hospital.

Results. Using the Genome Database of Latvian Population, 2439 patients with the diagnosis of type 2 diabetes mellitus were selected. Only 128 individuals out of 2439 satisfied all the inclusion criteria.

Out of 128 selected patients only 1 (0,78%) had positive GAD65 autoantibodies' result. Others' tests were negative.

Conclusion. According to the current research and anti-GAD65 test results, the problem with LADA misdiagnosis is not crucial in Latvia.

However, further research for evaluation of presence of other autoantibodies is essential for more accurate findings.

Acknowledgements. This research was supported and financed by Latvian Biomedical Research and Study Centre, serum samples were provided by Genome Database of Latvian population.

4. ASSOCIATION BETWEEN AGE OF THE TRANSPLANT RECIPIENTS AND RENAL TRANSPLANT FUNCTION AFTER THREE YEARS OF FOLLOW UP

Elina Glaudina[1], *Lilian Tzivian*[1], *Seda Arutjunana*[2], *Kristofs Folkmanis*[3], *Inese Folkmane*[1,4]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Faculty of Medicine, Rīga Stradiņš University, Riga, Latvia*
[3] *St. Bonifatius Hospital, Lingen, Germany*
[4] *Centre of Nephrology, Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. As the world population is ageing, there is an increase in the older incident end-stage renal disease, and the mean age of renal transplant recipients rises. Elderly patients are among the fastest-growing group starting renal-replacement therapy and waiting for kidney transplant.

Purpose. To investigate association between age of patients and renal transplant function after three years of follow up.

Materials and methods. Patients that received kidney transplant between January 2008 and December 2011 were enrolled into the study. Function of renal transplant was checked after three years' follow up. We used binary logistic regression adjusted for personal covariates (gender), diagnosis and comorbidities (Diabetes Mellitus, hypertension, existed infections, cardio-pulmonary diseases) to assess the association between age of the patient and function of the renal transplant.

Results. Study sample consists of 221 patients with mean age 45.8 (± 14.4), mostly men, with chronic glomerular nephritis. 24 patients died in the three year period. Most of the patients did not have any comorbidities, except for hypertension, which was present in 79.2% of patients. Dysfunction of renal transplant during three years' follow-up occurred in 30.8% of cases. In fully adjusted logistic regression model, age did not affect the dysfunction of renal transplant after three years (OR = 0.99; 95% confidence interval, CI 0.96; 1.01). Female gender was the protection factor against dysfunction of the renal transplant (OR = 0.50; CI 0.25; 0.99).

Conclusions. The study showed that a half of the enrolled patients retained a normal renal transplant function after three years of follow up. As the age did not affect the renal transplant function in long term, renal transplantation should be encouraged for the appropriate senior patients. These findings are important for the growing number of elderly patients on renal replacement therapy.

5. AN OPEN-LABEL, CROSSOVER PILOT STUDY OF ULTRA-LONG ACTING β_2-AGONIST OLODATEROL AND SHORT-ACTING β_2-AGONIST SALBUTAMOL BRONCHODILATOR EFFECT AFTER INHALATION IN PATIENTS WITH ASTHMA AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Māris Bukovskis[1], *Marvin Dittmann*[1], *Olga Madaja*[2], *Normunds Jurka*[1], *Gunta Strazda*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Department of Pulmonology, Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. Different β_2-agonist bronchodilators are recommended for treatment of obstructive lung diseases. Traditionally, β_2-agonists have been grouped according their speed and duration of action into fast, short-acting β_2-agonists (SABAs), and slow, long-acting β_2-agonists (LABAs). Combined fast and long acting properties of some β_2-agonists, i.e. formoterol, have demonstrated advantage in asthma treatment studies due to potential to use them as regular and symptomatic treatment agents at the same time.

Purpose. The goals of this pilot study were to compare the dynamic bronchodilation effect of olodaterol and salbutamol on the forced expiratory volume in the first second (FEV1), effective resistance (R_{eff}), forced expiratory volume in the first second and forced expiratory volume ratio (FEV1/FVC) and residual volume (RV) within first 30 minutes after inhalation in patients with asthma and chronic obstructive pulmonary disease (COPD).

Materials and methods. This study was performed in open-label, cross-over manner in patients with diagnosis of asthma according to Global Initiative of Asthma (GINA) guideline criteria, and history of reversible obstruction documented by a reversibility test in time frame of one year before the study with an improvement of FEV1 ≥ 12% and ≥ 200 ml 15 to 20 minutes after 200–400μg of salbutamol inhalation, and diagnosis of COPD and asthma/COPD overlap according Global Obstructive Lung Disease (GOLD) guideline diagnosis criteria.

Serial lung function measurements of FEV1%, R_{eff}, FEV1/FVC% and RV% according European Respiratory Society and American Thoracis Society (ERS/ATS) guidelines were performed by whole-body plethysmograph (Vyntus BODY, Care Fusion Version 01, USA) before and 5, 10, 20 and 30 minutes after of inhalation of 5 μg of olodaterol (Respimat™ inhaler device) or 200 μg of salbutamol (pMDI through Volumatic™, Allen & Hanburys, UK spacer).

Statistical analysis was done using the computer programme STATISTICA (7.0). Data were analysed using repeated measure ANOVA method.

Results. Overall, in 10 patients, 6 asthma, 3 asthma and COPD overlap and 1 COPD patient were recruited in this pilot-study. We observed statistically significant improvement of FEV1%, R_{eff}% and FEV1/VC% in both treatment groups compared to baseline ($p<0.05$). We did not observe a significant change of lung RV%. No significant

difference of every body-plethysmography parameter at every time point between both treatment groups was detected.

Conclusions. Lack of significant difference of lung function parameters at any time point of serial lung function measurement demonstrates fast bronchodilation effect of olodaterol.

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6. THE NEW RIGA AGREEMENT OF THE INTERNATIONAL CONSENSUS CONFERENCE ON NASAL AIRWAY FUNCTION TESTS AND ITS CONSEQUENCES

Klaus Vogt[1], *Gregor Bachmann-Harildstad*[2]

[1] *University of Latvia, Centre of Experimental Surgery, Riga, Latvia*
[2] *Akershus University Hospital, University of Oslo, Otorhinolaryngology, Lørenskog, Norway*

Background. In November 2, 2016, at the University of Latvia the first international and interdisciplinary consensus conference on nasal airway functions tests took place. The conference of medical doctors, engineers, physicists and statisticians was called together as an initiative of the Riga nasal research group. The results are recently published in January 2018 and shall be summarized here.

Purpose. The purpose of the conference was to skip overaged medical and technical standards in rhinology and to create new standards based on European law and the state of art in medicine and techniques and on the primary consensus of all sciences with an essential impact in the problem.

Materials and methods. Founded on the permanent structured research of co-workers and diploma students of the University of Latvia, among them 2 studies about 36,500 and 10,300 rhinomanometric measurements, the 4-phase-rhinomanometry was chosen as the leading standard method in functional rhinology, followed by some screening tests as for instance the measurement of Peak Nasal Inspiratory Flow (PNIF). The future position of Computational fluid dynamics was outlined as detailed morphological and functional diagnostic information.

Results. The new classification of nasal obstruction as an example of the new standard is the start-point of a new preoperative diagnostic in functional nasal surgery, reducing the high number of non-successful or unnecessary surgery, as well as measuring the effects of drugs. Also, sleep medicine will consider the rhinological diagnosis as of increasing importance.

Conclusions. The group of scientists involved in the uncommon event decided to see the meeting as a start-point of research of outstanding clinical meaning. They are working now together within the international project "Rhinodiagnost" by support of Germany and Austria. This project is on the way to be extended to Latvia, Italy, Ukraine and the USA.

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7. INVASIVE DISEASE CAUSED BY STREPTOCOCCUS PNEUMONIA IN PAULS STRADIŅŠ CLINICAL UNIVERSITY HOSPITAL

Haakon Vevatne Øverland[1], *Solvita Sederliņa*[1,2], *Uga Dumpis*[1,3]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Riga Eastern University Hospital, Riga, Latvia*

Background. *Streptococcus pneumonia* belongs to the group of gram positive *cocci*, and it is an α-hemolytic organism. This bacteria is the most common cause of community-acquired pneumonia, but it can also manifest as invasive disease like sepsis and meningitis. The main described risk factors for invasive disease are immunosuppression, chronic disease, age, heavy alcohol or drug use, and splenectomy. Serotype specific vaccines are available for prevention of the disease and recommended for high risk patients.

Purpose. The aim of the study was to characterize invasive pneumococcal disease in patients hospitalized in Pauls Stradiņš Clinical University Hospital.

Materials and methods. The Hospital Microbiology Database and Medical Records were used to extract the necessary information. Serotyping was performed in National Reference Laboratory, Riga Eastern University Hospital.

Results. Data on 26 patients hospitalized from January 2016 until November 2017 were included in the study. 58% of patients were females. The mean age of the women was 66.4 years and 62.5 years for the men.

Detected prevalence of resistance in isolates was 5% to Penicillin, 21% to Trimetroprim/Sulfamethaxasole, 10% to Clindamycin, 5% to Erythromycin, and 10% to Tetracycline.

Serotyping data were available for 18 patients. Six patients were infected with serotypes covered by both 10- and 13-valent vaccine, and 2 patients were infected with serotypes covered only by the 13-valent vaccine. 10 (55.5%) patients were infected with serotypes that are not covered by the vaccines. The most common serotype covered by the vaccines was 19A; 2 cases, 11.1%. The most common serotype not covered by the vaccines were 9N (2 cases) and 11A (2 cases).

Conclusions. Only 44.5% of the patients with serotyping available had pneumococcal serotypes covered by the available vaccine, which shows that there might be a selection of non-vaccine preventable strains after introduction of childhood vaccine.

Vaccination would prevent only half of the cases. The antibiotic resistance does not seem to be common in Latvian patients with invasive pneumococcal disease. More extensive study is needed to understand the trends in the country.

8. IMMUNOLOGIC RESPONSE TO HEPATITIS B VACCINATION IN PERITONEAL DIALYSIS PATIENTS

Olga Barbara Krammer[1], *Anna Silda*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Nephrology Center of Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. Hepatitis B virus (HBV) infection is a global health problem, with more than two billion people having serological evidence of current or past infection. Dialysis patients are at an increased risk of acquiring HBV compared to the general population.

Purpose. The aim of this study is to analyze the immunological response to HBV vaccination in peritoneal dialysis (PD) patients and possible factors affecting it.

Materials and methods. In this retrospective study, the patients, who had a PD catheter implanted during the years 2014–2016, were evaluated. Patients were excluded, if they showed serologic evidence of past/current infection, had no available anti-HBs titers after finishing the vaccination schedule, received no vaccination, did not finish it or already received it before enrolment to PD program. Those included received 40μg of recombinant HBV vaccine intramuscularly at a four dose schedule. Anti-HBs titers were evaluated one to two months and six months after the last dose of vaccine. Patients were grouped in responders (anti-HBs ≥10 IU/L) and non-responders (anti-HBs <10 IU/L) according their anti-HBs after one to two months. The following factors, which may affect the immune response, were assessed: age, gender, diabetes mellitus, hepatitis C infection, body mass index, point of vaccination (before/after PD start), time on dialysis, serum creatinine, urea, C-reactive protein (CRP), ferritin, albumin and parathormone. Laboratory data were reviewed at the time of first and last application of vaccine.

Results. Out of 90 initial patients, 21 showed serological evidence of present/past HBV infection, making a prevalence of 23.3%. The final study population included 42 patients (21 male, 21 female). 71.43% (n=30) of patients had seroconversion, 12 patients (28.57%) not. Non-responders were older (65.9±8.4 vs. 55.1±17.2 years, p=0.031), had lower levels of albumin (35.40±5.27 vs. 44.93±26.93 g/L, p=0.008; 34.78±6.35 vs. 47.88±43.37 g/L, p=0.001) and higher levels of CRP (13.41±9.91 vs. 5.36±9.98 mg/L, p=0.002; 37.99±6.33 vs. 4.07±6.28 mg/L, p=0.005) than responders. In 82% of patients, the anti-HBs titers dropped by a mean of 383 ± 309.2 IU/L after six months and 13.6% of initial responders lost titers.

Conclusions. There is a high prevalence of current/past HBV infection in this study population. The seroconversion in PD patients is lower than in general population. After six months, there is a noticeable drop in anti-HBs titers and part of initial responders lose protective antibodies. Age and CRP are negatively and albumin positively associated with the immune response to HBV vaccination in PD patients.

9. COMPLICATED URINARY TRACT INFECTION AND ACUTE PYELONEPHRITIS: COMPARISON BETWEEN FERTILE AND POSTMENOPAUSAL WOMEN

Viktorija Pogodina[2]*, Egils Vjaters*[1,2]

[1] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*
[2] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. Urinary tract infection (UTI) is the most common bacterial infection in young and elderly women. A complicated urinary tract infection (cUTI) is defined as an infection in a patient with pyelonephritis or a urinary tract with a structural or functional abnormality and positive bacteriuria. To this date, there have been no other studies comparing cUTI and acute pyelonephritis in postmenopausal and fertile age women in Latvia.

Purpose. To compare the difference in frequency and etiology of cUTI and acute pyelonephritis in postmenopausal and fertile age women, in Pauls Stradiņš Clinical University Hospital.

Materials and methods. Retrospective study was performed at the Center of Urology in Pauls Stradiņš Clinical University Hospital. Data contained in medical histories of patients with acute pyelonephritis or cUTI was gathered and analyzed with IBM SPSS v22.0 software.

Results. 57 women were included in the study. Thirty (52.6%) were in fertile and 27 (47.4%) – in postmenopausal age. The mean age of fertile and postmenopausal women was 30,0 ± 9,4 and 67,3 ± 13,8 years, respectively. BMI in fertile age was 23,8±4,4 and in postmenopausal – 29,1±4,7 (p<0.001). Prevalence of cUTI and acute pyelonephritis in fertile age was 6 (20.0%) and 24 (80.0%) respectively, while in postmenopausal period-cUTI 13 (48.1%) and acute pyelonephritis 14 (51.9%) (p<0.05). Urosepsis were found in 6 (22.2%) postmenopausal women and in 6 (20.0%) fertile age women (p=0.837). Infection caused by multiple pathogens were in 6 (22.2%) postmenopausal and 9 (30.0%) fertile women (p=0.560). The most common pathogen associated with these infections was *E. coli*, which was isolated in 40 (70.2%) patients, in 24 (80.0%) fertile age and in 16 (59.2%) postmenopausal women (p=0.087). Some less frequent microorganisms isolated from patients were *K. pneumoniae* (7.0%), *E. faecalis* (7.0%) and *S. agalactiae* (7.0%), with no statistically significant difference between the two groups. Other microorganisms were isolated considerably less frequently.

Conclusion. The study revealed that mean BMI in postmenopausal women was statistically significantly (p<0.001) higher than in fertile age women. Prevalence ratio of cUTI and acute pyelonephritis in fertile women was 1 : 4, while in postmenopausal women ratio was similar 1 : 1.1 (p<0.05). No statistical significance was found in prevalence of urosepsis and multiple causal bacteria in the two groups. *E. coli* was most commonly isolated bacteria 40 (70.2%), with statistically insignificant difference between fertile and menopausal women (p=0.087), greater number of patients are needed to evaluate, whether there might be a significant difference.

PAEDIATRICS

VIOLENCE AGAINST CHILDREN AND THE INTERNATIONAL OBLIGATIONS OF THE STATE AND PHYSICIANS (STATE-OF-ART)

Inguna Ebela[1], Martins Razuks-Ebels[2], Danute Razuka-Ebela[1]

[1] *Faculty of Medicine, Department of Paediatrics, University of Latvia, Riga, Latvia*
[2] *Latvian Protect the Children, Riga, Latvia*

Background. Violence compromises children's development, health and education and has a high cost for society – up to US$7 trillion a year, worldwide. The serious consequences of violence may last a lifetime demanding significant funding to treat future psychosomatic diseases. The United Nations Agenda for Sustainable Development 2030 includes a distinct global target to end all forms of violence against children. More than a half of violence announcements in Africa/Asia and 2/3 within the EU are classified as child neglect – a less easily identifiable form of child abuse. Medical personnel should be the key participants of the prevention system.

Purpose. To A) point out the direct role and responsibilities of the state, medical personnel and institutional staff in improving prevention, recognition and reporting of cases of the less easily identifiable forms of violence against children; and B) show that it is essential to target prevention and drive urgent investment as endorsed in the United Nations 2030.

Materials and methods. Review of: international academic and NGO researches, surveys, and using consulting service line of Latvian Save (Protect) the Children.

Results. In-depth research and trustworthy official statistics covering all forms of violence experienced by children are available for very few countries. In Latvia, only a small part of moderate violence cases has been detected. Thus, the state has failed to deliver support to the majority of victims. A significant gap exists between official statistics (regarding violence and rehabilitation), and the survey results of Latvian Save (Protect) the Children. Despite the existing mandatory legislation, most cases of moderate violence, such as emotional and neglect, are still being ignored and underreported by medical, educational and institutional staff, police, social workers and custody courts. In Latvia, most of the cases that are more difficult to identify still remain unrecognized due to the lack of: inter-institutional cooperation, a single step reporting system, and knowledge regarding law and masked violence among medical experts.

Conclusions. Expanded population-based surveillance of violence against children, especially less recognizable forms in young children, is essential to target prevention and drive the urgent investment in action endorsed in the United Nations 2030.

Proposals. Establish a single-step direct hotline for reporting cases of violence. The Law on Treatment, Law on Local Governments, Law on Children's Rights, Rules of Cabinet of Ministers should be complemented with mandatory reporting and special education courses for every medical professional. Courses on the rights of the child and violence against children should be included into the University program as mandatory.

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1. CAUSES OF SKULL FRACTURES, COMPLICATIONS AND TREATMENT OPTIONS FOR CHILDREN, 2010-2018

Ritvars Kalniņš [1], *Leila Geibijeva*[1], *Daina Kalniņa*[1], *Bassel Yaacoub Wehbe*[2], *Dāvis Ozoliņš*[2]

[1] *University of Latvia, Riga, Latvia*
[2] *Children's Clinical University Hospital, Riga, Latvia*

Background. Skull fractures are caused by a direct blow to the calvarium and the vault bones are most affected. Injuries are most often the result of domestic incidents, such as falls from the height of one's body, or an object's direct fall on the head. Quite frequently do injuries occur as the result of a motor vehicle accident or in an entertainment event. The incidence of complications for head injuries is 2–20%. Surgical treatment for skull fractures should be used in very severe cases.

Purpose. To establish the most common causes of skull fractures, the age at which an injury occurs, complications and methods of treatment for children under 18 years of age in Latvia.

Materials and methods. A patient history analysis was carried out in a retrospective study during the period from 2010 to 2018. 299 patients were registered with skull fractures at the Children's Clinical University Hospital during the aforementioned time period.

Results. A total of 299 patients were collected, of which 190 were male and 109 female. The highest trauma population was comprised of children under one year of age (n = 158), followed by children aged between one and seven years old (n=76), and eight to 18 years old (n=65). Falls (n = 141) and domestic injuries (n = 130) were the most common causes of fractures. Motor vehicle injuries (n = 15) and strikes with an object (n = 10) are less common. The bones of the calvarium affected were in the following order: parietal (n=181), occipital (n=29), frontal (n=17) and temporal (n=8). Fractures of the base of the skull usually go hand in hand with calvarium bone fractures (n = 24). Hematomas in traumas were found in 116 patients, brain contusion – 53 cases. Conservative therapy was used in 86% of cases, whereas surgical procedures were performed in 14% of cases.

Conclusions. Fractures of the skull are very common, and the most frequent causes are falls from the height below the age of one year, when the parents care for the child the most. It is necessary to educate the parents to pay more attention to the child. The most common complications are hematomas and brain contusions, which can lead to late neurological problems in the future. Therapeutic options have developed today, but conservative therapy is most commonly used, which reduces patients' stay and reduces the use of surgical therapy.

2. IMPACT OF NEONATAL EARLY-ONSET SEPSIS CALCULATOR ON ANTIBIOTIC USE IN NEWBORNS WITH SUSPECTED INFECTION

Lauma Vasiļevska[1], *Ilze Meldere*[1,2]

[1] *Faculty of Medicine, Rīga Stradiņš University, Riga, Latvia*
[2] *Children's Clinical University Hospital, Riga, Latvia*

Background. A recently published neonatal early-onset sepsis (EOS) calculator has the potential to reduce newborn antibiotic exposure based on 5 major risk factors.

Purpose. The objective was to compare actual antibiotic use to the stratification based on the sepsis calculator in newborns with suspected EOS and to investigate differences in EOS risk between newborns that received early (<12 h) versus late antibiotics (≥12 h of life).

Materials and methods. Retrospective review of infants born ≥ 34 weeks of gestation who received antibiotics within 72 hours after birth. The EOS risk score per 1000 live births was calculated and each newborn was retrospectively assigned to the recommended category by the Kaiser Permanente neonatal EOS calculator. Statistical analysis was performed using MS Excel, IMB SPSS Statistics 22 software and $p < 0.05$ was considered statistically significant. Data were tested for normality using Shapiro-Wilk test. Cross tabulation with χ^2 test and Fischer's exact test were used for nominal data, Mann-Whitney test and Kruskol-Wallis test for non-parametric data.

Results. The EOS calculator recommended not to start antibiotic therapy in 156 (77%) out of 205 reviewed infants. Antibiotic treatment was started early in 60 (29%) and late in 145 (71%) newborns. 13 (6%) positive blood cultures were identified.

Newborns that received early antibiotics had a significantly higher maternal EOS score (median 1.39, IQR: 0.39–2.12) compared with newborns in the late treatment group (median 0.03, IQR: 0.02–0.04).

Prematurity, cesarean section, spinal anesthesia, intrapartum antibiotic treatment, unknown Group B Streptococcus status were associated with early antibiotic treatment. Full-term pregnancy, no intrapartum anesthesia, no intrapartum antibiotics – with late antibiotic treatment.

Clinical condition deteriorated in the late treatment group, including one newborn with initially low risk score, but afterwards proven purulent meningitis.

Conclusion. Antibiotic use in newborns could be significantly reduced by more than 77%, leading to less need for laboratory monitoring and more accurate antibiotic targeting. Newborns with initial low sepsis risk score clinically deteriorated beyond 12 h of life. Continuous good clinical observation is crucial. More safety data is needed.

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3. ASSOCIATION BETWEEN SERUM LEVEL OF VITAMIN D AND DISEASE ACTIVITY IN JUVENILE IDIOPATHIC ARTHRITIS

Marta Laizāne[1], *Ieva Saulīte* [2], *Ingrīda Rumba-Rozenfelde* [1,2]

[1] *University of Latvia, Riga, Latvia*
[2] *Children's Clinical University Hospital, Riga, Latvia*

Background. Vitamin D deficiency is commonly seen in both adults and children. 13.0% of European individuals have serum 25(OH)D concentrations <30 ng/mL on average in the year [Cashman et al., 2016]. Although vitamin D is known to have an immunomodulatory effect [Myszka et al., 2014], it is still unclear whether deficiency is associated with higher disease activity. Some studies show no associations of serum 25(OH)D levels with musculoskeletal disease activity or functional status [Pakchotanon et al., 2013], while others suggest that vitamin D deficiency may be linked to disease severity in rheumatoid arthritis [Kostoglou-Athanassiou et al., 2012].

Purpose. The study was carried out in order to check the potential relationship between the serum concentration of vitamin D and disease activity in juvenile idiopathic arthritis.

Materials and methods During the study data of 31 patients with juvenile idiopathic arthritis, aged 1–18 years, were collected. Serum 25-hydroxyvitamin D, C-reactive protein, erythrocyte sedimentation rate, white blood cell count, rheumatoid factor, titers of antinuclear antibodies, anti-dsDNA antibodies, anti-TNF alpha antibodies and other parameters were gathered.

The relationship between the concentration of vitamin D and disease activity was analyzed based on C-reactive protein level, erythrocyte sedimentation rate, white blood cell count, rheumatoid factor and anti-dsDNA antibodies titers.

Results. Vitamin D level of analysed patients ranged from 8,17 to 52,71 ng/mL. 83,87% (n=26) were diagnosed with vitamin D deficiency (serum 25-hydroxyvitamin D (25[OH] D) below 30 ng/mL). Obtained data show weak negative correlation (r = - 0,312) between vitamin D level and serum C-reactive protein level. A strong positive relationship between vitamin D level and anti-dsDNA antibodies titer (r = 0,800) was found. There were found no significant relationships between vitamin D level and white blood cell count (r = - 0,02*0),* erythrocyte sedimentation rate (r = - 0,063) and rheumatoid factor (r = - 0,044).

Conclusions. The results of the study indicate that there is a weak reverse relation between the serum level of vitamin D and inflammation activity based on C-reactive protein, therefore we conclude that disease severity rises with a drop in the serum level of vitamin D. Further studies that include such information as the use of vitamin D supplements, eating habits and sun exposure are required in order make this study complete.

4. ASTHMA ASSESSMENT USING STEP UP AND STEP DOWN THERAPY AMONG PEDIATRIC PATIENTS

Ilze Dambe[1,2]*, Silvija Remberga*[1,2]*, Ingrīda Rumba Rozenfelde*[1,2]

[1] *University of Latvia, Riga, Latvia*
[2] *Children's Clinical University Hospital, Riga, Latvia*

Background. Worldwide, asthma is considered the most common chronic disease among children. The major aim of asthma treatment is to achieve and maintain asthma control. Suboptimal asthma control is associated with lower quality of life, more emergency care visits, increased health costs and airway inflammation causing remodeling. We evaluated treatment results using step up and step down therapy in paediatric patients.

Purpose. The aim of the study was to compare the efficiency between step up and step down therapy among paediatric patients.

Materials and methods. Patients with bronchial asthma were included in the study which was performed analyzing data about patients at Children Clinical University Hospital in Riga, who were coming for pulmonologist consultation during January 1, 2017 to December 20, 2017. The asthma therapy assessment was detected by using Asthma Control Test (ACT), spirometry and questionnaires about asthma manifestation age, medications and healthcare use. We evaluated the length of the used therapy until remission, causes of therapy change or prolongation.

Results. In evaluation were included 63 children (39 male and 24 female) divided in three groups. The average age of asthma manifestation was 4,4 years.

1st group included children using step up therapy (38, 60, 3%), average age in group 8,7 years, average length of the therapy 4,3 months. 26 % of the patients were hospitalized due to asthma exacerbation.

2nd group included children using step down therapy (19, 30, 1 %), average age in group 6,7 years, average length of the therapy 3,8 months. 5 % of the patients were hospitalized due to asthma exacerbation.

3rd group changing step up therapy to step down therapy (6, 9,5%), average age in group 10,6 years, average length of the therapy 3 month. 26 % of the patients were hospitalized in due to asthma exacerbation.

Conclusions. Step up therapy does not guarantee a stable asthma remission and respiratory infections are a high risk factor for the promotion of new asthma exacerbations.

5. FACTORS AFFECTING EARLY CHILDHOOD DEVELOPMENT AND HEALTH

Anna Voitkeviča[1], *Ilze Grope*[2]

[1] *RSU, Riga, Latvia*
[2] *BKUS, Riga, Latvia*

Background. Early child development and health must be a priority issue in policy and practice, because they may influence the entire future life of an individual. Recognizing factors that have an impact on this area may help to take steps in preventing infectious diseases and their complications, as well as to promote their development in the first year of life.

Purpose. Assessment of the factors having an impact on health and development in early childhood.

Materials and methods. The retrospective study was conducted in certified family doctor's practice examining all the records of children born from 2001 to 01.01.2017. in their first year of life (149 boys, 139 girls). In this study, the factors that may have an impact on toddlers' development (motoric, speech, weight gaining), susceptibility to infectious diseases (acute respiratory viral infection) and atopic dermatitis were grouped into 5 criteria: duration of breastfeeding period, gender, mother age, month of birth, having older siblings. Data was processed by Microsoft Excel and SPSS programs. Statistical analysis was performed using Spearman's correlation coefficient, epidemiological data analysis for incidence frequency detection.

Results. Processing of data revealed that frequency of ARVI in the first year of life has the strongest correlation with having older siblings ($r=0,33$; $p<0,01$). Atopic dermatitis has been more often diagnosed to children which have not ever been breastfed ($r=-0,19$; $p<0,05$) and the only child in the family ($r=-0,2$; $p<0,5$). There is a significant negative correlation between breastfeeding period duration and the weight gaining index in the age of 1 year ($r=-0,31$; $p<0,05$). The children who were born in summer have greater weight gaining index ($r=0,19$; $p<0,5$). The factors promoting motoric development are having older siblings ($r=0,3$; $p<0,5$) and the male gender ($r=0,19$; $p<0,05$). Speech development has a negative correlation with breastfeeding ($r=-0,28$; $p<0,05$), but the mother's age under 25 has a positive impact on it ($r=0,26$; $p<0,05$).

Conclusions. According to the study, having older siblings has a statistically significant positive correlation with frequency of ARVI during the first year of life. Statistically significant negative correlation has been revealed between breastfeeding and the weight gaining index in the age of 1 year. Other factors have too weak (<3) or statistically nonsignificant correlation with the studied parameters and need to be researched, involving a greater number of respondents.

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6. SLEEP HYGIENE AMONG LATVIAN ADOLESCENTS

Johanna Wojdyla[1], ***Marta Celmiņa***[1], *Anna Romanova*[1], *Egija Mičule*[1], *Ilva Daugule*[1]

[1] *University of Latvia, Riga, Latvia*

Background. Sleep hygiene is a set of practices and behaviours that promote good sleep. The changes in sleep patterns during adolescence can be explained by the shift of melatonin peak. Using the diagnostic criteria of "Inadequate sleep hygiene disorder", belonging to "Insomnia" group (ICSD-3), The Sleep Hygiene Index (SHI) was developed to evaluate behaviours affecting sleep.

Purpose. The objective of this study was to evaluate sleep hygiene practices among Latvian adolescents and to analyze factors influencing sleep hygiene in adolescence.

Materials and methods. A cross-sectional population based survey was performed in five schools in Latvia. Adolescents were asked to answer to the Sleep Hygiene Index questions. Its parameters were evaluated in relation to weight percentile, age, gender and self-assessment of sleep quality. Statistical analysis was performed using SPSS software with a significance threshold of $p < 0.05$. Independent sample t-test, ANOVA with *post hoc* test, Chi-Square test, Shapiro-Wilk test, Pearson Correlation coefficient and Spearman rho correlation were used to test the hypotheses.

Results. The final patient sample consisted of 178 adolescents of 12 to 19 years of age (m=15.62; SD±1.65 years), recruited from five schools in Latvia. Sixty four percent were females. Mean SHI score in the study population was 19.21 (SD ±6.1) with more respondents on the lower SHI range. In 23.73%, self-assessment of sleep quality was poor with higher prevalence in girls (29.4%) than boys (11.7%). Girls showed significantly worse sleep hygiene (m=19.8; SD± 6.13 vs. m=18.1; SD±6.04; p=0.004). Older adolescents (17–19 years of age) scored higher in SHI values compared to the respondents of 12–14 years of age (m=21.1; SD±7.3 vs. m=16.6; SD±4.8; p=0.001). Weight differences of SHI, however, were statistically significant only when correlating with weight percentile, but not when being grouped into overweight, normal weight and underweight adolescents. No statistical difference of SHI was observed between good and poor self-assessed sleep quality (p=0.687).

Conclusions. The findings highlight the conclusion that sleep hygiene among Latvian adolescents is relatively good and better in comparison with that of other countries' reported data. The majority of respondents have evaluated their sleep quality as good. Surprisingly, however, no significant difference of SHI was found between good and poor self-assessed sleep quality. Females had a worse sleep hygiene and worse self-assessed sleep quality than males. SHI scores were higher with age. These findings suggest that age-specific recommendations for sleep hygiene improvement should be developed.

7. PREVALANCE OF PATHOGENIC *ESCHERICHIA COLI* IN STOOLS FROM HEALTHY CHILDREN AND ASSOCIATION WITH DURATION OF BREASTFEEDING AND ALLERGIES

Egija Mičule[1], *Ilva Daugule*[1,2], *Aiva Brūmane*[1,2], *Marita Tīmane*[1], *Dmitrijs Perminovs*[1], *Silvija Remberga*[1,2], *Daiga Kārkliņa*[1,2], *Ingrīda Rumba-Rozenfelde*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Children's Clinical University Hospital "Gaiļezers", Riga, Latvia*

Background. Although enteropathogenic *Escherichia coli* (EPEC) are among the most important pathogens causing paediatric diarrhea worldwide, many studies have found EPEC in asymptomatic controls. It has been proposed that one of reasons that prevents enterocyte colonization by enteropathogens and protects from symptomatic EPEC infection is breastfeeding. Other factors that influence gut microbiome are: antimicrobial exposure and Caesarian birth. Some evidence relates *Escherichia coli* role in allergy development.

Purpose. The purpose of the study was to evaluate the presence of EPEC in stool samples of asymptomatic children and to determine a breastfeeding association with the presence of EPEC as well as analyze a possible impact of previous antibacterial treatment and delivery type to presence of EPEC and on the other hand EPEC impact to allergic diseases.

Materials and methods. Prospective study was performed at Children Clinical University hospital "Gaiļezers" and primary health care centres. Parents of children were asked to answer a questionnaire (family, allergies, childbirth, previous antibacterial therapy, breastfeeding) and to bring their child's faecal sample. Stool samples were analysed for the presence of EPEC by PCR method. Data were analysed using IBM SPSS Statistics 23.

Results. Altogether, 223 children were enrolled (53,4% girls; 46,6% boys, median of age 4,7 years (range 0,5 to 8,11 years)). In the total sample 15,7% were EPEC-positive. EPEC-positives had longer period of exclusive breastfeeding compared to negative ones (4,7 months *versus* 4,4 months, SD 2,5; p=0,03), there was no statistically significant evidence comparing total breastfeeding time to presence of EPEC. More often, the presence of allergies was marked in EPEC group compared to EPEC-negative group (34,3% versus 53,7%, p=0,05), whereas there was no significant difference between EPEC-positives and allergic reactions at least once in lifetime. There was no statistically significant association between prevalence of EPEC and delivery type, age, allergies in family, previous antibacterial therapy and number of family members.

