COMENIUS UNIVERSITY IN BRATISLAVA
JESSENIUS FACULTY OF MEDICINE IN MARTIN

ABSTRACTS

from

45th Students' Scientific Conference

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ABSTRACTS

from

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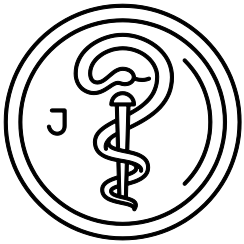

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Your talent determines what you can do.
Your motivation determines how much you are willing to do.
Your attitude determines how you do.

Lou Holtz, football coach

Dear all,

welcome to the 45th Students' Scientific Conference at Jessenius Medical Faculty Comenius University, which is again a kind of holiday of our academic community. In 2024, we commemorate the 55th anniversary of the independence of the medical faculty in Martin. Its representatives correctly understood that independence means greater responsibility. They understood that by investing in students and making research available to them means educating health professionals hungry for new knowledge and supporting progress in medicine. A long and beautiful tradition has emerged that supports competition, but at the same time fairness and self-reflection. Establishing a tradition is commendable, but keeping it alive for several decades requires a lot of effort and energy. The organizers did a great job again, so the students can demonstrate scientific results obtained in recent months under the guidance of their tutors. They will be cheered on by their classmates and friends. All of us who have already felt this sense of belonging are looking forward to the conference. We are looking forward to the presentations of students for whom our faculty is a good place to get an education and who, I believe, will find enough reasons after completing their studies to stay in their homeland and create better Slovakia. Because one can have anything he/she is willing to fight for. Even participation in such a conference may teach us not to give up...

Andrea Čalkovská
The Dean

PROGRAM AT GLANCE

Date: April 23, 2024

Place: Aula A – Novomeského 9, Martin
Aula B – Novomeského 9, Martin

Registration: April 23, 2024, from 7.30 or before the beginning of your section

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Aula A

Section of Clinical Disciplines ..... 08.15 – 10.30

– *coffee break*

Section of Pre-clinical Disciplines ..... 10.45 – 12.20

Aula B

Section of Theoretical Disciplines ..... 08.15 – 10.30

– *coffee break*

Section of Non-Medical Study Programmes..... 10.45 – 12.45

Award ceremony (Aula A) **13.00**

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Duration of lectures: 8 minutes, discussion – 4 minutes
Language: Slovak, Czech or English

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Comenius University in Bratislava
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Award ceremony (Aula A, 13.00)

ABSTRACTS

Book of abstracts is available at https://svoc.jlfuk.sk

CONGENERS IN ALCOHOLIC BEVERAGES AND THEIR IMPACT ON HUMAN HEALTH

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Introduction: Alcoholic beverages are a common part of social events and cultural celebrations. However, less discussed are the congeners that occur in these drinks. Congeners are substances that arise during the production of alcoholic beverages, mainly because of the fermentation process, the type of raw materials used, during the distillation or aging process of spirits and alcoholic beverages. The aim of this study is to summarize the effects of the congeners on the human body.

Material and methods: In order to provide a comprehensive review of the effects of congeners in alcoholic beverages, we carried out a careful PubMed search to identify medical literature concerning congeners and their effect on human body. Approximately 22 articles met the inclusion criteria and were included.

Results: This review showed various effects of the congeners in the alcoholic beverages. Overall, we have described several chemically similar groups of congeners. Methyl alcohol has the most harmful effect on the human body because of its toxic metabolites, ethyl formiate can cause squamous cell degeneration and metaplasia and acetaldehyde is hepatotoxic. On the other hand congeners such as gallic acid can have positive effects on human body with their anti-inflammatory effects . Presence of congeners in the human body can also have a positive contribution in forensic medicine, which can confirm the presence of alcohol in defense claims

Conclusion:. Congeners as substances present in the alcoholic beverages are often covered by ethanol and their detrimental effects can be underestimated. It is therefore of dire need to reduce the income of alcoholic beverages with high congener content, abide to safety regulations regarding the production of beverages.

THE EFFECT OF DIRECT ORAL ANTICOAGULANTS ON PLATELET AGGREGATION

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Introduction: Direct oral anticoagulants (DOACs) represent a new generation of drugs that have been increasingly used in the prevention and treatment of thromboembolic states. They work as selective factor IIa (FIIa) or factor Xa (FXa) inhibitors. Thrombin (FIIa) is the terminal enzyme of the haemostatic system. Despite its pivotal role in the coagulation cascade it is also the most potent activator of platelets. Therefore, the reduction in thrombin could result in indirect antiplatelet activity. This study aimed to investigate if and how DOACs impact platelet function.

Material and methods: Blood sample was taken 12 hours after the administration of dabigatran and apixaban and 24 hours after the administration of rivaroxaban (baseline at 7:00 AM), followed by next blood sample after 2 hours (at 9:00 AM) in order to reach highest possible concentration of all three DOACs. Light transmission aggregometry (LTA) was performed using Born method for the laboratory investigation of platelet function. Thrombin receptor-activating peptide-6 (TRAP-6) and gama-thrombin were used to induce aggregation.

Results: In our single-center study 101 patients with non- valvular atrial fibrillation were enrolled. TRAP- induced platelet aggregation was significantly lower 2 hours after both dabigatran (90,14 ± 10,49% vs. 79,39 ± 13,38%; p=0,0001) and FXa inhibitors (56,15 ± 8.53% vs. 29.51 ± 12.9%; p=0.0001) were administered compared to baseline measurements. Significantly lower platelet aggregation was also observed using gama-thrombin as an aggregation inductor in dabigatran group (29,3 ± 20,6% vs. 8,8 ± 5,5%; p<0,0001) and FXa inhibitors group (39,55 ± 32,15% vs. 19,79 ± 34,97%; p<0,0001).

Conclusion: TRAP/thrombin- induced platelet aggregation was significantly lower 2 hours after the drug-dose administration of both dabigatran and FXa inhibitors. Our finding could have some important clinical implications (risk of bleeding, influence of treatment based on patient risk profile...).

THE IMPACT OF DEEP BRAIN STIMULATION ON MOTOR AND NON - MOTOR SYMPTOMS OF LATE - STAGE PARKINSON'S DISEASE

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Introduction: Deep brain stimulation (DBS) is a neuromodulation method used in the therapy of motor complications of late-stage Parkinson's disease (PD). The most common target for implantation of the electrodes is subthalamic nucleus (STN), the alternative is globus pallidum internum. The most important condition for further successful treatment is the correct indication of the patients. The effect of stimulation could be evaluated by motor parts of Unified Parkinson's Disease Rating Scale (UPDRS) III and IV. The aim of presented study was to evaluate the data about the effect of DBS STN on motor and non-motor complications of late-stage PD.

Material and methods: The group of 12 patients suffering from PD was evaluated in the project. Each subject was examined using the UPDRS III and IV scale in ON and OFF state in 3 visits: V1 was done before the implantation of DBS system, V2 was done 3 months after the implantation of DBS system, V3 was done 6 months after DBS therapy. For the last visit were evaluated only 10 subjects (the 2 patients from the former group have not been 6 months after implantation yet). Then we have processed the data using the non-parametric Wilcoxon test to confirm our hypothesis (due to the small range of our group of patients).

Results: We have proven that in the UPDRS III scale there has been a significant improvement in ON state after 3 months (p=0,038), and also after 6 months (p=0,028) after the implantation of DBS system. We have also proven the improvement in UPDRS IV (p=0,016) scale. There has been a slight deterioration in OFF state after 6 months.

Conclusion: These data confirm the hypothesis, that DBS STN is an effective method in the treatment of the late-stage PD. The most significant improvement was observed in the UPDRS IV scale, which refers to the motor fluctuations. The slight deterioration in OFF state during the 6 months should be explained by the progression of PD.

ROXADUSTAT AS A TREATMENT OF ANAEMIA IN PACIENTS AFTER KIDNEY TRANSPLANTATION

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Introduction: Chronic kidney disease is a progressive condition that affects >10% of the general population worldwide. Renal anaemia is a form of normocytic, normochromic, hypoproliferative anaemia. It is frequently associated with poor outcomes and confers an increased mortality risk. Roxadustat is a recently approved hypoxia-inducible factor prolyl-hydroxylase inhibitor that has demonstrated favourable safety and efficacy in the treatment of renal anaemia. The aim of the study was to determine whether Roxadustat is an effective drug in treatment of anaemia in patients with CKD and mainly in patients after kidney transplantation. The secondary aim was to identify the potential of Roxadustat as fats stabilizing agent in such patients.

Material and methods: This is a monocentric study conducted on the patients of Transplant-nephrology department and/or Transplant-nephrology out-patient clinic of University Hospital Martin (n = 62) who have been treated with Roxadustat since August 1st, 2022.