Conclusions. Asymptomatic carrying of EPEC was observed in the represented population, and EPEC was more common among children who have had a longer period of exclusive breastfeeding. The prevalence of EPEC was more common in children without allergy, indicating the importance of hygiene hypothesis in the development of allergies.

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PATIENT SAFETY AND ORGANIZATIONAL RESEARCH

REVERSE INNOVATION AND THE WORLD PROBLEM OF PATIENT SAFETY: SHARING THE UK EXPERIENCE *(STATE-OF-ART)*

John Tingle[1]

[1] *Nottingham Law School, Nottingham Trent University, Nottingham, UK*

Background. Patient safety is a global problem. Every year an estimated one million patients die in hospitals across the world because of avoidable clinical mistakes. Potentially 150 avoidable patient deaths per week in England. In the United Kingdom, recent estimations show that, on average, one incident of patient harm is reported every 35 seconds (WHO).

A recent Johns Hopkins University study says medical error costs 250,000 lives in the United States every year – the biggest killer after cancer and heart disease.

According to WHO data, it is further estimated that 421 million hospitalizations take place in the world annually, and approximately 42.7 million adverse events occur in patients during those hospitalizations. Approximately two-thirds of all adverse events happen in low- and middle-income countries.

In many countries, health services, where they are available, are of poor quality, which compromises health outcomes and patient trust. Fifteen per cent of hospital expenditure in Europe can be attributed to treating safety accidents.

Purpose. Whatever part of the world we are in, we can all improve on patient safety. In some countries, fear of reporting errors impedes progress in developing a patient safety reflective learning culture. Globally, WHO state that in some instances patient safety efforts have been largely unsustained and uncoordinated showing limited systemic improvement. This paper critically analyses some of these initiatives.

Materials and methods. This paper also critically analyses the development of the patient safety agenda in the UK and identifies current policies and trends. The essential premise is that whilst the UK is a world leader in the development of patient safety policy, infrastructure and tools we have made mistakes. The mistakes will be discussed and there will be links drawn to the global patient safety movement. The NHS in England is developing new policies: the Safe Investigative Space, the Statutory Duty of Candour, the Healthcare Safety Investigation Branch (HSIB), Caps of claimant lawyers costs, Rapid Resolution Scheme for catastrophic birth injuries, Intelligent transparency.

Results. WHO call for clear policies, organizational leadership capacity, data to drive safety improvements, skilled health care professionals and effective involvement of patients in their care, are all needed to ensure sustainable and significant improvements in the safety of health care.

Conclusions. A comparative approach to the global patient safety problem can provide reflective new insights into common problems facing countries saving scare resources. It is important not to develop patient safety policies in country silos.

Acknowledgements. Nottingham Law School.

1. RELIGIOUS AND CULTURAL BELIEFS: THE POTENTIAL FOR PATIENT SAFETY TO BE COMPROMISED IN THE UNITED KINGDOM

Clayton Ó Néill[1]

[1] *Nottingham Law School, Nottingham Trent University, Nottingham, England, United Kingdom*

Background. A little attention has been given to the role of patients themselves in contributing to the safety of their healthcare provision. There has also been limited research into the relationship between patient safety and patients manifesting their religious or cultural beliefs.

Purpose. The focus of this paper is limited to the impact of religious or cultural beliefs on the safety of patients who make medical decisions based upon these beliefs. The paper supports current practice in English medical law where recognition is given to patients' religious and/or cultural beliefs, but advises that such recognition be confined to patients who have capacity and who have consented to specific medical treatment. However, caution is required when such harm emanating from religious/cultural belief is particularly injurious, such as in the case of female genital mutilation and, to a degree, ritual male circumcision. The paper also considers the refusal of blood transfusions by Jehovah's Witnesses in the context of patient safety and affirms the autonomy of capacitated patients in this regard.

Materials and methods. The paper considers, from a doctrinal and analytical perspective, the medical guidelines that deal with the manifestation of religious or cultural belief in healthcare decision-making. Additionally, the paper analyses the way in which English case law has attempted to resolve the issues by relying on legal precedent and human rights jurisprudence. Particular attention is given to a number of scenarios where patient safety is potentially compromised by this religious or cultural expression: ritual male circumcision, female genital mutilation, and refusal of blood transfusions by Jehovah's Witnesses.

Results. This paper calls for a move away from an understanding of patient safety that confines the discussion to the potential of healthcare professionals to bring about harm and to make errors towards a broader perspective that recognises the role of patients in the maintenance of their own safety.

Conclusions. Patient safety has to extend beyond the error and harm definitions. This broader perspective of patient safety would offer a more holistic view of the patient that recognises patient values and belief systems. This links in with the way in which English medical law puts the opinions/consent of the patient first and rejects medical paternalism.

Acknowledgements. Nottingham Law School.

2. ROLE OF THE TREATMENT RISK FUND IN PATIENT SAFETY CULTURE

Agnese Bankava[1], *Evija Palceja*[1,2]

[1] *University of Latvia, Riga, Latvia*
[2] *Children's Clinical University Hospital, Riga, Latvia*

Background. With the European Union directive on the application of patients' rights in cross-border healthcare (Directive), Latvia has entered into force a legally binding obligation to implement the elements of the Patient safety strategy. The Treatment Risk Fund (TRF) is a good basis for the development of patient safety culture.

Purpose. The objective of the current study was to evaluate whether the TRF legislation will enable the patient safety culture in Latvia. This paper critically analyses legal norms of Latvia to point out changes necessary for the development of TRF as significant element of patient safety culture and strategy both at the national and institutional level.

Materials and methods. Study analyses the legal framework for healthcare in Latvia: the Medical Treatment Law, the Law on the Rights of Patients, also provides analysis of legal liability of healthcare practitioner, the Latvian Administrative Violations Code with the paragraph of the Medical Treatment Act, the role and legal framework of TRF in that context.

Results. Several non-compliances with the Directive were found: it is difficult for patients to receive a compensation for harm in cases when no causal link is found between the harm and the action or failure to act by a medical practitioner during the medical treatment process; it is difficult for patients to receive a compensation in cases when other persons involved in the medical treatment process have caused the harm; not only are medical practitioners partially unprotected in the framework of their professional activity and may be called to administrative or criminal liability after an examination of a patient's compensation claim, but the TRF even increases that possibility; liability for the action or failure to act by medical practitioners employed at a medical treatment institution has been indirectly transferred to the medical treatment institution.

Conclusions. The TRF fails to promote the implementation of patient safety culture as the action or failure to act by medical practitioners must be proven in relation with the harm caused to the patient, and not the harm, which is a result of healthcare as a process, as provided for in the Directive. The TRF operational rules should be reassessed taking into account the fundamental principles of customer safety, including by reassessing who is the subject of insurance, considering that the medical treatment process involves not only medical practitioners but also pharmacists and medical treatment support persons.

Acknowledgements. University of Latvia.

3. 'MEDICATIONS WITHOUT HARM': EXPLORING MEDICATION EXPERTISE, KNOWLEDGE-BUILDING AND FAKERY

Morgan Shimwell[1]

[1] *Nottingham Law School, Nottingham Trent University, Nottingham, UK*

Background. In March 2017, the World Health Organization launched its Third Patient Safety Challenge: 'Medications Without Harm'. The WHO has identified that medication errors are largely caused by systemic failures in healthcare systems, which create endemic problems of poor quality service delivery, lead to or encourage practices that increase the risk of adverse events and create opportunities for confusion and mistakes. It has set an action-plan that aims to bring together clinicians, health policy-makers and patients to share best practices, develop guidance and to raise public awareness about safety of medications.

Purpose. The WHO has begun the process of identifying research questions and priorities to begin to contribute towards the achievement of its action plan. This presentation will consider the scope of the WHO Challenge and outline three significant issues that require further consideration to ensure that any actions taken are as effective as possible in tackling systemic medication errors.

Materials and methods. This paper critically analyses the WHO Patient Safety policy documents, along with relevant policy and legislation from the UK and Latvia. Additionally it draws from public health and sociological research into medicines and consumption practices.

Results. There are three key problematic assumptions and ambiguities in the Challenge. Firstly, there is a delicate line to be drawn between raising awareness of systemic levels of medication error as a starting point for improvement, and pushing patients into taking responsibility for their own medication management without having sufficient knowledge and expertise.

Further, there is a concern that any educational tools promoted by WHO will have to compete with other unreliable, unverifiable sources of information. As such, any work in furtherance of this Challenge must take account of the contexts, in which medicines and medicine information are consumed.

Finally, the WHO Challenge makes no substantive mention of the problem of falsified medicines. There is a significant overlap between medication safety and falsified medicines. Whilst safe medication practices can be improved to reduce errors in the delivery and administration of medications to patients, these are ultimately undermined if the medications safely delivered are inherently fraudulent.

Conclusions. The WHO Patient Safety Challenge must take account of a number of wider problems which will significantly impact upon its action programme and the effectiveness of any measures adopted. National health authorities would be wise to investigate these issues within their own countries before embarking upon improvements in medication practices.

Acknowledgements. Nottingham Law School.

4. MEDICAL ERROR REPORTING SYSTEM IMPLEMENTATION POSSIBILITIES IN TWO LATVIAN HOSPITALS

Līva Stupele[1]

[1] *Vidzeme University of Applied Sciences, Valmiera, Latvia*

Background. According to World Health Organization's data, on average every tenth patient experiences harm during the medical treatment. Medical errors vary in their severity and frequency, but they are present in all levels of health systems (Kalra, Kalra, & Baniak, 2013, p. 1161). Most errors are system errors, which can be prevented. Data shows that between 50% and 80% of the medical errors are systematically preventable (Amalberti, et al., 2011:392; Gurjar, et al., 2011:58). Medical error reporting system is a platform and tool, whereby medical personnel reports errors with an aim to gather the information on the events, cases, analyze and learn from them (Hession-Laband & Mantell, 2011, p. 151).

Purpose. The objective of the current study was to investigate the medical error reporting system implementation possibilities in two Latvian hospitals. Two questions have been raised: what are the factors affecting medical staff in medical error reporting and what is the preparedness of hospitals A and B to introduce systematic medical error reporting system?

Materials and methods. Research was carried out in two Latvian hospitals and data was gathered in 25 interviews with medical personnel, representatives of the hospital administration and system experts.

Results. In both hospitals, medical errors are perceived as isolated cases that have occurred through a fault of given individual's actions or lack of actions. Medical errors are not related with weaknesses in the system and processes within the organization. Organization's internal culture and historical experience with medical errors analysis, as well as the perception and understanding of reporting system's objectives and the benefits determine medical staff's ability to report their mistakes. Hospital managers and administration's representative's initiative and attitude towards the need of the medical error reporting system is crucial in the implementation process.

Conclusions. Before creating local error reporting systems in the hospitals, there should be a definition, what is considered an error, and a clear distinction must be drawn between error, negligence and intentional harm. Legislative changes must be made before asking medical personnel to report errors. There should be a greater awareness and more extensive education about patient safety to set the mindset that errors are system-based, and not caused by individuals. One of the unused resources is the professional associations, which could be more involved in the educational process, setting the patient safety topic as an obligatory theme for continuing education, arising from their role of re-certification.

Acknowledgements. Vidzeme University of Applied Sciences.

5. PARTICIPATION OF PATIENT'S FAMILY MEMBER(S) IN HOSPITAL CARE AS PATIENT'S RIGHT AND PATIENT SAFETY ISSUE

Solvita Olsena[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. Hospitals in Latvia are restricting presence of patient's family members in hospital care settings. At two main hospitals in Latvia, a family member or other person designated by a patient, is not allowed to be present at the ICU and emergency departments.

Purpose. The objective of this paper is to examine, whether restrictions to presence of a family member are in line with patients' rights law and how they could influence patient's safety in hospital.

Materials and methods. The legal regulations regarding patients' rights in hospital have been analysed. The literature on patient centred care, and role of family participation during treatment of patients in serious conditions has been studied.

Results. The Patients' Rights law, Art. 5 (7) provides: "The patient may agree to the presence of other persons during medical treatment or to invite other persons, if it does not hinder the medical treatment". This means, that the patient has the right to decide, whether his/her family, or some other person/s should be present during medical care. The law provides an exception to limit this right in cases, when presence of family members may hinder the medical treatment. Such exception should be applied on a case to case basis, objectively proving necessity of the restriction. As observed in practice, administrations of hospitals and medical practitioners in general consider that presence of any family member would hinder the medical treatment. An opposite approach is taken by hospitals in other countries. The Johns Hopkins Hospital in Baltimore, USA and The Armstrong Institute for Patient Safety and Quality developed models of family involvement in ICU and proved that such approach leads to better outcomes in respect to efficiency of the nurses, patient centred care, quality and safety.

Conclusions. The approach limit patient's right to have a family member in ICU, emergency rooms and other hospital settings is violating patient's rights. Such practices do not respect dignity of a patient and therefore may lead to a humiliating treatment. Such approach is also contrary to the patient-centred care model and involves additional patient safety risks. Therefore, it is suggested to reconsider hospital policies and ensure that a family member can be involved in the care of patients in hospitals as much as possible.

Acknowledgements. University of Latvia.

6. ROLE OF REGULATORY FRAMEWORK IN REPORTING AND LEARNING

Evija Palceja[1,2], *Agnese Bankava*[1]

[1] *University of Latvia, Riga, Latvia*
[2] *Children's Clinical University Hospital, Riga, Latvia*

Background. With the European Union Directive on the application of patients' rights in cross-border healthcare (Directive), also joining the OECD, a legally binding obligation to implement the elements of the Patient safety strategy has been entered into force in Latvia. As of October 2017, amendments have been made to Latvian regulatory enactments, which have made obligatory the introduction of reporting-learning systems in medical institutions, which should become one of the key elements of risk management. However, reporting and learning culture depends on the regulatory framework.

Purpose. The objective of the current study was to evaluate whether the legislation would enable the patient safety and reporting and learning system in Latvia. This paper analyses legal norms of Latvia to point out changes necessary for the development of patient safety culture and implementation of patient safety strategy both at the national and institutional level.

Materials and methods. This study analyses the regulatory framework for patient safety culture in Latvia, which is necessary to implement reporting and learning system to get acquainted with the opinions on patient safety held by the Directive, WHO, EU, OECD as well as those of various other industry representatives, and to draw conclusions about patient safety in Latvia and the amendments, which are necessary to the Latvian regulatory framework.

Results. Several important non-compliances were found with the patient safety recommendations in the EU and Directive: medical practitioners may be called to administrative or criminal liability after an examination of information on incident received through reporting system. There is no protection of information received through reporting in Latvia. Law on the Rights of Patients stipulates that in general it is the attending physician who is responsible for the quality and results of the entire treatment of a patient, which leads to the blaming of the individual instead of investigation of patient safety incident root causes.

Conclusions. In Latvia, the issue as to who is responsible for the quality of medical treatment has not yet been clarified. Latvia needs to introduce a provision in its legislative acts, which would provide for the protection of the whistle-blower from being held liable and the protection of the information concerning any medical practitioner, as well as to determine that the information obtained as a result of the reporting process can be used only in the framework of the reporting and learning system.

Acknowledgements. University of Latvia.

7. ETHICAL ASPECTS OF REGISTRY-BASED MEDICAL RESEARCH IN LATVIA

Signe Mežinska[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. National population-based registries (e.g., births and deaths, causes of death, registries related to infectious diseases control, prescriptions) are a valuable source of data for public health, epidemiological and other types of medical research. Internationally, population-based registry data is extensively used to research important areas, in which other study designs may encounter ethical difficulties or be difficult to use in other aspects. At the same time, an important prerequisite for the use of this data for medical research is that personal data protection requirements and ethical principles are followed. In Latvia, there is a lack of experience in merging data for research purposes from population-based registries held by different institutions, as well as lack of ethical guidelines and legal regulations for using this data in medical research.

Purpose. The objective of the current study was to analyse 'smart practice' examples for ethical governance of registry-based research in European countries to justify policy proposals for Latvia.

Materials and methods. This study applies the 'smart practices analysis' methodology originally developed by Eugene Bardach (1998).

Results. The analysis shows that there is a number of risks, which must be eliminated by ethical governance of registry-based research, e.g. risk of identification of study participants, loss of control, upon which project data are used, a breach of confidentiality, loss of public trust to medical research. Consequently, the governance policy must aim at safeguarding integrity and protecting research subjects. The 'smart practices analysis' showed that Nordic countries have introduced a number of successful policies for ethical governance of research using data from population-based registries. The presentation will include in-depth analysis of these 'smart practice' examples.

Conclusions. There is a growing researchers' interest in using and combining national population-based registries in Latvia; however, the existing policy and legal regulations for collecting and combining data lack ethical guidelines and limits use of these resources. The best practice examples from Nordic countries should be applied to enable research using population-based registries in Latvia.

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SURGERY, ANESTHESIOLOGY AND INTENSIVE CARE

1. MANAGEMENT OF PANCREATIC CANCER IN A SPECIALIZED HEPATO-PANCREATO-BILIARY CENTER, SHORT AND LONG TERM OUTCOMES

Anna Udre[1], *Haralds Plaudis*[2,3], *Antons Rudzats*[2], *Evita Saukane*[2], *Elina Liepina*[2,4]

[1] *University of Latvia, Riga, Latvia*
[2] *Riga East Clinical University Hospital, Riga, Latvia*
[3] *Rīga Stradiņš University, Riga, Latvia*
[4] *Latvian Centre of Disease Prevention and Control, Riga, Latvia*

Background. Surgery is the only potentially curative treatment for patients with pancreatic cancer. However, less than 20% of patients can potentially undergo curative surgery. Analysis of complications and short and long-term outcomes can provide a better understanding of this devastating disease and change treatment strategy.

Purpose. The aim of this study is to share our experience of surgical management of patients with pancreatic cancer at the Department of Surgery between years 2014 and 2017, and analysis of long-term results.

Materials and methods. Only the patients to whom operation was performed with curative intent were included in study. Management of patients was provided according to National Comprehensive Cancer Network guidelines. Surgical procedure, the overall ICU and hospital stay, morbidity rate, short and long-term outcomes were analysed.

Results. Overall, 49 patients underwent resection with curative intent. Of these, 33 had pylorus-preserving pancreaticoduodenectomy, 1 – spleen preserving distal pancreatectomy, 11 – distal pancreatectomies without spleen preservation, and 2 – central pancreatectomy. 9 (18.4%) patients had borderline resectable tumours and venous vascular resection was performed. The mean operation time and intraoperative blood loss was 191.3±53.5 min and 469.6±283.4 mL. The mean tumour size was 3.46±3.09 cm and 40.8% (n=20) patients were classified as having T3 and T4 tumours. However, R0 resection rate was achieved in 83.6% (n=41). The mean number of harvested lymph nodes were 7.02±5.91(range between 1–22) and lymph nodes were found to be positive for tumour metastasis only in 28.6% (n=14) patients. Morphological examination revealed ductal adenocarcinoma in 42 (85.7%) patients and 4 (8.2%) patients had neuroendocrine tumours, 3 (6.1%) patients had other type of tumour. The overall complication rate was 30.6% (n=15) and most common complications were delayed gastric emptying, intra-abdominal abscess, pleural effusion. The overall ICU stay was 3.84±2.15 days and hospital stay reached 17.06±8.54 days respectively. Mortality rate was 2.04% (n=1). Analysis of cancer related mortality revealed that one year survival reached 38.46% (n=15), two-year survival 12.82% (n=5) and three-year survival 2.56% (n=1). The highest mortality was observed in patients having pancreatic adenocarcinoma. From all observed patients 53.84% (n=21) died due to the cancer during three year period. Nine patients were lost for long-term follow-up.

Conclusions. Pancreatic adenocarcinoma is the most frequent type of pancreatic tumour with the highest mortality rate during the first 12 months after surgical intervention. To achieve better outcomes' management and follow-up of patients should be provided in specialised centres.

2. RISK FACTORS AND PREVENTION OF ANASTOMOTIC LEAKAGE AFTER RECTAL RESECTIONS IN CANCER PATIENTS

Sabina Dranova[1], *Sergejs Januškevičs*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Oncology Centre of Latvia at Riga East University Hospital, Riga, Latvia*

Background. Disputes still exist about the impact of patient and tumour characteristics on anastomotic leakage (AL) after total mesorectal excision (TME) for rectal cancer.

Purpose. The objective of the retrospective study was to define risk factors for AL and to report clinical consequences of leakage in a large cohort of patients who underwent rectal resection by experienced surgeon(s) using standardized technique at a single institution.

Materials and methods. Between January 2010 and December 2014, the total of 249 patients underwent radically curative elective TME with a following construction of anastomosis. Patient and neoplasia characteristics, details of surgery, fashion of the anastomosis, and postoperative results were recorded. Univariate and multivariate analysis were applied to identify risk factors for anastomotic leak.

Results. In our operated patients, the anastomotic leakage rate was 7.2% (18 of 249 patients), and mortality due to the sepsis was 11.1% (2 of 18 patients). In univariate analysis, tumor size and absence of a preventive stoma were associated with increased anastomotic leak rates, whereas American Society of Anesthesiologists (ASA) score and tumor localization above the anal verge showed borderline clinical significance. In multivariate analysis, tumor diameter, tumor localization, and absence of a protective stoma were significantly associated with anastomotic leaks.

Conclusions. Patients with bulky and low rectal cancers are at high risk for AL. A preventive stoma and endoanal tube significantly decrease the rate of clinical leaks and subsequent reoperation after TME.

3. LATE RESULTS OF COLON CANCER RESECTIONS IN OBESE PATIENTS

Mantas Jodinskas[1], *Donatas Danys*[2], *Eligijus Poškus*[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

Background. Medical literature shows that laparoscopic surgery has been proven to have significant benefits for patients who are eligible for this technique. These benefits include decreased post-operative pain, decreased length of hospital stay, shorter recovery time and improved cosmetic outcome, although late results are unclear and there is a long-lasting controversy, whether higher BMI is associated with worse perioperative outcomes of laparoscopic colon surgery.

Purpose. The aim of this study was to compare results between laparoscopic and laparotomy methods treating colon cancer in obese patients after 1-year follow up in Vilnius University Hospital Santaros Klinikos.

Materials and methods. Retrospective analysis of 107 patients who underwent elective laparoscopic surgery was made. Patients with BMI ≥ 30 kg/m^2 were divided into two groups: group A – 35 patients (32.7 %) underwent laparoscopic surgery and group B – 72 patients (67.3 %) underwent laparotomy surgery. Main measures included preoperative, intraoperative and postoperative outcomes. Statistical analysis was performed using MS Excel and SPSS programs.

Results. The group B had significantly higher surgical site infection rate, shorter operative time and longer average hospital stay ($p = 0.03$). BMI has decreased in 11 (40.8%) patients of group A and in 31 (52.5%) patients of group B. Complications' rate 1-year after primary surgery was higher in group B – 20 (27.7 %) patients versus group A – 4 (11.4 %) patients. Incisional hernias were more common in the laparotomy surgery group compared to the laparoscopic surgery group. Patients were satisfied with the operation 92.6 % and 47.6 % in group A and B, respectively.

Conclusions. This study showed that laparoscopically treated obese patients tended to have a better prognosis and perioperative outcome compared to the laparotomy group after 1-year follow up. Nevertheless, obese patients remain a significant challenge for colorectal surgeons, as higher BMI is associated with worse perioperative outcome. More research is needed to properly evaluate late results of different types of treatment in this area of surgery.

4. MONITORING OF HYPERCOAGULABILITY BY THROMBOELASTOGRAPHY IN BARIATRIC SURGERY

Kristina Kupcinskiene[1], *Darius Trepenaitis*[1], *Ruta Petereit*[2], *Juozas Kupcinskas*[2], *Rita Gudaityte*[3], *Almantas Maleckas*[3], *Andrius Macas*[1]

[1] *Department of Anesthesiology, Lithuanian University of Health Sciences, Kaunas, Lithuania*
[2] *Department of Gastroenterology, Lithuanian University of Health Sciences, Kaunas, Lithuania*
[3] *Department of Surgery, Lithuanian University of Health Sciences, Kaunas, Lithuania*

Background. Obesity is known as a major risk factor for postoperative vein thrombosis. Thromboelastography (TEG) is used to monitor viscoelastic features of blood clots.

Purpose. The aim of this study was to determine hypercoagulable states in patients undergoing bariatric surgery and to assess dynamics of coagulation parameters in the perioperative setting using TEG.

Material and methods. We included 60 consecutive patients undergoing bariatric surgery. TEG alterations were assessed at 4 time points: at baseline, after the surgery, and on postoperative day 1 (POD1) and 2 (POD2). Hypercoagulable state was defined when patients showed clot strength (G) of ≥11 dynes/cm² or maximum amplitude (MA) ≥68 mm.

Results. Fourteen patients (23.3%) out of 60 showed hypercoagulability prior to surgery on TEG. Fibrinogen levels were significantly higher in the G ≥11 group compared to the G <11 group, at 4.2 and 3.8 g/l, respectively (p=0.02). Seventeen patients (28.3%) had MA ≥68 mm at baseline. Fibrinogen levels increased significantly from 3.90 at baseline to 4.16 g/l in POD2 (p<0.001). There was an increase in mean reaction time from baseline (6.74 s) to POD2 (7.43 s, p=0.022). We found a correlation between baseline fibrinogen levels and MA (R=0.431, p=0.001) or G (R=0.387, p=0.003). ROC curve analysis showed that fibrinogen levels can predict clot strength (G) ≥11 dynes/cm² with AUC=0.680 (p=0.044).

Conclusions. A considerable proportion of patients referred to bariatric surgery show a trend towards hypercoagulability on TEG. This study shows the potential of hypercoagulation monitoring by TEG in the perioperative setting of bariatric surgery.

5. EFFICIENCY OF THE NEW METHOD OF INTRAABDOMINAL TRANSVERSUS ABDOMINIS PLANE (INTAP) BLOCK IN LAPAROSCOPIC INGUINAL HERNIA REPAIR

Artūrs Triščenkovs[1], *Igors Ivanovs*[1,2], *Maija Rikmane*[1], *Sarmīte Boka*[1,2], *Viktors Folkmanis*[1,2], *Biruta Mamaja*[1], *Guntars Pupelis*[1,2]

[1] *Riga East University Hospital, Riga, Latvia*
[2] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. Pain after laparoscopic inguinal hernia repair is the main problem interfering with patient comfort and return to normal activity. Ultrasound-guided (USG) transversus abdominis plane (TAP) block is a well known method for analgesia in early postoperative period, but this method is technically challenging and time consuming.

Purpose. In our study, we describe a new method of INTAP block and evaluate its efficiency for laparoscopic inguinal hernia repair.

Materials and methods. INTAP block is the method of transversus abdominis plane block under visual control during laparoscopy by transabdominal needle. The needle is inserted through one 5 mm trocar and injection is done 2 cm below *spina iliaca anterior superior*. The method is easy to implement, there is no need for specific skills and it takes about 1 minute to perform. In total, 60 patients undergoing elective laparoscopic transabdominal preperitoneal inguinal hernia repair were randomised in two groups: TEST group 30 patients INTAP block with 20ml of 0,25% Bupivacaine and PLACEBO group 30 patients INTAP block with saline. In postoperative period pain and discomfort was assessed using 0–10 visual analogue scale (VAS) at 4, 24 hours and analgesics consumption.

Results. There was no significant difference in age, gender, BMI, hernia size in both groups. In TEST group, pain at 4 hours after operation was significantly lower – median 1 (IQR 0-2,5) than in PLACEBO group 6 (IQR 4-6), p<0,001. Discomfort level was significantly lower in TEST group 2 (IQR 0-6) than in PLACEBO group 6 (IQR 4-10) p<0,001. There was less need for postoperative analgesics in TEST group – 1 injection in comparison with PLACEBO group – 3 injections, p<0,001 and no needs for opioid injections in TEST group-0 in comparison with PLACEBO group – 1, p=0,032.

Conclusions. The new INTAP block is an effective method to reduce pain, discomfort and needs for analgesics after laparoscopic inguinal hernia surgery.

6. FFRCT ROLE IN PREOPERATIVE EVALUATION OF PATIENT WITH PERIPHERAL ARTERY DISEASE UNDERGOING ELECTIVE SURGERY

Kristiāna Ulme[1], *Edgars Zellāns*[1,2], *Dainis Krieviņš*[1,2], *Gustavs Latkovskis*[1,2,3], *Indulis Kumsārs*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*
[3] *Institute of Cardiology and Regenerative Medicine, University of Latvia, Riga, Latvia*

Background. Patients with peripheral artery disease (PAD) tend to have low activity level and therefore have no clinical coronary artery disease (CAD) symptoms. CAD diagnosis is delayed and usually made only after clinical manifestation. Patients with PAD are at greater risk of perioperative cardiovascular complications, mortality. HeartFlow FFRct (fractional flow reserve computed tomography) is a non-invasive method that uses standard CT (computed tomography) data to create personalized 3D model of the coronary arteries. This method greatly reduces unnecessary invasive patient testing.

Purpose. To detect significant changes in coronary arteries affecting blood flow in PAD patients prior to elective surgery using non-invasive FFRct analysis and to treat them early.

Materials and methods. In a prospective study that took place in Pauls Stradiņš Clinical University Hospital, Riga, Latvia 55 patients with PAD were included. Patients were undergoing elective vascular surgery and never had any CAD symptoms, myocardial infarction. All patients received a coronary CT scan and the acquired data were used by HeartFlow FFRct to evaluate patients' coronary arteries anatomy and function. Age, gender, active smoking, ankle – brachial index, vital signs, used medicines were recorded.

Results. Study included 55 individuals (mean age 66±9 years), 46 (84%) men and 9 (16%) women, 44 (80%) patients had hypertension, 9 (16) had diabetes but 18 (33%) patients were active smokers. Using HeartFlow FFRct 39 (71%) patients have significant narrowing of coronary arteries, out of which 31 (56%) coronarography has been or will be done. Out of 17 patients, for whom coronarography has been done, in 59% PCI was performed, 23% were candidates for coronary bypass, while 18% received optimal drug therapy and a thorough observation by cardiologist. Comparing CAD patient group with non-CAD group, significantly differed blood pressure levels (152±17 vs. 138±16 p=0,008) and ankle – brachial index (0,5±0,1 vs. 0,55±0,1 p=0,048). Patients' weight made no significant difference (p=0,721).

Conclusions. The majority of PAD patients even without CAD symptoms have significant stenosis in coronary arteries. HeartFlow FFRct is an effective method to detect CAD in PAD patients prior to surgery to evaluate cardiovascular risk and to start early treatment decreasing perioperative complications.

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7. RESULTS OF POPLITEAL ARTERY STENT PATENCY RATES IN ASSOCIATION WITH PREOPERATIVE AND POSTOPERATIVE TIBIAL RUN-OFF SCORE

Aina Kratovska[1,2], *Andrejs Bernšteins*[1], *Sanita Ponomarjova*[1,3], *Patrīcija Ivanova*[1,2,4]

[1] *Department of Interventional and Diagnostic Radiology, Riga East University Hospital, Riga, Latvia;*
[2] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[3] *Faculty of Medicine, Riga Stradiņš University, Riga, Latvia*
[4] *Department of Vascular Surgery, Riga East University Hospital, Riga, Latvia*

Background. Popliteal artery in patients with peripheral arterial disease (PAD) is one of the most contradictive anatomic locations regarding treatment modality choice and patency rates. Historically, popliteal artery was considered as no-stenting area. Due to developing endovascular techniques, patients with severe comorbidities and poor distal run-off are now frequently consigned to endovascular recanalization of popliteal artery frequently associated with stenting.

Purpose. The aim of this study was to assess short-term patency results of popliteal artery stenting and association with pre-/postoperative tibial run-off score.

Materials and methods. In this single center, retrospective case–series study all patients with popliteal artery stenting in 2015–2016, popliteal artery lesion length >7 cm and involvement of P1–P2 segment were selected. The following descriptive parameters analyzed: a) gender b) age; c) TASC II type of femoropopliteal lesion dedicated to treatment; c) Rutherford category of PAD; d) American Society of Anesthesiologists (ASA) score. Preoperative and postoperative tibial run-off score (0–15 points) was calculated according to scoring system invented by authors and presented previously. 6-month patency rates were estimated by digital subtraction angiography or duplex-ultrasound. Univariate and multivariate regression analysis was performed, $P< 0.05$ was considered statistically significant. SPSS 22 program was used for statistical analysis.

Results. 35 patients were initially selected for the study: 60% (n=21) were female, 40% (n=14) – male. Mean patient age 74.03 (55–94) years. 22.9% of patients (n=8) had femoropopliteal lesion TASCII type B, 42.9% (n=15) – type C, 34.3% (n-12) – type D. 37% (n=13) of patients had Rutherford category 4 of PAD, 31.4% (n=11) – category 5, 31.4% (n=11) – category 6. ASA score II and III was diagnosed in 63% (n=22) and 37% (n=13) respectively. Mean preoperative vs. postoperative tibial run-off score was 5.7 (0.5-15.0) vs. 7.71 (1.5–15.00) points ($p<0.001$). In 6 months, 7 patients were lost to follow-up, in 67% (n=27) of cases popliteal stent was patent, treatment failure was diagnosed in 33% (n=9) of cases. The mean time to repeated hospitalization in patients with treatment failure was 77.3 (5–178) days. Univariate and multiple logistics regression analysis did not show statistically significant association between age, gender, pre-/postoperative tibial run-off score or popliteal stent length with target lesion treatment failure rate.

Conclusions. Long segment popliteal artery stenting in 6-month follow-up show acceptable patency rates. Pre- and postoperative tibial run-off is weak in patients with long popliteal artery lesions, but no statistically significant association with popliteal stent failure was found in short-term results.