Results: We discovered a significant improvement in the levels of hemoglobin after one month of Roxadustat treatment (P < 0,0001) and another significant improvement after 3 months (P = 0,0010) and in follow-up – 5,8 months (P = 0,0013). There was no significant difference in eGFR, so hemoglobin levels were not affected by kidney function. In the next step the group of patients was divided based on history of kidney transplantation. Again, we confirmed significant improvement in hemoglobin levels in kidney transplantation group in first month of treatment (P < 0,0001) as well as in month 3 (P = 0,0225) and in follow up (P = 0,0010). Same results were confirmed in non-transplanted subgroup of patients for month 1 (P = 0,0010) and for month 3 (P = 0,0080). However, there was no significant difference between hemoglobin levels in month 3 and follow up in this group. The effect on lipid metabolism has not been confirmed in our group of patients.

Conclusion: Our first analysis confirmed that Roxadustat is very effective, not only in patients with CKD, but also in patients with anaemia after kidney transplantation.

ASSESSMENT OF HEMOSTASIS IN PATIENTS WITH SEVERE PSORIASIS – IS A HYPERCOAGULATION STATE PRESENT? A PILOT PROSPECTIVE STUDY

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Introduction: Psoriasis is an immune-mediated, inflammatory dermatosis widely connected to cardiovascular comorbidities. It has been repeatedly described in several studies and meta-analyses that patients with severe psoriasis are at higher risk of thrombotic complications. Rotational thromboelastometry (ROTEM) is a viscoelastic hemostatic test that enables sophisticated evaluation of *in vivo* hemostasis in whole blood samples. This study aimed to evaluate changes in hemostasis in psoriatic patients using ROTEM.

Material and methods: We performed a pilot, observational, cohort and prospective study. A total of 61 patients with severe psoriasis (Psoriatic Area Severity Index >15) were enrolled in this study. The control group consisted of 60 healthy blood donors. Blood samples were tested with ROTEM Gamma (Pentapharm GmbH, Munich, Germany) analyzer using INTEM, EXTEM, and FIBTEM reagents. We measured clotting time (CT), clot-forming time (CFT), maximum clot firmness (MCF), amplitude 10 minutes after CT (A10), amplitude 20 minutes after CT (A20) and alpha angle.

Results: The group of psoriatic patients involved 30 men and 31 women with an average age of 51 (± 13 years). We compared patients with severe psoriasis to 60 healthy controls (34 men, average age 42 ± 9 years). Our analysis revealed significant changes in the following parameters: prolonged CT-EXTEM ($p<0,05$), CT-FIBTEM ($p<0,05$), CFT-FIBTEM ($p<0,05$), shorter CFT-INTEM ($p<0,05$), bigger MCF-EXTEM ($p<0.05$), A10-EXTEM ($p<0,05$), A20-EXTEM ($p<0,05$), alfa-EXTEM ($p<0,05$), A10-INTEM ($p<0,01$), A20-INTEM ($p<0,05$), alfa-INTEM ($p<0,001$), alfa-FIBTEM ($p<0,05$) in patients with severe psoriasis compared to healthy controls.

Conclusion: We observed abnormal changes in hemostasis using rotational thromboelastometry in patients with severe psoriasis. These changes mean hypercoagulable condition in patients with psoriasis. Every parameter of clot firmness in patients with psoriasis is significantly bigger than in the control group. This is the first study evaluating hemostasis in patients with psoriasis using ROTEM.

Keywords: severe psoriasis, rotational thromboelastometry, hemostasis

EFFICACY OF CONSERVATIVE TREATMENT OF PECTUS EXCAVATUM BY EVALUATION OF 3D SCANS AND CLINICAL EXAMINATION DURING FIRST MONTHS OF TREATMENT

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Introduction: Pectus excavatum (PE) is a deformity of the chest wall, affecting the sternum and the rib cage, causing sunken chest. This deformity can affect cardiac and respiratory function, but in most of the patients have a bad psychological effect. Vacuum bell (VB) treatment is non-invasive method based on the application of a vacuum over the thoracic deformity. Long-term daily application of the vacuum on the deformity leads to remodelation of the chest wall and alleviation of the deformity.

Material and methods: The study included 44 patients (F:3, M:41, median 14 years old). They underwent 3D scans and a clinical examination, during which measurement of lateral and anteroposterior chest wall length and depth of deformity were taken before the start of the treatment and after six months. The indices used to evaluate PE deformation were calculated (clinical Haller´s index - HI, 3D HI, anthropometric index - AI and 3D AI), and the correlation of clinical parameters with 3D parameters was established. Then the indices change with the change in depth of deformity was compared, giving us the idea of the treatment efficacy.

Results: In this study the authors found statistically significant correlation of parameters measured clinically and using 3D device, slightly higher correlation was found in case of measurement before treatment and in AI. As the change of depth of the deformity is clinical marker of treatment success, authors provided correlation of change in depth with measured indices. There was significant correlation with clinical AI, correlation with clinical and 3D HI was not significant, and correlation with 3D AI was relatively low.

Conclusion: This study suggests that although clinical measurements of the deformity may be sufficient to evaluate progress of treatment, 3D scanning is very promising method, as it has strongly positive influence on compliance. Poorer correlations between indices and change in depth may implicate that it may not be sufficient parameter to evaluate the treatment outcome.

BREAST CARCINOMA SCREENING IN SELECTED GROUP OF PATIENTS

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Introduction: Breast carcinoma is the most common cancer among women worldwide. The average lifetime risk of developing the disease is 13%. The risk of women with a family history of breast carcinoma can go up to 39%. Our study aimed to focus on a specific group of women and enable them to learn about the risks and their possible mitigation. Our secondary aim was to calculate the risk factors of our subjects and screen the women with increased risk. The study has the elements of primary and secondary prevention and educational purposes too.

Material and methods: Within the study, 365 women were approached to fill out a questionnaire regarding potential risk and protective factors for the development of breast cancer and learn about the screening programs in Slovakia and self-examination of the breasts. Out of 365 approached 106 respondents participated in the study. Evaluation of the questionnaires was performed together with risk calculations. 19.8% of respondents with the highest risk factors were selected and invited for further investigations, which consisted of thorough history, physical and ultrasound examination. Women at higher risk were instructed on preventive measures and further risk mitigations.

Results: Within the project, more than 300 women were educated on breast self-examination and cancer screening programs in Slovakia. The majority of respondents (85,8%, N=106) had undergone preventive examination by a gynaecologist in the past 2 years, thus only 56% performed self-examination of breasts regularly. 16% of respondents have a family history of breast carcinoma. 19,8% of the respondents with the highest calculated risk were invited for further investigation. 11 women attended the examination at University Hospital Martin. Four respondents were assessed with BIRADS1 and six with BIRADS2. One respondent assessed with BIRADS0 is planned for further investigation.

Conclusion: Screening programs play an important role in the prevention of malignant diseases. Breast self-examinations can be a useful tool in spotting the first signs of the disease, motivating a woman to further investigate her health.

3D RECONSTRUCTION AND PRINTING OF A COMPLICATED ACETABULAR FRACTURE AND PREOPERATIVE PLANNING

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Introduction: In the treatment of acetabular fractures, the greatest emphasis is put on a surgical revision with perfect anatomical reconstruction to prevent the development of posttraumatic arthrosis in the affected joint or at least to delay its development. The goal of this study is 3D reconstruction of a complicated acetabular fracture, followed by 3D printing and preoperative planning to provide the most accurate articulation in the joint to prevent the development of posttraumatic arthrosis.

Material and methods: DICOM data from a CT scan of a polytrauma patient was used for 3D reconstruction with use of "3D Slicer" software. The 3D model was exported as a 1:1 scale .stl file. Then, the model was imported into "Blender" software for slight editing and optimization for 3D printing. After these modifications, the .stl file was uploaded to "PrusaSlicer" for slicing (preparing the model for printing) and exported in G-code format. Finally, the model was printed using an Original Prusa i3 MK3S+ 3D printer and PLA filament. The 3D printed model was provided to the surgeon of Department of Traumatology at University Hospital Olomouc.

Results: The 3D printed model corresponded to anatomical reality. The positions of the printed fragments were correlated with their locations during surgery. The position and length of the fixation screws were determined preoperatively. The 3D model also helped to determine the approximate shape of the surgical plate that was finalized during surgery, ultimately reducing operative time.

Conclusion: 3D printing can be used to create models of fractures. The models provide doctors with a more complex view of patient's injury and aid in pre-operative planning. Preoperative planning with use of 3D printed models can reduce time of surgery and anaesthesia significantly, reduce dose of ionizing radiation received by the patient and lower the costs of running operating theatre. The presented process is also an example of combining the preclinical and clinical field.

PROGNOSTIC SIGNIFICANCE OF p53 PROTEIN EXPRESSION IN DIFFUSE LARGE B-CELL LYMPHOMA AND HIGH GRADE B-CELL LYMPHOMA WITH MYC, BCL2 AND/OR BCL6 GENE REARRANGEMENTS

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Introduction: Diffuse large B-cell lymphoma (*DLBCL*) and High grade B-cell lymphoma with double/triple rearrangement of genes *MYC*, *BCL*-2 and/or *BCL*-6 (*HGBL DH/TH*) are counted amongst the most common haematologic malignances around the world. As we know today their biological behaviour is very heterogenous and prognosis of the patients is therefore affected by many different prognostic factors, one of them possibly being expression of *p53* antigen. In our research we have analysed expression of *p53* protein and its effect on prognosis of Slovakian patients with *DLBCL* and *HGBL DH/TH*.

Material and methods: In this retrospective study we carefully analysed under the microscope altogether 101 samples of DLBCL and HGBL DH/TH between years 2008-2020 for their expression of p53 protein. Different cut-off lines (20%, 50%, 80%) were taken into consideration based on the most recent studies with still not-uniform conclusions made about this topic. Afterwards, the results were compared with overall survival (OS) of the patiens. The data were censored on 31.12.2023 and statistically analysed in software Prism10.

Results: In case of 20% and 50% cut off lines we have not found any statistically significant difference in OS between p53 positive and p53 negative DLBCL cases (p=0,3726, and p=0,7509, respectively) nor HGBL cases (p=0,3070 and p=0,6925, respectively). However, there was apparent difference in OS in DLBCL category using cut off line of 80% positive cells (p=0,1977).

Conclusion: Our study pointed out the difference in OS between Slovakian patients diagnosed with DLBCL NOS who are p53 negative *versus* p53 positive using 80% cut off line with the latter group showing much worse prognosis. These results need to be further supported by higher amount of cases and preferably correlated with results of genetical analyses of *TP53* gene rearrangements.

COMPLICATIONS AFTER PERORAL ENDOSCOPIC MYOTOMY FOR ACHALASIA – SINGLE CENTER RETROSPECTIVE ANALYSIS

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Introduction: Endoscopic therapy is adopted as a treatment of esophageal motility disorders, including achalasia (peroral endoscopic myotomy – POEM). The procedure is carried out under general anesthesia and consists of the creation of the mucosal entry, submucosal tunneling, myotomy and closure of the mucosal entry. Oral diet is initiated after the exclusion of submucosal leak on X-ray contrast study that is recommended the following day after the procedure. In case of its unavailability, oral diet is initiated based on the clinicians' judgement. X-ray contrast study has become unavailable in our institution. We therefore evaluated the rate of complications in the settings of clinical decision – based initiation of oral diet.

Material and methods: This is a single-centre retrospective analysis of the high-volume centre. We evaluated POEM procedures for esophageal achalasia in four consecutive years (2020-2023) in our high-volume centre. All procedures were performed by the experienced endoscopist (>100 POEM procedures). We recorded (1) the rate of peri- and postprocedural complications, (2) length of the hospital and (3) rate of the late complications.

Results: We included 135 POEM procedures per 4 years. Mean age of the patients was 53.2±16.3 years. 120 patients (88.9%) were also evaluated 3 months after the procedure. We detected complications in 9 patients (6.7%) – 5 aspirations during the intubation and 5 perforations of the mucosa during the POEM procedure. Of these perforations, 4 were detected and solved during the procedure and 1 was detected on the 3rd day after the procedure on the CT scan and required extension of the hospital stay. The mean hospital stay was 6.5(±1.4) days. We detected no late complications in patients that we evaluated 3 months after the procedure.

Conclusion: Complications after POEM procedures are rare if performed by experienced endoscopist. The majority of complications were detected during the procedure, only 1 complication occurred after the procedure. Our complications rate is comparable with those provided by centres performing routine X-ray contrast study following day after the procedure.

THE TRENDS IN PSYCHOACTIVE SUBSTANCES ABUSE AMONG MOTOR VEHICLE DRIVERS IN THE SLOVAK REPUBLIC DURING THE YEARS 2022-2023

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Introduction: DUI (*Driving under the influence*) remains a critical issue in ensuring road safety, motivating this study to examine prominent trends in psychoactive substance abuse among motor vehicle drivers in Slovakia from 2022 to 2023.

Materials and methods: A retrospective analysis was based on data obtained from the Department of Toxicology at the Healthcare Surveillance Authority in Martin (Slovakia) in co-operation with the Department of Forensic Medicine and Medicolegal Expertise, Jessenius Faculty of Medicine in Martin. For data collection, spreadsheets were created and utilized to organize the dataset. The total number of positive toxicological analyses was 481 drivers. Qualitative analyses covered blood and urine samples, while quantitative analysis focused solely on blood.

Results: The average age of apprehended individuals was 31, with women comprising 9.6% of the cohort. Blood and urine samples were collected from 58.2% of drivers, 41.4% provided blood samples only, and urine samples exclusively were provided by 0.4% of the sample.

Substituted amphetamines were prevalent, with 81% testing positive in blood and 80% in urine. Methamphetamine emerged as the dominant substance: 15 drivers tested below the cut-off concentration of 20 ng/mL, 115 drivers showed concentrations of 20-150 ng/mL, and 257 drivers exceeded the concentration of 150 ng/mL. The highest recorded concentration was 890 ng/mL. Cannabinoids exhibited a prevalence of 53% in blood, 61% in urine, with THC being the only illegal one: 5 drivers tested below the cut-off concentration of 1 ng/mL, 56 drivers showed concentrations of 1-10 ng/mL, and 10 drivers exceeded the concentration of 10 ng/mL. Benzodiazepines were sporadic (2.7% in blood, 3.9% in urine), and opioids were even less prevalent (1.5% in blood, 2.1% in urine). Cocaine was rarely detected (1% in blood, 0.7% in urine).

Conclusion: These findings underscore the dominance of methamphetamine and the need for improvement in the DUI recognition process. Inconsistencies between police and medical data, as well as delays between sample collection and toxicological analysis, point out the necessity for process optimization.

THE POTENTIAL OF MITOCHONDRIAL HAPLOGROUP DETECTION IN THE ROMA POPULATION OF SLOVAKIA IN FORENSIC ANALYSIS

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Introduction: Due to its properties, mitochondrial DNA represents an optimal target molecule for forensic analysis. In addition to its high resistance to the external environment and relatively high copy number per cell, it is mainly the existence of mitochondrial haplotypes that can be used to classify individuals as members of geographically mappable haplogroups. Current knowledge in the field of mitochondrial DNA analysis shows that there is a close association between ethnicity and an individual's haplotype.

Methods: Blood samples from 192 probands of Slovak Roma population were processed, DNA was extracted, and after sequencing and bioinformatic analysis of hypervariable regions HV1 and HV2, we identified individual haplotypes and classified them into major haplogroups. The results of the analysis of samples were compared with the results of work carried out using a similar methodology on samples from 374 probands representing the Slovak Caucasian race.

Results: We identified 83 haplotypes within 192 samples, classified into 13 major haplogroups. The most significant results were identified for the M5 subgroup, which shows a significantly higher frequency of occurance in the Roma Population compared to the Caucasian race not only in Slovakia but also in other European countries.

Conclusion: In our study we were able to identify a few haplotypes characteristic for the Roma ethnic group in terms of frequency of occurrence. For practical application of these findings in forensic analysis, further studies on a larger number of probands will be needed for a more thorough characterization of ethnic-specific haplotypes.

THE EFFECT OF AMAROGENTIN, AGONIST TAS2R, ON AIRWAY DEFENCE MECHANISMS IN AN EXPERIMENTAL MODEL OF ALLERGIC ASTHMA

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Introduction: Mast cells participate in the early and late reactions of allergic sensitization, chronic inflammation and airway remodeling. Previous experiments using human mast cell line LUVA revealed, that amarogentin significantly inhibited histamine secretion by influencing intracellular Ca^{2+} signalling. Therefore, we wanted to evaluate the effect of amarogentin in an experimental model of allergic asthma in guinea pigs. The present study assesses the effect of amarogentin, administered p.o., on impaired airway defence mechanisms such as cough, bronchoconstriction and ciliary frequency.

Materials and methods: *Animals:* An experimental model of allergic asthma was induced by a combination of parenteral and inhaled administration of ovalbumin for 28 days.

In vivo analysis of the cough reflex sensitivity: The cough reflex analysis was performed on conscious animals using a whole-body double-chambered plethysmograph. Aerosol of citric acid was used for cough induction.

In vivo analysis of specific airway resistance (sRaw): Similarly, by the two-chamber plethysmograph we analysed the cough reflex. To induce airway spasm, we used citric acid and histamine causing bronchoconstriction.

In vitro analysis of ciliary beating frequency (CBF): The isolated ciliary epithelial cells were used to prepare microscopic samples. The values of CFB were evaluated using a Zeiss Axio Vert microscope. A1 with camera Basler 504KC.