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8. CALORIC INTAKE EVALUATION IN BURN PATIENTS

Māra Melnalksne[1], *Arnolds Jezupovs* [1, 2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Riga East University Hospital Medical Centre "Biķernieki", Riga, Latvia*

Background. Critically ill burned patients are characterized by a strong oxidative stress, an intense inflammatory response, and a prolonged hypermetabolic response, all of which are proportional to the severity of injury. Nutrition therapy constitutes an integral part of the treatment from the early start of the initial resuscitation.

Purpose. The purpose of the study was to calculate the caloric needs of burn patients and to evaluate the actual caloric intake and the relationships between caloric intake and skin fold measurements, serum total protein levels and death rate in burn patients hospitalised in Riga East University Hospitals Medical centre "Biķernieki" National Burn Centre's intensive care unit (ICU).

Materials and methods. All patients with burns hospitalised between September 1, 2017 – December 28, 2017 were enrolled in the study. The study was approved by a local ethical committee. Gender, age, extent of the burns, stay length in ICU, caloric intake, total serum protein levels, upper arm circumference measurements and skinfold thickness measurements were analysed by SPSS 21. software. The caloric requirements for patients were calculated using Harris-Benedict and Schofield equations.

Results. Altogether 21 critically ill patients with up to 40 % TBSA were enrolled in the study. The mean length of stay in the ICU was 16 (± 9) days, the mean of the caloric requirements calculated by Harris-Benedict equation were 2947(±589) kcal a day and by Schofield equation 2191(±447) kcal a day, the mean of the actual caloric intake in a day was 1718(±252) kcal, 5 patients received less than 1500 kcal daily. A significant correlation was found between caloric intake of less than 1500 kcal a day and death rate ($p<0.0019$). Another significant correlation was found between serum total protein levels under 50 g/L at day 7 and death rate ($p<0.0049$). Furthermore, obtained results showed another correlation between decreased thickness of skinfold measurements and caloric intake of less than 1500 kcal a day ($p<0.0129$) and a significant correlation between caloric intake of less than 1500 kcal a day and decreased upper arm circumference measurements ($p<0.0008$).

Conclusions. A difference between caloric requirements calculated by formulas and the actual intake was found. Inadequate caloric intake in patients with burns results in lower total serum protein levels, decreased thickness of skinfold and upper arm circumference measurements and higher overall death rates. Measuring skinfold thickness and upper arm circumference could be a great method of accessing the nutritional status of burn patients when weights are not available

9. RISK FACTORS AND MANIFESTATIONS IN DIABETIC FOOT ULCERS

Daina Kalniņa[1], *Svjatoslavs Kistkins*[1], *Sintija Sauša*[1,2], *Arnolds Jezupovs*[1,3]

[1] *University of Latvia, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*
[3] *Riga East University Hospital, Riga, Latvia*

Background. Diabetic foot ulcers occur as a result of various risk factors and can lead to lower limb amputation. Proper diabetes management and avoidance of risk factors can help prevent foot ulcers and reduce the number of amputations.

Purpose. To estimate hospitalized diabetic patients with lower limb amputation risk factors and compare with the rest of the patient group with amputations.

Materials and methods. We were analyzed data from three hospitals. A retrospective cohort study was used. We assessed diabetes patients who had undergone lower limb amputation in 2016. Amputation risk factors were assessed for diabetic and non-diabetic groups paying particular attention to fasting blood glucose (FBG), cardiovascular abnormalities, chronic kidney disease, sex, age, presence of infections, bacterial spectrum. To compare categorical risk factors, Chi-squire test and Fisher exact probability test were used. T-test was used for age and FBG. P value below 0.05 was considered statistically significant. VITEK 2 automated systems were used for bacterial identification, and for analysis – STATA 13.0 version software.

Results. In age group up to 65 years, men (80.9%) had foot amputations more frequently than women (19.1% of the total; 95% CI, p <0.001), while the age group of 65 years showed no statistically significant difference. A higher frequency of distal foot amputations (60.4%) and transtibial (65.4%) were found in case of diabetic patients, compared to the control group (39.6% and 33.62%). Statistically significantly more amputations were observed in patients older than 65 years (70.1%, p = 0.001). More amputations (61%) with diabetic ulcers were carried out in the warmer months of the year (p = 0.03).

Diabetic patients with amputations incidence of diabetic nephropathy – CKD III 93.3%, IV CKD 80% (p = 0.003), severe chronic heart failure functional class III 63.6% (p = 12:04), and myocardial infarction 64.4% (p = 0.007).

In diabetic foot isolates *S. aureus* (35%) and the *Proteus spp.* (18%) were found. Four MRSA (12%) were found in 33 *S. aureus* isolates. In *Proteus* group, three ESBL producing bacteria were found, one resistant to ceftazidime, two to cefotaxime.

Conclusions. Diabetic patient often have amputation according to distal occlusions in leg arteries or infected diabetic foot ulcers and secondary osteomyelitis. The most common causes of diabetic foot were *S. aureus*.

10. OPTICAL 3D SCANNING IN ASSESSMENT OF SOFT TISSUE DEFECTS

Jānis Fridrihsons[1,2]*, Arnolds Jezupovs*[1,2]

[1] *Department of Surgery, Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Clinic of Surgical Infection, Riga Eastern University Hospital, Riga, Latvia*

Background. Since the advent of digital camera technology, digital imaging has established a firm place in documentation and monitoring of healing of soft tissue diseases. Digital photographic assessment of soft tissue defects has been shown to be valid and repeatable [1].

However, the conventional digital photography has several limitations in these applications. Photographic assessment does not directly describe volumetric tissue defect, rather, it is a surface projection.

Photographic planimetric accuracy can be achieved only in defects that are near planar, which is rarely the case in sufficiently large defects, especially limbs.

Laser based 3D scanner has been studied in wound volumetric assessment in recent study [2].

Purpose. Here we investigate capabilities of using a consumer grade 3D scanner in assessment of soft tissue defects.

Materials and methods. Intel RealSense™ F200 based optical 3D sensor bundled with Sense™ For Intel® RealSense™ software platform was used to obtain 3D scans. Soft tissue defect model was used to obtain stable specimen for repeatability assessment. Tissue model was scanned and digitally analysed. Direct measurement of volume was obtained by immersion technique. In 8 clinical cases, consecutive scans throughout treatment were obtained for patients receiving negative pressure wound therapy. Obtained 3D digital models were analysed in 3D Studio MAX™ and Matlab™ software environments.

Results. In soft tissue model, wound bed depression measurement is accurate within 1,5 mm. Wound volume measurement accuracy is related to wound area and area/depth ratio. Wound area measurement accuracy is 2 cm^2 for model wound of 150 cm^2.

Conclusions. 3D scanning of soft tissue defects may be a valuable evolution of present wound healing monitoring techniques. Wound analysis by 3D scans is more labour intensive than photographic analysis, which can be changed by development of automated edge detection algorithm. In clinical cases, wound volume decrease precedes wound area decrease.

Acknowledgements. No funding was received for presented study. Equipment used in this study was provided by authors.

POSTER PRESENTATIONS

BASIC MEDICAL SCIENCE

1. ENTEROCYTE IRON TRANSPORT AND HOMEOSTASIS: ROLE OF INTRACELLULAR COMPARTMENTS

Jurijs Markovs[1], *Gundega Knipse*[1], *Dzanna Krumina*[1], ***Agate Galuza***[1]

[1] *Department of Anatomy and Histology, Faculty of Medicine, University of Latvia, O. Vācieša iela 4, Riga, Latvia*

Background. Iron metabolism involves iron trafficking along specific cellular compartments, including endosomes and lysosomes. It is well known that the endosomal-localized DMT1 is responsible for mobilizing iron out of endosomes. It was recently shown that members of the transient receptor potential (TRP) superfamily could function as intracellular cation release channels whose localization is commonly assigned to late endosomes and lysosomes.

Purpose. The aim of this study was to evaluate the relationship between focal iron deposition and endolysosomal markers in the intestinal mucosa.

Materials and methods. Because the subcellular localization of low-molecular iron after its uptake into enterocytes is difficult to pursue, the absorption of dietary non-heme iron by intestinal enterocytes of chickens has been investigated using a range of morphological techniques. Duodenal sections from one-to-thirty-day-old Lohman Brown cockerels were stained with Perls' Prussian blue stain for iron detection. Late endosomes and lysosomes in the enterocytes were highlighted by immunohistochemistry using an anti-CD68 and anti-TRPV1 antibodies. Fifteen birds of the first group were fed basal diet of wheat-barely, fifteen chickens of the second group received the same basal diet supplemented with inorganic iron (1000 mg Fe/kg) for 30 days.

Results. There was no stainable iron in the small intestinal enterocytes and in the *lamina propria* of control group. Conversely, with iron feeding, iron deposits appeared as a narrow string of *punctae* in the subapical area all along the brush border. Some iron deposits in the presumptive macrophages of the *lamina propria* were visible. TRPV1 immunoreactivity was localized in the subapical compartment of the villous enterocytes, having a *punctuate* appearance. The pattern of CD68 immunoreactivity was quite similar to selective cytoplasmic expression of TRPV1. Both CD68 and TRPV1-positive material and iron deposits within enterocytes were consistently localized at the same area in the vicinity of the brush border.

Conclusions. Our animal model of iron overload has demonstrated the accumulation of selective iron subapical deposits co-localized with endolysosomal markers The data seems to support the theory that at least a half of the iron transported across the villous enterocytes uses a vesicular pathway, and that a significant portion of the vesicular pathway involves the endolysosomal system, which is located *en route* towards the basolateral membrane. These results also indicate that TRPV1 is localized to the late endosomes and lysosomes, where TRPV1 may function to transfer the endosomal free Fe (2+) into the cytoplasm in the transferrin cycle in parallel to DMT1.

2. IN-PATIENT BENZODIAZEPINE DETOXIFICATION: PECULIARITIES OF CONSUMPTION AND DEMOGRAPHY

Gabija Valauskaite[1], *Deima Eitmontaite*[1], *Robertas Badaras*[1,2]

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

Background. Benzodiazepines are very widely used prescription medicines. They may be prescribed safely for short-term treatment of anxiety, insomnia and are advised long-term for some forms of epilepsy and spasticity. Although, long-term use of these drugs can be harmful and cause dependence.

Purpose. To analyse patients treated for benzodiazepine dependence and to identify whether harmful habits might influence using larger doses of benzodiazepines.

Materials and methods. We retrospectively evaluated 42 patients, who were diagnosed with benzodiazepine dependence syndrome and had undergone benzodiazepine detoxification at Republican Vilnius University Hospital from 2012 to 2017. Patients admitted for benzodiazepine overdose and those who had been using benzodiazepines for less than 6 months were excluded from the study. Since patients had used different kinds of benzodiazepines, the doses were converted into diazepam equivalent (DE). was processed by MS Excel and SPSS 22.0 software.

Results. 42 patients (23 women and 19 men), ages ranging from 27 to 71 years, were studied. 30 patients had been referred to detoxification by doctors: 15 patients by a general practitioner (35,7%), 15 – by a psychiatrist. One patient by an ambulance (2,4%) and 11 (26,2%) had made the decision on their own. 22 patients (52,4%) simultaneously suffered from psychiatric disorders: 10 patients were suffering from recurrent depression disorder, 6 patients from alcohol dependence syndrome, 2 patients had bipolar disorder, 2 patients had a mixed anxiety disorder and 2 suffered from a severe depression episode. 12 patients (28,6%) had admitted to using alcohol. 6 patients (14,3%) admitted to smoking. Average duration of benzodiazepine consumption was 13,95 years, ranging from six months to 30 years. 45.24% of the patients took lorazepam, 40.48% clonazepam, alprazolam was consumed by 23,8%, diazepam by 14,29% and 7,14% of the patients took bromazepam. The average DE was 123,27mg (SD±218,968). To investigate, whether there is a statistically significant DE dosage difference between alcohol consuming and not consuming patients, T independent test was used. Statistically significant difference was not found ($t=-0.361$, $p>0.05$, $p=0.720$), and neither with smoking ($t=-0.211$, $p>0.05$, $p=0.834$).

Conclusions. Most of the patients had been referred to detoxification by a doctor. Almost a half of the patients had been using lorazepam. More than a half had been suffering from a simultaneous psychiatric disorder. Smoking and alcohol use did not have a statistically significant impact on DE dose. Nevertheless, further investigations should be done in the future with larger samples, and more changeable factors could be included.

3. BACKGROUND LEVEL OF DNA DAMAGE DETERMINED IN WHOLE BLOOD AND LYMPHOCYTES OF MULTIPLE SCLEROSIS PATIENTS

Vitālijs Borisovs[1-2], *Elīna Ļeonova*[1], *Jolanta Kalnina*[3], *Natalia Mjagkova*[3], *Nikolajs Sjakste*[1]

[1] *Medical Biochemistry Department, Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Faculty of Biology, University of Daugavpils, Daugavpils, Latvia*
[3] *Center of Marine Medicine, Riga, Latvia*

Background. Oxidative stress is considered to be one of the crucial factors in the pathogenesis of multifactorial multiple sclerosis (MS). DNA breaks could be one of consequences of the oxidative stress, however, data on DNA breakage in MS is very scarce and contradictory.

Purpose. The goal of this study was to determine the level single-stranded DNA breaks by means of alkaline single cell gel electrophoresis (comet assay) in whole blood or isolated lymphocytes.

Materials and methods. Groups of healthy subjects and MS patients were enrolled in the study. Lymphocytes were recovered from human blood of healthy patients and with multiple sclerosis. Alkaline single cell gel electrophoresis was performed on whole blood and lymphocyte samples. Results were analysed statistically to determine the correlation between DNA breaks in healthy patients and patients with multiple sclerosis.

Results. A trend for increase of the level of DNA breakage was observed in specimens taken from MS patients compared to healthy persons, although statistical significance was not reached yet. Continuation of the study is on line, both groups will be increased.

Conclusions. Our data indicates sensitivity of the lymphocyte DNA to the isolation procedure, and presents preliminary data on increased DNA breakage in nucleated blood cells of the MS patients.

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4. STUDIES OF IMMUNOMODULATORY EFFECTS OF *VISCUM ALBUM* IN *IN VITRO* MODELS

Arta Denina[1], *Una Riekstiņa*[1]

[1] *Faculty of Medicine, University of Latvia, Riga Latvia*

Background. Cancer is one of the leading cause of death globally. Conventional cancer therapies have their limits due to their undesirable side effects and immune suppressive effects in the long run. In this light, the demand for efficient complementary treatments is on rise. Stimulation of the immune system is one of the anti-cancer effects attributed to *Viscum album* extracts. The other effects include induction of cancer cell apoptosis and reduction in tumor progression. The immunomodulatory effects of *Viscum album* in *in vitro* studies, animal models, as well as in some clinical trials has been suggested through enhancing the secretion of cytokines and increasing the counts of immune cells. Growing interest in immunomodulatory and other anti-cancer effects of *Viscum album* has been demonstrated by increasing number of the original scientific articles published on this topic.

Purpose. The objective of the current study was to gather the latest original scientific information about experimental methods used to assess immunomodulatory effects induced by *Viscum album* extracts on immune cells *in vitro*. The results of this work are foreseen to lay grounds for further research, in particular, for elaboration of a novel study design (model) using research infrastructure provided within the State National Research centre "Pharmacy and Biomedicine" and Pharmacy study program infrastructure of the University of Latvia Faculty of Medicine.

Materials and methods. Literature search was performed on *PubMed* based on inclusion criteria: publication date no later than January 2017; search terms *Viscum album, ViscumTT, Viscum album AND immunomodulation, Viscum album AND anti-cancer, Viscum album AND immune system, mistletoe AND immunomodulation* locating 38 citations. Original articles investigating immunomodulatory effects were further analysed.

Results. Responses of immune cells including natural killer cells, macrophages, T lymphocytes (CD4+, CD8+, $CD16^+/CD56^+$ and $CD\ 19^+$ T) and dendritic cells were identified to participate in immunomodulatory activity of *Viscum album.* Immunological parameters were also identified in induction of the immunomodulatory effects, including pro-inflammatory (i.e. TNFα, IFN gamma, IL-1, IL-2, IL-6, IL-8) and anti-inflammatory (i.e. IL-10) cytokines. Role of signalling pathways (i.e. NFkB) in *Viscum album* induced immunomodulation was revealed to be important.

Conclusions. The current study provided grounds for developing original study design for further studies of immunomodulatory effects of *Viscum album* in laboratory settings. Donors` peripheral blood mononuclear cells will be used to study cell surface biomarkers, signalling pathways and cytokine response.

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5. *IN VITRO* EFFICACY COMPARISON OF TWO HERBAL FORMULATIONS USED FOR CHRONIC WOUND HEALING

Baiba Zandersone[1], *Somit Kumar*[1,2], *Valdis Pirags*[1], *Iveta Liduma* [1], *Arnolds Jezupovs*[1,3], *Agnese Zvaigzne*[1], *Sujith Subash Eranezath*[2], *Tatjana Tračevska*[1]

[1] *University of Latvia, Riga, Latvia*
[2] *Arya Vaidya Chikitsalayam and Research Institute, Coimbatore, India*
[3] *Riga East University Hospital, Riga, Latvia*

Background. The increasing incidence of drug-resistant pathogens has drawn the attention of the scientific communities towards studies on the potential antimicrobial activity of plant-derived formulations, used in traditional medicine [1].

Complex herbal formulations contain phytochemical constituents, which act synergistically or agonistically in production of pharmacological action, which is not completely understood. Therefore, it is necessary to research the antibacterial efficacy of complex formulations.

Purpose. Polyherbal ayurvedic oil formulation, *Jathyadi Thailam* and its crude herbal extracts, are popular in traditional Indian medicine for treatment of various topical wounds [2]. The properties of these formulations and the underlying mechanism of plant synergism are not studied yet. Therefore, the aim of this study was to evaluate an antibacterial properties of AFI (Ayurvedic Formulation of India) and AVP (Arya Vaidya Pharmacy,) formulations, namely, the final product and the activity of the two crude plant extracts (solvents – hydroethanolic, N-hexane) *in vitro*. Both formulations were compared to elucidate the more effective herbal combination and the extract for further modification.

Materials and methods. The final oils were analysed by agar dilution method. The four extracts of crude herbal mixture were obtained by the hexane and aqueous ethanol (HE) solvents, two extracts of each formulation. The extracts were analysed by Broth microdilution method for the Minimal Bactericidal Concentration (MBC), an antibacterial activity against gram-positive and gram-negative bacteria species.

Results. The bacteriostatic effect on gram-positive bacteria was shown for the final *J. Thailam,* both formulations, by agar dilution method. As for gram-negative bacteria, mostly no growth inhibition was achieved by both formulations. All the extracts showed better activity (lower MBC) for gram-positive bacteria compared to that for gram-negative, as determined by Broth microdilution method for crude extracts, MBC was in general lower for AVP hydroethanolic extract (MBC 1.95- 31.25mg/ml), followed by AVP N-hexane extract (MBC 1.95–62.50mg/ml) for gram-positive bacteria. Similarly, AFI hydroethanolic extract (MBC 7.81–62.50) was more active than AFI N-hexane extract (MBC 15.62–62.50) for gram-positive bacteria. Both hydroethanolic extracts were more efficient for gram-negative bacteria than for N-hexane extract. No inhibitory effect for AFI N-hexane extract was shown.

Conclusions. To summarise, both herbal formulations are more effective for gram-positive bacteria than for gram-negative bacteria. The extracts from AVP formulation showed higher antibacterial activity compared to those from AFI formulation. Further research is necessary to evaluate efficacy of midpolar extract fractions to achieve higher antimicrobial activity for gram-negative bacteria.

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6. 4-PHASE-RHINOMANOMETRY DATA IN DIFFERENT AGES AND ITS CORRELATION WITH AGE AND ANTHROPOMETRIC PARAMETERS

Mārtiņš Blumbergs[1], *Līga Akmeņkalne*[1], *Laura Grava*[1], *Dārta Nīmane*[1], *Kaspars Peksis*[1,2], *Klaus Vogt*[1,2]

[1] *Faculty of Medicine, University of Latvia*
[2] *Center of Experimental Surgery, Faculty of Medicine, University of Latvia*

Background. Four phase rhinomanometry is a type of investigation, with the help of which a lot can be deduced about nasal air flow and breathing resistance of the patient and allows objective assessment of nasal patency. No reliable reference values are available in the age group 16–19 and will be presented in this study.

Purpose. The aims of this study were to determine values of 4-phase rhinomanometry in adolescents and find possible correlations between rhinomanometric data and anthropometric parameters.

Materials and methods. 4-phase rhinomanometric measurements were undertaken on 80 healthy adolescents, with 10 male and 10 female volunteers in each age group before and after decongestion. Logarithmic effective resistance was analyzed and anthropometric parameters were measured that could potentially correlate with 4-phase rhinomanometric measurements. The Pearson correlation coefficient was used for the statistical analysis of the data.

Results. As a result of this study, upper, lower and mean normal values for adolescents were obtained. No significant differences in nasal resistance between nose sides were found ($p>0.05$). Following correlations between anthropometric and rhinomanometric data were found. Resistance in male adolescents actually increases between the ages of 16 and 18, with a decrease observed only afterwards. For female volunteers, a generally constant trend can be seen in the right nostril with only a slight decrease between the ages of 18 and 19 after decongestion. Log. effective resistance decreases with increasing nasal and alar width, upper lip length and nasal length, suggesting that larger features imply lower resistance. ($p<0,05$) In younger adolescents nasal resistance is significantly higher than in late adolescents, suggesting that the smaller the child, the higher the nasal resistance.

Conclusions. Log. effective resistance does exhibit some signs of a decrease with age in male and female adolescents**,** suggesting that the smaller the child, the higher the nasal resistance. Correlation was found only with 4 anthropometric parameters, suggesting that inner nasal structures is included. Moreover, there are differences between genders, which could be due to faster nasal development in females in this age group. However, the sample size in this study could have simply been too small for precise statistical analysis, suggesting that this age group should be studied more.

7. VISUAL ACUITY AND INTRAOCULAR PRESSURE CHANGES AFTER CONVENTIONAL AND FEMTOSECOND LASER–ASSISTED CATARACT SURGERY

Dārta Nīmane[1], *Laura Grava*[1], *Igor Solomatin*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Dr Solomatin Eye Rehabilitation and Vision Correction Centre, Riga, Latvia*

Background. Cataract surgery is the most commonly performed surgical procedure in the world. Methods of cataract surgery are continuously improved. Phacoemulsification is the standard surgery procedure for cataract in the developed countries. In last years, Femtosecond laser-assisted cataract surgery *(FLACS)* has been introduced into phacoemulsification cataract surgery to perform corneal incisions, capsulorhexis, and nuclear fragmentation. *FLACS* are new option to potentially improve patient outcomes and safety of the surgery.

Purpose. Through the retrospective data analysis, examine and compare the effectiveness of cataract therapy, comparing visual acuity and intraocular pressure among patients after conventional cataract surgery and *FLACS*.

Materials and methods. The study was conducted at Dr. Solomatin eye rehabilitation and vision correction center. The study included 140 patients (140 eyes). The average age of all the patients was 64,2 ± 3 years. Visual acuity and intraocular pressure was measured in three phases – the first day, two weeks and one month after the surgery. Data was analysed statistically using SPSS statistics analysing software, using descriptive statistical methods, "p" value was also calculated.

Results. Comparing visual acuity changes after conventional cataract surgery, the first day average visual acuity was 0,3, but after *FLACS* – 0,5. Similarly, after two weeks of surgery, visual acuity respectively was 0,5 and 0,6. One month after surgery the average visual acuity using conventional method was 0,5, but using *FLACS* – 0,7. There was a statistically significant difference between these two groups ($p<0.001$). Comparing intraocular pressure changes after conventional cataract surgery on a first day average intraocular pressure was 22,9 mmHg (CI 95% 21,0–24,9), but after *FLACS* – 19,7 mmHg (CI 95% 17,6–21,8). Two weeks after surgery, intraocular pressure respectively was 17,49 mmHg (CI 95% 16,3–18,7) and 16,06 mmHg (CI 95% 14,8–17,3). One month after surgery the average intraocular pressure after both methods was equal – 15 mmHg (CI 95% 14,2–15,8). Comparing intraocular pressure, a statistically significant difference between these two groups was found only for the first day after surgery ($p<0,001$).

Conclusion. During postoperative period, comparing conventional method of cataract surgery with *FLACS* method, visual acuity after *FLACS* method improved significantly, whereas intraocular pressure between these two methods did not show statistically significant difference, except for the first day after surgery, where after *FLACS* average intraocular pressure was significantly lower – 5,5 mmHg than it was after the conventional method. More randomized, blind studies with long-term visual outcomes need to be performed to properly evaluate the efficacy of *FLACS* compared to the conventional cataract surgery.

8. DRY EYE SYNDROME DEVELOPMENT AFTER LASIK REFRACTIVE SURGERY

***Jūlija Meščerjakova*[1]**, *Dārta Nīmane[1], Jana Gertnere[2], Igor Solomatin[1,2]*

[1] *University of Latvia, Faculty of Medicine, Riga, Latvia*
[2] *Dr Solomatin Eye Rehabilitation and Vision Correction Centre, Riga, Latvia*

Background. Nowadays, more and more patients choose laser correction to get rid of the use of eyeglasses or contact lenses, thus improving the quality of their life. However, often after this type of therapy, Dry Eye Syndrome (DES) develops when patients complain of eye itchiness and lacrimation. The most common causes for DES following laser correction are the iatrogenic damage to the corneal nerve fibre, loss of conjunctival goblet cells, as well as postoperative inflammation causing excessive secretion of lacrimal gland fluid.

Purpose. To investigate and compare the incidence of DES development and its severity after LASIK refractive surgery by conducting a prospective clinical study.

Materials and methods. The study has been conducted at Dr Solomatin Eye Rehabilitation and Vision Correction Centre, and included 46 patients (92 eyes), aged 30.2 ± 2 years. Patients have been surveyed using Ocular Surface Disease Index (OSDI) questionnaires to evaluate the subjective complaints and DES presence in the preoperative stage. An objective examination has been held using Tears Break Up Time (TBUT) and Schirmer's test 1 day before laser correction, as well as on the 7th day after the surgery, to evaluate DES changes during perioperative period. The obtained data has been analysed applying analytical and comparative statistics methods, using SPSS software.

Results. In our study population (N=46), mean age of 30.2 ± 2 years, 29 patients (58 eyes) had dry eye symptoms, 17 (34 eyes) were symptom free. Before LASIK 34,78% of patients had mild, 26,09% moderate, and 17,49% severe DES. Schirmer's test in group wits DES symptoms after LASIK decreased by 5 mm ($p<0.001$), also in group without symptoms the results decreased by 6mm ($p<0.001$). If we compare TBUT test before and after LASIK, in both groups results decreased by 2 sec ($p<0.001$).

Conclusions. Our research results were statistically significant. We found that LASIK causes dry eye syndrome symptoms in symptom free group and aggravates symptoms in symptomatic group. The symptoms of post LASIK DES can be troublesome and lead to decreased satisfaction with surgical outcomes. To prevent progression of DES symptoms it is necessary to use artificial tears and regenerative ointments in postoperative period.

9. CORRELATION BETWEEN SUBJECTIVE AND OBJECTIVE VISUAL ACUITY AFTER PHACOEMULSIFICATION

Marta Jasa[1], *Vita Lāčplēse*[1], *Guna Laganovska*[2]

[1] *Rīga Stradiņš University, Riga, Latvia*
[2] *Rīga Stradiņš University, Department of Ophthalmology, Riga, Latvia*

Background. The number of blind people worldwide is estimated at ~50 million, and a half of these cases are due to cataracts. The most common sign of cataract is decreased visual acuity, consequently, it has been the standard measure of the visual effect of this phenomenon. After cataract surgery, vision can be successfully restored, although it also depends on comorbidities.

Purpose. To evaluate the patients' objective results of visual acuity and compare them to subjective assessment.

Materials and methods. In a prospective study, 48 patients (48 eyes) who underwent uneventful phacoemulsification in a single university hospital were selected. A questionnaire was conducted which included questions about participants' life quality assessment associated with vision. Objective visual acuity was determined on follow-up visits. Collected data was analyzed with programs MS Excel, SPSS, using descriptive statistical methods with confidence interval (CI) of 95%.

Results. 48 patients, out of which 29 [95% CI = 0.46–0.73] were female (60,4%), and 19 – male [0.27–0.54] (39,6%). Mean age was 75.67, median age 77. After cataract surgery, 47 patients had improvements in visual acuity without correction and one patient showed no changes. Mean difference between vision acuity before and after surgery was 0.5 [0.42–0.58].

Mean mark for subjective vision assessment from 1 to 5 (1 denotes poor vision, 5 – very good) before surgery was 2.06 and after – 4.25, the average improvement being 2.19. 44 patients rated their vision after surgery as better than before, 4 had no change.

By evaluating subjective vision impact on daily activity 30 patients [0.48–0.75] (62.5%) claimed increased ability to read, 13 [0.16–0.41] (27.1%) had no changes, decreased capability was in 5 cases [0.04–0.23] (10.4%). 42 patients [0.75–0.95] (87.5%) reported improvement watching television, 5 [0.04–0.23] (10.4%) results were the same, 1 [0–0.12] (2.1%) had a worse condition. Generally, 6 patients [0.05–0.25] (12.5%) stated that surgery had no impact on their daily activity, 13 [0.16–0.41] (27.1%) showed minor changes, 29 [0.46–0.73] (60,4%) experienced significant improvement.

No significant correlation was found ($p>0.05$) by using Spearman's test between subjective assessment of vision difference before and after surgery and difference of objective visual acuity.

Conclusions. 1) Subjective and objective vision acuity highly improved after cataract surgery although there was no significant correlation between these difference measures. 2) 87.5% of patients had improvements in daily activity associated with vison after surgery, only 12.5% had no changes.

Acknowledgements. The study took place in Riga Stradiņš University ophthalmology students' scientific circle.

ABSTRACT WITHDRAWN BY AUTHORS AFTER PUBLICATION

10. THE EFFICACY OF DISINFECTANTS AGAINST MULTIDRUG RESISTANT MICROORGANISMS

*Iveta Līduma[1,3], **Elza Dzērve**[1], Elza Vazdiķe[1], Aija Žileviča[1], Arnolds Jezupovs[1,2], Tatjana Tračevska[1]*

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Clinic of Surgical Infection, Riga East University Hospital, Riga, Latvia*
[3] *Centre of Tuberculosis and Lung Diseases, Riga East University Hospital, Riga, Latvia*

Background. The extensive use of antimicrobials and disinfectants in recent years has accelerated the emergence and spread of resistant microorganisms in hospitals and in the community, too. It is very important to use precise concentrations of disinfectants and to follow carefully the instructions of use to avoid the transmission of multidrug resistant microorganisms. There is a lack of studies showing whether disinfectants are sufficiently effective to prevent the spread of resistant superbugs.

Purpose. To determine the efficacy of various hospital-based disinfectants used to inhibit growth or to kill multidrug resistant bacteria isolated from clinical material.

Materials and methods. In the study, disinfectants such as chlorhexidine in concentrations of 0.05% and 0.5%, povidone-iodine, furagin, and hand disinfectants containing ethanol 75% and 84% were tested for the purpose of inhibiting the growth of following multidrug resistant bacteria: MRSA, MRSE, *Pseudomonas aeruginosa, Klebsiella pneumoniae* and *Acinetobacter baumannii*, isolated from clinical material. The reference strains *S. aureus* ATCC 25923 and ATCC 33591 as well as *P. aeruginosa* ATCC 27853 were used as drug susceptible control strains. The effectiveness of disinfectants using agar well method was checked. Antimicrobial susceptibility for all isolates were tested by the Bauer-Kirby disc diffusion method according to the Clinical Laboratory Standards (CLSI M100-S24, 2017) guidelines.

Results. The results of the study showed that all MRSA and MRSE strains were susceptible to disinfectants containing chlorhexidine, ethanol (84%) and furagin, but were moderately susceptible to disinfectants containing povidone iodine and ethanol (75%). *K. pneumoniae* strain was susceptible to chlorhexidine and moderately susceptible to povidone-iodine and furagin-containing disinfectants, while disinfectants containing ethanol did not inhibit bacterial growth. *P. aeruginosa* strains were susceptible to chlorhexidine 0.5%, but were moderately susceptible to chlorhexidine 0.05% and povidone iodine, as well as to ethanol-containing products. All of *P. aeruginosa* strains were resistant to furagin. The two strains of *A. baumanni* were susceptible to chlorhexidine at a concentration of 0.5%, but moderately susceptible to chlorhexidine 0.05% and to povidone iodine and to ethanol containing agents. Two other *A. baumannii* strains were resistant to povidone iodine, ethanol and furagin. The growth of these bacteria was inhibited by a disinfectant containing 0.5% chlorhexidine.

Conclusions. This study showed that gram-positive resistant strains such as MRSA and MRSE could be more or less effectively eliminated by the existing disinfectants. However, the tested gram-negative bacterial strains: *K. pneumoniae, P.aeruginosa, A. baumannii* showed resistance to many disinfectants**,** mainly to povidone iodine, ethanol and furagin. Therefore, the applicability of currently used disinfectants should be revised, in order to prevent spread of drug-resistant bacteria.