Results: The results show the ability of amarogentin to reduce manifestations of bronchial hyperreactivity represented by the measurement of specific airway resistance. Moreover, CBF analysis points to a protective effect of amarogentin on airway epithelium. Besides this, the potential antitussive effect of amarogentin was investigated, but cough reflex analysis did not bring any significant result.

Conclusions: This study demonstrated a beneficial effect of amarogentin on airway defence mechanisms. A possible explanation for the effect may involve direct stimulation of TAS2R in the airways. However, to fully explain the mechanism of action of amarogentin, it is necessary to perform an immunological analysis, which would demonstrate a possible anti-inflammatory and anti-remodeling effect resulting from TAS2R stimulation.

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ANTIBIOTIC TREATMENT ATTENUATES COUGH RESPONSE IN GUINEA PIG MODEL

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The respiratory system evolutionarily developed a complex set of defensive and protective mechanisms due to its constant exposure to air-born irritants. Recently, thanks to modern sequencing and omics methods, information on the microbiome of the respiratory tract, which is a complex ecosystem of microorganisms located from the nasal cavity to the alveoli, has been collected. Information on the dysbiosis of the respiratory tract and its association with various pathological conditions, such as bronchial asthma, COPD, and cancer indicates that the airway microbiome acts in the respiratory tract as a functional component of the defence/protection of this part of the human body. Antibiotic (ATB) treatment is routinely used in the treatment of respiratory infections and its effect on airway defence is not known, therefore we addressed the assessment of the ATB treatment effect on cough reactivity in the guinea pig model. Cough was induced chemically in double chamber whole-body plethysmograph HSE855 by inhalation of citric acid aerosol (0.4M) for 5 minutes in Dunkin-Hartley guinea pigs before and after treatment by sulfadoxine/trimethoprim combination (200/40 mg/mL, dose 0.02 mL/kg i.p., 5 days) compared to the saline-treated (0.02 mL/kg i.p., 5 days) group (n=8 each). The number of cough bursts decreased in the ATB-treated group by ≈ 70% (median ± interquartile range; 6.5±5.25 vs 2±2.25, P=0.0159) and in the saline-treated group by ≈ 30% (5.5±3.75 vs 4±5.25, n.s.). Cough latency increased in both groups as well, however not significantly (mean ± standard error of the mean; ATB-treated group 80.2±32.07s vs 193.3±28.82s; saline-treated group 93.2±19.45s vs 140.0±40.42s). ATB treatment decreased the cough reflex reactivity in an animal model, but the exact mechanisms of interaction of airway dysbiosis and afferent cough pathways remain unclear. ATB-induced airway dysbiosis must be considered, especially in patients with already attenuated cough reflex, such as elderly patients, patients with neuromuscular conditions, after stroke etc.

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TRANSCRIPTOMIC SIGNATURES AS BIOMARKERS OF STATIN ANTIPROLIFERATIVE EFFECT ON CANCER CELLS

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Introduction: Statins, primarily used for hyperlipidemia and atherosclerotic cardiovascular disease, exhibit pleiotropic effects including anti-cancer properties influenced by tumor characteristics and cholesterol pathway activation. However, the pleiotropic effects of fluvastatin extend beyond cholesterol synthesis. Our aim was to identify genes outside this pathway whose expression might correlate with fluvastatin sensitivity in selected cell lines and could serve as potential biomarkers.

Material and methods: *In silico* analysis involved data analysis of a microarray study using statins. To identify potential biomarkers, we have utilized several bioinformatic tools, including ROC Plotter, a machine learning-based algorithm for validating biomarkers. Genes with the highest AUC values were subsequently explored in depmap portal (depmap.org). The antiproliferative effect of fluvastatin on cancer cell line cultures (MCF-7, MiaPaCa-2, WPMY-1 and PC_3) was measured by WST1 assay and IC_{50} values were calculated. Data were correlated with expression level (measured by qPCR) of the gene identified by *in silico* results.

Results: In our analysis, we identified a network of 125 genes with reduced expression levels compared to control, primarily involved in regulating cell cycle and death processes. Further screening using the ROC Plotter algorithm revealed three genes, *BIRC5*, *SHCBP1*, and *DEPDC1*, with high AUC across utilized datasets, indicating potential as biomarkers. Subsequent analysis via the depmap portal demonstrated negative correlations between *BIRC5*, *SHCBP1*, *DEPDC1* expression, and sensitivity to fluvastatin across various tumor cell lines (MCF-7, MiaPaCa-2, WPMY-1 and PC_3). We selected four cell lines, in which we experimentally determined IC_{50} values for fluvastatin and measured *BIRC5* expression using qPCR. The results revealed varied responses among cell lines, possibly influenced by *BIRC5* expression.

Conclusion: Experimental validation of *in silico* analysis revealed varied responses of MCF-7, MiaPaCa-2, WPMY-1 and PC_3 cell lines to fluvastatin, potentially linked to *BIRC5* expression levels. This suggests *BIRC5* as a candidate biomarker, though further investigation is warranted.

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GENETIC PROFILING OF MALIGNANT MELANOMA

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Introduction: Malignant melanoma is a type of skin cancer originating from melanocytes, the cells responsible for producing melanin. Main characteristics of the cancer are a high rate of metastasis, considerable heterogeneity and high mortality. Pathogenesis is based on intermittent exposure to UV light with large number of nevi or atypical nevus increasing the risk of malignity further. Only less than 10% of all malignant melanomas are based on congenital mutations in the form of autosomally dominant mutations of CDK4 and P16/CDKN2A genes. This study aimed at utilizing MLPA for molecular analysis of typical markers for familial malignant melanoma.

Material and methods: After being confirmed by a pathologist, tissue samples were obtained from 12 patients suffering from stage 3 and 4 malignant melanoma. DNA samples were isolated from formalin-fixed paraffin-embedded (FFPE) tissue samples and then quantified using the Nanodrop. DNA samples were subsequently used for MLPA analysis of CDKN2A/2B and CDK4 genes using SALSA MLPA Probemix P419 CDKN2A/2B-CDK4 (MRC Holland). MLPA analysis is expected to take two days. DNA desaturation and preparation of hybridization Master mix will be performed on the first day, with the subsequent hybridization process occurring over a period of 20 hours overnight. Second day will involve ligation and PCR reaction, last step will be fragment analysis and final analyzation of results.

Results: As of the writing of this abstract the analysis is not yet finished and as such no data can be presented.

Conclusion: This study should find the prevalence of genetic markers linked to the stage 3 and 4 of malignant melanoma among selected participants. As the prevalence of melanomas increases, it is important to properly define and update statistical prevalence of different types of melanomas.

IN VIVO CHARACTERIZATION OF NEURAL PRECURSORS DERIVED FROM IPS CELLS

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Introduction: Neural precursors (NPCs) are multipotent cells which can differentiate into several types of mature neural cells such as neurons, astrocytes, and oligodendrocytes. These cells could have numerous ways of use in regenerative medicine. In this project, our main goals were: i) to characterize the *in vivo* properties of NPCs in order to test their possible tumorigenic potential, ii) to establish a new in vivo model at JLF UK and ii) to test the ability of NPCs to cross the hematoencephalic barrier of newly established in vivo model (chicken embryo).

Materials and methods: With the use of iPSc technology (reprogramming cells into pluripotent stem cells), NPCs were derived from ALS-patient skin fibroblasts by reprogramming the cells to the state of pluripotency and then differentiating them into neural precursors. To test their possible ability to form tumors (teratomas), we xenotransplanted the cells under the skin of Crl:NU(NCr)-Foxn1nu 6-week-old male athymic nude mice (The Jackson Laboratory, USA). For testing the extravasation properties of NPCs, we established the new in vivo method – in ovo chicken embryonic assay (CEA) and performed the pilot experiments to optimize the protocol.

Results: NPCs derived from ALS patient did not show any tumorigenic potential as verified with the xenotransplantation experiments. Extravasation properties of NPCs cells were not yet tested as supply of the key reagents for their expansion was not provided by local distributors during the project. However, we were able to establish the new, in ovo, chicken embryo-based method (assay), for the first time at Jesssenius Faculty of Medicine in Martin.

Conclusion: Through the duration of this project, we tested the ability of iPSc-derived NPCs to form tumors and introduced a new methodology at the Jessenius Faculty of Medicine. New in vivo method will be use in future for testing the extravasation potential of iPS-derived cells and newly derived cancer cell lines.

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THE EFFECT OF MODULATION OF ION HOMEOSTASIS IN A CELLULAR MODEL OF NEURODEGENERATION

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Introduction: Affecting membrane potential and calcium regulation through the modulation of ATP-sensitive potassium channels (KATP) is able to influence the progression of neurodegeneration. Beside the cell surface of neurons, KATP were identified also in mitochondrial membranes. Till nowadays, intracellular distribution of KATP and especially their specific role in mitochondrial physiology seems to be underestimated factor. To elucidate the distinct roles of mitochondrial KATPs in experimental condition, their selective modulators like diazoxide and 5-hydroxy decanoate could be utilized alternatively to non-selective modulators such as pinacidil and glibenclamide.