11. THE EFFECT OF SILICA PARTICLES ON DIFFERENT MICROORGANISM ABILITY TO ABSORB ULTRAVIOLET RAYS

Julija Melkonane[1], *Dzintars Ozolins*[2]

[1] *Residency development program, University of Latvia, Riga, Latvia*
[2] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. The outer shell of the microorganism is characterized by a certain electric charge value. Microorganism adhesion ability depends on the electrical potential of the outer shell. In the current study SiO2 were used as an adhesive substance. Significant phenomena of UW absorption capacity of certain microorganisms, depending on the presence of SiO2, have been detected. This enables the development of a new diagnostic method for the differentiation of microorganisms.
Purpose. The objective of the current study was to find out if silica microparticles influences microorganism ability to absorb ultraviolet ways.
Material and Methods. N.gonorrhoeae ATCC (American Type Culture Collection) 13076, MSSA ATCC 25923, MRSA ATCC 33591, M.catarrhalis ATCC 25238, E.coli ATCC 25922, K.pneumonia ATCC 700603, C.freundii ATCC 43864, Salmonella enterocolis ATCC 13076, S.pneumoniae ATCC 49619, C.albicans ATCC 10231. C.kefur, C.crusei, C.glabrata pure cultures from the Microbiology laboratory, Traumatology and orthophedics hospital, Riga. 9-13 mkm SiO2 spherical non-porous glass beads, Aldrich Chemistry, USA. UV-1280 Shimadzu spektrophotometer, Japan.
Results. All microorganisms: both bacteria and yeasts, have stronger absorption of UW with the addition of SiO2. Larger wavelength absorption rates with SiO2 are observed throughout the interval 450-250 nm. M.catarrhalis ($p=0.0007$), E.coli ($p=0.003$), C.freundii ($p=0.00008$), Salmonella enterocolis ($p=0.0001$), S.pneumoniae ($p=0.00007$), MSSA, K.pneumonia, C.albicans, C.crusei, C.glabrata ($p<0.00001$) shows statistically significant differences between measurements in UW absorption. Comparing N.gonorrhoeae, MRSA and C.kefur wave-absorption numerical values, there are no statistically significant differences. N.gonorrhoeae wave absorption rates without SiO2 and with it were: 450 nm – 0.117 and 0.125, 250 nm – 0.835 and 0.833; MSSA: 450 nm – 0.432 and 0.379, 250 nm – 1.147 and 1.235; MRSA: 450 nm – 0.442 and 0.421, 250 nm – 1.129 and 1.121; M.catarrhalis: 450 nm – 0.465 and 0.420, 250 nm – 1.312 and 1.191; E.coli: 450 nm – 0.410 and 0.378, 250 nm – 1.136 and 1.043, K.pneumonia: 450 nm – 0.420 and 0.354, 250 nm – 1.140 and 1.032; C.freundii: 450 nm – 0.439 and 0.389, 250 nm – 1.133 and 1.080; Salmonella enterocolis: 450 nm – 0.478 and 0.424, 250 nm – 1.552 and 1.250; S.pneumoniae: 450 nm – 0.387 and 0.343, 250 nm – 1.189 and 1.086.
Conclusions. When bonded with SiO2, both bacteria and yeasts absorb UW stronger. Yeasts absorb UW stronger than bacteria with and without silica microparticles. Short UW bacteria absorb weaker than long ones with and without silica. N.gonorrhoeae ATCC 13076 has unique wave absorption phenomena: in the case of the long waves exposure, when bonded with silicon dioxide, N.gonorrhoeae absorbs it weaker, but without SiO2 – stronger.

CARDIOVASCULAR MEDICINE

1. AUTOLOGOUS BONE MARROW MONONUCLEAR STEM CELL INTRACORONARY TRANSPLANTATION: EXPERIENCE IN LATVIAN CARDIOLOGY CENTER

*Ieva Briede[2], **Emma Sokolova**[2], Inga Narbute[2], Indulis Kumsars[2], Dace Sondore[2], Karlis Trusinskis[2], Sanda Jegere[2], Gustavs Latkovskis[2], Andis Dombrovskis[2], Kristine Dombrovska[2], Ainars Rudzitis[2], Karlis Strenge[2], Agnese Strenge[2], Kristine Spalva[2], Raimonds Mikijanskis[3], Eriks Jakobsons[1], Liene Patetko[1], Simona Krapse[1], Baiba Rupaine[1], Kristaps Erglis[1], Martins Erglis[1], Andrejs Erglis[1]*

[1] *Cell Transplantation Centre, Pauls Stradiņš Clinical University Hospital, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*
[3] *University of Latvia, Riga, Latvia*

Background. Heart failure and acute myocardial infarction are the leading cause of morbidity and mortality worldwide. In spite of standard treatment, acute myocardial infarction (AMI) and chronic heart failure (CHF) still caries significant morbidity and mortality worldwide. Since the first successful bone marrow stem cells transplantation performed, there is a way to improve left ventricle ejection fraction and cardiac remodelling.

Purpose. To evaluate, whether regenerative therapy is safe and improves cardiac systolic function within one year in patients with acute coronary syndrome and chronic heart failure.

Materials and methods. Between September 2009 and April 2016, patients aged 18 to 75 years with acute myocardial infarction and successful revascularization (but with reduced LV EF 15–50% or LV apical aneurysm) or known CHF at the Latvian Center of Cardiology were enrolled for autologous mononuclear stem cell transplantation (n=123). There were n=100 (81.3%) patients with AMI and n=23 (18.7%) patients with CHF. During follow-up, we analysed clinical and angiographic results such as all-cause death, cardiac death, target vessel-related myocardial infarction (MI), target lesion revascularization (TLR), target vessel revascularization (TVR). We report the interim analysis of the follow-up at 12 months after stem cell therapy. Statistical data analysis was performed with SPSS software (IBM SPSS Statistics Version 21, SPSS Inc., USA).

Results. Man population from n=123 was 112 (91.9%) at mean age 51.91±10.96 years. Previous PCI was performed in n = 33 (26.8%), diabetes mellitus 9 (7.3%), arterial hypertension n=58 (47.2%), dyslipidaemia n=90 (73.2%), positive family history n=39 (31.7%), active smoking n=49 (39.8%). Mean left ventricle ejection fraction at baseline in patients with acute coronary syndrome (n=96) was 42.76±9.02%, in patients with chronic heart failure (n=21) – 27.33±9.57%. Mononuclear stem cell implantation mostly done in left anterior descending artery n=85 (86.7%). Mean implanted cell amount was 47.44±26.06 million. One year follow-up reached n=88 (71.54%), echocardiography performed 82 (93.18%), left ventricle ejection fraction in patients with AMI (n=70) increased significantly (from 43.94±8.23 to 48.83±11.44%, $p<0.001$), in patients with chronic heart failure (n=12) (from 29.83±7.83 to 35.42±10.13 %, p=0.015).

Conslusions. Stem cell therapy is safe and significantly improves cardiac systolic function within one year in patients with acute coronary syndrome and chronic heart failure. The study should be continued with a longer follow-up up to 24 months in a larger group of patients.

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2. EFFECT OF NORDIC WALKING ON CARDIOVASCULAR INDICATORS

*Jānis Kangars[1], **Jūlija Boļšakova**[1], Inese Pontaga[2]*

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Department of Anatomy, Latvian Academy of Sport Education, Riga, Latvia*

Background. The reason to choose such a topic is due to a high mortality level caused by cardiovascular diseases. Annually, 17.5 million people worldwide die of cardiovascular disease, and most of them are of working age. Besides, Latvia cardiovascular disease also is the most widespread reason of death. Vascular system ensures one of the main life function in human, supplying human body with the necessary nutrition and oxygen. A potential of a human body is generally limited by functionality of both cardiovascular and respiratory systems.

Purpose. To investigate the effect of a 2-month Nordic walking (NW) on the cardiovascular system.

Materials and methods. 10 women from 50 to 60 years old took part in the study. The study required three workouts in a week with duration one hour each.The following measurements were recorded at rest before and after 2 months of NW: weight (kg), height (cm), body mass index (BMI, kg/m^2), heart rate (beats per minute - bpm), systolic and diastolic blood pressure.

Results. After two months of NW the mean BMI of participants decreased by 0.42 kg/m^2 (SD 0.3 kg/m2), the mean systolic blood pressure decreased by 2 mmHg (SD 5.5mmHg), the mean diastolic blood pressure decreased by 0.6 mmHg (SD 3.73 mmHg) and the mean heart rate decreased by 6.2 bpm (SD 2.6 bpm).

Conclusions. NW training increases the efficiency of the cardio-vascular system in older subjects. Participants, who had hypertension before the research, achieved improvement with regard to systolic pressure after the workouts in average accounting for 7 mmHg, but those participants with normal arterial pressure before the research (training) experienced no change at the conclusion of the study. Hence, the overall arterial pressure improvement is not overly impressive.

3. OXIDATIVE STRESS PARAMETERS, DEPRESSION SYMPTOMATICS AND QUALITY OF LIFE LEVEL IN PATIENTS WITH PRIMARY AND RECURRENT STABLE CORONARY HEART DISEASE

Tarass Ivascenko[1], *Vladimirs V. Voicehovskis* [1], *Julija G. Voicehovska* [1], *Andrejs Skesters* [1], *Oskars Kalejs* [1], *Ketija Apsite* [1], *Julija Grigorjeva* [1]

[1] *Rīga Stradiņš University, Riga, Latvia*

Background. Depression (D) is 3–4 times more common in patients with coronary heart disease (CHD) than in the prevalence in the population. D increases the risk of cardiac mortality, and is associated with an increased risk of secondary acute ischemic events.

Pathophysiological mechanisms such as the activity of inflammatory reactions, circulating inflammatory mediators, dysfunction of the endothelium influence the relationship between these diseases. The accumulation of free radicals in the endothelium of blood vessels leads to its damage and after to dysfunction, this leads to the development of inflammatory reactions and oxidative stress (OS). Active forms of oxygen initiate lipid damage, influence neuronal membrane phospholipids and in result, it can cause cellular necrosis or disruption of signal transmission mechanism.

Reconsidering the attitude towards the use of antidepressants and antioxidants can be particularly useful in the prevention of CHD and it depends from understanding of interactions between D and CHD.

Purpose. To identify and examine the relationship between the severity of symptoms of depression and indicators of OS in primary SCHD patients and in patients with recurrent SCHD.

Materials and methods. A retrospective case-control study, ambulatory patients aged 45–65 years: 50 patients with recurrent SCHD and 50 patients with primary SCHD. It is assessed in both target groups: manifestations of stable CHD (using structured interviews); OS parameters in the blood (MDA, GPx); quality of life level (QoL, questionnaire Q-les-Q by J. Endicott, short form, valid Latvian language version); D (long form of Geriatric Depression Scale by J. A. Yesavage and others, the valid Latvian language version GDS-LAT).

Results. The data obtained from 51 patients with primary SCHD and 50 relapses of SCHD: in P with primary SCHD, D was established in 25 cases, in P with recurrent SCHD – at 30. The mean score of the QoL was 63.5% of the total possible score in the group with primary SCHD and 61.1% in the group with relapse of SCHD. GPx does not have any significant changes in both groups. Further results will be reported.

Conclusions. There is a positive correlation between the level of D and the level of OS markers in patients with SCHD. In patients with recurrent SCHD and D, the level of OS markers in the blood will be higher than in patients with primary SCHD.

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GASTROENTEROLOGY

1. PERCUTANEUS ENDOSCOPIC GASTROSTOMY – RETROSPECTIVE CASE ANALYSIS

Diāna Riekstiņa[1], *Eduards Krustiņš*[1,2]

[1] *Rīga Stradiņš University, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Latvia*

Background. PEG tube placement is a common endoscopic procedure and has noticeably lower complication rates and 30-day mortality, unlike surgical methods. It is widely used for patients with swallowing difficulties and functioning gastrointestinal tract for long-term nutritional support. The most common indications for PEG placement are cerebrovascular diseases and cancer related swallowing difficulties. PEG is not recommended for patients with transient swallowing difficulties, short life expectancy and is less beneficial for patients with dementia.

Purpose. To determine common complications after PEG procedure in Pauls Stradins Clinical University Hospital (PSCUH), and evaluate prognostic factors, which can affect patient survival after PEG placement.

Materials and methods. Patients who underwent PEG procedure from 01.02.2014 to 01.12.2017 were selected from PSCUH Endoscopy database. Using patient records, the following data was collected – sex, age, admission date, PEG procedure date, discharge or death date, primary diagnosis, complications, underlying diseases, length of use of nasogastric (NG) tube, antibiotic, anticoagulant and anti-aggregant use before and during PEG procedure, use of analgesics, laboratory analysis (albumin, thrombocyte levels).

Results. 77 patients were selected in ages from 23 to 88, with median age of 66.5 and mode – 75 years. Reasons for PEG placement included stroke, amyotrophic lateral sclerosis, oropharyngeal cancers. Average NG tube feeding time was 15.85 days (2 – 87 days) and only 12 patients had NG tube feeding longer than 30days. 8 patients received specific antibiotic prophylaxis, for 2 specific antibiotic prophylaxis did not meet recommended antibacterial spectrum. 17 patients had minor complications after PEG insertion. 16 patients noted complaints like pain, discomfort and painful palpation around insertion site. One patient had nausea, one – diarrhea and one – peristomal leakage. 7 patients had major complications – 4 had aspiration, from whom one with further cardiopulmonary resuscitation and 3 pulled out PEG tubes, from whom two had dementia and one cerebral infarction. One patient had PEG removal after 13 days during hospital stay. Re-hospitalization was needed for 4 patients: one had PEG dysfunction, in one tube fell out; the other two were re-admitted for PEG removal.

Conclusions. We found no difference between survival of patients under 60 and over 60 years, and no difference between males and females. In addition, there was no impact of major complications on survival time after PEG procedure. Neurologic patients had statistically significant longer mean and median survival time than oncology patients. Moreover, PEG tube placement in patients with dementia was less beneficial due to major complications.

2. AN ANALYSIS OF PATIENTS DATA OF THE END STAGE LIVER DISEASE REGISTRY

Eva Cine[1,2], Jeļena Ivanova[2], Aiga Stāka[1,2], Poļina Zaļizko[1,2], Nora Aleksīna[1,2], ***Elizabete Liniņa****[1], Edīte Beķere[1], Aldis Puķītis[1,2]*

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. The prevalence of end-stage liver disease has significantly increased over the recent years in Latvia. Due to health care budget allocation, Pauls Stradins Clinical University Hospital is planning to start liver transplantation on the regular basis from January 2018. Considering that, it is of utmost importance to evaluate Liver transplant registry recipient list according to diagnosis of end-stage liver disease by using the Model for End-Stage Liver Disease (MELD) score, median age and gender to prioritize patients waiting for a liver transplant.

Purpose. To evaluate the Liver transplant recipient list according to etiology, MELD score of patients who are on transplant waiting list in Pauls Stradins Clinical University Hospital.

Materials and methods. We retrospectively analyzed the data obtained from 48 patients, who were included in recipient list between July 2016 and December 2017. 4 patient died on the waiting list and our final case sample consisted of 44 patients with an average age of 50 (range 21–73 years), in equal sex ratio. MELD score was calculated using creatinine level, total bilirubin level and international normalized ratio (INR). According to patient MELD score, all subjects were divided into two groups: MELD 15 or less – passive patients list (group 1) and MELD more than 15 – active patients list (group 2).

Results. Regarding liver disease diagnosis, 43% (14 males and 5 females) had chronic viral hepatitis – 89% (n=17) had chronic hepatitis C (HCV) infection and 11% had chronic hepatitis B (HBV) infection. One patient has HBV and hepatitis D virus coinfection. In 29% with chronic hepatitis C infection was complicated by hepatocellular carcinoma (HCC). The second big group was the patients with autoimmune cholestatic liver disease – 16% (n=7, 3 males and 4 females) had primary sclerosing cholangitis (PSH) and 2 females had primary biliary cholangitis. The third group (5 patients, 11%) consisted of patients with alcohol related liver cirrhosis. Remaining group (25%, 11 patients) was patients with other liver disease (autosomal dominant kidney and liver disease etc.). Median MELD scores were 12.7, respectively (range, 6 to 30). 69% were included in group 1, but 31% in group 2.

Conclusions. The obtained data showed that the most frequent causes of end stage liver diseases were viral hepatitis (predominantly HCV) and cholestatic liver diseases (PBC, PSC). One third of all the recipients could become candidates for the elective liver transplantation in the near future.

3. RESULTS OF URSODEZOXYCHOLIC ACID USE IN GASTROESOPHAGEAL REFLUX DISEASE

Maryna Shcherbynina[1], ***Victoria Gladun***[1]

[1] *Department of Medical Technologies of Diagnostics and Rehabilitation, Oles Honchar Dniprovsky National University, Dnipro, Ukraine*

Background. It is accepted that gastroesophageal reflux disease (GERD) is a quasi-endogenous disease. Discoordination of the motor-evacuation function of the upper parts of the digestive tract leads to damage to the oesophagus mucosa by cytotoxic refluxate. Complicated forms of GERD, can develop under the influence of mixed (with the participation of bile) reflux. Therapy with proton pump inhibitors does not affect the main links in the pathogenesis of GERD. Combined therapy of GERD using ursodeoxycholic acid (UDCA) is proposed. This approach ensures the predominance of hydrophilic substances of bile acids in the reflux and reduction of its damaging effect on the mucous membrane of the stomach and oesophagus.

Purpose. To study the clinical efficacy of UDCA in patients with GERD using the international questionnaire GerdQ.

Materials and methods. Altogether 90 patients were included in the study, 53 of them men and 37 women aged 18 to 41 years (mean age 29.3 ± 5.2 years). After the diagnosis based on the results of the questionnaire of the diagnosis of GERD, two observation groups were formed, comparable quantitatively, by sex and age. The first group of patients (n = 44) was offered a treatment course – pantoprazole 40 mg / day, the second (n = 46) – pantoprazole (40 mg / day) and UDCA with a single daily dose (10 mg / kg) immediately after dinner. The results of the questionnaire were evaluated before and at the end of the follow-up period – after 6 weeks of taking prescribed medications. All patients signed a voluntary consent to participate in the study. Statistical processing of the obtained results was carried out using variation statistics methods using the Microsoft Excel program.

Results. The total score of questionnaires before treatment: 1st group 15 ± 4.37, 2nd group – 16 ± 4.96 ($p>0.05$), in the category B, respectively, 4.45 ± 0.68 and 4.39 ± 0.64 ($p> 0.05$); after treatment: 1st group, 14 ±2,46, 2nd group 7 ± 2,21 ($p <0,05$), in the category B, 3,81 ± 0,61 and 1,31 ± 0,2 respectively ($p <0.01$).

Conclusions. Additional inclusion of UDCA in the therapy scheme of GERD compared with monotherapy with pantoprazole increases its effectiveness 1.5 times. Reduction of the score of the questionnaire for category B after treatment is evidence of the presence of the biliary component in the pathogenesis of GERD.

4. FACTORS INFLUENCING QUALITY OF BOWEL PREPARATION FOR COLONOSCOPY

Nora Aleksīna[1,2]*, Eduards Krustiņš*[1,2]*, Aldis Puķītis*[1,2]

[1] *University of Latvia, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. Technological advances in colonoscopy have led to improvements in both image enhancement and procedural performance. Despite these advances, the utility of colonoscopy remains dependent on the cleanliness of the colon or the quality of bowel preparation. Quality criteria for colonoscopy as adequate bowel preparation, cecum intubation, adenoma diagnostics allows to evaluate the performance of examinations.

Purpose. To investigate the relationship between patient's socio-demographic factors, awareness of the preparation process, the pre-colonoscopy preparation methods, their regimen to the results on the Boston scale (BBPS).

Materials and methods. Patient survey was performed from February to July year 2017. Patients who signed informed consent and were prepared to colonoscopy examinations at Pauls Stradins Clinical University Hospital (PSCUH) were included in the study.

Results. 120 patients were surveyed. Adequate intestinal purity (BBPS 6-9 points) was achieved in 75 (63%) cases, incomplete (BBPS< 3 points) – in 18 (15%). Out of 120 surveys, it was learned that 58 were preparing for colonoscopy with mixture of macrogolum 4000, *Natrii sulfas anhydricus*, *Natrii hydrogencarbonas*, *Natrii chloridum* and *Kalii chloridum* (Macrogol), 30 – could not recall, 20 – with mixture of *Natrii sulfas anhydricus*, *Magnesii sulfas heptahydricus* and *Kalii sulfas*, 6 – with mixture of *Natrii picosulfas*, *Magnesii oxidum leve* and *Acidum citricum anhydricum*. 8 additionally used enema. Of 120 patients, 111 followed a one-day plan. In the case of first-time colonoscopy, the average BBPS score was 5,64 points, repeated – 5,79 points. There was no statistically reliable relationship between the time between the acquisition of information and the colonoscopy, the body mass index (BMI) and inadequate purity of the intestine before colonoscopy (p> 0.05). Most of the information on the preparatory process (82 cases) was obtained from written sources. 72 patients thought that the received information was sufficient.

Conclusions. Our data showed that in 37% of colonoscopies intestinal purity was inadequate, as the patient was poorly prepared for examination. Inpatients and those who have chronic illnesses or are undergoing a colonoscopy for the first time, are more likely to be poorly prepared for it. The BBPS does not directly relate to the patient's education level, BMI. Additionally, application of enema and when information is provided on intestinal preparation process is not relevant, as it does not affect the evaluation of intestinal purity (BBPS). Macrogol mixture was the most commonly used intestinal cleanser at that time.

5. DIABETES MELLITUS RISK FACTORS IN CHRONIC PANCREATITIS PATIENTS

Nora Aleksīna[1,2], *Imanta Ozola-Zālīte*[1,2], *Eva Cine*[1,2], *Jeļena Ivanova*[2], *Aldis Puķītis*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. Diabetes mellitus occurrence in chronic pancreatitis (CP) patients varies widely from 5% to more than 80% depending on disease duration, aetiology and other factors. As other types of diabetes mellitus, 3c type as well have the similar acute and chronic complication risk. The recognition of risk factors is essential in order to prevent or modify the timing of the development of diabetes.

Purpose. To evaluate association between body mass index (BMI), sarcopenia, sarcopenic adiposity, intramuscular adipose tissue amount and such clinical parameters as age, gender, aetiology, disease duration, recurrent pancreatitis, pain syndrome, exocrine insufficiency, surgery and 3c type diabetes mellitus. Also, to detect prevalence of sarcopenia and sarcopenic adiposity in CP patients.

Materials and methods. Study was carried out as prospective cross-sectional. Patients were included from Pauls Stradiņš Clinical University Hospital from February 2016 until April 2017. The data about clinical parameter and computed tomography (CT) scan images of patients were collected. For the CT scan analysis, *VikingSlice* software was used. The axial slices of the 4th lumbar vertebra level was chosen for skeletal muscles and adipose tissue compartment segmentation. The Hounsfield Unit thresholds for skeletal muscles were -29 until 150, adipose tissue -190 to -30. For statistical analysis Chi square, Mann-Whitney and logistic regression were used to evaluate association between diabetes mellitus and risk factors in CP patients.

Results. In the study, 118 patients (90 (76%) males, median age 53 ± 13 years, range 23–87 years old) with CP were included. Median BMI was 23.66 kg/m^2 ± 4,46. 37 (31.4%) patients had diabetes mellitus. 51 (78%) of patients with normal BMI (18.5–24.9gk/m^2), 20 (71%) overweight patients (BMI 25–29.9kg/m^2) and 3 (25%) obese patients (BMI >30kg/m^2) had sarcopenia. In univariate analysis, endocrine insufficiency was associated with exocrine insufficiency (ρ = 0.045) and surgery (ρ = 0.021). Logistic regression model revealed possible association with intramuscular adipose tissue (OR 1.14; CI (95%) 0.991-1.3).

Conclusions. Sarcopenia prevalence in CP patients was high, while sarcopenic adiposity was lower. A significant association were found between 3c type diabetes mellitus and exocrine insufficiency, and surgery. Probably, there is an association with intramuscular adipose tissue, as well.

6. ASSESSMENT OF TWO PLASMA ANTIBODY TESTS AND STOOL ANTIGEN TEST FOR DETECTION OF *HELICOBACTER PYLORI* IN MIDDLE-AGED CAUCASIAN POPULATION WITH DECREASED PEPSINOGEN LEVELS

Sabine Skrebinska[1,2], *Ilva Daugule*[1,3], *Daiga Santare*[1,3,4], *Sergejs Isajevs*[1,3,5], *Inta Liepniece-Karele*[1,5], *Dace Rudzite*[1,4], *Ilze Kikuste*[1,3,6], *Aigars Vanags*[1,6], *Ivars Tolmanis*[6], *Juris Atstupens*[1], *Jin Young Park*[7], *Rolando Herrero*[7], *Marcis Leja*[1,3,4,6]

[1] *Institute of Clinical and Preventive Medicine, University of Latvia, Riga, Latvia*
[2] *Faculty of Continuing Education, Rīga Stradiņš University, Riga, Latvia*
[3] *Faculty of Medicine, University of Latvia*
[4] *Riga East University Hospital, Riga, Latvia*
[5] *Academic Histology Laboratory, Riga, Latvia*
[6] *Digestive Diseases Centre „GASTRO", Riga, Latvia*
[7] *Prevention and Implementation Group, International Agency for Research on Cancer, Lyon, France*

Background. The overall accuracy of latex-agglutination test, enzyme-linked immunosorbent assay (ELISA) and stool antigen test (SAT) for detection of *H. pylori* in general Latvian population has been previously reported to be 83.95%,86.23% and 84.52%, respectively. The performance of these tests may be influenced by existing conditions, such as gastric atrophy.

Purpose. To assess the accuracy of latex-agglutination test, ELISA and SAT for *H. pylori* detection in a subgroup of individuals with decreased level of pepsinogens (Pg) from the GISTAR pilot study.

Materials and methods. Blood and faecal samples were analysed in healthy individuals (40–64 years), who are referred to esophagogastroduodenoscopy according to the study protocol (n=1,003). *H. pylori* antibodies were assessed in plasma by latex-agglutination method (Test1) and ELISA (Test2) and *H. pylori* antigen in faecal samples was detected by monoclonal SAT (Test3) in participants with decreased PgI (≤30ng/mL) and/or PgI/II(≤2 for latex-agglutination based method;≤3 for ELISA). Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), Kappa value, overall accuracy of tests were analyzed in relation to histology as the gold standard.

Results. The analysis included 236 participants. The Test2 yielded relatively low specificity leading to overall low accuracy, while Test3 showed lower, but more balanced sensitivity and specificity (see Table below).

Table. **Accuracy of three non-invasive tests in relation to histology in patients with decreased level of pepsinogens.**

Test	Sensitivity / Specificity (95% CI)	PPV / NPV (95% CI)	Kappa value (95% CI)	Overall accuracy
Test1 (n=230)	86.4% / 76.2% (79.1–91.9) / (66.9-84.0)	81.2% / 82.5% (73.5–87.5) / (73.4 – 89.5)	0.63 (0.53-0.73)	81.7%
Test2 (n=112)	96.8% / 53.1% (89.0–99.6) / (38.3 – 67.5)	72.6% / 92.9% (61.8–81.8) / (76.5 – 99.1)	0.52 (0.37-0.67)	77.7%
Test3 (n=81)	74.5% / 76.5% (59.7–86.1) / (58.8-89.3)	81.4% / 68.4% (66.6–91.6) / (51.4 – 82.5)	0.50 (0.31-0.69)	75.3%

Conclusions. The overall accuracy of the studied tests for *H. pylori* detection was lower among the participants with decreased level of pepsinogens compared with the previously reported Latvian data.

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7. THE IMPACT OF TUMOUR INVASION DEPTH AND DIFFERENTIATION ON MEDIAN SURVIVAL IN PATIENTS WITH STAGE IV GASTRIC CANCER

Renāte Kaminska[1], *Unda Kaļķe*[1], *Sigita Hasnere*[1,2]

[1] *University of Latvia, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. The stomach cancer takes the fourth place among the cancer-related deaths in the world. In TNM classification, T describes the tumour invasion in stomach layers. The pathologist gives stomach cancer a grade of differentiation from I to IV. Lower grade cancer cells tend to be slow growing, those of a higher grade grow more rapidly and are more likely to spread.

Purpose. To determine, if the invasion depth and differentiation of the tumour impact, the median survival in patients with stage IV gastric cancer.

Materials and methods. Retrospective study, in which data of histologically confirmed gastric carcinoma were obtained from clinical university hospital within the period of 2015–2017. We evaluated the impact of tumor differentiation on median survival in patients with stage IV gastric cancer.

Results. In total, 81 patients were identified, 31 patients had been diagnosed with stage IV. 77% (n=24) patients with stage IV gastric cancer received symptomatic treatment. In this group of patients, T2 carcinoma was confirmed in 9% (n=2) of cases, T3 – 25% (n=6) and T4 in 67% (n=16) of patients. Patients who received symptomatic treatment with T2 tumour survived 27 days, T3 tumours – 41 days and T4 – 26 days (p=0.807). 23% (n=7) patients with stage IV gastric cancer received palliative chemotherapy. 14% (n=1) of patients had T3 and 86% (n=6) had T4. Patients who received palliative chemotherapy with T3 median survival was 47 days, with T4 – 327 days (p=0.014).

The degree of differentiation was not known for 38% (n=9) of the patients who received symptomatic treatment, GII had 25% (n=6) patients, GIII – 33% (n=8), 4% (n=1) of patients had an undifferentiated gastric carcinoma. Patients with stage IV gastric cancer, who received symptomatic treatment, with moderately differentiated tumour survived 27 days, poorly differentiated – 33 days, with undifferentiated – 31 days (p=0.895). Out of 7 patients with stage IV gastric cancer, who received palliative chemotherapy, 28,6% (n=2) had GII, GIII-42,8% (n=3), and 28,6% (n=2) had GIV gastric cancer. Patients with GII tumour survived 441 days, with GIII – 84 days, with GIV – 47 days (p=0.282).

Conclusions. Tumour size did not impact median survival in patients with stage IV gastric cancer and symptomatic treatment.

Statistically significant longer-term survival was observed in patients with T4 tumour, however, the number of patients was too small to suggest that patients with T4 tumour have longer survival rates than patients with T3 tumour.

Tumour differentiation does not impact median survival in patients with stage IV gastric cancer with both symptomatic and chemotherapy.

GYNAECOLOGY

1. SLEEP DEPRIVATION AND ASSOCIATION WITH DEPRESSION SYMPTOMS AMONG PREGNANT WOMEN IN LATVIA

Ņina Šakele[1], *Ņikita Šakels*[1], *Jūlija Meščerjakova*[1], *Ksenija Baidina*[1], *Larisa Tomkoviča* [2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Maternity Hospital, Riga, Latvia*

Background. Pregnancy is a time of happy expectation, however, unfortunately, many women in this period experience sleep disturbances, which have significant effects on lives of mothers and unborn children. In fact, according to the National Sleep Foundation's 1998 Women and Sleep poll, 78% of women reported more disturbed sleep during pregnancy than at other times. Hormonal, metabolic, psychological and physiologic factors are at fault here, which play significant roles in sleep quality. It is very common for pregnant women to experience nausea, heartburn, nocturia, and back pain, all of which may interfere with sleep. Moreover, pregnancy increases risk of disorders such as snoring, restless leg syndrome and snoring and obstructive sleep apnoea (OSA). Sleep disturbances may develop due to anxiety about baby, labour, family and work, unfortunately, the situation after baby`s delivery becomes even worse, and sleep duration and quality decreases. Sleep deprivation is associated with higher levels of pro-inflammatory serum cytokines, such as interleukin-1 (IL-1), IL-2, IL-6, tumor necrosis factor (TNF) α, and C-reactive protein, that are associated with higher risks of postpartum depression development and preterm delivery. Inflammation can influence the levels of serotonin and catecholamine (norepinephrine, epinephrine, and dopamine), impacting the hypothalamic–pituitary–adrenal (HPA) axis, which controls cortisol levels.

Purpose. The objective of the current study was to find association between sleep deprivation and symptoms of depression among pregnant women in Latvia.

Materials and methods. 100 pregnant women undergoing antenatal care in Latvia, Riga (Maternity Hospital) were interviewed using Pittsburgh Sleep Quality Index (PSQI), General Anxiety Disorder (GAD-7) and Patient Health Questionnaire (PHQ-9) scales, the obtained data from the scale`s results was analyzed and summarized in an analytic cross-sectional study.

Results. 50% (n=50) were diagnosed with symptoms of depression, and 62% (n=31) had anxiety symptoms. 88% (n=44) of these women experienced sleep deprivation $p<0.001$.

Conclusions. Poor subjective sleep quality was associated with depressive state during pregnancy. These findings may promote investments in studies designed to examine the efficacy of sleep-focused interventions to treat pregnant women with sleep disorders and depression.

2. DATA COMPARISON BETWEEN PHARMACOLOGICAL INDUCTION OF LABOUR AND SPONTANEOUS DELIVERY

Santa Ūdre[1], *Viktorija Šalajeva*[1], *Darja Arīna Miškina*[1], *Pāvels Srebnijs*[1], *Zane Krastiņa*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. Induction of labour involves the artificial stimulation of uterine contractions with the aim of achieving vaginal delivery. The main point of this study is to understand, what type of complications have inducted labours.

Purpose. To compare the differences in the maternal and foetal outcomes between pharmacological induced and spontaneous labour in nulliparous women.

Materials and methods. This was a prospective observational study of 72 women, which carried out over a period of 5 months. The study population comprised nulliparous pregnancies, who were inducted with perioral prostaglandin E2 (PGE2) at a gestational age of 40 weeks. Control group: patients who had a spontaneous labour at gestational age of 41 weeks.

Results. 32 patients with induction of labour and 40 with spontaneous labour were enrolled. Primiparous women whose labour was induced spent a longer time in labour than women who presented in spontaneous labour. Caesarean delivery was performed in 40 cases: induction group – 14 cases (44%), spontaneous group – 26 cases (35%). Both the 1-minute and the 5-minute Apgar scores were higher in the induced group and newborns' weight and height were higher in the spontaneous group, while no neonatal complication occurred in either groups. Epidural anaesthesia was performed more frequently in the spontaneous group (52%). Episiotomy was performed more frequently in the spontaneous group (73%), and in the induction group (27%). However, the amount of perineal laceration was higher in the induced group – (57%), but in the spontaneous group – (43%). The percentual correlation of perineal laceration (stage I) in induced and spontaneous groups was equal. The amount of perineal laceration (stage II) was higher in the induced group (62,5%). The number of uterine dysfunction in two groups is equal (50%). However, the I stage of uterine dysfunction was more frequently observed in the induced group (65%), whereas stage II of uterine dysfunction – in the spontaneous group (66%).