Material and Methods: In our study, we utilized human SH-SY5Y neuroblastoma cells commonly used in research of Parkinson's disease. We induced neurodegeneration using mitochondrial respiratory complex inhibitor-rotenone. Effects of mitochondrial vs surface KATPs was tested by alternative 24-hour exposure to glibenclamide/diazoxide/pinacidil/5-hydroxydecanoate in control and rotenone conditions. Our focus was set on the evaluation of changes of intracellular calcium levels in mitochondria and cytoplasm separately using confocal microscopy of vital cells by colocalisation analysis of fluorescence. To assess neurotransmitter release potential, we measured cytosolic Ca^{2+} oscillation by calcium imaging following the stimulation of action potential. Finally, to correlate results with viability of the cells, we perform MTT test and process the results together with changes in cell counts in specific experimental conditions.

Results: Our results indicate that selective modulation of mitochondrial KATPs using agonist diazoxide and 5-hydroxydecanoate as an antagonist modulate calcium homeostasis inside the cell in different manner as was observed after use of non-selective KATP modulators (pinacidil and glibenclamide). Specific features of selective mitochondrial KATPs modulation are evident after comparison of calcium changes in control and pathological conditions as well.

Conclusion:

Our in vitro experiments reveal significant differences in the effects of mitochondrial and cytoplasmic KATPs in neurodegenerative conditions. Besides that, we observed lowered calcium levels in mitochondrial network compared to the cytoplasm. Further, we observed shift in ratio between mitochondrial and cytoplasmic calcium signal, which depended on chosen KATP modulator. This observation suggests a novel approach in assessing apoptosis risk reflected by relative increase of mitochondrial calcium concentration.

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ANALYSIS OF CEREBRAL VOLUMETRIC CHANGES IN NEURODEGENERATIVE DISEASE USING MAGNETIC RESONANCE

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Introduction: Neurodegenerative disorders (NDDs) are CNS diseases with diffuse progressive neurodegeneration causing morphological and volumetric brain changes. The volumetric alternations can be noninvasively assessed using magnetic resonance (MR)-volumetry. MR-volumetry is still being explored as a primary neurological tool for monitoring atrophic processes and clinical deterioration in NDDs patients. In this study, we started to create a local institutional MR brains volumetric database of NDDs patients and appropriate controls to clarify the clinical usefulness of MR-volumetry.

Material and methods: Recruited were 24 patients diagnosed with Amyotrophic Lateral Sclerosis (ALS; 6 patients aged 51±7 years), Sclerosis Multiplex (SM; 6 patients: 46±6 years), Alzheimer's disease (AD; 6 patients: 65±3 years), and Parkinson's disease (PD; 6 patients: 58±6 years), and 14 healthy controls aged correspondingly to patient groups (CON; aged 57±6 years). The gender distribution was equal in each study group. MR-volumetry was performed at 3 Tesla MR-scanner acquiring sagittal T_1-weighted MR-scans (time to repeat/echo = 2400/2.24ms, field of view = 256x240mm^2, 208 slices per slab with 0.8mm thickness). The MR-volumetry of 63 brain regions was evaluated using FreeSurfer. Statistical differences in MR-volumes between NDDs and CON and between NDDs' subgroups were analyzed using ANOVA in Jamovi of the R-Core Team.

Results: Our results showed MR-volumetric signs of AD (enlarged lateral ventricles and *choroid plexus*, atrophied *cerebellum*), PD (enlarged *putamen* and *nucleus accumbens*), SM (atrophied mid/posterior *corpus callosum*), and ALS (enlarged 4th ventricle), that can distinguish these NDDs from CON; but to a considerable extent also from others NDDs.

Conclusion: Our results suggest the non-negligible benefits of MR-volumetry as a supportive clinical tool in NDDs distinguishing and characterization. The utility of establishing (not only) an institutional MR brain volumes database was so declared.

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CHEMOPREVENTION OF EXPERIMENTAL BREAST CARCINOMA BY PLANT NUTRACEUTICALS

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Introduction: Comprehensive oncology research showed evidence that plant nutraceuticals may beneficially modulate carcinogenesis. The original data of our working group demonstrated the oncostatic efficiency of low-dose mixtures of phytochemicals present in specific herbs, spices, or fruits in rodent models of breast carcinogenesis.

Methods: This study aimed to analyse the anticancer effects of dietary administered Aronia melanocarpa L. in the model of chemically-induced rat mammary adenocarcinoma. A. melanocarpa (as fruit peels) was administered in the diet at two concentrations of 0.3% (w/w) and 3% (w/w) during the whole experiment. At autopsy, mammary carcinomas were removed and prepared for analysis.

Results: In the chemopreventive model, aronia at both doses significantly increased Bax expression, decreased Bcl-2 and VEGF, and increased the Bax/Bcl-2 ratio compared to the control. Aronia at a higher dose significantly increased the cytoplasmic expression of caspase-3 compared to the control and to the aronia group applied at a lower dose. Aronia at a higher dose significantly reduced tumor stem cell marker CD133 expression compared to the control group. In addition, analysis of the epigenetic effects of aronia in cancer tissue showed significant changes in histone chemical modifications, miRNAs expression, and methylation status of tumor-suppressor genes in vivo.

Conclusion: The present study is the first to analyze the antitumor effect of A. melanocarpa in the models of experimental breast carcinoma in vivo. Individualized cancer-type profiling and patient stratification are crucial for effectively implementing plant nutraceuticals within targeted anti-cancer strategies in clinical oncology.

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THE EFFECT OF THE METHIONINE DIET ON THE INTERNAL STRUCTURE AND INTEGRITY OF THE KIDNEY

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Introduction: Reduced kidney function is associated with an increased risk for cardiovascular events and mortality compared with the general population, with incrementally increased risk as the glomerular filtration rate declines. As further confirmation of the existence of a narrow cross-talk that may accelerate both processes, some cardiovascular disease risk factors (e.g. diet, metabolic disorders) play, at the same time, also a role in chronic kidney disease progression and vice versa. Methionine is an essential amino acid commonly ingested in food. One of the intermediate products of its metabolism is also homocysteine. A high level of homocysteine in plasma is a risk of health complications at the vascular level. Our research focuses on the effect of the high methionine diet on the kidneys.

Material and Methods: In this experiment, we conducted our study meticulously, using females (n = 10) and males (n = 10) of Wistar rats. Five animals/groups were induced on a methionine diet of 2 g/kg animal weight/day for 28 days. After the sacrifice of the animals, kidneys were prepared using the paraffin method and evaluated by light microscopy utilising the dyes H&E and PAS. Then, immunohistochemical analysis with markers CD-34, SMA, and Iba1 was performed.

Results: Histomorphological analysis showed changes in terms of enlargement of urinary space around the glomeruli and dilatation of proximal tubules. The PAS reaction showed thinning of the filtration membrane. The CD-34 marker helped assess changes at the endothelium level of the capillaries and postcapillary venules. The SMA marker showed modulation of juxtaglomerular cells and activation of myofibroblasts. Using the marker Iba1, macrophage multiplication was confirmed.

Conclusion: These results suggest a toxic effect of a high methionine diet on the kidneys, with suspected filtration membrane affection, damage at the endothelial level, and oncoming inflammation with possible fibrosis, which might represent an interesting and relevant target for future therapeutic interventions.

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DIET HIGH IN METHIONINE AND ITS EFFECT ON THE CEREBELLUM OF LABORATORY ANIMALS

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Introduction: Methionine (Met) is one of the essential amino acids. Accumulation of homocysteine, an intermediate product of Met metabolism, causes hyperhomocysteinemia (hHcy). hHcy is associated, among other things, with neurotoxicity. The cerebellum plays a crucial role in normal brain function, and its structural and functional involvement in several neurological diseases is associated with the impairment of cognition, mood and behaviour. Due to the lack of scientific works focused on cerebellar neurodegeneration and based on previous research, we decided to explore the impact of inducted hHcy by a high-methionine diet on laboratory animals' cerebellum.

Material and Methods: A high-met diet of 2 g/kg of animal weight/day for four weeks induced mild hHcy in adult Wistar rats, both males (n = 5) and females (n = 5). After the mild Hcy induction, animals were sacrificed, and the cerebellum was prepared for the paraffin method and proceeded for subsequent histological and immunohistochemical analyses. For evaluation of the possible neurodegenerative pattern, we utilised Cresyl violet staining (CV) and Bielschowsky method (BS) followed by immunohistochemical method with detection of Neurofilament light chain antibody (NfL) and Glial fibrillary acidic protein antibody (GFAP)

Results: Histomorphological analyses showed decreased vitality of Purkinje cells (PCs) with swelling bodies mainly in the hHcy male rats. Female hHcy rats were characterised by shrinking bodies of PCs. BS indicated the presence of diffuse amyloid plaques in the white matter and the molecular layer of the cortex in the hHcy male rats, but there were no signs of their presence in female hHcy rats. There was reduced immunolabeling of NfL with reactive astrocytes presence in hHcy animals in both sexes.

Conclusion: We showed that mild hHcy can evolve toxic body environment with potentially detrimental impact to the PCs, seen on the morphological levels with worse outcomes in male Wistar rats. Those findings can contribute to the better understanding of the potentially deleterious impact of modifiable risk factor (hHcy) in clinically relevant neurological disorders.

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EFFECT OF CODEINE ON COUGH IN THE PONTINE RESPIRATORY GROUP IN CATS

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Introduction: The pontine respiratory group (PRG) is composed of a heterogeneous population of respiratory and non-respiratory neurons essential for the control of respiratory rate and pattern. PRG includes the Kölliker-Fuse (KF) nuclei and the adjacent lateral and medial parabrachial (PB) complex. The lateral PB nuclei are responsible for an inspiratory facilitatory influence, and the medial PB nuclei together with KF nuclei control the expiratory facilitatory response. There is a functional connection via excitatory projections between the KF, lateral PB, and the ventrolateral medulla, rostral ventral respiratory group, and other medullary regions essential for optimized respiratory output as well as for control of cough reflex. The involvement of PRG neurons in the antitussive activity of codeine has not yet been established.

Material and methods: Codeine was microinjected into the KF nuclei and adjacent subnuclei of the PB complex on 12 male cats (4.13 ± 0.24 kg) anesthetized with sodium pentobarbital. The cough reflex was induced mechanically by a soft polyethylene fiber in the trachea (tracheobronchial cough). Electromyograms (EMGs) of the diaphragm (DIA) and abdominal muscles (ABD), esophageal pressures (EP), and blood pressure were recorded and analyzed.

Results: Unilateral microinjections of 3 mM codeine (total 37 ± 1.2 nl) in KF and PB had no significant effect on cough number ($p > 0.05$). Codeine significantly reduced the amplitudes of ABD EMG (by 36% compared to the control; $p < 0.01$), which resulted in a significant decrease in expiratory EP amplitudes during cough reflex (by 38.5% compared to control; $p < 0.05$). There was also a slight but statistically significant reduction in DIA EMG amplitudes (by 14% compared to the control; $p < 0.05$), which was accompanied by a non-significant reduction in inspiratory EP amplitudes (by 21% compared to the control; $p > 0.05$).

Conclusion: Our results show that the effect of codeine in the PRG is mainly limited to the cough motor pattern, particularly the expiratory component of the cough reflex. The excitability of cough was preserved, therefore, we can exclude the participation of PRG in the cough gating mechanism.

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RADIOFREQUENCY ELECTROMAGNETIC FIELDS FROM WIRELESS AND WIRED HEADPHONES MEASURED ON THE HUMAN HEAD PHANTOM

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Introduction: The use of mobile phones and Bluetooth-enabled devices has increased exponentially over the past three decades. The International Agency for Research on Cancer (IARC) classifies Radiofrequency Electromagnetic Fields (RF EMF) emitted by telecommunication devices as a Class 2B carcinogen. Studies on their impact on human health are becoming more relevant than ever before. The aim of this study was to determine whether wired and wireless headphones are effective in reducing RF EMF exposure during different stages of a phone call.

Material and methods: A human head phantom with electrical impendances corresponding to those of tissues in a physiological human head was used. A multi-directional antenna was placed inside, connected to a NARDA SRM-3006 spectrum analyzer. Three types of headphones were chosen for the measurements: on-ear wireless (OEWL), in-ear wireless (IEWL), and on-ear wired (OEW). The headphones were paired or connected to a mobile phone at a standard distance of 50 cm. Measurements were recorded in three different stages of mobile use: No call (N) – device presented but turned off, Waiting (W) – phone ringing, (C) – connected call. These values were replicated five times, averaged, and compared to those recorded while using a mobile phone at ear level 10mm from the surface of the phantom. Background RF EMF values were subtracted to give net values.

Results: All values were statistically compared to stage N using Instat GraphPad software. For all devices, the values were significantly higher in stage W or C compared to stage N (W OEWL: 7.3 ± 14.8 nW; $p<0.001$; W IEWL: 17.5 ± 19.4 nW; $p<0.001$). The highest RF EMF values were measured when using the mobile phone directly (C: 15837 ± 231.9 nW; $p<0.001$) compared to N (1.8 ± 0.9 nW). The greatest reduction was observed when using wired earphones (W: 1.1 ± 2.5 nW), which was not even significant to N (0.3 ± 0.2; $p = 0.9$).

Conclusion: From our findings, it is evident that the use of any type of headphone variant tested is effective in reducing the value of RF exposure when compared to using the mobile phone directly.

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EFFECT OF IONIZING RADIATION ON NEUROGENESIS IN THE BRAIN IN THE EXPERIMENTAL MODEL

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Introduction: Ionizing radiation, which is used in the radiological treatment of patients with primary or secondary brain tumors, causes a wide spectrum of changes in brain tissue. Radiation does not only affect directly targeted tissue. The surrounding cells are also indirectly irradiated with lower therapeutic doses; however, they do not have a sparing effect. The phenomenon of radiation-induced injury transfer from irradiated to non-irradiated cells is known as the bystander effect. Due to the higher radiosensitivity, the study of direct and indirect radiation effects in animal models focuses on brain regions with persistent neurogenesis. These regions include the lateral ventricles' subventricular zone (SVZ) and the hippocampal dentate gyrus (DG).

Material and methods: In the experiment, we used adult 12-month-old albino male Wistar rats (n=20). We divided rats into a control group (n=10), and in the second group (n=10), we irradiated the animal's spinal cord segments (C1-Th1) with a total dose of 24 Gy, divided into 3x8 Gy, one time per week. Subsequently, we measured metabolites in the corpus striatum, hippocampus, and olfactory bulb (OB) using in vivo proton magnetic resonance spectroscopy (1H MRS) twice: 48 hours (IRR1 group) and 2 months (at the age of 14 months; IRR2 group) after irradiation. After collecting and processing the brain tissue, we evaluated the histological changes of stem/progenitor cells and neurons in the neurogenic regions using immunofluorescence staining, confocal microscopy, and image analysis.

Results: Ionizing radiation induced a significant in vivo decrease in total N-acetyl aspartate to total creatine (tNAA/tCr) in OB, which was more pronounced in the IRR1 than in the IRR2 group. After irradiation, we detected a minor decrease in the number of neuroblasts and stem cells, especially in the SVZ and hippocampal DG.

Conclusion: The radiation-induced bystander effect significantly influenced metabolic conditions rather than the cellular population in neurogenic brain areas. Mild histological changes may be a sign of the adaptive response of the tissue to ionizing radiation.

EPIGENETIC MODULATION OF METABOLISM: UNRAVELING THE NEXUS BETWEEN NUTRITION AND HEALTH

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Introduction: Epigenetic modifications regulate gene expression and therefore cellular phenotype. Dysregulation in epigenetics is considered to play a significant role in etiopathogenesis of a number of medical conditions, including diseases of affluence and ageing. The level of appropriate metabolic substrates and sufficient activity of epigenetic regulatory points modifying enzymes are designating the epigenetics. Certain small molecules and metabolites seem to be supporting the healthy phenotype and even inducing pro-longevity epigenetic modifications. This study aims to evaluate to which extent are these molecules with potential affecting the epigenetic regulation with consequential phenotypic alterations.

Materials and methods: Human glioblastoma cells (T98G) were used to assess the epigenetic effects of valproate, curcumin, 3-hydroxybutyrate and propionate. The effects were checked on several levels: cell growth, gene expression, cellular metabolism, and methylation profile of histones. The state-of-the-art techniques to study the interplay among metabolomics, epigenomics and cellular phenotype changes, which we have employed were cell culturing, enzymatic assays, and liquid chromatography coupled to mass spectrometry, as well as immunoprobing and purification of proteins.

Results: The supplementation of culture media for 24 hours with either valproate, or curcumin, or 3-hydroxybutyrate, or propionate affected the growth of the cells as follows. While valproate and curcumin possessed the inhibitory effect on the cell growth, 3-hydroxybutyrate stimulated the growth of the cells. Propionate had no significant effect on the cell growth. Enzymatic together with LC-MS analyses allowed for quantitative analysis of more than 20 metabolites in culture media. All tested compounds affected the cellular metabolism by altering the capacity of cultured cells to metabolize glucose, lactate, amino acids, ketone bodies and vitamins in different extents, modulating the rate of anaerobic and aerobic processes. While all tested compounds affected the gene expression that was assessed by estimation of LDH activity, only curcumin possessed the capability of affect the methylation profile of histone 3.