Conclusions. Our study suggests that induction of labour in postterm pregnancies is associated with a significantly higher Caesarean section rate. To estimate other parameters, investigation has to be continued.

3. CONTRACEPTIVE UNDERSTANDING AMOUNG YOUNG FEMALE ADOLESCENTS

Kristiāna Čačka[1], *Līga Gaisiņa*[1], *Evelīna Korsaka*[1], *Dainis Balodis*[1]

[1] *Rīga Stradiņš University, Riga, Latvia*

Background. Many young females engage in sexual risk behavior that can result in unintended health outcomes such as teen pregnancy and sexually transmitted diseases. CDC research of U.S. high school students surveyed in 2015 shows that 30% had had a sexual intercourse during the previous 3 months, and 14% had not used any method to prevent pregnancy.

Purpose. The aim of study was to evaluate young females' knowledge about contraception, prevention of sexually transmitted diseases and teen pregnancy.

Materials and methods. The study group included 91 female students aged 17 to 19 from Rezekne State Gymnasium No.1., and Riga State German Grammar School. An originally created questionnaire was used to collect self-reported data from respondents about their sexual experience and behavior. Analysis was performed using IBM SPSS, 23.0 version.

Results. Research included 91 respondents. 54.9 % (n=50) admitted to having had sexual relationship. 45.1% (n=41) indicated vaginal; 25.3 % (n=23) oral; 13.2 % (n=12) anal intercourse. The most commonly used contraception method was male condom in 53.8 % (n=49). However, 12.1 % (n=11) did not use any methods to prevent pregnancy or sexually transmitted diseases. Only 49.5 % (n=45) respondents evaluated their knowledge about contraception as good. 56% (n=51) of the respondents did not know if intrauterine contraception device prevents STDs. Out of all the 50 respondents who admitted having sex, 30% used contraception rarely or never. 50% (n=25) had used alcohol or drugs before sexual intercourse. When asked to name the main sources of information used to educate themselves about contraception, school 83.5 % (n=76), internet 79.1 % (n=72), friends 46.2 % (n=42) were mentioned.

Conclusions. The data conveys a picture of young female adolescents' poor knowledge about safe sexual relationship or prevention of sexually transmitted disease and teen pregnancy. Data shows a high prevalence of sexual intercourse in inebriated state. Furthermore, it is necessary to integrate mandatory, comprehensive and medically accurate sexual education in the school programs.

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4. ENDOMETRIOSIS NODE IN ECTOPIC PELVIC ORGANS

*Katrīna Bandere[1], **Līna Lazdiņa**[1], Marta Paeglīte[1], Sergejs Isajevs[1,2]*

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Pathology Centre, "RAKUS", Riga, Latvia*

Background. Endometriosis is defined as presence of endometrial glands and stroma outside the uterine cavity. This tissue is found in ectopic pelvic organs, such as the ovaries, vaginal straight union, escrow bladder or bladder, as well as in extra pelvic locations as the lungs, kidneys, ureters or brain. The main symptoms are pelvic pain and infertility (in around 50% of the women affected). The cause is not entirely clear. The areas of endometriosis bleed each month, resulting in inflammation and scarring. Biopsy is the most assured method of diagnosis.

Purpose. The main objective of the study is to review various locations of cases of endometriosis nodes in ectopic pelvic organs as well as the median age for most common ectopic sites of endometriosis.

Materials and methods. Altogether 95 patients were enrolled in retrospective and descriptive study. Patients' data was obtained from patohistological reports of ovarian and fallopian tube samples sent to Pathology Centre in Riga, confirming the pathologic diagnosis of endometriosis. Data was collected from January to July of 2016. The patients who were found to have an endometriosis node in a gynaecological scar, soft tissue of abdominal wall, ovaries or fallopian tubes were analyzed. Descriptive data was collected and analyzed. The average age of the patients was 44.8 years ± 14.5 years.

Results. The following variables were studied: the age at diagnosis (44.8 years ± 14.5 years) and location (endometroid cyst in one ovary, 43.2%, fallopian tube, 18.9%, soft tissue of abdominal wall (gynaecological scar), 13.7%, uterus, 12.6%, fallopian tube, 8.4%. In some cases, multiple locations were discovered (ovaries and fallopian tubes, 2.1%, ovaries and uterus,1.1%). Using independent means T-test, the median age for women with endometroid cyst was determined: M=44.24; SD=14.17, but with endometriosis in gynaecological scar the median age is M=34.50; SD=12.98 (p=0,017).

Conclusions. In this study, it was determined that the median age for women with endometriosis in general was 44.8 years, and the most common location for endometriosis was ovaries, but the second most common site was in gynaecological scars. The women who had endometriosis in gynaecological scars were younger than those who had endometriosis in ovaries. Rarely multiple locations of endometriosis nodes could be discovered.

5. ENDOMETRIOSIS NODE IN GYNEACOLOGICAL SCARS

Katrīna Bandere[1]*, Līna Lazdiņa*[1]*, Marta Paeglīte*[1]*, Sergejs Isajevs*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Pathology Centre, "RAKUS", Riga, Latvia*

Background. Endometriosis is defined as the presence of normal endometrial mucosa (glands and stroma) abnormally implanted in locations other than the uterine cavity. Most often, this is observed on the ovaries, fallopian tubes, and tissue around the uterus and ovaries. Endometriosis nodes are observed in extra pelvic locations, particularly in gynaecological scars, with the abdominal wall being one of the most frequent locations. The main symptoms are pelvic pain and infertility (in around 50% of the women affected). The cause is not entirely clear. The areas of endometriosis bleed each month, resulting in inflammation and scarring. Biopsy is the most assured method of diagnosis.

Purpose. The main objective of the study is to review patient characteristics of cases of endometriosis nodes in gynaecological scars.

Materials and methods. Altogether 95 patients were enrolled in retrospective and descriptive study. Patients' data was obtained from patohistological reports of ovarian, and fallopian tube samples sent to Pathology Centre in Riga confirming the pathologic diagnosis of endometriosis in 95 cases. Data collection was conducted from January to July of 2016. All of the patients had an endometriosis node in a gynaecological scar. Descriptive data was collected and analyzed. The average age of the patients was 44.8 years ± 14.5 years.

Results. A total of 13 patients (out of 95) with an anatomopathological diagnosis of an endometriosis node in a post-gynaecological operation scar were established. The following variables were studied: the age at diagnosis (35.1 years +/− 13.2 years) and location (Caesarean scar, 46.2%; peritoneum, 23%; omentum, 15.4%, soft tissue of abdominal wall, 15.4%).

Conclusions. The median age of women at the time of diagnosis of an endometriosis node in a post-gynaecological operation scar was 35.1 years +/− 13.2 years. The most common location for endometriosis nodes in post-gynaecological scars was in post-Caesarean section scars. Etiopathogenic hypotheses include the theory of immune tolerance induced by pregnancy; however, most authors support the theory of iatrogenic implantation. The treatment of endometriosis in gynaecological scars is by resection with safety margins, although in some cases surgical treatment is combined with hormonal therapy. No preventive measure has been shown to decrease the risk of endometrial nodules in scars; it appears to be prudent in performing gynaecological interventions that could produce an ectopic endometriotic nodule.

6. USE OF HORMONAL CONTRACEPTIVES AND PREMENSTRUAL SYMPTOMS IN THE POPULATION OF FEMALE STUDENTS STUDYING IN RIGA, LATVIA

Aylin Memis[1], *Valdis Folkmanis*[1], *Lilian Tzivian*[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. Premenstrual syndrome (PMS) is an underdiagnosed condition of many women with a high risk of chronic pain and depression. It is difficult to diagnose the PMS, as it remains different in every individual and does not show a typical clinical pattern. The relationships between intake of hormonal contraceptives and their effect on premenstrual syndrome is one of the underestimated issues. The investigation of these relationships, as well as the proposition of the efficient treatment of this condition is important. To perform such investigations, characterization of specific population regarding their contraception habits is crucial.

Purpose. To characterize the population of Latvian students that use contraceptives from socio-demographic aspects and concerning their PMS symptoms.

Materials and methods. Cross-sectional study based on internet survey (Google Online Poll) was performed among female students from different universities of Riga, Latvia. The survey included questionnaires for collecting personal information (age, country of origin, native language), questions related to the use of hormonal contraceptives (oral, combined, progesterone only, copper-only), and questions related to possible premenstrual symptoms (type, length, strength).

Results. Seventy-eight female students studying in Latvia were enrolled into the study; of them 53.8% were from Latvia, 6.4% from Finland, 14.1% from Germany, and 10.4% from countries. These numbers also correspond with the native language. The mean age of participants was 26.6 (± 5.21) years. Most of participants (56.2%) used non-oral contraceptives, followed by combined oral pills (21.8%), mostly for a period of more than five years. Participants noticed increased appetite, fatigue and headache (88.5%), irritability and mood swings, breast tenderness and abdominal bloating (87.2% each symptom), depression and crying (83.35) as most common and severe PMS symptom.

Conclusions. Most of the women suffer from the PMS, with one or more PMS symptoms. Consequently, universal guidelines for premenstrual syndrome for clinicians are necessary.

INTERNAL MEDICINE & INFECTIOUS DISEASE

1. THROMBOSIS RELATED ABO, F5, MTHFR, AND FGG GENE POLYMORPHISMS IN MORBIDLY OBESE PATIENTS

Kristina Kupcinskiene[1], *Martyna Murnikovaite*[2], *Greta Varkalaite*[2], *Simonas Juzenas*[2], *Darius Trepenaitis*[1], *Ruta Petereit*[3], *Juozas Kupcinskas*[2,3], *Almantas Maleckas*[4], *Andrius Macas*[1]

[1] *Department of Anaesthesiology, Lithuanian University of Health Sciences, Kaunas, Lithuania*
[2] *Institute for Digestive Research, Lithuanian University of Health Sciences, Kaunas, Lithuania*
[3] *Department of Gastroenterology, Lithuanian University of Health Sciences, Kaunas, Lithuania*
[4] *Department of Surgery, Lithuanian University of Health Sciences, Kaunas, Lithuania*

Background. Obesity is a well-known risk factor for thrombotic complications. Different studies show that genetic mechanisms for obesity and thrombosis might have common pathways.

Purpose. The aim of the present study was to determine the frequency of thrombosis related ABO, F5, MTHFR, and FGG gene polymorphisms in morbidly obese patients and compare them with the group of non-obese individuals

Materials and methods. Gene polymorphisms were analyzed in 320 morbidly obese patients (BMI > 40 kg/m^2) and 303 control individuals (BMI < 30 kg/m^2) of European descent. ABO C>T (rs505922), F5 C>G (rs6427196), MTHFR C>T (rs1801133), and FGG C>T (rs6536024) SNPs were genotyped by RT-PCR.

Results. We observed a tendency for MTHFR rs1801133 TT genotype to be linked with morbid obesity, when compared to CC genotype; however, the difference did not reach the significant P value (OR 1.84, 95% CI 0.83–4.05, P = 0.129). Overall, the genotypes and alleles of rs505922, rs6427196, rs1801133, and rs6536024 SNPs had similar distribution between morbidly obese and nonobese control individuals. Distribution of height and weight means among individuals carrying different rs505922, rs6427196, rs1801133, and rs6536024 genotypes did not differ significantly.

Conclusions. Gene polymorphisms ABO C>T (rs505922), F5 C>G (rs6427196), MTHFR C>T (rs1801133), and FGG C>T (rs6536024) were not associated with height, weight, or morbid obesity among European subjects.

2. ANTIBIOTIC RESISTANCE FEATURES OF *STAPHYLOCOCCUS AUREUS* IN VILNIUS HOSPITALS FROM 2015 TO 2017

Lina Kapleriene[1], *Agne Kirkliauskiene*[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
[2] *Institute of Biomedical Sciences, Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

Background. *Staphylococcus aureus* is one of the most frequent pathogenic bacteria, which causes a large number of hospital-associated infections. In 2016, 10.4% of hospital-acquired infections in Lithuania were caused by *S. aureus*. During the last 10 years, *S. aureus* caused from 24.8% to 10.4% hospital-associated infections. According to the data of the European Centre for Disease Prevention and Control, the proportion of MRSA isolated from blood and cerebrospinal fluid is increasing every year. In 2016, the percentage of MRSA in Lithuania was 10–25%.

Purpose. To determine antimicrobial resistance of *Staphylococcus aureus* in hospitalized patients.

Materials and methods. *Staphylococcus aureus* samples from two hospitals in Vilnius were taken. *S. aureus* strains were isolated and their susceptibility to oxacillin, cefoxitin, kanamycin, clindamycin, erythromycin, norfloxacin, fucidic acid, penicillin, ciprofloxacin, tetracycline, gentamicin, rifampin, vancomycin and mupirocin was tested. Antibiotic susceptibility testing was performed using the disc diffusion method according to the Clinical Laboratory Standards Institute guidelines. The data was summarized as numbers (%) or as means, as appropriate.

Results. A prevalence study involving 600 patients' samples was performed. 52.8% of the patients were males and 47.2% – females. The mean age was 61.9 years. The biggest part of strains was found in patients' wounds (41.3%), another part was found in blood (10.7%), pus (4.8%), skin (2.5%), nose (2.0%), sputum (9.5%), urine (2.5%) and from other samples (26.7%). The antimicrobial susceptibility testing revealed that 75.7% of the isolated strains were resistant to penicillin, 6.5% to tetracycline, 3.7% to oxacillin, 4.7% to cefoxitin, 5.5% to norfloxacin, 9.3% to erythromycin, 8.0% to kanamycin, 5.0% to clindamycin and 4.5% to gentamicin. 35% (n=210) of *S. aureus* strains were tested to mupirocin and all of these strains were susceptible. All of tested strains (n=600) were susceptible to rifampin and vancomycin. 21% of *S. aureus* strains were susceptible to all tested antibiotics.

Conclusions. *S. aureus* resistance rate to antimicrobials is quite high in hospitalized patients. 4.7% of the isolated strains were MRSA. All of tested strains were susceptible to rifampin, vancomycin and mupirocin. 21% of *S. aureus* strains were susceptible to all the tested antibiotics.

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3. COMPARISON OF COMPLICATED URINARY TRACT INFECTIONS AND ACUTE PYELONEPHRITIS IN MEN AND WOMEN

Viktorija Pogodina[2], *Egils Vjaters*[1,2]

[1] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*
[2] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. Complicated urinary tract infection (cUTI) is defined as cystitis and pyelonephritis caused by uropathogenic bacteria in males and young or elderly females with underlying diseases. Complicated UTI can occur in any gender and at any age, however, it is frequently associated with higher age. The risk is highest in patients with abnormal voiding, recurrent UTI, functional abnormalities of the urinary tract, indwelling urinary catheters, renal diseases and with other concomitant immunocompromising diseases for example, diabetes. So far, no studies in Latvia have compared acute pyelonephritis and cUTI in men and women.

Purpose. To compare the difference in frequency and etiology of cUTI and acute pyelonephritis in men and women in Pauls Stradiņš Clinical University Hospital.

Materials and methods. Retrospective study was performed in Pauls Stradiņš Clinical University Hospital Urology department. Information was gathered from medical histories of patients with cUTI and acute pyelonephritis and statistical analysis performed with IBM SPSS v22.0 software.

Results. Ninety-three patients were included in the study, of these 36 men (38.7%) and 57 (61.3%) women. Mean age of men and women was 60,8 ± 16,9 and 47.7 ± 22.1 respectively (p=0.003). Prevalence of cUTI in men was 34 (94.4%), and in women 19 (33.3%) (p<0.001). Acute pyelonephritis in men was diagnosed only in 2 (5.6%) cases, while in women 38 (66.7%). Multi-infection was found in 7 (19.4%) men and 15 (26.3%) women (p=0.507). In 18 (19.4%) cases, pathogens were isolated from patients' blood, in 6 (33.3%) men and 12 women (66.7%) women. In two thirds of these cases, the isolated bacteria was *E. coli*. Urine isolates were, as follows: *E. coli* 66.7% (22 men and 40 women, p=0.366), *E. faecalis* 8.6% (4 men and 4 women, p=0,706), *K. pneumoniae* 6.5% (2 men and 4 women, p=0.999), *S. epidermidis* 5.4% (3 men and 2 women, p=0.315), *S. agalactiae* 5.4% (1 men and 4 women, p=0.675), other pathogens were isolated less frequently.

Conclusions. Complicated UTI in men were associated with higher age, than in women (p=0.003). Acute pyelonephritis was found considerably more often in women than in men (p< 0.001), while cUTI was diagnosed in men more frequently than in women (p<0.001). The most common bacteria found in urine of both men and women was *E. coli*. Difference in all isolated uropathogenic species between men and women was found to be statistically insignificant.

4. ASSOCIATION BETWEEN MAGNESIUM INTAKE AND CLINICAL OUTCOMES IN PERITONEAL DIALYSIS PATIENTS

Ilze Valaine[1], *Lolita Vija Neimane*[2]

[1] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*
[2] *Rīga Stradiņš University, Riga, Latvia*

Background. Magnesium fulfils important roles in multiple physiological processes, accordingly, a tight regulation of magnesium homeostasis is essential. Dysregulated magnesium serum levels, both hypermagnesemia and hypomagnesemia, are common in patients with chronic kidney disease and have been associated with poor clinical outcomes. In chronic kidney disease patients, dysregulated serum magnesium is an important contributor to all causes of death.

Purpose. The aim of the current study was to assess connection between magnesium intake, serum magnesium, and clinical outcomes in peritoneal dialysis patients.

Materials and methods. Altogether 76 patients (42 men and 34 women) were included in the study with an average age of 58 ± 17 years. Were included Pauls Stradiņš Clinical University Hospital Peritoneal Dialysis Department patients and assessed using several research instruments (questionnaire developed by researcher, 3 day food intake record, laboratory test of serum magnesium, examination of patient records). The acquired results were summarized and analysed.

Results. A half of the peritoneal dialysis patients daily consumed the required amount of magnesium with food, and the serum magnesium levels were normal for the most of the peritoneal dialysis patients.

Conclusions. There is a connection between the amount of magnesium consumed, serum magnesium, and clinical outcomes. The most common comorbidities of peritoneal dialysis patients are coronary heart disease and chronic heart failure. Lower serum magnesium is associated with diabetes, lower serum albumin, and using proton pump inhibitors. The patients who include in their diet wholemeal bread more often have a higher magnesium intake with food and serum magnesium level.

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5. ASSOCIATION BETWEEN BODY MASS INDEX AND BRONCHIAL HYPERREACTIVITY TO METHACHOLINE

Krista Luīze Bicāne[1], *Gunta Strazda*[1,2], *Normunds Jurka*[1], *Valentīna Gordjušina*[1], *Immanuels Taivans*[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. Asthma and obesity have become more prevalent over the past decades; furthermore, obesity is recognised as a risk factor of developing asthma. However, inconsistencies in the scientific literature remain. Bronchial hyperreactivity (BHR) is considered a defining feature of asthma; therefore, association between bronchial reactivity and body mass index (BMI) was studied.

Purpose. The objective of the study is to analyse the association between BMI and bronchial reactivity to methacholine (PD_{20}) in males and females.

Materials and methods. A retrospective analysis included data from 2180 adults (1502 females and 678 males), who underwent methacholine bronchial provocation test to exclude possible asthma diagnosis from July 2014 to November 2017. Provocative dose of methacholine that reduces FEV1 by 20% (PD_{20}) was used as a measure of bronchial reactivity. Subjects were divided into 6 groups: group 1 with PD_{20} <0.094 mg; group 2 with PD_{20} between 0.094 and 0.329 mg; group 3 – PD_{20} 0.329 – 0.799 mg; group 4 – PD_{20} 0.799 – 1.974 mg; group 5 – PD_{20} 1.974 – 3.149 mg and group 6, which showed no significant response to methacholine. Mean BMI was calculated for each of the groups and statistical significance of difference was compared with group 6 using ANOVA.

Results. The highest BMI was observed in group 1 in females (29.15±1.38 vs 26.62±0.39 kg/m^2 in group 6; p=0.0005). Elevated BMI was also found in other female groups compared to group 6 (group 2 – 28.74±1.28, p=0.0019; group 3 – 29.11±0.97, p<0.00001; group 4 – 28.60±0.89, p<0.0001; group 5 – 27.96±0.89, p=0.0072 vs 26.62±0.39 kg/m^2). Our results did not find such correlation in male group (group 1 – 27.06±1.76, p=0.86; group 2 – 26.19±1.62, p=0.40; group 3 – 27.53±1.19, p=0.33; group 4 – 27.57±1.08, p=0.26; group 5 – 27.65±1.33, p=0.29 vs 26.90±0.42 kg/m^2 in group 6).

Conclusions. The results showed that BMI was positively associated with bronchial hyperreactivity in females. No significant correlation between BMI and bronchial hyperreactivity was found in males. Future studies are necessary to establish the mechanisms underlying gender differences.

6. CHANGES OF ANKYLOSING SPONDYLITIS(AS) ACTIVITY AS A RESULT OF THE TREATMENT OF BIOLOGICAL MEDICINAL PRODUCTS

Aļina Ašmane[1], *Olga Leitāne*[1], *Laura Grava*[1], *Mārtiņš Blumbergs*[1], *Daina Andersone*[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. Biological medicinal products have been used for biological treatment for rheumatic diseases for 20 years. They contain proteins of living organisms. Biological drugs have immunomodulatory properties that reduce the level of cytokines in the blood, thus reducing disease activity and improving quality of life. The following metrological indicators were used to evaluate the effectiveness of medicines: BASDAI, BASFI AND ASDAS.

The gold standard for measuring and evaluating disease activity in Ankylosing Spondylitis is the BASDAI, or the Bath Ankylosing Spondylitis Disease Activity Index. The Bath Ankylosing Spondylitis Functional Index was named for the location of the institution (Bath England) where authors A. Calin and colleagues developed this validated index to determine the degree of functional limitation in patients with the inflammatory autoimmune disease Ankylosing Spondylitis (AS). These researchers recognized that, although treatment for AS is focused on pain control and the improvement of function, the available methods of assessing function were not specific to AS and were inadequately validated.

Purpose. To evaluate the efficacy of TNF alpha blockers in 20 AS patients at the beginning and end of a 5-year-period.

Materials and methods. 20 outpatients from the PSKUS Rheumatology Department participated in the study, 6 women and 14 men were enrolled into evaluatiion of completed scales at the time of initiation and last visit: BASDAI, BASFI, ASDAS with 4 activity levels, CRO, ESR.

Results. Before the initiation of TNF α blocker therapy, 58% of patients had low disease activity (BASDAI> 4), spinal cord mobility was reduced by 53% (BASFI> 4, o).

Before the initiation of TNF α blocker therapy, 5% of patients had remission, 10% had a low activity, 79% had otitis media and 6% had a high activity.

After a 5-year treatment efficacy control, 42% had low-libido activity, spinal cord movement was increased in 100% of patients.

After 5 years of treatment with TNF α blockers, 21% of patients had remission, 32% had a low activity, 37% had viviparous activity and 10% had a high activity.

Conclusions. As a result of treatment with TNF α blockers after 5 years, patients with AS experienced decreased inflammatory back pain (0.9) and increased spinal mobility was observed in all patients with reduced mobility. This means that the quality of life of patients has improved. The efficacy of TNF α blockers in reducing disease activity is most pronounced in patients undergoing remission at minimal activity and in patients with environmental activity.

7. EVALUATION OF NASAL VENTILATION OF PATIENT WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Kristīne Jakone[1], *Gunta Strazda*[1], *Normunds Jurka*[1], *Kaspars Peksis*[1], *Valentīna Gordjušina*[1], *Immanuels Taivans*[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. Chronic obstructive pulmonary disease (COPD) is a chronic inflammation of the airways, which causes changes not only in the peripheral airways but also in other airways. There is also an increase in the number of evidence of changes in nasal breathing in connection with COPD.

Purpose. The aim of the work is to compare the changes in nasal resistances (Reff, Reffin and Reffex) in patients with COPD and to determine the correlation between nasal resistances and pulmonary function (FVC, FEV1, FEV1/FVC).

Materials and methods. Rhinomanometry with 4-Phase-Rhinomanometer and spirometry were performed in COPD patients (n=26) and in the corresponding age control group (n=15). To compare the nasal resistances in COPD and the control group, we used one way analysis of variance (ANOVA). To evaluate the relationship between nasal and lung functional parameters for both groups, we used the analysis of covariance (ANCOVA).

Results. We did not find a significant difference between COPD patients and nasal resistances in the control group. In spite of the different values of FEV1/FVC in comparable groups ($p < 0.00001$), we found an affinity that is similar to those in both groups – the higher the nasal resistances, the lower the FEV1/FVC (Reff $p = 0.0302$; Reffin $p = 0{,}0284$; Reffex $p = 0.0234$). The determination coefficient of the general model r^2 (Reff $r^2 = 84.0\%$; Reffin $r^2 = 84.0\%$; Reffex $r^2 = 84.1\%$). Such consistency was not found between nasal resistances and FEV1 or FVC.

Conclusions. Patients with COPD have no increased nasal resistances compared to healthy subjects, but they have an inverse correlation between nasal resistances and respiratory function (FEV1/FVC) values. This indicates that difficulty in breathing through the nose contributes to the formation of obstructive changes in the airways.

8. VITAMIN D LEVEL IN BLOOD FOR CARDIOVASCULAR RISK GROUP PATIENTS IN OUTPATIENT HEALTH CARE

Inita Iļičuka[1], *Dagnija Gulbe*[2]

[1] *SIA "Indra Mukane Family Doctor's Practice", Riga, Latvia*
[2] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. Research has confirmed that insufficient vitamin D levels are associated with skeletal muscle diseases, as well with many other pathological processes in the body, including changes in the cardiovascular health.

Purpose. Identify and evaluate the level of vitamin D in patients with cardiovascular risk in outpatient care.

Materials and methods. The study took place from February to April of 2017 in the practice of a general practitioner. Using a probabilistic multi-step selection method, 100 outpatient card samples were selected for assessing cardiovascular risk and testing vitamin D levels in blood.

Results. 65% of patients with cardiovascular risk were low vitamin D level in blood (<30 ng / ml), 4% deficiency (<10 ng / ml), and 31% had enough vitamin D (> 30 ng / ml). The mean vitamin D value was 24.78 ng / ml, but most often it was 16 ng / ml. The study participants had an average of 24 ng / ml in the period from November to April, but in the period from May to October – 25 ng / ml. The average amount of vitamin D in blood of women was 25 ng / ml, whereas for men it was 24 ng / ml.

Of the 51% of the study participants with a high risk of cardiovascular risk (CVR), 35% had insufficient vitamin D levels and 2% had vitamin deficiencies. Of the 20% of the second largest group of respondents with very high CVR, 15% had insufficient vitamin D, and 1% had a deficit. Of the 4% of the study participants with an extremely high CVR, 2% had a vitamin D deficiency, but 1% of its absence. Of the 13% respondents, insufficient vitamin D was 8% in subjects with increased CVR.

Additionally, risk factors (RF), such as diabetes mellitus (CD), body mass index (BMI), and patient history of cardiovascular disease, were 75% of patients, of which 57% had insufficient vitamin D levels or a lack of it.

Conclusions. Most of the patients in the cardiovascular risk group had insufficient vitamin D levels in blood, regardless of gender and season. Slightly more than a half of patients with additional risk factors had insufficient vitamin D or its absence.

9. CORRELATION BETWEEN ROSACEA AND SYSTEMIC CHRONIC INFLAMATION

Milēna Jakuba[1]*, Māra Rone-Kupfere*[1,2]

[1] *Rīga Stradiņš University, Riga, Latvia*
[2] *Department of Dermatology and Infectology, Rīga Stradiņš University, Riga, Latvia*

Background. *Rosacea* is a chronic skin disease with frequent relapses and therapy resistance characterized by the face erythema, telangiectasia and papulopustular elements. During last several years, the disease prevalence increased rapidly (2–22%) [*Tan,* et al., 2016], which justifies the amount of new research on the topic. Despite the fact that latest scientific research shows correlation between *rosacea* (or others inflammatory dermatoses) and functional dysfunction of digestive system as well as metabolic syndrome, specific retrospective studies are not published yet. It is crucial to identify objective diagnostic markers for improvement of *rosacea* patients' treatment and optimisation of prevention complex (including cardiovascular risk prevention).

Purpose. The objective of the current study was to determine correlation between *rosacea* and systemic chronic inflammation.

Materials and methods. Laboratory analyses of dermatological patients in the period from 2008 to 2017 are used. Patients were divided into 2 groups: with *rosacea* diagnosis as research group and patients with other inflammatory dermatoses (including *acne vulgaris,* psoriasis) as control group. Each patient's specific laboratory markers were analysed – the homeostasis model assessment (HOMA), C reactive protein (CRP), tumor necrosis factor alfa (TNF-alfa), triglycerides, transglutaminase IgG. For data registration, Microsoft Excel 14.7.2 was used, for analysis – IBM SPSS Statistics Data Editor 22.

Results. Data of 121 patients was used. *Rosacea* was diagnosed in 34 patients and 87 patients were in control group. Mean HOMA index was 1.81 in research group and 1.55 in control group (p=0.505). Mean CRP was 0.67 mg/dL and 2.75mg/dL (p=0.301) respectively. Triglycerides level was 1.12 mmol/L in group with *rosacea* diagnosis, 1.08 mmol/L (p=0.553) in group with other inflammatory dermatoses. Transglutaminase IgG level was 1.4 IU/ml and 1.55 IU/ml (p=0.680), respectively.

Conclusions. The correlation between *rosacea* and chronic inflammation is not declared as statistically significant in involved research group. Larger control and research groups are needed to identify the correlation and evaluate the influence of other factors.

10. ANALYSIS OF SURFACE MICROBIOLOGICAL CONTAMINATION IN LATVIAN HOSPITALS

Marina Bogdanova[1], *Angelika Krūmiņa*[1,2]

[1] *Faculty of Medicine, Rīga Stradiņš University, Riga, Latvia*
[2] *Institute of Food Safety, Animal Health and Environment "BIOR", Riga, Latvia*

Background. The one of the most important problems in medical care is health-care associated infections (HAI). Hundreds of millions of patients all over the world are affected by HAI each year that results in prolonged hospitals days, most common complications with long-term disability, increased antimicrobial resistance, highest coast of therapy, and mortality.

Purpose. The aim of study was to analyse surface microbiological contamination in hospitals to identify HAI.

Materials and methods. 180 samples from overall four Riga and Regional hospitals' were taken by wet wipe test for detection of *Staphylococcus spp.,* non-fermenting species of bacteria, coliform bacteria, and sulphite-reducing *Clostridia.* Selective agars were used for microorganism growing and MALDI-TOF-MS for identification. Statistics was performed by MS Excel and IBM SPSS v.21.

Results. 24,5% (n=44) of all 180 samples were positive for at least one of analysed bacteria. Totally were identified 10 different microorganism species: *A. baumannii, P. aeruginosa, S. aureus, S. haemolyticus, S. epidermidis, S. simulans, S. warneri, S. hominis, C. perfringens, and P. septica.* The first three species belong to microorganisms that are causing HAI – this group make 34% (n=15) of all founded bacteria: *A. baumannii* (46,7% of identified HAI), *P. aeruginosa* (33,3% of HAI) and *S. aureus* (20% of HAI). 66,7% of all founded HAI were identified in samples from empty wards, the most common location was bed frames. Comparing Riga and regions, we sum up that 53,3% of founded HAI were in Riga's hospitals, but 46,7% in regions. Despite these results, an overall contamination by HAI-associated microorganisms in regional hospitals was higher: 37,8% of all samples from Riga's hospitals were contaminated by microorganisms, but only 23,5% of them were HAI. In regions, there were 11,1% of samples containing bacteria, but microorganisms causing HAI were 70% of them.

Conclusions.

1) An overall microbial contamination was major in Riga's hospitals, which could be associated with higher number of patients, but the frequency of HAI was greater in the regions. It could be related to special Infection Control Departments in Riga's hospitals that do not exist in regions.

2) Identification of HAI in empty wards, which are ready for new patient intake, shows that there are problems with effective fulfilment of sanitary and counter-epidemic regimen plan in some inpatient departments of Latvian hospitals.

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11. EVALUATION OF MOBILITY IN PATIENTS WITH KNEE OSTEOARTHRITIS AFTER SAPROPEL MUD THERAPY USING WHODAS 2.0 INSTRUMENT

Jevgēnijs Šusts[1], *Inese Kokare*[1,2], *Ilze Hāznere*[1], *Anita Trokša*[1], *Lina Butane*[1], *Ivita Pole*[1], *Jūlija Roze-Verba, Anita Bergmane*[2], *Jānis Zaltāns, Līva Jasote*[1]

[1] *Pauls Stradins Clinical University Hospital, Center for Physical Medicine and Rehabilitation, Riga, Latvia*

[2] *University of Latvia, Riga, Latvia*

Background. Osteoarthritis is a degenerative joint disease predominantly affecting the weight bearing joints including the knee. Osteoarthritis mostly affects people over the age of 60. Limitation of motion in the joint is one of the main symptoms in knee osteoarthritis, which, together with pain, greatly decreases the quality of life. Lately, doctors and patients have been trying to postpone or avoid surgical treatment of knee osteoarthritis by improving the efficacy and duration of pharmacological and other adjuvant treatments including mud pack therapy. WHODAS 2.0 is a disability assessment tool which allows the evaluation of the joint function according to the health status of the patient during the previous 30 days.
Purpose. The aim of this study was to evaluate the efficacy of mud therapy on mobility of patients with diagnosed knee osteoarthritis.
Material and Methods. This study was conducted as a randomised prospective controlled trial. A total of 224 patients with diagnosed osteoarthritis of the knee took part in this trial. Patients were divided into 3 groups. Group 1 (n=73) with mud pack application on the affected knee at 38-40°C. Group 2 (n=73) with mud that had been heated to a temperature of 100°C prior to the procedure thus losing its therapeutic value. Group 3 (n=78), the control group, patients who did not receive mud application. Assessment included the administration of WHODAS II, particularly the mobility domain.
Results. Based on WHODAS II mobility domain, the results demonstrate a statistically significant improvement of mobility in group 1 patients 10 days after treatment and at a 6-month follow up after treatment. With a total score of 10.08 ±3,87 pre-treatment, 8,77±3,29 ($p<0,001$) on day 10 and 8,22±3,39($p<0,001$) at the 6-months follow up. Improvement is also observed in group 2 with a score of 11,19 ±4,82 pre-treatment, 9,62±4,33($p<0,001$) at day 10 and 8,27±3,39($p<0,001$) 6 months after treatment. No improvement was observed in the control group.
Conclusions. A course of 10 days of mud application as a complimentary treatment has a positive effect on patient mobility with diagnosed knee osteoarthritis.
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PAEDIATRICS

1. FACTORS ASSOCIATED WITH GHRELIN LEVELS AMONG CHILDREN AND ADOLESCENTS WITH OVERWEIGHT AND OBESITY

*Ieva Srauhmane[2], **Ilva Daugule**[1], Irēna Rinkuža[1,2], Ingrīda Rumba-Rozenfelde[1,2]*

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Children's Clinical University Hospital, Riga, Latvia*

Background. Obesity can lead to long-term and serious health problems that could affect quality of life and reduce survival. Appetite-regulating gastrointestinal peptide ghrelin affects metabolism and weight, however, the precise activity, as well as association with various factors is not clear yet.

Purpose. To determine the acetylated and total ghrelin level in children with obesity and analyse the factors affecting it.

Materials and methods. The prospective study was conducted at the Children's Clinical University Hospital at endocrinologist's ambulatory admission hours during the period from 2012 to 2017. Blood samples were collected from children with overweight or obesity patients in a specialized vacutainer and concentration of ghrelin, glucose, cholesterol, triglycerides, high density lipoprotein cholesterol (HDL), low density lipoprotein cholesterol (LDL), *H. pylori* and insulin like grow factor -1(IGF-1) was determined. Statistical analysis: Spearman correlation test, Kruskal-Walis test, multivariate regression analysis.

Results. In total, 92 children and youngsters aged 2 to 17 years participated in the study.

Level of total and acylated ghrelin correlated with BMI percentiles (p=0,070). Acetylated ghrelin was higher in patients with overweight (326,8 pg/ml) compared to patients with obesity 164,8pg/ml (p<0,005). The level of total ghrelin was significantly higher in overweight patients than in obese patients (452,7pg/ml vs 266,08 pg/ml; p=0,008).

A negative correlation was observed between total/acetylated ghrelin and IGF-1 (correlation coefficient -0,284 (p=0,0136) and -0,349(p=0,0025), respectively). A positive correlation was observed between total ghrelin level and triglycerides (correlation coefficient 0.298, p = 0.037). In patients with *H. pylori* infection, total/acylated ghrelin levels were 464.147pg/ml and 193.62 pg /ml, (P> 0.05), respectively. No correlation was found with LDL and HDL.

In the multivariate analysis, the total ghrelin level was significantly correlated with IGF-1 (p = 0.0025), BMI percentiles (p = 0.07) and triglyceride (p = 0.02); acetylated ghrelin – with IGF-1 (p = 0.0025) and triglyceride (p = 0.06).

Conclusions. In the studied population, the total and acetylated ghrelin level correlated with the BMI percentiles and was higher in overweight patients compared to obese patients, indicating a possible resistance and suppression of ghrelin in neuroendocrine axis in overweight/obese children.

The observed negative correlation between ghrelin and IGF-1 indirectly refers to growth hormone and IGF-1 negative feedback with ghrelin secretion.

Correlation between the level of ghrelin and triglycerides could indicate the role of dietary triglycerides in the development of the ghrelin synthesis, as well as the possible effects of the ghrelin on the accumulation of triglycerides, which should be further studied.

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2. INFANT BREAST MILK COMPOSITION AND ASSOCIATED FACTORS

Laura Lagzdiņa[1], *Līga Broka, Ilva Daugule*[1], *Inga Ciprovič*a[2], *Ingrīda Rumba-Rozenfelde*[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*

[2] *Faculty of Food Technology, Latvian University of Agriculture, Jelgava, Latvia*

Background. Although the benefits of breast-feeding have been known for a long time, and breast milk is considered as ideal nutrition for infants, composition of breast milk is still a matter for research, since breast milk differs among mothers and populations, as well as during different times of lactation. Previously, a study has been performed about breast milk composition among lactating women in Latvia during the first month of lactation, while there is no study about breast milk composition during further lactation period.

Purpose. The aim of the study was to determine the composition of breast milk and influencing factors thereof among lactating women in Latvia in different lactation periods, as well as to compare the results with data from other countries.

Materials and methods. Thirty-six breast milk samples were gathered from the 36 random mothers (from 2nd to 6th month of lactation), living in different cities of Latvia. Milk samples were analysed in Latvian University of Agriculture (pH, density, protein, fat, and lactose concentration). Mean values (95% confidence interval) were calculated with *MedCalc*.

Results. Breast milk composition among lactating women on the 2nd – 6th lactation month is shown in the table below.

Table

Breast milk composition among lactating women

Macroelements	Concentration % N=36	Confidence interval (95%)
pH	6.487	6.4377 to 6.5367
Density kg/m3	1017.962	1008.8439 to 1027.0791
Protein	1.100	1.0391 to 1.1609
Fat	2.771	2.2359 to 3.3053
Lactose	7.254	71.1326 to 73.9533

Breast milk composition among lactating women was comparable to data from lactating women in Latvia on the 11th to 28th lactation day, although concentration of fat in the studied samples was significantly lower (2.7% vs. 4.42%).

The milk protein concentration in our samples was higher (1.1% vs. 0.9%), while fat concentration was lower (2.7% vs. 5.2%) compared to the data from the American Academy of Paediatrics.

Conclusions. Although the composition of the studied milk samples among lactating women in Latvia on the 2nd to 6th lactation month was comparable to data from other countries, the content of fat was significantly lower compared to American data, possibly reflecting dietary differences among mothers.

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3. AUTOIMMUNE INDICATORS IN PEDIATRIC ARTHRITIS PATIENTS

Liene Maulica[1,2], *Sandra Feierābende*[1], *Ieva Saulīte*[1,2], *Ilva Daugule*[1], *Ingrīda Rumba-Rozenfelde*[1,2]

[1] *University of Latvia, Riga, Latvia*
[2] *Children's Clinical University Hospital, Riga, Latvia*

Background. The most common children's chronic rheumatic disease is Juvenile Idiopathic Arthritis (JIA). JIA is developing as a result of various external factors and it is genetically predisposed, chronic autoimmune disease. Reactive arthritis (ReA) is mainly postviral and needs to be differentiated from JIA. Clarifying the expression of autoimmune parameters in paediatric arthritis patients is necessary for establishing an early diagnosis.

Purpose. To establish the association of autoimmune parameters in patients having juvenile idiopathic arthritis and reactive arthritis.

Material and methods. In a retrospective study, data was obtained from patients' medical records. The study included 41 patient with JIA (1 to 18 years of age, 32 girls). Diagnosis of juvenile idiopathic arthritis was made according to (ILAR,2001) diagnostic criteria. Further, 30 reactive arthritis patients included in the study were from 3 to 17 years of age, girls – 18. The following autoimmune parameters in paediatric arthritis patients were analyzed: antibodies to double-stranded DNA (anti-dsDNA), antinuclear antibodies (ANA), Serum amyloid A (SAA), tumor necrosis factor alpha (TNF-alpha), anti-Cyclic Citrullinated Peptide (anti-CCP).

Results. The distribution of hospital patients according to juvenile idiopathic arthritis subtypes showed similarity to distribution described before (Barut et al., 2017): polyarticular seropositive JIA – in 3(7.3%) patients, polyarticular seronegative JIA – in 19(46%) patients, oligoarticular persistent JIA – in 10(24%) patients, oligoarticular extended JIA – in 1(2%) patient, psoriatic JIA – in 2(4,8%) patients, enthesitis – in 6(14,6%) patients, systemic JIA was not diagnosed in any patient.

An increase of anti-CCP antibody level was more frequently observed ($p<0,05$) in patients having JIA, while no difference was observed in respect to an increase of TNF-alpha between patient groups. Antinuclear antibody level was increased in the polyarticular JIA group, but elevations did not show a statistically significant difference compared to reactive arthritis group.

Conclusions. Thus, the data showed a moderate activity among JIA and reactive arthritis patients, marked elevation of anti-CCP was detected among polyarticular juvenile arthritis patients.

4. COMPARISON OF EFFICACY OF THE MONTESSORI THERAPY AND APPLIED BEHAVIOR ANALYSIS THERAPY IN CHILDREN WITH AUTISM SPECTRUM DISORDERS

Aleksandrs Vasiļonoks[1], *Marija Namestnikova*[2], *Nina Šakele*[2], *Ņikita Šakels*[2], *Valdis Folkmanis*[2,3], *Lilian Tzivian*[2]

[1] *Children's Clinical University Hospital, Riga, Latvia*
[2] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[3] *Centre of Social Podiatry, University of Latvia, Riga, Latvia*

Background. According to the World Center for Disease control, in the last 10 years the frequency of symptoms of autism spectrum disorders in Europe increased more than twice (from 1: 150 to 1:68). Children with Autisms spectrum disorders may have different problems, such as problems with fine motoric function, listening, reading, behavior problems and many others. Up to date, there is no effective autism therapy worldwide. Two mostly known methods of such a therapy are Applied Behavior Analysis (ABA) and the Montessori therapy. Some studies investigated the results of ABA therapy efficacy in children with Autism spectrum disorders, but studies on the Montessori therapy with regard to these disorders are scarce. Of these, only one study on the efficacy of the Montessori therapy was performed in Latvia.

Purpose. To compare differences and efficacy of two most popular ABA therapy and the Montessori therapy.

Materials and methods. We used the data from the prospective Multisensory therapy efficacy study (2013–2016). In this study, the efficacy of the Montessori method of therapy was investigated, involving35 children with Autism disorders syndrome. We compared results of this study with the results of and 5 international studies on ABA therapy (study population varied from 19 to 45). We calculated the percentage of effective treatment in concordance with different problems of children with Autism spectrum disorders.

Results. Classes at the Montessori method showed improvement in 72% of children, and were mostly effective for children with speech and small motoric problems. According to different reviews, ABA therapy showed improvement in 42–90% of cases, mostly in children with problems in listening perception.

Conclusions. Each method of therapy gives better results with regard to fixed problems of Autisms spectrum disorders. Therapy prescribed for each individual case should be differentiated according to the major problem of each child.

5. PREVAELANCE OF IGE-RELATED ALLERGY AND ASSOCIATION WITH RISK FACTORS IN A GROUP OF LATVIAN CHILDREN WITH FOOD ALLERGY

Marija Namestnikova[1]*, Ilva Daugule*[1]

[1] *University of Latvia, Faculty of Medicine, Riga, Latvia*

Background. Prevalence of allergic diseases has grown rapidly and continues to rise. Recently the role of IgE in the development of allergy has been discussed. Although the most common food products that cause an increased allergic response are cow's milk, eggs, wheat, fish, and peanuts, the most allergenic products could vary in different populations. In addition, several factors as type of delivery, breast-feeding, family atopy and the use of antibiotics in the first year of life could influence development of allergy.

Purpose. To detect the proportion of IgE related food allergy and most often observed allergenic products among allergic children, and further, to analyse association between family anamnesis, type of delivery, breast feeding and presence of IgE related allergy.

Materials and methods. A retrospective study was carried out in Children Clinical University Hospital outpatient allergologist consultation, analyzing data about all children attending the consultation during 2016. The statistical analysis used: x^2 test, *Mann-Whitney* test.

Results. The total patient sample included data about 174 children (107 male, mean age 6.7, SD +/-4.27 years). The total IgE antibody titre was elevated in 42%(73/174) in children. The total IgE levels were increased in 47% (34/73) children < 6 years compared to 53% in children>6 years (p=0.065). In the majority of children, specific IgE was elevated against the food panel with egg white, cow's milk, wheat, rice, peanut, soy bean protein - 65.3%(49/73), in 22.7% (17/73) of children – against the panel of peanuts, hazelnuts, brazil nuts, almonds, coconuts; in 18,7% (14/73) and 13.3%(10/73) – against food panel with orange, apple, banana, peach and pork, beef, chicken meat, lamb meat, respectively.

Allergy in family was observed in 34.7% (25/73) of children with IgE related allergy compared to 24% (24/101) among children with non-IgE related allergy (p=0.002). Breast feeding for five months was observed among 32.4% (23/73) of children with IgE related allergy compared to 21.4% (21/101) among children with non-IgE related allergy(p<0.0004). Antibacterial treatment was observed among 41.4% (12/73) of children with IgE related allergy compared to 24.3% (9/101) among children with non-IgE related allergy (p=0.053).

Conclusions. Large proportion of the studied allergic children had non-IgE related allergy, arising discussion about the role of other factors in the development of allergy. However, the most often observed allergens were similar to data from other populations. Allergy in family anamnesis and breast-feeding rather played a role in the development of IgE-related allergy compared to non-IgE related allergy.

6. QUALITY OF LIFE OF OVERWEIGHT AND OBESE CHILDREN IN LATVIA

*Madara Rudzāte[1, 2], **Kristīne Kurtiša**[1], Irēna Rinkuža[1, 2], Ingrīda Rumba-Rozenfelde[1, 2]*

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Children's Clinical University Hospital, Riga, Latvia*

Background. Obesity is an increasing problem not only in industrialized countries, but also in Latvia (S. Kupča et al., 2013). The most disturbing fact is that the number of children with overweight and obesity keeps growing. Many studies are dedicated to weight problems as a risk factors for different diseases, but none about the quality of life of children with obesity and overweight in Latvia.

Purpose. To establish, whether paediatric overweight or obesity do affect the quality of life in its different categories.

Materials and methods. The patient group included 87 children aged 8 to 17 years with overweight and obesity according to age related BMI percentile charts, and their parents. Basic anthropometric measurements – height and body weight – were performed on each patient during an endocrinologist's visit. From the obtained data, the BMI was calculated and results were compared with the BMI percentile charts according to the child's age. If the data showed overweight or obesity, the patient and his or her parents were asked to participate in the study to analyse their quality of life according the *KIDSCREEN-52* survey (Ravens-Sieberer U. et al., 2005, The KIDSCREEN Group Europe, 2006).

Statistical analysis was performed, using Mann-Whitney test, Pearson correlation coefficient.

Results. Based on HRQoL survey data among obesity or overweight patients' families, statistically significantly higher scores were obtained from children compared to their parents in such categories of life quality evaluation as mood and emotions, psychological well-being, self-perception, school environment and social acceptance. The most significant difference was observed between children and parents answers about physical well-being ($p<0.001$), i.e. – children evaluated their mood better than their parents did.

In addition, obese children assessed their quality of life significantly higher than children with overweight, in home and family life categories ($p=0.03$).

Conclusions. Paediatric obese patients assessed their quality of life higher than the respective parents did. Level of BMI excess affects the quality of life evaluation in patients.

7. PEDIATRIC INTRA-ABDOMINAL ABSCESS MANAGEMENT IN CHILDREN'S HOSPITAL, AFFILIATE OF VILNIUS UNIVERSITY HOSPITAL SANTAROS KLINIKOS

Diana Maldžiūtė[1], *Raminta Martinaitytė*[1], *Jonas Puodžiu*[1], *Kęstutis Trainavičius*[2]

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

Background. Intra-abdominal abscesses in paediatric population are associated with complicated appendicitis. Empiric antibiotics should be initiated immediately at the presence of an intra-abdominal abscess. Further treatment could be only conservative, percutaneous drainage or aspiration, laparoscopic or laparotomic abscessectomy.

Purpose. The aim of the study was to analyse paediatric intra-abdominal abscess management in Children's Hospital, the affiliate of Vilnius University Hospital Santaros Klinikos.

Materials and methods. A retrospective analysis of hospitalized patient medical files during 2012.01.01–2016.12.31 was performed. Patients with radiologically or surgically confirmed intra-abdominal abscess were included in the study. Treatment failure was defined as the need for additional intervention after initial treatment. The statistical analysis was performed using SPSS 22.0.

Results. 22 children were included in this study, with a mean age 10,6 years, female male ratio 1:1.2. 22 primary abscesses with a mean diameter of 77,5 mm were treated. Appendicitis was associated with 91% of all abscesses. The initial treatment was successful for 14 patients. 6 patients received an initial conservative treatment, 4 of them (67%) needed additional intervention. There was no significant difference in length of hospitalization between treatment groups. Successful transrectal drainage was accomplished in two cases. In one case, intestinal fistula presented after laparoscopic appendectomy and abscessotomy.

Conclusions. We conclude that majority of our hospital patients were successfully treated invasively. The selection of treatment tactic should rely on patient's health status, localization of the abscess and doctor's experience, not only the size of the formation and/or duration from onset of symptoms to hospitalization. Calculated statistics may be unrepresentative of the actual situation due to the small study sample.

8. COMPARISON OF CHILDREN RECEIVING ANTIBIOTIC THERAPY WITH CHILDREN UNDERGOING APPENDECTOMY FOR TREATMENT OF ACUTE APPENDICITIS

Leila Geibijeva[1], *Ritvars Kalniņš*[1], *Lilian Tzivian*[1], *Valdis Folkmanis*[1], *Paulis Laizāns*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Pediatric Surgery Clinic, Children's Clinical University Hospital, Riga, Latvia*

Background. Acute appendicitis is one of the most common abdominal emergencies that may require surgery. The decision whether to operate on the patient (complicated appendicitis) or not (non-complicated appendicitis) is the key in management of acute appendicitis. It is important to understand the benefits and disadvantages of both treatment options, keeping in mind that appendectomy itself carries risks including mortality. For that purpose, it is necessary to perform a detailed analysis of patients with and without a diagnosis of complicated appendicitis.

Purpose. To compare patients with complicated and non-complicated appendicitis based on their demographic and disease-related parameters.

Materials and methods. Cross-sectional analysis of the Children's Clinical University Hospital's archive was performed using the 'Andromeda' system. We assessed patients with primary acute appendicitis diagnosis that were included in the database in 2017. Descriptive statistics were calculated for all study variables. We used Chi-square and t-tests to compare patients with complicated and non-complicated appendicitis in their demographic (age, gender) and disease-related (i.e. time of hospitalization, laboratory tests) parameters.

Results. The study sample consists of 220 patients with a mean of age 11.9 years (SD = 3.7), mostly boys, 86.6% older than 7 years. 61.8% were diagnosed with complicated appendicitis and were operated on immediately. In those older than 7, most of the patients had heightened inflammatory markers at the time of hospitalization, with significantly higher values for patients with complicated appendicitis (Chi square test, $p < 0.01$). Of those patients that were initially diagnosed as non-complicated, 13.6% were operated on after the initial treatment. Of those that had complicated appendicitis, 6.1% had been diagnosed with non-complicated appendicitis in the past. There was no significant difference between genders in the type of diagnosis. Median time of hospitalization was 5.0 days (range from 2 to 20). Significant difference was found in the time of hospitalization ($t = 13.2$, $p < 0.01$) with the mean time of hospitalization for complicated 6.27 (SD = 2.5) vs. 3.15 (SD = 0.74) days for non-complicated patients.

Conclusions. New recommendations for appendicitis diagnosis (complicated/non-complicated) were introduced by the medical personnel of the Children's Clinical University Hospital in 2017. As a result of the new recommendations, the hospitalization times, quality of life and recovery time of non-complicated patients have significantly improved, demonstrating the importance of correct initial diagnosis in children with appendicitis.

9. MATERNAL RISK FACTORS FOR STILLBIRTH: POPULATION BASED STUDY

Irisa Zile[1,2], *Inguna Ebela*[1], *Valdis Folkmanis*[1], *Ingrida Rumba-Rozenfelde*[1]

[1] *Faculty of Medicine, Department of Paediatrica, University of Latvia, Riga, Latvia*
[2] *The Centre for Disease Prevention and Control of Latvia, Riga, Latvia*

Background. The number of stillbirths has decreased more slowly than the maternal mortality or mortality in children younger than 5 years worldwide, which have been explicitly targeted in the Millennium Development Goals. Placental pathologies and infection associated with preterm birth are linked to a substantial proportion of stillbirths. Appropriate preconception care and quality antenatal care that is accessible to all women has the potential to reduce stillbirth rates.

Purpose To assess potential risk factors associated with stillbirth within maternal medical diseases and obstetric complications.

Materials and methods. Retrospective cohort study (2001–2014) was used to analyse the data from the Medical Birth Register on stillbirth occasions and live births as controls. In total, the data on 293,206 was analysed. Adjusted Odds ratios (OR_{adj}) with 95% confidence intervals (CI) were estimated. Multiple regression model adjusted for maternal age, parity and gestational age.

Results. There was a total of 1,813 stillbirths and 291,393 live births between 2001 and 2014 in Latvia. The stillbirth rate was 6.2 per 1,000 live and stillbirths taken together. There were 73.5% (95%CI 71.4%–75.5%) antepartum stillbirth cases. The presence of maternal medical diseases greatly increased the risk of stillbirth, including diabetes mellitus (OR_{adj}=2.5; 95%CI 1.6–4.0; p<0.001), chronic hypertension (OR_{adj}=3.1; 95%CI 1.6–6.0; p<0.001), oligohydromnios/polyhydromnios (OR_{adj}=2.4; 95%CI 1.9–2.9; p<0.001). Pregnancy complications such as abruptio placenta (OR_{adj}=2.8; 95%CI 2.2–3.5; p<0.001) and intrauterine growth restriction (OR_{adj}=2.2; 95%CI 1.8–2.7; p<0.001) were important risk factors for stillbirth. Pregnancy with Rhesus isoimmunisation, pregnancy-induced hypertension and gestational diabetes also increased the odds of stillbirth risk but not statistically significantly. The proportion of Rhesus isoimmunisation was higher for stillbirth than live births (χ^2=11.3; p<0.01), respectively 1.1% to 0.5%; pregnancy-induced hypertension (χ^2=12.0; p<0.001), respectively 4.7% to 3.3% and gestational diabetes (χ^2=5.8; p<0.05), 1.0% to 0.6%.

Conclusions. Risk factors most significantly associated with stillbirth include maternal history of chronic hypertension and abruptio placenta. Early identification of potential risk factors and appropriate perinatal management are important issues in the promotion of adverse foetal outcomes and preventive strategies need to focus on improving antenatal detection of foetal growth restriction.

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10. CONSERVATIVE AND OPERATIVE TREATMENT OF PANCREATIC INJURY IN CHILDREN'S HOSPITAL, AFFILIATE OF VILNIUS UNIVERSITY HOSPITAL SANTAROS KLINIKOS

Agnė Matuolytė[1], *Rūta Vilija Dagilytė*[1,2], *Kęstutis Trainavičius*[1,2]

[1] *Faculty of Medicine, Vilnius University, Lithuania*
[2] *Children's Hospital, Affiliate of Vilnius University Hospital Santaros Klinikos, Lithuania*

Background. As the incidence of children sustaining blunt pancreatic trauma is low, the treatment of such injury remains controversial. In the past decade, there has been an ongoing debate, whether the optimal approach is operative intervention or conservative treatment.

Purpose. To investigate the trauma mechanism, demographic data, results of laboratory tests as well as treatment approach and its outcome of patients admitted to Children's Hospital, Affiliate of Vilnius University Hospital Santaros Klinikos due to pancreatic trauma from 2011 to 2017.

Materials and methods. Retrospective analysis of 9 case histories of children admitted to Children's Hospital, Affiliate of VUHSK due to pancreatic trauma from 2011 to 2017 was carried out. Data was evaluated using Microsoft Excel and IBM SPSS Statistics 24 programme.

Results. The mean age of patients was 9.6 years. The dominant trauma mechanism – blunt injury caused by a fall from bike (n=5). Leucocytosis after trauma was observed in all the patients (the average 15,76 x 10^9/l ± 7,77). Anaemia was seen in 55.5% of cases (n=5). Since the specifity of amylase in greater in children, alfa-amylase levels in urine were evaluated in our study. The average alfa-amylase levels of all patients was 449,7 U/L ± 213.0. Operative treatment was applied to 77.8% of patients (n=7), while the rest were treated conservatively. The average length of stay in ICU in the operated group – 5.57 ± 2.2 days compared to 2 ± 2.2 in the conservative treatment group, but according to T-test the difference is not statistically significant (p=0.135). The average length of hospitalization in operative treatment group – 29.7 ± 5.2 days and 25 ± 5 days in the conservative treatment group. However, the performed T-test showed that length of stay in hospital in two groups does not differ statistically significantly (p=0.534). Antibacterial treatment was given to 77.8% patients with co-amoxiclav and cefuroxime being the most often used antibiotics (each used 28,6%). There was no dominant operative method in the treatment of pancreatic trauma, it ranged from laparoscopy to laparotomy in various cases due to severity of injury. Treatments like marsupialization, drainage and cystectomy of pancreatic pseudocyst were also observed.

Conclusions. In Children's Hospital, Affiliate of Vilnius University Hospital Santaros Klinikos, operative approach remains the dominant treatment of pancreatic injury. However, according to our data, in our hospital, the length of stay in ICU or hospital does not differ significantly between the operative and conservative treatment groups.

11. ATTACHMENT STYLE AND ILLNESS BEHAVIOUR IN MIDDLE CHILDHOOD PRIMARY CARE ATTENDERS WITH FUNCTIONAL SOMATIC SYMPTOMS

Andis Užāns[1], *Gunta Užāne*[2] *Vija Siliņa*[3]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Outpatient Clinic "Veselības centru apvienība, MC Jugla", Riga, Latvia*
[3] *Primary Care Practice SIA VijaMed, Riga, Latvia*

Background. Somatic symptom complaints that cannot be explained by organic findings are common in primary care settings, up to 30% of visits. Somatic symptoms are often explained by somatization. Somatization-related illness behaviour is a debilitating lifelong condition with heavy burden to health care system, a decrease in quality of life. The condition starts in middle childhood. Somatic symptom presentation may be a normal trait. Different approaches have been used to explain risk factors of somatization-related illness behaviour. Attachment insecurity is extensively studied within the last decade, but still short of experimental findings in population and clinical studies.

Purpose. The objective of the current research is to test whether attachment insecurity is a risk factor with regard to somatization-related illness behaviour in middle age child primary care attenders.

Materials and methods. Children aged 8 to 12 year were identified through analysing medical records in five urban primary care practices in Riga (the total number of registered children in age group – 389) Patients with diagnoses of functional syndromes without organic cause (n=96) were selected for the study. Informed parental consent and child's assent to participate was received in 69 cases. Child Somatization Inventory (CSI), Child Attachment Interview (CAI), Illness Behaviour and Social Adjustment questionnaire was used. Analytic statistics was performed using Two-tailed unpaired t-test for numerical variables and Chi –square test for categorical variables.

Results. Descriptive statistics: the mean age of group is 10,2 (SD 1, 24), 65 % female. Attachment style at representational level was coded in two way secure/insecure (S/I) classification. S n=17 (39,5%) (female n=12, 70,6%), I n= 26 (60,5%) (female n=16, 61,5%) Somatization symptoms in CSI mean in S group were 6,7, I group – 8,4. T-test two-tailed is 0,074. Illness behaviour distribution in S group distribution: "less then monthly" n=16, "weekly" n=1, in I group "less then monthly" n=15, "monthly" n=8, "weekly" n=3. The Chi-square statistic is 5,731, p value is 0,01668 p <0,05

Conclusions. Insecure attachment style at representational level is moderately associated with multisymptomatic somatisation. Insecure attachment style is associated with illness behaviour in comparison to secure attachment. Illness behaviour is moderately expressed and probably unrecognized in primary care practices.

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12. ROLE OF ADOLESCENT PSYCHOTHERAPY IN THE HEALTH CARE SYSTEM

Inta Zīle[1,2]*, Valdis Folkmanis*[1]*, Lilian Tzivian*[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *I. Zīle, Practice in Psychotherapy, Riga, Latvia*

Background. Adolescence is a specific period in life, during which not only biological, but also psychological changes occur. These can result in formation of different disturbances that would affect the further quality of life. During the last decades, the number of adolescents with chronic fatigue and chronic pain has increased. Pharmacological treatment is less effective for adolescents; therefore, psychotherapy is the first line of treatment. Adolescent psychotherapy promotes healthy personal development, decreases ill-disposed fixations and somatization, relieves chronic somatic illnesses, helps to minimise doses of medications, treats psychiatric and psychosomatic disturbances, increases quality of life, and decreases expenses for medical procedures lifelong.

Purpose. The objective of the current study was to assess and summarise results of long-term adolescent psychotherapy.

Materials and methods. Nine adolescent patients aged from 12 to 18 that underwent long-term adolescent psychotherapy (at least for one year, 1 or 2 times a week) between 2015 and 2017, were enrolled in the study. We used psychodynamic assessment in the beginning and at the end of the treatment to assess changes in the psychological status of adolescents due to psychotherapy.

Results. Each of the adolescents had his/her specific problems. The following problems were identified: bullying at school; drug addiction and bipolar disorders; somatization and bullying at school; medium-to-severe depression with suicidal thoughts; post-suicide affective disturbance combined with unstable emotional personality; severe suicidal depression with psychotic symptoms; irritable bowel syndrome; medium-level depression with panic attacks; affective dis-regulation. Two of nine adolescents additionally had computer addiction, and three of them could not attend school because of the symptoms. The median psychotherapy duration was 1.5 years. After psychotherapy we observed the following changes: improved psychosocial adaptation (ability to attend school, better academic results and relationship with parents and peers, no more bullying), decreased somatic complains and panic attacks, milder behavioural disturbances and less anti-social behavior, lower doses of medication, visits to other doctors necessary more rarely, absence of hospitalization in psychiatric or somatic clinics.

Conclusions. Adolescent psychotherapy is an effective treatment and prevention method for disturbed adolescents with somatic, psychiatric and social difficulties.

13. THE MOST FREQUENT VISUAL APPARATUS DISEASES AMONG PATIENTS WITH CLEFT LIP AND/OR PALATE

Arina Tupīte[1], *Artjoms Tupīts* [2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Department of Oral and Maxillofacial Surgery, Rīga Stradiņš University, Riga, Latvia*

Background. Cleft lip and/or palate are the most common form of craniofacial defects and may occur isolated or in association with many other structural abnormalities. It is estimated that these defects affect approximately 1 in every 600 newborn babies worldwide. Each year in Latvia about 30–40 babies are born with an orofacial clefts (OFCs).

Purpose. To identify and analyse the prevalence of ophthalmologic problems among children with OFCs.

Materials and methods. The total of 153 parents were surveyed in Riga Cleft Lip and Palate Centre from November of 2015 to December of 2016. The questionnaire consisted of 10 questions asking parents about child's concomitant and ophthalmologic diseases.

Results. In total, 153 questionnaires were included in this study. Of the 153 patients with cleft lip and palate screened, 23 (15%) had ocular abnormalities. Eyelid abnormalities were the commonest accounting for 63 % of the total defects. Second commonest abnormality was squint (27%), abnormalities of the nasolacrimal apparatus (8%) and refractive errors (2%).

Conclusions. Our survey revealed that eyelid abnormalities, nasolacrimal duct dysfunction and refractive errors are the commonest ophthalmic pathologies. Children with OFCs should be assessed as soon as possible after birth by a multidisciplinary team, also involving the ophthalmologist.

NEUROLOGY AND PSYCHIATRY

1. DEPRESSION AND QUALITY OF LIFE AMONG LATVIAN DIABETIC PATIENTS: A CROSS-SECTIONAL STUDY

Veronika Jakupceviča[1]

[1] *Faculty of Medicine, Rīga Stradiņš University, Riga, Latvia*

Background. Depressive disorder is highly prevalent among diabetic patients with a negative impact on the quality of life.

Purpose. The aim of the study was to determine prevalence of depression symptoms and severity among diabetic patients, evaluate quality of life for diabetic patients.

Materials and methods. A cross-sectional study was designed. Specifically for the study a questionnaire was compiled. For devising the questionnaire, a sociodemographic questionnaire was used, as well as PHQ-9, SF-36 assessment tools. The study took place at Riga East University Hospital Outpatient Department. In total, 101 diabetic patients were interviewed. The interview on the average took 20 minutes. MS Excel database was designed for data collection and basic statistics. IBM SPSS was performed for data analysis.

Results. In total, 83 (82,2%) had type 2 diabetes and 17 (16,8%) had type 1 diabetes, one (1%) had diabetes of another type. Depression symptoms were present in 33 (32,7%) patients: 21 (20,8%) had mild depression symptoms, 7 (6,9%) had moderate depression symptoms, 3 (3%) – moderately severe depression symptoms, 2 (2%) –) severe depression symptoms. Diabetic patients' general health, according to self-evaluation was: 60 (59,4%) fair, 27 (26,73%) good, 14 (13,9%) poor. Diabetic patients with depression symptoms had poorer quality of life indices than diabetic patients without depression symptoms: physical functioning 67,12 versus 82,57; role functioning/physical 40,15 versus 82,72; role functioning/emotional 59,59 versus 93,14; energy/fatigue 45,61 versus 70,88; emotional well-being 61,09 versus 84,65; social functioning 70,08 versus 95,59; pain 57,27 versus 82,65; general health 30,00 versus 46,79. There is a strong correlation between depression and role functioning/physical (*Spearman's rho* = -,515; p= 0,000), depression and energy/fatigue (*Spearman's rho* = -,680; p= 0,000), depression and emotional well-being (*Spearman's rho* = -,636; p= 0,000), depression and social functioning (*Spearman's rho* = -,636; p= 0,000).

Conclusions. Depression is highly prevalent among diabetic patients and depression screening should be performed. Depression has a negative impact on the quality of life. There is strong correlation between depression and role functioning/physical, depression and energy/fatigue, depression and emotional well-being, depression and social functioning.