Conclusion: Here we provide the novel data that valproate, curcumin, 3-hydroxybutyrate and propionate are compounds possessing the potential to affect the epigenetics of human cells on the level of their growth, gene expression, cellular metabolism, and methylation profile of histones. While valproate and curcumin are compounds with well-studied epigenetic effect with known molecular mechanism, we provide evidence revealing the novel effects of 3-hydroxybutyrate and propionate on cellular, metabolic, and gene expression level. These results agree with our hypothesis that also 3-hydroxybutyrate and propionate are compounds and cellular metabolites with epigenetic potential. Further research is planned to identify to which extent are both compounds influencing the posttranslational modifications on histones together with possibility to identify new types of such modifications.

COGNITIVE ASPECTS OF EMOTIONAL REGULATION IN THE CONTEXT OF LANGUAGE PROCESSING IN MULTILINGUAL INDIVIDUALS: NEUROPSYCHO-LINGUISTIC STUDY

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Introduction: Multilingualism is considered an important element of European competitiveness. Except for facilitating intercultural communication, this trend also positively affects cognitive abilities, such as problem solving, attention and memory as well as the flexibility of cognitive process. The aim of our study is to investigate how cognitive aspects of emotional regulation are interconnected during language processing in multilingual individuals.

Materials and methods: Sixty-six first-year medical students (44 women and 22 men), 19 to 26 years old, participated in the present study. A galvanic skin response (GSR) and oximeter were used to measure autonomic nervous system responses. All the participants were instructed to memorize 10 Slovak and 10 English words which they had to reproduce. Changes in participants' in skin conductance and pulse were monitored and recorded before, during and after the word recall tasks. A standardized PANAS (Positive and Negative Affect Schedule) questionnaire was administered to assess participants' emotional states. Two sample t-test as well as Spearman correlation test were used to analyze the study results.

Results: A GSR device was used to measure the emotional states of students with the typical reading at the relaxed stage ranging from 50 - 70. We found that the best cognitive word recall (MEAN=62%) was in the range of 70 – 79 with the highest pulse (MEAN=102). The students were also more stressed when reproducing the words in the first language ($p<0.05$), while they remembered statistically significantly ($p<0.05$) more words in Slovak (MEAN=68.26%) than in English (MEAN=56.28%). Students had difficulties to remember medical English words (MEAN=47.91%). Surprisingly, male students were more stressed than female students ($p=0.0029$). The PANAS questionnaire assessed positive affect in students ($p<0.05$).

Conclusion: Our study partially correlates with findings from the scientific literature, but further studies with students from different cultural background are needed. To better understand emotional-cognitive processes, it is necessary to further investigate brain activity using methods such as ERP or MRI in multilingual students.

CONTRIBUTION TO THE ROLE OF PULMONARY SURFACTANT IN THE AIRWAY SMOOTH MUSCLE PHYSIOLOGY

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Introduction: Pulmonary surfactant is complex of phospholipids, surfactant-associated proteins SP-A, SP-B, SP-C, SP-D, carbohydrates and neutral lipid cholesterol (2-8%). In addition to well-documented effects in the alveoli, surfactant has been shown to relax airway smooth muscle (ASM) indicating its regulatory role in ASM tone. Optimal composition of surfactant is crucial for its physiological properties and higher level of cholesterol was found to be harmful for surfactant film integrity. We aimed to test the hypothesis that inactivation of pulmonary surfactant caused by changes in the proportional representation of its components leads not only to alveolar collapse seen in some lung diseases, but disturbs also the relaxing function of pulmonary surfactant.

Material and methods: Exogenous surfactant Curosurf® (Chiesi Farmaceutici, Parma, Italy) has been diluted to 1 mg of phospholipids (PL)/mL and cholesterol was added in concentrations of 20% (by mass of the surfactant PL) to the surfactant suspension to investigate surface tension in pulsating bubble surfactometer. Nineteen healthy adult male Wistar rats (312± 16 g of body weight) were anesthetized and trachea was excised. Tissue strips containing ASM were mounted in the tissue organ bath chambers filled with Krebs-Henseleit buffer (heated to 37 °C and gassed with pneumoxide to maintain pH 7.4). First, muscle viability and reactivity were tested by exposing tracheal tissues to methacholine chloride (1 μM). After methacholine precontraction, ASM was exposed to surfactant (1 mg of PL/mL) without or with cholesterol and reactivity of ASM was recorded.

Results: Minimum surface tension (γmin) of surfactant significantly increased in the presence of 20% cholesterol (surfactant: 0 mN/m vs. surfactant with cholesterol: 22.6 ± 1.0 mN/m; $p<0.01$). Intact surfactant decreased reactivity of precontracted rat tracheal ASM ($p<0.01$), while relaxing effect of inactivated surfactant containing cholesterol was reduced ($p<0.05$). Conclusion: The results indicate that surfactant attenuates airway smooth muscle tone. Inactivation of surfactant interferes with its relaxing function and is likely included in pathophysiology of obstructive lung diseases such as asthma.

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ANTIOXIDANT TREATMENT OF ACUTE RESPIRATORY DISTRESS SYNDROME: SYSTEMIC OR PULMONARY ROUTE OF ADMINISTRATION?

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Introduction: Acute respiratory distress syndrome (ARDS) is a severe and life-threatening condition with insufficient lung function and hypoxemia. Acute inflammation, oxidative stress, and accumulation of reactive oxygen species during supportive ventilation result in lung injury and respiratory failure. The effect of native antioxidants can be enhanced by therapeutic antioxidants such as N-acetylcysteine (NAC). Therefore, N-acetylcysteine together with an effective route of administration appears to be a reasonable treatment option. The aim of the study was to prove the hypothesis that NAC delivered to the lungs as intratracheal bolus using high-frequency oscillatory ventilation (HFOV) is more efficient than routine systemic intravenous NAC therapy on lung function and inflammation in a clinically relevant model of severe ARDS.

Material and methods: ARDS was triggered in anaesthetized, ventilated adult New Zealand white rabbits (27 ♂; 2.5 (0.5) kg) by intratracheal instillation of HCl (3 ml/kg, pH 1.5), in combination with high tidal ventilation (VT 20 ml/kg) and fraction of inspired oxygen (FiO_2) 1.0 to mimic ventilator-induced lung injury (VILI). Once the severe ARDS model was reached (a ratio of arterial oxygen partial pressure to inspired oxygen fraction, P/F ≤13.3 kPa), NAC therapy (ACC injekt 100 mg/1 ml, 100 mg/kg b.w.) was administered by intratracheal bolus using HFOV (f. 10 Hz , MAP 1 kPa, ΔP 0.9 kPa, NAC HFOV i.t. group, 7♂) or alone (NAC bolus i.t. group, 7♂) or systemically (NAC i.v. group, 5♂). During the next 4 hours of lung protective ventilation, blood gases and respiratory parameters were recorded regularly. Postmortem, lung wet-to-dry weight (W/D) ratio indicated the accumulation of oedema in the lungs, and total and differential leukocyte counts in bronchoalveolar lavage fluid were evaluated.

Results: Both intratracheal and systemic intravenous NAC therapy significantly improved lung function compared to untreated animals. Only intratracheally administered NAC with or without HFOV significantly decreased total W/D ratio and total leukocyte count compared to controls. The study found no significant difference in outcomes between intratracheal and intravenous NAC administration (NAC HFOV i.t. vs. NAC bolus i.t. vs. NAC i.v. groups). The general effect of therapy administered by pulmonary route is comparable to systemic route.

Conclusion: N-acetylcysteine administered into lungs is not superior to systemic therapy in treatment of experimental ARDS. Further research is required in this area.

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PREVALENCE OF DEVELOPMENTAL ANOMALIES OF THYROID GLAND IN SLOVAK POPULATION: A PROSPECTIVE AUTOPSY-BASED STUDY

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Introduction: Thyroid gland is an organ frequently subjected to various morphological variations due to its embryological development. Thyroid diverticulum – a thyroid precursor, originates between the first and second pharyngeal pouches, descending towards the cricoid cartilage and tracheal rings via the thyroglossal duct. By the 6th week of gestation the thyroglossal duct starts to obliterate. Failure in its obliteration causes differentiation of the distal part of the thyroglossal duct into the pyramidal lobe (PL), while the cranial portion may alter into a fibromuscular remnant - levator glandulae thyroideae (LGT).

Material and Methods: In this study we observed variations of the PL and LGT in 86 non-embalmed, non-frozen dead bodies (66 male and 20 female bodies) dissected on the Department of Forensic Medicine and Medical Expertises, Jessenius Faculty of Medicine in Martin, Comenius University in Bratislava. PL and LGT were evaluated according to developed evaluation criteria.