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2. FREQUENCY OF PSYCHIATRIC DISORDERS IN WOMEN OF REPRODUCTIVE AGE IN RIGA MATERNITY HOSPITAL

Linda Rubene[1], *Elmārs Rancāns*[1,2]

[1] *Rīga Stradiņš University, Riga, Latvia*
[2] *Riga Psychiatry and Narcology Centre, Riga, Latvia*

Background. Disturbances in mental health in the perinatal period can cause negative personal and child developmental outcomes. There are several risk factors to take into consideration and the major ones include previous psychiatric disorders.

Purpose. To find out the frequency of patients with different psychiatric disorders in the past or at the moment of the interview at the Riga Maternity Hospital.

Materials and methods. The study was performed during the period from 01.02.2017 to 31.12.2017 in Riga Maternity Hospital, encompassing 235 women in the reproductive age range at the post-delivery ward. Data collection was based on questionnaire including basic patient information, and the M.I.N.I (mini-international neuropsychiatric review). Data was processed in Microsoft Excel.

Results. Altogether 75 (31,9%) of the women had some kind of psychiatric disorder according to M.I.N.I in the past or at the moment of the interview. To differentiate various disorders, 41 (17,4%) patients had depression, 3 (1,3%) – mania, 9 (3,8%) – hypomania, 5 (2,1%) – panic disorder with agoraphobia, 1 (0,4%) – panic disorder without agoraphobia, 13 (5,5%) – agoraphobia without panic disorder, 15 (6,4%) – generalized panic disorder, 19 (8,1%) – obsessive compulsive disorder, 3 (1,3%) – post-traumatic stress disorder, 5 (2,1%) – mood disorder with psychotic symptoms, 4 – psychotic disorder, 1 (0,4%) – bulimia, 6 (2,6%) – generalized anxiety disorder.

Conclusions. This study showed that over 30% of the women who were at the Riga Maternity Hospital had psychiatric disorders. Considering this, we can conclude that it is important to ask patients about their past and present mental health, otherwise for a large group of the patients one of the major risk factors for perinatal psychiatric disorders remains not assessed, which decreases the ability to provide adequate prophylaxis and treatment in time.

Acknowledgements. The study was brought in collaboration with the Riga Maternity Hospital and RSU Psychiatry and Narcology Department.

3. COMORBIDITY OF ANXIETY, DEPRESSION AND HYPOCHONDRIASIS IN GASTROENTEROLOGICAL PATIENTS

Lukas Aranauskas[1], *Deima Eitmontaitė*[1]

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

Background. The significance of mental disorders is likely to be underestimated because of poor understanding of interconnection between mental and physical health. Many health conditions escalate the risk for mental disease, and comorbidity often impedes diagnosis.

Purpose. To establish a link between anxiety, depression, hypochondriasis, demographics and unhealthy habits in gastroenterological patients.

Materials and methods. During the period from January 2017 to May 2017, a prospective study including gastroenterological patients had been performed in Vilnius University Hospital Santaros Klinikos. Each patient, before undergoing a colonoscopy procedure, was asked to fill in a pre-compiled questionnaire. The questionnaire comprised questions regarding demographics, unhealthy habits, and concomitant illnesses. Hospital Anxiety and Depression Scale (HADS) and Health Anxiety Self-Assessment (Whitley index) questionnaires were integrated.

Results. The study population consisted of 43 patients (mean age 57.052 ± 17.509 years; 62.8% males, 38.2% females). 46.5% of the patients admitted to consuming alcohol regularly. Alcohol-consuming patients had significantly more pronounced anxiety (Cohen-d index 0.73), depression (Cohen-d index 0.62) and hypochondriasis (Cohen-d index 0.76). A connection was found both between anxiety and depression symptoms (Spearman coefficient 0.312) and between anxiety and hypochondriasis (Spearman coefficient 0.437). Scale reliability Cronbach's alpha results: anxiety questionnaire – 0.631, depression – 0.662, hypochondriasis – 0.836.

Conclusions. The patients who admitted to consuming alcohol on a regular basis had more pronounced signs of anxiety, depression and hypochondriasis compared to the patients who abstained from alcohol. Anxiety had a direct link with hypochondriasis. Quite significant scale reliability was determined, especially on hypochondriasis scale. Mental disorder awareness has to be raised among healthcare professionals and incorporated into all aspects of healthcare.

4. PSYCHE AND THE SKIN: A MULTIDISCIPLINARY APPROACH

Andreia Esteves Morete[1], *Silvestrs Rubins*[1,2]

[1] *University of Latvia, Riga, Latvia*
[2] *Latvian Dermatology Institute, Riga, Latvia*

Background. Psychodermatology, a prominent dermatology subspecialty, deals with the interactions between skin and CNS. Psychocutaneous diseases are classified as psychophysiological (psychosomatic) disorders, primary psychiatric disorders with dermatological symptoms, dermatological disorders with secondary psychiatric symptoms and miscellaneous.

Purpose. To detect the prevalence and level of anxiety and depression in dermatology patients; to measure the impact of the skin wellbeing in participants QoL; to analyse literature that links psychological disorders and skin diseases.

Materials and methods. This case-control study was performed from September to November of 2017 in Latvia, and included 62 volunteers: dermatology patients with psoriasis, acne, vitiligo, rosacea and atopic dermatitis, and control group participants. Two questionnaires were used: HADS and DLQI. Statistical analysis involved descriptive statistics methods, Shapiro-Wilk test, Median and Mann-Whitney U tests, Kruskal-Wallis test, independent samples t-test, Chi-square and Fisher's exact tests.

Results. The sample included 32 participants in patients' group (20 females, 12 males), and 30 participants in control group (15 females, 15 males). The total sample participants' mean age was 37. Females are significantly more anxious ($p<0.001$), score higher depression ($p=0,037$), and higher DLQI ($p=0.034$) than males. Age has no impact on anxiety and DLQI; depression is seen more often in older participants ($p=0.021$). Anxiety prevalence in patients group is close to significant ($p=0.054$), they are more depressed ($p=0.002$) and DLQI is significantly higher ($p<0.001$), than in control group. Anxiety is significantly higher in psoriasis, acne and vitiligo patients than in control group ($p<0.05$). Depression is significantly higher in vitiligo patients than in acne, rosacea and control group (<0.05).

Conclusions. Females are more anxious, have a higher depression distribution and a higher impact of skin on QoL. Age has no influence on anxiety prevalence and skin impact on QoL, but depression scores are higher in older age. Anxiety is close to significant in patients' group, however, depression and skin impact on QoL is significantly higher. Anxiety is higher in psoriasis, acne and vitiligo patients than in control group. Vitiligo patients are more depressed than acne, rosacea patients and control participants. Skin still impacts QoL in control group participants, and has an extreme impact on psoriasis and atopic dermatitis patients.

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5. OCCIPITAL NEURALGIA TREATMENT EFFECTIVENESS USING NERVE BLOCK TECHNIQUE: PROSPECTIVE ANALYSIS OF 44 PATIENTS

Raimondas Juškys[1], *Gytis Šustickas*[2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
[2] *Department of Neurosurgery, Republican Vilnius University Hospital, Vilnius, Lithuania; Faculty of Medicine, Utena University of Applied Sciences, Utena, Lithuania*

Background. There is a great deal of tools for treatment of occipital neuralgia, however, currently we lack a complete consensus among the practitioners regarding the approach to this debilitating condition. Occipital nerve block (ONB) is known as one of the management options, but there is a shortage of available scientific literature exploring its effectiveness.

Purpose. To assess the efficacy and safety of ONB procedure in treatment of medically refractory occipital neuralgia.

Materials and methods. Forty-four patients aged between 28 and 84 years (age mean = 56.30 ± 14.71), of which 79.55% were female (n=35) have been diagnosed with occipital neuralgia (ON), and they were treated with a local anaesthetic and corticosteroids combination injection into the greater or greater and lesser occipital nerve (n=29 and n=15, respectively) and followed up after 6 months. Analysis of those patients was carried out to compare results of Visual Analog Scale (VAS) and Barrow Neurological Institute Pain Intensity Score (BNIPIS) prior to treatment, 24 hours after the block and 6 months later during a follow-up. Analgesic medication consumption before and after the 6 months was recorded. Comparison of procedure efficacy in lidocaine and bupivacaine groups was made. Similarly, evaluation of block potency for acute and chronic pain categories was also implemented. The success criteria was defined as patient satisfaction with own condition for at least 6 months, not requiring another block in order to stay comfortable.

Results. Of 44 patients, 42 (95.45%) who underwent occipital nerve block procedure, showed satisfactory results for at least 6 months. Mean headache VAS scores decreased from 7.23 ± 0.93 (pre-treatment) to 1.95 ± 1.59 (24 hours after, $p<0.0001$) and increased to 2.21 ± 1.73 during 6 month follow up, showing no statistically significant difference between the post-interventional and a half year VAS scores ($p=0.07$). The medication necessity to control pain decreased from all the patients to 16.67% (n=7) during the 6 months check up. There was no statistically significant difference in effectiveness of ONB with regard to the local anaesthetic used or the pain group targeted. Similar results were obtained, comparing patients who underwent more than one ONB.

Conclusions. Occipital nerve block with a local anaesthetic and corticosteroids provides a safe, simple and effective treatment method for patients with medically refractory occipital neuralgia.

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6. FREQUENCY OF HLA-DRB1 GENE HAPLOTYPES IN PATIENTS WITH MULTIPLE SCLEROSIS IN LATVIAN POPULATION

Gundega Kauke[1], *Dace Ziemele*[2], *Lana Vainsteine*[3], *Gundega Gulbe*[4], *Evija Gutmane*[4], *Guntis Karelis*[5], *Viktorija Kenina*[2], *Angelika Krumina*[5], *Andrejs Millers*[3]

[1] *Faculty of Medicine, Rīga Stradiņš University, Riga, Latvia*
[2] *Department of Biology and Microbiology, Rīga Stradiņš University, Riga, Latvia*
[3] *Department of Neurology and Neurosurgery, Rīga Stradiņš University, Riga, Latvia*
[4] *Faculty of Continuing Education, Rīga Stradiņš University, Riga, Latvia*
[5] *Department of Infectology and Dermatology, Rīga Stradiņš University, Riga, Latvia*

Background. Multiple Sclerosis (MS) is a demyelinating disease of the central nervous system that affects young adults worldwide. The etiology of this disorder is multifactorial. The exact etiology is unknown; however, there is a strong evidence of a genetic component in it. The association with HLA DRB*01 has been demonstrated in high risk population.

Purpose. To determine the presence of HLA-DRB1 alleles in patients with approved MS by McDonald criteria 2010 in Latvia.

Materials and methods. The study included 81 patients with MS that were approved according to McDonald criteria 2010 and 100 healthy control patients from Latvian population. HLA genotyping was performed with PCR method, using mixture primers of DRB1 16 allele gene variants. The significance of differences in individual subtypes between patients and controls was assessed by Mantel-Haenszel test and Fisher exact correction for small numbers. The relative risk (RR) and 95% confidence intervals (CI) were computed by standard methods

Results. Frequency of HLA-DRB1*15 (RR 6.13 (2.58–14.70); p = 0.003) was significantly increased in multiple sclerosis patients compared with the control group. HLA-DRB1*04 (RR 2.31 (0.83–8.08); p = 0.06) The frequency of HLA-DRB1*04 (OR 2.61 [0.83–8.08]; p = 0.06]) was considerably increased in patients with MS, however the difference was no longer significant, when the p-value was not corrected for the number of alleles HLA-DRB1*12 (OR 0.17 [0.01–1.26]; p = 0.04) was found to be significantly lower in MS patients and higher in control group.

Conclusions. People with gene alleles HLA-DRB1*15 and HLA-DRB1*04 have a higher risk of developing MS in Latvian population. To receive more reliable data on the prevalence of HLA alleles in Latvian patients and their possible association with MS, there is a need for further HLA allele investigation in a larger number of MS patients in combination with the evaluation of radiological and clinical features.

7. RELATIONSHIP BETWEEN 25-HYDROXYVITAMIN D LEVEL AND DISEASE ACTIVITY IN PATIENTS WITH RELAPSING-REMITTING MULTIPLE SCLEROSIS

Aleksandra Jeņičeka[1,2]

[1] *University of Latvia, Riga, Latvia*
[2] *RAKUS, Riga, Latvia*

Background. Recently, vitamin D insufficiency is being admitted as a risk factor for multiple sclerosis onset and progression. This research is an attempt to determine the connection between 25-hydroxyvitamin D level and disease activity. According to several scientific studies, vitamin D supplementation may reduce the progression of the disease and could be used as a part of treatment of multiple sclerosis. Multiple sclerosis is the most widespread disabling neurological disease of young adults; new cases are registered each year worldwide.

Purpose. To study multiple sclerosis activity depending on the 25-hydroxyvitamin D level in patients from Latvia.

Materials and methods. Retrospective study on the basis of Vecmilgravis Health Center of Multiple Sclerosis. Results of serum 25-hydroxyvitamin D measurements of 76 patients with relapsing-remitting multiple sclerosis were compared with the results of 337 healthy controls.

Results. Multiple sclerosis patients: equal sex ratio, with mean age of 37,8 years, mean course of the disease – 10,9 years. Mean 25-hydroxyvitamin D level for multiple sclerosis patient group depending on season: winter – 21,31 ng/mL, spring – 27,08 ng/mL, summer – 27,65 ng/mL, autumn – 21,92 ng/mL. 25-hydroxyvitamin D level for multiple sclerosis patients according reference range: normal – 29% (n=22), insufficiency – 62% (n=47), deficiency – 9% (n=7). Mean 25-hydroxyvitamin D level: 24,49 ng/mL for result for multiple sclerosis patient group, 23,29 ng/mL for the controls. Exacerbation rate: 39 cases for summer and autumn months together, which is higher than for winter and spring – 32 cases.

Conclusions. Insufficiency of mean 25-hydroxyvitamin D level for MS patient group is widespread and persists without a reference to season, gender or age. It is recommended to make measurements of 25-hydroxyvitamin D levels and to adjust its level to normal according to reference range in case of necessity. Results obtained in this research could be a good basis for further in-depth studies of multiple sclerosis.

Acknowledgements. The data about healthy controls was kindly provided by Central Laboratory.

8. BACK PAIN AMONG MEDICAL STUDENTS

*Zanda Arājuma[1], **Anna Romanova**[1], Juris Dzenis[1,2]*

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Clinic of Neurosurgery, Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. Back pain (BP) is one of the most common complaints among working-age population. It is a major medical, social and economic problem. The overall low muscle tone and stiffness or muscle strain due to hypodynamia, as well as stress are among the most common causes of BP. Stress is a given in medical school (especially during the first year) and medical students (MS) spend more time sitting and studying than other students – consequently, they are at risk of developing BP.

Purpose. To examine the prevalence of BP in medical students and physical activities importance in BP.

Materials and methods. A self-delivered questionnaire survey was carried out among MS from the first to the sixth year (University of Latvia, Rīga Stradiņš University). The questions were: "Do you exercise? Did you have back pain before studying in medical school? Did back pain start during the studies in university? What kind of pain do you have? How long in minutes can you sit in lectures?"

Results. 363 MS filled in the questionnaire.

Demographics: 292 MS were women, 71 MS were men and 135 MS were in age group 19±1 y.o., 184 were in age group 23 ± 2 y.o., 37 MS were in age group 28±2 y.o and 7 MS were in age group over 30 years. In the 1st year – 85 students, 2nd – 71, 3rd – 67, 4th – 48, 5th – 44 and 6th – 48. Exercise: 228 MS admitted exercising regularly and the rest – 135 students –denied it.

Prevalence and duration of BP: only 46 MS denied having BP. 96 MS (26%) admitted having BP that manifested itself before going to university (the first year MS – 42% (n=35), the second – 38% (n=27), the third – 28% (n=19), the fourth 17% (n=8), the fifth – 16% (n=7), the sixth – 15% (n=7).

221 MS admitted having BP that started while studying: in the first year MS 51 % (n=43), in the second – 58% (n=41), the third – 70% (n=47), the fourth – 75% (n=36), the fifth – 61% (n=27), the sixth – 56% (n=27).

MS who did exercise could sit in lectures longer: the mean = 68.60 ± 64 min/day; and those who did not exercise could not sit as long: mean 48 ± 45 min/day, and there was a statistically significant difference (p=0.001) between the groups.

Conclusions. Prevalence of BP in MS is very high – 87%. In one third of cases, BP has been started before going to medical school (30% of all BP). The majority of BP manifested during medical school (70%) with peak incidence in the first year and then it declines gradually. It can also be explained with the MS adaptation and their growing ability to cope with stress through the years of study. If MS exercise, it is possible to sit longer in lectures, which means they have bigger durability. To prevent back pain we can suggest MS to exercise more. The impact of perceived stress on BP in MS is an object to be studied.

9. DIFFERENCES IN CLINICAL AND RADIOLOGICAL CRITERIA BETWEEN SURVIVORS OF SPONTANEOUS INTRACEREBRAL HAEMMORRHAGE AND LETHAL CASES

Zanda Arājuma[1], *Juris Dzenis*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Clinic of Neurosurgery, Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. A spontaneous intracerebral haemorrhage (SIH) has the highest mortality rate of all intracranial hematomas. IH accounts for about 10% of all strokes and predictable incidence is 35 to 45 patients per 100,000 inhabitants in Europe's and North America.

Purpose. To detect the difference in clinical and radiological sings between IH patient groups – survivors and lethal cases.

Materials and methods. A retrospective medical record review was performed in the Pauls Stradins Clinical University Hospital and in Riga East Clinical University Hospital Gailezers. Inclusion criteria: an age of at least 40, spontaneous intracerebral haemorrhage in hemispheres. Exclusion criteria: pontine or cerebellar haemorrhage. Assessed parameters: clinical signs – systolic blood pressure (SBP), diastolic blood pressure (DBP), measured by ambulance; Glasgow coma scale rate (GCS) measured by neurologist on the first day; radiological signs (emergency head CT) – SIH volume, midline shift, brain perifocal edema.

Results. A total of 153 patient histories were selected. Demographics: 49% of patients were discharged (31% women and 18% men) and 51% deceased in hospital (23% men and 28% women).

SBP: mean BP =188 ± 35 mmHg in survivors group and 175 ± 44 in lethal case group ($p=0.05$). DBP: mean = 102 ±18 mmHg in survivors group and 97 ±25 mmHg in lethal case group ($p=0.23$). GCS rates: mean score 13 ±2.6 in survivors group and 8 ±4 in lethal cases group ($p<0.01$). IH volume: 15 ±25ml in survivors group and 76 ± 78 ml in lethal cases group ($p<0.01$). Brain midline shift ($p<0.01$) and cerebral edema ($p<0.01$) on emergency CT were more common in the group of lethal cases.

Conclusions. Patients, who are more likely to survive, have higher SBP and GCS, lesser haemorrhage volume, and fewer signs of edema and brain midline shift at the first day. We recommend these parameters to make a prediction for the outcome of SIH.

PUBLIC HEALTH

1. OCCUPATIONAL DISABILITY IN MUSCULOSKELETAL DISEASES – EXPLORATORY ANALYSIS OF PERSONALISED SOCIAL SECURITY DATA

Juris Bārzdiņš[1], *Rita Konstante*[1,2]

[1] *University of Latvia, Riga, Latvia*
[2] *Hospital planning at Sykehusbygg HF, Trondheim, Norway*

Background. According to the data of the Central Statistical Bureau, in the last five years, the number individuals formally recognized for the first time as occupationally disabled due to musculoskeletal diseases (MSD) have grown by 24%, and it rises particularly rapidly in the working population (+29%). In 2016, of all recognized disabilities among working individuals nearly a quarter was due to MSDs (24%). During the same five year period, the number of sickness absence days covered by the social insurance institution had also increased (+ 29%), and the amount paid for total sickness benefits had increased by 90%, reaching €139 million. Since in the sick-leave certificates the diagnosis of sickness causing absence without rare exceptions is usually not recorded:

1) it is impossible to assess the cost effectiveness of MSD prevention, treatment and rehabilitation measures (because the proportion of the cost of sickness benefits attributable to these diseases is not known);
2) it is impossible to launch timely especially for MSDs individuals' important interventions aimed at reducing further exclusion from the workplace (since the social security institutions become aware of the cause of long-term incapacity for work only when an application for a formal recognition of disability is already submitted).

Purpose. The objective of the retrospective study was to determine the incidence, duration, and costs of incapacity for work, as well as employment and income of persons, which were later formally recognized as disabled, and to assess the opportunity for early return to work initiatives in case of MSD.

Materials and methods. The study uses pre-collected data unified through a personal identifier, obtained from a variety of social security databases on 3186 individuals formally recognized in 2016 as occupationally disabled due to MSD. An exploratory data analysis / dynamic data visualisation was performed to identify outliers, trends and patterns, and to formulate hypotheses.

Results. For individuals included in the study, the direct MSD related social security costs exceeded € 3,7 million for the one year period before the official recognition of disability, and reached € 4 million in the following year. An unusual pattern of sickness absence indicating possible regulatory inconsistencies was identified.

Conclusions. Linking the personalized information in the segregated social security and healthcare databases provides an unprecedented opportunity to study otherwise hidden details of the interaction of both systems.

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2. INTERNATIONAL STUDY ON AGE, AGING AND WORKABILITY – VALIDATION OF STUDY QUESTIONNAIRES

Natalja Karpova[1], *Inga Priede*[2,3], *Valdis Folkmanis*[3], *Lilian Tzivian*[3]

[1] *State Agency of Medicines, Riga, Latvia*
[2] *Riga 2nd Hospital, Riga, Latvia*
[3] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. Study questionnaires developed in one country can be translated and used in other countries in their native language. The main problem of this process is that people speaking different languages can fail to understand the meaning of some questions the same way. To avoid a misunderstanding and to permit the comparison of results in different countries, the intellectual validation of questionnaires had to be performed.

Purpose. The objective of the current study was to perform an intellectual validation of questionnaires translated from German to Latvian and Russian at the sample of medical personnel in Latvia

Materials and methods. We obtained the German version of the international study "Age, Aging and Workability (AwAKE)" from the main investigator – the Centre of Health and Society, University of Dusseldorf, Dusseldorf, Germany. The study took place in Germany, Israel, Japan and Latvia; thus, the study questionnaires were translated according to the needs of each specific country. We performed the qualitative analysis according to two mother tongues existing in Latvia, – Latvian and Russian. We analysed results of 4 focus groups, 4 people in each, two groups for each language. We collected questions that could be interpreted differently. Additionally, we performed a quantitative analysis of each version of question obtained during the qualitative analysis. Forty-five participants, all medical workers, were enrolled in this part of the analysis. We analysed the most frequently given version of the question in each of the language groups, and performed Chi-square analysis to see the difference between them.

Results. We identified 19 questions that had a possibility of different interpretation. We formulated 4 possibilities of re-formulation (variants) for each one of questions that corresponded to interpretations in focus groups according to the qualitative analysis. We obtained 25 Latvian and 20 Russian questionnaires of understanding of versions. All the versions for all the questions were chosen by participants at least once. Most frequently given versions were similar in language groups for 10 questions. A significant difference between Latvian and Russian speakers was observed in 4 of 19 questions (Chi-square test, $p < 0.05$).

Conclusions. Double intellectual validation of questionnaires translated from foreign languages is recommended for best understanding of answers of a study population. Such validation allows for better interpretation of the study results.

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ONCOLOGY

1. EVALUATION OF CLINICAL, MORPHOLOGICAL AND PROGNOSTIC CHARACTERISTIC OF BASAL CELL CARCINOMA

Margarita Tatičeka[1], *Sergejs Isajevs*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Centre of Pathology, Riga East University, Riga, Latvia*

Background. Basal cell carcinoma is the most common, slow growing, locally invasive malignant tumour of the skin. The highest incidence has been observed in Australia and South America. Basal cell carcinoma almost never metastasizes beyond the original tumor site. Five-year recurrence after surgical excision is up to 10%. However, the morphological and clinical characteristic for the prediction of the recurrence of basal cell carcinoma is of a particular importance.

Purpose. The purpose of our study was to compare clinical, morphological and prognostic characteristics of basal cell carcinoma.

Materials and methods. Altogether 60 patients were enrolled in the study. The patients underwent surgical excision of basal cell carcinoma in 2011 at Riga East University Hospital. The study was approved by the local ethical committee. The histopathological examination of basal cell carcinoma tissue was performed. The clinical data was analysed. The results were analysed by SPSS 22 version software. The correlation between histopathological and clinical characteristics were analysed by Spearman rank correlation test or Chi-squared test then appropriate. P value <0.05 was considered statistically significant.

Results. The obtained results showed that 38 women and 22 men were enrolled in the study. The average age of patients was 63±14 years. The obtained results revealed that stage I carcinoma was found in 50 cases, stage II carcinoma in 7 cases, stage III carcinoma in 2 cases, and stage IV carcinoma in 1 case. In addition, according to histological classification, 42 patients had nodular type carcinoma and 18 patients had superficial type carcinoma. The recurrence was observed in 10% of the cases. The significant correlation between basal cell carcinoma histological type and size ($p<0.001$), histological type and TNM stage ($p<0.001$), TNM stage and size ($p<0.001$) was observed. In addition, we have demonstrated the correlation between the presence of ulceration and patient gender ($p<0.05$), TNM stage and presence of ulceration ($p<0.05$) and presence of ulceration and tumour size ($p<0.05$).

Conclusions. To conclude, the predictive characteristics for the basal cell carcinoma recurrence, were histological type, the presence of tumour ulceration, patient's gender and tumour size.

2. ASSOCIATION OF LUNG CANCER HISTOLOGICAL SUBTYPES WITH AIRFLOW LIMITATION AND BEHAVIOUR

Selga Savčenko[1,3]*, Viktorija Krēgere*[1,3]*, Alvils Krams*[1,4]*, Sergejs Isajevs*[2,3]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Department of Pathology, Faculty of Medicine, University of Latvia, Riga, Latvia*
[3] *Center of Pathology, Riga East University Hospital, Riga, Latvia*
[4] *The Centre of Tuberculosis and Lung Diseases, Riga East University Hospital, Riga, Latvia*

Background. Lung cancer is the leading cause of cancer-related deaths in the EU, both among men and women. Histologic subtypes of lung cancer (adenocarcinoma and squamous cell carcinoma) have different outcome and treatment.

Purpose. The objective of the current study was to compare the clinical and histopathological characteristics and their impact on disease-free and overall survival.

Materials and methods. The study was retrospective. Altogether, 88 patients were enrolled in the study. The patients underwent surgical treatment at Riga East University Hospital during 2012–2013. The histopathological and clinical data was analyzed. Mann-Whitney U test was used to assess the differences between the groups. The correlations were analyzed by Spearman test. Overall survival and disease-free survival was assessed by Kaplan-Meier method.

Results. The obtained results showed that 25 enrolled patients were female and 63 were male. Our study results demonstrated that the average age of patients was 61,95 ±10,84 years. 50 patients had squamous cell carcinoma and 38 had adenocarcinoma. Tumor size varied from 0.8 to 8.0 cm. The average tumour size was 3.8 ± 1.5cm.

9 patients underwent neoadjuvant treatment, but 31 patient underwent adjuvant treatment. The obtained results revealed that 20 patients had stage-IA; 27 patients-IB; 12 patients-IIA; 7 patients-IIB; 15 patients-IIIA; 3 patients-IIIB and one patient had stage IV.

The negative correlation between airflow limitation (FEV1 and smoked pack-years history) in patients with adenocarcinoma was revealed (Rho=-0,383; p=0,02). In addition, the patients with squamous cell carcinoma had a more prominent airflow obstruction compared to patients with adenocarcinoma. There were no significant differences between histopathological subtypes and disease free-survival and overall survival.

Conclusions. Patients with squamous cell carcinoma had more severe airflow limitation compared to patients with adenocarcinoma, however, the lack of association between histological lung cancer subtypes and survival was observed.

3. TREATMENT EVALUATION OF OLAPARIB IN PATIENTS WITH BRCA MUTATION POSITIVE OVARIAN CANCER IN ONCOLOGY CENTRE OF LATVIA

Zane Munkena[1], *Unda Druska*[1], *Zanete Zvirbule*[2], *Alinta Hegmane*[2], *Evita Gasenko*[2], *Signe Plate*[2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Department of Chemotherapy and Haematology, Riga East Clinical University Hospital, Riga, Latvia*

Background. Ovarian cancer is the fifth most common type of cancer in women and the fourth most common cause of cancer-related death in women. Approximately 80 % of patients have a response to platinum-based chemotherapy. However, most patients have relapses, and responses to subsequent therapies are generally short-lived. BRCA mutation positive ovarian cancer is associated with a worse prognosis. On January 9, 2015, European Medicine Agency (EMA) approved olaparib capsules for the treatment of patients with deleterious or suspected deleterious germline BRCA-mutated advanced ovarian cancer who have been treated with three or more prior lines of chemotherapy. Only 8 patients in Latvia have received treatment with olaparib up to September 2017.

Purpose. To evaluate the efficiency of a new oral medication olaparib as maintenance monotherapy for BRCA mutation positive ovarian cancer in 8 patients.

Materials and methods. 8 patients were included in a retrospective research study. They had recurrent ovarian cancer with high-grade serous component, which was platinum-sensitive. Patients received PARP inhibitor olaparib capsules at a dose of 400 mg twice daily. Patients continued the assigned treatment until objective disease progression. Data was collected from ambulatory medical record cards between December 2015 and September 2017.

Results. Results obtained from 8 patients (median age 47,6 ± 11,5) were available for the analysis. All patients had received surgical treatment – total hysterectomy with bilateral salpingo-oophorectomy and deomentisation. The number of lines of adjuvant chemotherapy treatment was 3,85 ± 3,5 prior to the administration of olaparib. Histology showed grade 3 high malignancy serous papillary adenocarcinoma. Upon diagnosis of ovarian cancer, the measurement of tumor marker CA-125 was elevated. The median treatment duration was 8,8 ± 7,8 months. 5 patients (62,5%) continue to receive olaparib as maintenance therapy. In 3 patients (37,5%), the treatment was discontinued due to disease progression.

Conclusions. The analysis shows the importance of maintenance therapy approach in prolonging progression-free survival. Some of the patients' overall survival now exceeds 17 months. The treatment was assessed as satisfactory; mild anaemia and nausea were observed as adverse effects. In general, patients' quality of life is preserved.

4. HISTOPATHOLOGICAL CHARACTERISTICS OF THE ORAL SQUAMOUS CELL CARCINOMA

Tatjana Zablocka[1,2,3], *Elza Dzērve*[3], *Elza Vazdiķe*[3], *Zenta Lakovica*[3], *Sergejs Isajevs*[2,3]

[1] *Faculty for Continuing Medical Education, Rīga Stradiņš University, Riga, Latvia*
[2] *Center of Pathology, Riga East University Hospital, Riga, Latvia*
[3] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. The squamous cell carcinoma is the most common morphological type of oral malignant neoplasm. The oral cancer usually was detected in advanced stage and characterized by poor prognosis present advanced cancer, in the majority cases with poor prognosis. The incidence of oral cancer increased in EU countries, especially in East Europe, it could be related with smoking, poor hygiene of the oral cavity and different types of infections, etc.

Purpose. The purpose of the study was to compare the clinical and histopathological criteria of oral squamous cell carcinoma behavior.

Materials and methods. Altogether 102 patients were retrospectively enrolled in the study. Patients were undergoing biopsy and/or surgical treatment at Latvian Oncology Centre during 2012–2014. The tissue samples were assessed histopathologically. The histopathological and clinical characteristics were assessed. Statistical analysis was performed by GraphPad Prism 7.0 version software. The p value < 0.05 was considered as statistically significant.

Results. The obtained results showed that 80 patients were male and 22 patients were female. The average age of patients was 60,14 ± 10,59 years. The tumors predominantly were moderately differentiated (grade 2), the average tumor size was 2,1 ± 1,6cm. The 26 patients had tumor recurrence. The obtained results showed that the negative correlation between T substage and stromal lymphocytic infiltration, perineural invasion and patients age was revealed (respectively, Rho= -0,2057, p=0,0410; Rho= -0,2454, p=0,0143; Rho= -0,1349, p=0,0012). The positive correlation between status of the lymph node and grade, tissue necrosis, invasion in lymphatic and blood vessels was demonstrated (Rho=0,2434, p=0,0136; Rho=0,2098, p=0,0342; Rho=0,3542, p=0,0002; Rho=0,2575, p=0,0143).

Conclusions. The selected histopathological characteristics correlated with tumor behavior and prognosis and represented prognostic features of the squamous cell carcinoma. The assessment of these characteristics is still important for the stratification of clinical behavior and prognosis of the oral squamous cell carcinoma.

5. CORRELATION OF THE FREQUENCY OF SARCOMA RECURRENCE WITH PATIENT'S AGE

Dana Cmaka[1], ***Jūlija Blaževiča***[1], *Sigita Hasnere* [1,2]

[1] *University of Latvia, Riga, Latvia*
[2] *Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. Sarcoma is a rare aggressive malignant tumor. Sarcoma is fatal, especially the soft tissue sarcoma. Early-stage sarcomas are asymptomatic, leading to belated diagnosis. Approximately 50% of osteosarcomas and 20% of soft tissue sarcomas are diagnosed in patients under 35 years. Rothermundt C, et al., in retrospective review included 174 consecutive patients with a soft tissue sarcoma of the limb who underwent follow-up by oncologists at a single center from 2003 to 2009. The rate and site of recurrence and mode of detection were analyzed. Eighty-two patients (47%) experienced relapse.

Purpose. To examine how the frequency of sarcoma relapses correlates with the patient's age.

Materials and methods. The data from histologically confirmed sarcoma were obtained from Pauls Stradiņš Clinical University Hospital in year 2014–2017. We used several methods: *Boxplot*, standard deviation, histogram, Kaplan-Meier survival analysis. We analyzed gender, histological type, treatment and frequency of relapses.

Results. The study included 29 patients, 21 women and 8 men. The most commonly histologically confirmed cases were undifferentiated polymorph sarcoma in 41% (n=12) and leiomyosarcoma in 20% (n=6) of cases. Most commonly, sarcoma is diagnosed between 59 and 72 years. The average age of patients is 62.83 ±12.68 years. The most commonly used was the combination therapy – surgery with chemotherapy in 58% (n=15) of cases, only chemotherapy in 23% (n=6) of cases, radiotherapy in 4% (n=1) of cases and only surgery in 15% (n=4) of cases. Only 31% (n=9) of patients had a relapse. In patients with relapses, predominantly was used combination therapy – surgery with chemotherapy in 56% (n=5) of cases. The median survival was 38 months.

Conclusions. The number of patients was too small to conclude, how frequency of sarcoma relapses correlates with the patient's age.

6. ROLE OF DYNAMIC CONTRAST ENHANCED IMAGES IN mpMRI PROTOCOL FOR PROSTATE CANCER AND EXTRACAPSULAR EXTENSION DETECTION

Katrina Brauna[1], *Mara Tirane*[1], *Maija Radzina*[1], *Peteris Prieditis*[1], *Egils Vjaters*[2], *Karlis Miculis*[2]

[1] *Department of Radiology, Pauls Stradiņš Clinical University Hospital, Riga, Latvia*
[2] *Department of Urology, Pauls Stradiņš Clinical University Hospital, Riga, Latvia*

Background. A routine prostate mpMRI protocol includes high-resolution T2-weighted sequences (T2WI), diffusion-weighted sequences (DWI) and dynamic post-contrast enhancement (DCE) sequences. This routine mpMRI protocol has been shown to improve prostate cancer (PCa) detection. However, the value of DCE in the mpMRI protocol for the screening of clinically significant tumors have been discussed.

Purpose. To compare the results of mpMRI with and without DCE sequences for the detection of clinically significant PCa and extracapsular extension (ECE).

Materials and methods. Retrospective study, 46 patients with peripheral zone (PZ) cancer included. The mpMRI were performed between the years 2014 and 2017 and were cross-referenced with radical prostatectomy specimens. Findings were graded according to the Prostate Imaging – Reporting and Data System Version 2 (PI-RADS v2) and clinical staging (T staging).

Results. The mpMRI results in the non-contrast and contrast-enhanced reading sessions were similar with no statistical difference between the groups. DCE sequence did not change PI-RADS score (Wilcoxon matched-pairs signed rank test, p=0.1250).

Sensitivity and specificity for detection of ECE with and without DCE were 57,1%, 87,2% and 42,9%, 92,3%, respectively. Sensitivity and specificity for detection of seminal vesicle invasion without DCE were 60%, 97,6% and with DCE the results obtained were similar. Statistically reliable linear weak correlation between T stage identified postoperative and T stage detected with DCE (r = 0.450; p=0.002) were obtained.

The results also reveal a weak correlation between T stage detected postoperative and T stage detected without DCE (r = 0,448; p=0,002).

Conclusions. According to our study data, DCE MRI does not substantially improve the accuracy of ECE detection and T staging of PCa, therefore we propose to use DCE MRI additionally only for PZ cancer detection in equivocal cases (PI-RADS 3).

7. UPGRADING AND DOWNGRADING OF GLEASON SCORE IN PATIENTS WITH PRE-OPERATIVE BIOPSY AFTER RADICAL PROSTATECTOMY

Andris Romašovs[1], *Egils Vjaters*[1], *Edgars Vasiljevs*[1]

[1] *University of Latvia, Riga, Latvia*

Background. Prostate cancer is one of the most common cancer worldwide and the second most common in men. In 2012, prostate cancer became most common cancer in Europe in a male population. In Latvia, 5134 men were diagnosed with prostate cancer between 2012 and 2016, and 1969 deaths occurred during this period.

Purpose. The main purpose of this study is to investigate the rate of upgrade and downgrade of Gleason score (GLS) in patients, who had pre-operative prostate biopsy comparing it to radical prostatectomy specimen.

Materials and methods. Study took place at Pauls Stradiņš Clinical University Hospital, Pilsoņu iela 13, Riga, Latvia. Design of the study is a retrospective cohort. 323 patients enrolled in the study who received radical prostatectomy (RP) between 2012 and June 2017. All the patients underwent pre-operative biopsy. Inclusion criteria were more than eight needle core biopsies, no regional or local metastasis. Information about patient age, date of RP, RP specimen GLS, tumour percentage in RP specimen, prostate weight and volume, PSA before biopsy, count of needle core biopsies performed, biopsy GLS, count of positive needle core biopsies and percentage of tumour in each positive needle core biopsy were obtained using medical case record. All the patients were divided into groups for comparison. All the data was analysed using IBM SPSS 22. To analyse information, non-parametric tests were performed. For nominal variables, Pearson Chi-square was applied. For statistical significance, a p-value of <0.05 was used.

Results. Upgrading of Gleason score was noted in 52.7% (N=165) of cases and a downgrade in 8% (N=25) (p=0.04). From 2012 to 2014, an upgrade was made in 59.7% and a downgrade in 9.2% of cases. From 2015 to June 2017, number of cases with an upgrade in Gleason score after radical prostatectomy declined to 41.2% and downgraded to 6.1%. A number of positive needle core biopsies lowered chance of upgrading after RP (p=0.041). It was also concluded that the time between biopsy and surgery impacted upgrading frequency. Patients, who had the surgery performed earlier had a lower chance of upgrade (p=0.022).

Conclusions. Gleason score differs between biopsy and radical prostatectomy specimen. It is challenging for an urologist to guide a patient through active surveillance and to make a decision when it is time to perform surgery on the basis of PSA, biopsy GLS and digital rectal examination due to frequent upgrade in GLS after RP.

8. INCREASED CD9a EXPRESSION IN PROSTATE CANCER COMPARED TO BENIGN PROSTATE HYPERPLASIA

Kristofs Folkmanis [1,2], *Janis Eglitis*[1,3], *Valdis Folkmanis* [1], *Sergejs Isajevs*[1,3]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *St. Bonifatius Hospital, Lingen (Ems), Germany*
[3] *Riga East University Hospital, Riga, Latvia*

Background. Prostate cancer is a common solid malignancy and incurs a high mortality. The tumorigenesis, metastasis and drug resistance of prostate cancer are associated with the cargos of exosomes such as miRNAs, lncRNAs and proteins. In addition, prostate cancer cells modulate the surrounding stromal cells via the exosomes. However, the spatial distribution and expression of exosomes biomarkers in the tissue in benign and malignant lesions is still of interest.

Purpose. The objective of the current study was to compare the expression of exosomal biomarker CD9a in the tissue of patients with prostate cancer and benign hyperplasia.

Materials and methods. The study was retrospective. Altogether, 30 patients were enrolled in the study. The patients underwent surgical treatment at Riga East University Hospital at 2014. The CD9a expression was analysed by immunohistochemistry. The Mann-Whitney U test was used to assess the differences between the groups. The p value < 0.05 was considered as statistically significant.

Results. 20 patients with prostate acinar adenocarcinoma and 10 patients with prostate benign hyperplasia were enrolled in the study. CD9a staining was cytoplasmic, vesicular, predominantly focal, mainly located apically. In benign hyperplasia none or mild staining was observed, whereas the expression of CD9a in cancer tissue was almost mild to intense. Obtained results showed that CD9 expression was significantly increased in prostate acinar adenocarcinoma compared to control group (2.8 ± 0.42 vs 0.60 ± 0.51, score, $p<0.0001$).

Conclusions. CD9a expression was significantly increased in prostate acinar adenocarcinoma. CD9a could be the potential beneficial biomarker for prostate cancer early diagnosis and screening.

9. CAN THE METABOLIC ATTRIBUTION OF LESIONS ACQUIRED FROM PET/CT PREDICT THE PRIMARY TREATMENT OUTCOME OF HODGKIN LYMPHOMA?

Laura Žilevičė[1], *Donatas Vajauskas*[1,2]

[1] *Faculty of Medicine, Vilnius, Lithuania*
[2] *Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

Background. The standard treatment for Hodgkin lymphoma (HL) is first-line chemotherapy – 2-3 cycles of ABVD (Adriamycin Bleomycin Vinblastine Dacarbazine) followed by Involved-Field Radiation Therapy (IFRT) for the limited stage disease, and up to 8 cycles of ABVD or up to 6 cycles BEACOPPesk (Bleomycin Etoposide Adriamycin Cyclophosphamide Oncovin Procarbazine Prednisolone) followed by localized RT for the advanced stage disease. Since lymphoma is often identified as multiple lesions with different size and metabolic activity, estimates of lymphoma treatment prognosis include total metabolic tumor volume (TMTV) and tumor lesion glycolysis (TLG) calculated from positron emission tomography with low dose computed tomography (^{18}F-FDG PET/CT) data.

Purpose. To evaluate ^{18}F-FDG PET/CT prognostic role in predicting treatment response to first-line treatment of HL on a small group of patients.

Material and methods. We retrospectively selected 10 patients with newly diagnosed HL, 2015 to 2017 treated at Hematology department. All patients routinely underwent pretreatment and control ^{18}F-FDG PET/CT. PET/CT scans from mid skull to upper thighs were obtained 1 hour after injection of 4 MBq/kg ^{18}F-fluordeoxiglucosis and quantitatively analyzed. The stage of the disease (Lugano classification) before treatment and response to treatment (the Deauville criteria) was determined by assessing PET/CT data according to guidelines approved by European hematologists. The maximal standardized uptake value (SUV_{max}) was defined as the maximum voxel intensity within the volumetric region of lesion. A threshold of 41% of the maximum signal intensity was used to delineate the metabolic tumor volume (MTV). Patient with TMTV represent the sum of every individual lesion MTV. The TLG was calculated as the result of TMTV and SUV_{max} mean multiplication.

Results. 10 patients with HL enrolled into this study with mean age 43±16 year and 6 of them presented with B symptoms. Our study was divided into two equal groups. First group responders – Deauville score ≤2 with TLG mean 1296,27±1320,49 g, SUV_{max} 8,87±3,5 g/ml with TMTV 126,84±132,27 cm^3. Second group non-responders – Deauville score ≥4 with TLG mean 2706,6±2673,55 g, SUV_{max} 11,27±6,21 g/ml with TMTV 196,5±104,39 cm^3.

Conclusion. To the best of our knowledge, this small group analysis demonstrated that higher TLG, SUV_{max}, and TMTV correlated with lower response to first-line treatment. Pretreatment metabolic attribution of HL lesions acquired form ^{18}F-FDG PET/CT is likely to provide valuable prognostic significance. This small patient group analysis was made to evaluate first data, before analyzing the prognostic value of the metabolic attribution of HL lesions in a larger patient population.

SURGERY, ANESTHESIOLOGY AND INTENSIVE CARE

1. SURGICAL WAIT TIME AND 30-DAY MORTALITY FOR PATIENTS WITH HIP FRACTURE

Jānis Jukonis[1], *Sergejs Zadorožnijs*[1,2], *Unda Kaļķe*[1], *Pēteris Jukonis*[3]

[1] *University of Latvia, Riga, Latvia*
[2] *Hospital of Traumatology and Orthopaedics, Riga, Latvia*
[3] *Rīga Stradiņš University, Riga, Latvia*

Background. Hip fracture is a major problem in our society, and it seems that this tendency will rise over the next few years. Because of the ageing of our society, the incidence of hip fractures will have tripled (from 1.66 million in 1990 to 6.26 million in 2050 worldwide). It is also a serious diagnosis for a patient, because it has a significant and morbid mortality rate. Even 30-day mortality rate can reach from 7–10%. There are many factors which can contribute to this high mortality rate (age, gender, hospitalization time, comorbidity), but one of the leading factors of mortality rate is the timing of the operation. Most guidelines recommend carrying out the surgery within 24–48 h of admission. In a retrospective observational study with 257 367 patients, operation which was delayed by more than 48 hours increased the 30 day mortality rate by 41%. It seems that it is crucial to carry out the surgical manipulation as fast as possible.

Purpose. The purpose of this study was to determine whether delaying the operation by more than 24 hours after admission affects 30-day mortality rate in patients with hip fractures.

Materials and methods. This is a retrospective study. The study contains more than 850 cases of hip fractures, which where treated in Hospital of Traumatology and Orthopaedics. The data regarding mortality rate was collected from Ārsta birojs.

Results. During the study, we gathered 859 cases. 30 days after hospitalization, the overall mortality rate was 4,19% (altogether, 36 registered deaths). The average waiting time was 2.9 days (standard deviation was 2,16). There was no significant difference ($p > 0,05$) between the patients who received surgical manipulation in 24 hours or the patients who waited for more than 24 hours.

Conclusions. Although we could not find a significant difference between patients who had a surgical treatment in 24 hours and who waited more than 24 hours, the obtained data shows that the average time of operation is almost 3 days, which is more than the guidelines recommend. The overall mortality 30 days after hospitalization was more than 4%, therefore it would be interesting to analyse whether the waiting time affects mortality in a 6-month or one year period.

2. MORTALITY IN PATIENTS WITH NON-TRAUMATIC AMPUTATIONS

Kirills Fokins[1], *Aleksandra Panova*[1], *Madara Kalniņa*[1]

[1] *Rīga Stradiņš University, Riga, Latvia*

Background. Long-term survivability after surgical amputations is still very low, and with an increase in cardiovascular events and metabolic disease incidence, it is possible that mortality will increase even further. A growing number of amputees provides countless social, economic and medical challenges. As the mean age of amputees becomes smaller and age of retirement increases, working age population decreases.

Purpose. The objective of this study was to evaluate mortality in patients undergoing amputations during their initial stay in hospital after operation and subsequent mortality after six months, one year and eighteen months. Risk factors, such as comorbidity, previous conservative therapy and time from symptom onset until surgery, were evaluated as important predictors of mortality.

Materials and methods. Using the data from medical histories, 102 patients were enrolled to the study. Inclusion criteria was a surgical amputation in the past eighteen months. Patients with traumatic amputations were excluded. Additionally, the information on patient age, cause of surgery, type of surgery and type of anaesthesia was collected. A further phone survey was performed with these patients. Non-contacted patients were excluded from further study.

Results. The most frequent cause of amputation is atherosclerosis and complications of diabetes. The mean age of patients was 69.1 years (31–93). Thirty-seven patients (36.3%) were females and sixty-five (63.7%) were males. Out of 102 patients receiving surgical amputation 20.6% (n=21) died during postoperative hospital stay. Mortality increased to 26.9% (n=21) after six months, 42% (n=29) after a year and 57.9% (n=33) after eighteen months.

Conclusions. Effective treatment of primary diseases could lead to a dramatic decrease in mortality as majority of patients initially present with a decompensated state of illness. Mortality in patients undergoing surgical amputation correlates with their comorbidities. Long-term survivability in patients after amputation is greatly decreased, with less than a half surviving more than eighteen months.

3. EFFECTIVENESS OF TREATMENT OF DEEP VEIN THROMBOSIS OF LOWER EXTREMITIES WITH PERCUTANEOUS TRANSLUMINAL ANGIOPLASTY AND STENTING

Anna Ūdre[1], *Aina Kratovska*[1,2], *Sanita Ponomarjova*[2], *Patrīcija Ivanova*[1,2]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*
[2] *Riga East Clinical University Hospital, Riga, Latvia*

Background. The treatment of posttrombotic and May-Thurner syndromes has changed a lot in the last decades. Posttrombotic or May-Thurner syndromes can cause severe clinical symptoms as oedema, skin changes, suprapubic varices and even venous ulcers. For many years, the primary treatment of iliac vein occlusion or stenosis was conservative, very long-lasting and limiting the life-quality for patients. Endovascular recanalization of deep veins has become an important treatment for iliac vein occlusion.

Purpose. To evaluate the early results, clinical symptoms and regression of the oedema of patients with DVT in lower extremities after percutaneous transluminal angioplasty and stenting.

Materials and methods. Retrospective analysis of 22 patients with iliac vein angioplasty was carried out. Invasive treatment was performed from November 2011 to December 2016. The status of patient symptoms was cleared out by telephone survey. The data was analysed using Excel and SPSS 22.0.

Results. 22 patients were included in the study. All the patients were symptomatic and went for endovascular recanalization, angioplasty and following stenting. The average age of patients was 43 years. 16 patients were female, and 6 were men. 2 patients had improved restenosis by angiography, one patient had an early in-stent thrombosis, and one asymptomatic in-stent occlusion was observed at control angiography. In thelephone interview, the patients admitted regression of oedema, no need for compression stockings, disappearance of suprapubic varices.

Conclusions. Iliac vein interventions are effective treatment of choice for patients with symptomatic posttrombotic or May-Thurner syndrome. A proper patient selection and a larger group of patients are needed for further research to generalize the results.

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4. MANAGEMENT AND FACTORS PREDICTING THE RECURRENCE OF SPONTANEOUS PNEUMOTHORAX: A RETROSPECTIVE TERTIARY CENTRE STUDY

Rugilė Strobeikaitė[1], *Žymantas Jagelavičius*[1,2]

[1] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*
[2] *Centre of Heart and Chest Surgery, Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania*

Background. Spontaneous pneumothorax is a common disease with air in the pleural cavity. This condition can be managed with different therapeutic options, varying from conservative to invasive methods. This disease tends to recur in some patients, but predictive factors and optimal anti-recurrence treatment are not fully established.

Purpose. The aim of this study is to evaluate management options for spontaneous pneumothorax and to investigate factors, which affect recurrence of this condition.

Materials and methods. This was a single-centre retrospective study. The treatment of 104 cases (89 patients) of spontaneous pneumothorax in 2013–2016, was reviewed. The association between recurrence of spontaneous pneumothorax and characteristics of the patients at their first hospital stay was evaluated by binary logistic regression analysis.

Results. Eighty-one (77.9%) cases were managed with chest tube drainage. This treatment was successful for 63 (60.6%) cases, and 18 (17.3%) cases were further treated surgically because of persistent air leaks. Twenty-three (22.1%) cases were initially operated for recurrent spontaneous pneumothorax. Surgical approaches in operated cases were: video-assisted thoracoscopic surgery 34 (83%), axillary thoracotomy 7 (17%). The first episode of the disease was treated in 65 (62,5%) patients. Males comprised 50 (76.9%) of these patients and the median age at presentation was 34 years. Fifty-three (81.5%) patients in the first episode group were diagnosed with primary spontaneous pneumothorax. During follow-up period, 11 (16.9%) of the patients presented with recurrence of the disease. Binary logistic regression analysis showed that sex (OR=1.427, 95% CI 0.273 to 7.462, P=0.674), age (OR=1.011, 95% CI 0.974 to 1.050, P=0.561) and type of pneumothorax (OR=1.023, 95% CI 0.191 to 5.482, P=0.979) were not significantly associated with recurrence.

Conclusions. In most of the cases, chest, tube drainage was successful treatment. When surgical management was required, video-assisted thoracoscopic surgery was the most common approach. Sex, age and type of pneumothorax appear not to be predictive factors of recurrence of the disease in this study.

5. LAPAROSCOPIC AND OPEN REPAIR SURGERY COMPARISON OF THE PERFORATED GASTRODUODENAL ULCERS

Mārtiņš Blumbergs[1], *Laura Grava*[1], *Dārta Nīmane*[1], *Olga Leitāne*[1], *Aļina Ašmane*[1], *Igors Ivanovs*[1]

[1] *Faculty of Medicine, University of Latvia, Riga, Latvia*

Background. Laparoscopic surgery is becoming more popular every year, also as surgical treatment option in perforated peptic ulcers. However, in this diagnosis it remains unclear, whether and how, comparing these two methods, laparoscopic surgery is safer and efficient for the patient.

Purpose. Through the retrospective data analysis, to compare both surgery options using information about the patients' postoperative state.

Materials and methods. Medical records of all patients who underwent laparoscopic or open repair surgery of perforated peptic ulcers at the Riga East University Hospital Clinical Centre "Gailezers" between January 2013 and December 2016 were evaluated. The study included 190 patients. To compare and analyse postoperative state, data from medical records was used – duration of the acute symptoms (h), size of perforation (mm), operative time (min), postoperative hospital stay (days), time of the resumption of oral intake (days), time of the hospital bedrest (days), number of used analgesics and postoperative complications. Statistical analysis was carried out using SPSS statistics analyzing software, using Levene's test for equality of variances and Mann-Whitney U test to compare medians. In addition, "p" values were calculated.

Results. From the total of 190 patients, of whom, 38 received laparoscopic repair and 152 open repair, were included in this study. Comparing the duration of the acute symptoms in each group (OR=open repair; LS=laparoscopic) with t-test (Independent Samples), mean values were – LS= 4.618 h and OR=6.158 h ($p= 0.044$ (< 0.05)). Size of perforation LS = 3,68 mm, OR = 7,03 mm ($p<0.001$). Operative time – LS= 77.50 min, OR= 82.61 min and ($p=0,438$ (> 0.05)). Postoperative hospital stay LS = 5.32, OR = 8.72 days ($p<0.001$). Time of the resumption of oral intake LS = 3.18, OR = 4.34 days ($p<0.001$). Time of the hospital bedrest LS = 3.24, OR = 5.19 days ($p<0.001$). The amount of used analgesics LS = 4.84, OR = 7.80 ($p=0,042$). Mann-Whitney U test showed the same trend, where only operative time showed no significant differences ($p>0,05$)

Conclusions. Laparoscopic surgery is comparable with open surgery in repair of perforated peptic ulcers. Advantages of laparoscopic surgery include a shorter postoperative stay, earlier resumption of oral intake, shorter hospital bedrest time and less analgesic intake – which might suggest that there is less postoperative pain. However, with more detailed comparison and prospective data, including tests about the quality of life, should be undertaken to further assess the safety and efficacy of laparoscopic repair for peptic ulcer perforation.

6. EVALUATION OF BARIATRIC SURGERY PATIENTS' WEIGHT REDUCING EXPERIENCE

Guna Bīlande [1], *Maksims Mukāns* [2,5], *Igors Troickis* [1,2], *Egons Liepiņš* [1], *Oļegs Kozlovskis* [3], *Juris Žarinovs* [3,4], *Guntars Selga* [6]

[1] *SIA "Jūrmalas slimnīca", Latvia*
[2] *AS „EZRA-SK Rīgas slimnīca „Bikur Holim"", Latvia*
[3] *SIA „Siguldas slimnīca", Latvia*
[4] *SIA „Rīgas 1. slimnīca", Latvia*
[5] *Statistical Unit, Rīga Stradiņš University, Latvia*
[6] *Faculty of Oral Medicine, Rīgas Stradiņš University, Latvia*

Background. The modern industrialization brings along not only a string of benefits, but also a variety of health problems, obesity being one of them. There are three key approaches to obesity treatment: lifestyle change, weight loss medications and weight loss surgery. It is recommended to lose 5%–10% of excess weight prior to surgery. Physical activity plays a critical role in improving health of obese individuals.

Purpose. The objective of the current study was to evaluate lifestyle habits and weight loss experience of obese patients prior to bariatric surgery.

Materials and methods. This is 1-year quantitative cross-sectional study that was carried out from November 01, 2016 to October 31, 2017. The subjects of study were patients, who applied for bariatric surgery in one of the four clinics in Latvia that were included in research. Patient participation was voluntary and random.

Results. There were 72 individuals (63 women and 9 men; age 30–49 years). The maximum lifetime weight range was 132–96 kg with average patient BMI 37.6 kg/m^2. At least 1 co-morbidity was admitted by 27% of patients. 54.8% of patients are eating regular breakfast. Irregular meals during week had negative weak correlation with rate of breakfast, dinner and supper, r=-0.280, p=0.017, r=-0.261, p=0.027, r=-0.261, p=0.027, respectively. Patients, who had additional meals had a positive correlation with abnormal eating – in the morning r=0.339, p=0.004, in the midday r=0.251, p=0.036, in the evening r=0.237, p=0.049. Most of the subjects became obese in childhood (23.3%) or in adolescence (37%). Only 14 patients (19.2%) succeeded to reduce weight prior to surgery; 20 subjects (27.4%) weight was relatively stable, but rest of the patients' (53.3%) weight increased. 98% of all patients had tried different weight loss methods before. There is a linkage between patients' age and food consumption – subjects aged under 37 years regularly overeat (61.3%), but are more likely to have regular meals (72.2%). There is a lack of physical activity – only 30.1% of patients are active more than 40 minutes a day. Over 70% of patients spend at least 4 hours a day in sitting position.

Conclusions. The results highlight that all the patients unsuccessfully tried to reduce weight by other methods before bariatric surgery. The reasons for poor preparation were irregular meals, breakfast avoidance, low physical activity and patient's age under 37 years. Additional research and data are needed to understand, whether regular meals, adequate physical activity, combined with other additional methods together give better results to prepare for surgery.

7. EXPERIENCE REMOVAL OF *XANTHELASMA PALPEBRARUM* USING THE METHOD OF PLASMA SUBLIMATION

Ingrida Ritina[1,2], *Silvestrs Rubins*[1,2], *Andris Rubins*[1,2]

[1] *Departament of Dermatovenerology, University of Latvia, Riga, Latvia*
[2] *Latvian Dermatology Institute, Riga, Latvia*

Background. Choosing the treatment method of xanthelasma palbebrarum is an important theme for dermatologists. Xanthelasmas palpebrarum (XP) are benign skin lesions that do not threaten human health, do not affect the functions of the eyelids, but ptosis has been known, they deliver aesthetic discomfort, and so do the unsightly appearance of the skin. Patients come to the experts for their removal on medical and aesthetic indications and the choice of the method of removing, the preferred methods are less painful, with a short period of healing and have a prognosis of a fewer repeated treatments.

Purpose. To assess the effectiveness, safety and convenience of XP plasma sublimation using Plexr® device, and to observe the healing process after XP tissues sublimation. The comparison of the reparative processes' speed after the XP removal applying plasma-generation device with other methods.

Materials and methods. The group of 15 patients was selected, who wished to remove xanthelasma palpebrarum. Each of them was examined visually and by means of the Dermlite 3DN dermatoscope. All 27 xanthelasma palpebrarum were removed by one treatment with a plasma-generating device Plexr® (GMV, Italy). Re-examination of patients was carried out after the scab from the treated area of the skin had fallen off and one year after the procedure.

Results. A total of 15 cases were included in this study. The mean age of the patients was 56 years and it ranged from 33 to 67 years, and the male-to-female ratio of the patients' population was 2:3. Twelve patients had bilateral XP and 3 patients had unilateral XP. All 27 XP were removed by one treatment with a plasma generating device Plexr® (GMV, Italy). During the procedure on the site remote XP brown crust is formed, which disappears within 7–14 days. A full restoration of skin texture occurred during the month without scars and pigmentation disorders. The authors did not detect XP recurrence one year after the procedure. All the patients were satisfied with the cosmetic result. No intraoperative complications occurred, and none of patients complained of pain during procedure.

Conclusions. The results convincingly demonstrate the effectiveness of the new treatment methods of xanthelasma palpebrarum by using the plasma-generating device, and the possibility of its use in aesthetic medicine. The method is controllable to the maximum and safe in handling even treating the eye area and on the eyelids. The advantages include less pain, fast healing process, no traumatisation of the surrounding tissue, and prognostically fewer repeat treatments.

8. ELEVATION OF THE POSTOPERATIVE LEVEL OF ANALGESIA AFTER *N. ISCHIADICUS* BLOCK WITH MULTIMODAL PAIN PROTOCOL IN LOWER EXTREMITY SURGERIES

Arnija Reihmane[1], *Aleksejs Miščuks*[1,2], *Iveta Golubovska*[1,2], *Rota Vēciņa*[2], *Svens Rubulis*[2]

[1] *University of Latvia, Riga, Latvia*
[2] *Hospital of Traumatology and Orthopaedics, Riga, Latvia*

Background. When performing lower extremity reconstruction surgeries, spinal anaesthesia (SA) is the most widely used type of anaesthesia. Although SA is effective, additional peripheral nerve blocks could be the preferred choice, where the region of surgery is analgised longer, thereby lowering the consumption of opioids. It is intended that *n. ischiadicus* block (NIB) in combination with SA will provide additional analgesia in lower extremity surgeries and in postoperative analgesia.

Purpose. The objective of this study is to decrease the postoperative pain level after lower extremity reconstruction surgeries and evaluate NIB effect on postoperative analgesia.

Materials and methods. Prospective, randomized study was carried out in Hospital of Traumatology and Orthopaedics, Riga, Latvia. Patients, who complied with the inclusion criteria, are divided in two groups. I group – SA group – SA with *Sol. Bupivacaine* 2–4ml 0,5%, depending on BMI. II group – SA and NIB group – SA and NIB with *Sol. Ropivacaine* 20–40ml 0,375%, depending on BMI. *N. ischiadicus* block is ultrasound guided. Postoperatively all patients receive medication by a standardized multimodal analgesia protocol. In the postoperative period patients are completing a pain journal. The consumption of morphine is documented. The data is statistically processed, using SPSS program.

Results. 23 patients were enrolled in the study, SA group – 47,8%, SA and NIB group – 52,2 %. The subjective pain level right after the surgery in SA group vs. SA and NIB group: 0,9:0. The subjective pain 2 hours the after surgery in SA group vs. SA and NIB group: 1,45:0,25. The subjective pain level 4 hours after the surgery in SA group vs. SA and NIB group: 2,4:0,83. The subjective pain level 6 hours after the surgery in SA group vs. SA and NIB group: 4,91:1,92 ($p>0,05$). The subjective pain level 8 hours after surgery in SA group vs. SA and NIB group: 3,73:3. The subjective pain level 10 hours after surgery in SA group vs. SA and NIB group: 3,45:3,33. The mean time till the usage of morphine in SA group was 7,55 hours; SA and NIB group – 7,92 hours ($p<0,05$). The study is being continued so that accurate results and conclusions can be made.

Conclusions. Spinal anaesthesia and its combination with *n. ischiadicus* block reduce pain after lower extremity surgeries. The combination of SA and NIB extends the level of analgesia for 6 hours after lower extremity surgeries. *N. ischiadicus* block does not lower the intake of morphine after surgery.

9. PREDICTION OF DIFFICULT TRACHEAL VIDEOLARYNGOSCOPIC INTUBATION USING EL-GANZOURI RISK INDEX

Antons Zakalkins[1], *Sigita Kazūne*[2]

[1] *University of Latvia, Riga, Latvia*
[2] *Hospital of Traumatology and Orthopaedics, Riga, Latvia*

Background. Unanticipated difficult intubation still exists as a significant problem. El-Ganzouri risk index is a bedside difficult airway evaluation method, which can help determine risk of difficult airways. However, the evidence of using of El-Ganzouri risk index in difficult laryngeal visualisation using videolaryngoscopes is limited.

Purpose. Determine the specificity and sensitivity of El-Ganzouri multivariate risk index to predict difficult laryngeal exposure, using Storz C-MAC videolaryngoscope equipped with D-type blade.

Materials and methods. We conducted a study of 29 patients, which were examined using El-Ganzouri risk index before induction of anaesthesia. After induction of anaesthesia videolaryngoscopy was performed, using Storz C-MAC videolaryngoscope equipped with D-blade and laryngeal visualisation was graded using Cormack-Lehane scale. After laryngeal visualisation, grading endotracheal tube insertion was performed and numbers of attempts, as well as complications during intubation were recorded. Sensitivity, specificity, positive and negative predictive values were calculated, receiver operating characteristic curve and area under curve was obtained.

Results. Sensitivity and specificity were 54.2% and 80.0% at El-Ganzouri risk index cut-off value of 2 points. Calculated positive predictive value was 26.7% and negative predictive value was 92.9%. Calculated AUC was 78.3%.

Conclusions. El-Ganzouri risk index shows moderate sensitivity and specificity when used with Storz C-MAC videolaryngoscope. It can be used to predict difficult laryngeal visualization during videolaryngoscopic intubation.

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10. BARRIERS HINDERING EARLY MOBILIZATION IN CRITICALLY ILL PATIENTS IN THE INTENSIVE CARE UNIT

Līva Jasote[1], *Inese Kokare*[1,2], *Ilze Hāznere*[1], *Ilze Valaine*[1], *Anita Trokša*[1], *Jevgēnijs Šusts*[1]

[1] *Center for Physical Medicine and Rehabilitation, Pauls Stradiņš Clinical University Hospital, Riga, Latvia*
[2] *University of Latvia, Riga, Latvia*

Background. There is a well-rounded evidence that early mobilization is safe and beneficial in critically ill patients, but implementation into practice can be challenging due to potential barriers. These barriers include patient factors like hemodynamic instability; structural barriers like personnel and equipment availability; organizational barriers like no written mobilization protocol, scheduling mobility team and communication between team members. Lack of physicians' referral is a potential barrier that indicate a gap in knowledge regarding early mobilization in ICU.

Purpose. The objective of this paper is to discuss the reasons for underutilization of early mobilization team in critically ill patients and to report on the development of a clinical practice recommendations tailored toward specific needs of Pauls Stradiņš Clinical University Hospital's Intensive Care Unit.

Materials and methods Review of literature was conducted to identify barriers that intensive care units face when implementing early mobilization recommendations. We held multidisciplinary team meetings to identify potential barriers for mobilization relevant for our ICU. All the team members, including nurses, shared their concerns about the potential barriers allowing us to gain a comprehensive view of the obstacles that hinder implementation of early mobilization specifically in our ICU. Based on these opinions, we developed consensus on safety criteria and contraindications for early mobilization and parameters to be monitored during mobilization. Both PMR doctor and physiotherapist attended rounds to discuss patients' readiness for mobilization with ICU physicians and to foster communication between both departments.

Results. Summarizing concerns of all the involved specialists allowed us to distinguish several groups of barriers. The most common were organizational barriers such as lack of physicians' referral or scheduling procedures to allow ICU personnel assist mobility team. Lack of practical information to base clinical decision making is a barrier for early mobilization of critically ill patients. Patient factors like low level of patient consciousness or hemodynamic instability was also barriers. Structural barriers like inconvenient equipment were also noted, most commonly, non-adjustable beds and sliding mattresses.

Conclusions. Barriers that hinder early mobilization can be reduced by organising multidisciplinary team meetings to develop consensus on when to start mobilization. Effective communication between mobility team and ICU personnel is of an utmost importance, since implementation of early mobilization protocol requires change of culture and dedicated staff.