Results: Total incidence of developmental anomalies of the thyroid gland was established in 63.95 % (55/86) of the bodies. Pyramidal lobe was observed in 59.3 % of cases, occurring more frequently in male cadavers, 60.61 %. PL was prevalent mostly on the left side – 50.98 %. Junctional PL was determined in 58.82 %, isthmal PL in 27.45 %, while lobar PL was noted in 13.73 %. Average height, width, and area of PL were estimated 23.81 mm (SD ± 9.95 mm), 13.13 mm (SD ± 5.16 mm), 320.16 mm^2 (SD ±203.64 mm^2), respectively. Most frequent ratio of height to width of PL 1.3 : 1 was observed in 13.73 % of detected PLs. Levator glandulae thyroideae was observed in 47.67 % of samples. Incidence of LGT prevailed in male cadavers – 48.48 % and on the left side – 53.66 %. Macroscopic evaluation showed prevalence of fibrous LGTs, 65.85 %, while muscular LGTs were second less frequent. The most diverse type of LGT was hyopyramidal LGT, observed in 70.73 % samples.

Conclusion: Knowledge gained from this study is applicable especially in surgical field to reduce risk of intraoperative and postoperative complications in thyroid surgery such as recurrent thyroid cancer, thyroid remnant in situ, excessive bleeding, poor response to radioactive I-131 therapy, dissemination of cells etc., as well as in diagnostic procedures and scintigraphic methods.

Keywords: thyroid surgery, clinical anatomy, developmental anomalies, pyramidal lobe, levator glandulae thyroideae.

SUPPORT FOR SKIN-TO-SKIN CONTACT AFTER CHILDBIRTH AND ITS CONTEXT

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Introduction: Skin-to-skin contact immediately after birth brings many benefits for the short-term and long-term health of mother and child and their relationship bond. The aim of the work was to find out the support of skin-to-skin contact (SSC) immediately after childbirth and its connection.

Material and methods: A cross-sectional quantitative study design was chosen. We used a non-standard questionnaire of our own design, the questions of which were focused on demographic data, obstetric characteristics, women's awareness of SSC, women's experiences with the implementation of SSC support, perceptions of SSC support in relation to its importance, breastfeeding and child satisfaction. The research sample consisted of 427 female respondents with an average age of 30.01 (± 4.70). Descriptive statistics were used to analyze the data.

Results: 62.76% of women expressed sufficient information about SSC after childbirth. The most common source of information was the Internet. Only 8.67% of women mentioned midwives/nurses as a source of information. Less than half of women (47.78%) had SSC support according to recommended procedures. Most women perceived a positive connection of SSC support with breastfeeding (82.35%), with the relationship with the child (86.77%) as well as with more self-confident parental competences (68.63%). 29.27% of women did not latch the child in the delivery room, and only 18.74% of women latched the child to the breast by themselves. We found that more women with supported SSC compared to women with unsupported SSC exclusively breastfed (69.12% vs 47.53%). Higher child dissatisfaction was noted in women with unsupported SSC compared to women with supported SSC (crying: 80.71% vs 19.61%, sleep problems 66.82% vs 24.01%).

Conclusion: On the part of midwives, it is essential to improve awareness and support of SSC, also precisely because of the proven positive connections, in order to ensure quality care based on evidence, which will enable mothers and their children to have the best possible start in life.

ANALYSIS OF SELECTED MICROBIOLOGICAL INDICATORS OF DRINKING WATER IN WELLS IN THE TURIEC REGION

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Introduction: Well water is a source of drinking or utility water for many people. However, it may contain various microorganisms that can be harmful to human health. The aim of the research was to analyse the level of microbial contamination of water in wells in the Turiec region.

Material and methods: The sample consisted of 24 private wells from four villages in the Turiec region. Water sampling was done twice, in November 2023 and March 2024. The sampling was performed by well owners, who were instructed on the sampling procedure. The samples were then transported to the laboratory of the Department of Public Health at JFM CU, where they were analysed. The samples were analysed for the presence of *Escherichia coli*, coliform bacteria, and enterococci using membrane filtration method, and for the presence of microorganisms cultivable at 22°C and 36°C using pour plate method. Well owners also filled out a questionnaire regarding well characteristics such as the presence of a filter, well type, and others. Chi-square test and Fisher's exact test with a significance level of $p<0.05$ were used for statistical analysis.

Results: The number of samples meeting all parameters in the first measurement was 1 (4.2 %) and 7 (29.2 %) in the second measurement, with a statistically significant difference ($p=0.0479$). We also observed a statistically significant difference in the total number of parameters tested that were bellow limits, between the first and second measurements (n=62, 51.7 % and n=79, 65.8 % respectively, $p=0.025808$). There were no significant differences between wells using filters and those without filters, or between dug and drilled wells in both measurements.

Conclusion: The findings of our study indicate a risk of microbial contamination in the well waters. However, the results are only indicative as not all factors that could affect water quality were considered. Given the importance of ensuring safe water, it is crucial to continue monitoring the microbiological quality of water in wells and regularly testing its parameters.

HEALTH LITERACY OF WOMEN FROM ROMA COMMUNITIES IN CONNECTION WITH PREGNANCY, CHILDBIRTH, AND THE PUERPERIUM

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Introduction: Roma communities often live in unfavorable conditions, which is also related to a lower level of literacy, difficult access to education with a high degree of social or health risk, including in the field of reproductive behavior. The study aimed to determine the literacy of women of reproductive age in Roma communities.

Material and methods: A cross-sectional quantitative study design was chosen. The research group consisted of 48 female respondents (average age 30.75 ± 10.81) from 5 Roma settlements. A self-constructed questionnaire was used for data collection in which it was possible to get 19-76 points. Descriptive statistics were used to analyze the obtained data. **Results:** An average score of literacy was 52. Women with incomplete primary education (with an average of 6.7 children) scored on average 7 points lower than women with a secondary education (with an average of 3.2 children). The most common sources of obtaining information were the family (38%) and the doctor (32%). Midwives and Internet proved to be insignificant. In some settlements, laymen Roma midwives were present. The lowest level of literacy was on the issue of contraception (73% of women had no knowledge), the appropriateness of physical activity during pregnancy, and the impact of alcohol and nicotine on the health of the mother and child. Up to 80% of childless women demonstrated sufficient knowledge in child care. Almost half of the mothers had no knowledge about the appropriate time for the first sexual intercourse after childbirth. 29% of respondents over the age of 18 regularly go to gynecological examinations and 2 mothers have never had one. 69% of respondents indicated a desire for further education.

Conclusion: The research results draw attention to the need to adapt educational standards in the field of reproductive health to the needs of women while respecting their culture. Educational interventions in Roma communities by midwives can be key to increasing health literacy and the overall quality of life of women and their families.

PERIPARTUM INJURY IN THE CONTEXT OF SEXUALITY

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Introduction: Birth injury is a very common phenomenon accompanying vaginal birth. Its presence can have an impact on the quality of life, especially in the context of sexuality. It is usually associated with temporary dyspareunia. The aim of the study was to identify women's perception of sexuality in connection with childbirth and birth injury.

Material and methods: Cross-sectional descriptive research was carried out on the basis of a self-constructed questionnaire. After the pilot study, data collection was carried out in a combined form (in person/electronically) with the participation of 478 female respondents with an average age of 29.68 ± 4.19 years. The questions were focused on data about childbirth, birth injury, pain, first experiences with sexual intercourse after childbirth, and breastfeeding. Statistical data processing was carried out using descriptive statistical methods.

Results: The lowest pain on the Numeric Rating Scale (NRS) during the first coitus after childbirth was declared by uninjured women (1.85 ± 2.32) and the highest after episiotomy (4.12 ± 2.69). The effect of breastfeeding on dyspareunia was uncertain. Women most often resumed sexual activity in the time interval of 2 months after childbirth for each type of injury. Lubricant and condom use were associated with more painful first intercourse compared to no use for each type of injury. Of the circumstances that could have an impact on the pain of intimate intercourse, the respondents most often mentioned psychological factors (46.65%), the level of lubrication (26.99%) and the partner's approach (15.69%).

Conclusion: Birth injuries have a significant impact on a woman's sexuality after childbirth, which can manifest in sexual discomfort in the first weeks and months. It is necessary to eliminate the occurrence of birth injuries as much as possible and to conduct a wider discussion about the issue of postpartum dyspareunia among health professionals and the lay public.

Keywords: birth injury, sexuality after childbirth, dyspareunia, childbirth, women.

ORAL HEALTH OF PREGNANT WOMEN – VIRTUAL PATIENT

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Introduction: The maintenance of oral health during pregnancy holds predominant importance for the overall well-being of both the mother and the developing fetus. Acquiring adequate knowledge concerning this subject is essential when promoting oral cavity health among pregnant women, particularly with assistance from midwives. The major intent of the bachelor thesis is to develop an educational tool —a virtual patient— with a focus on enhancing the understanding of oral health practices of pregnant women, specifically created and adjusted for students pursuing studies in midwifery.

Material and methods: The development of a virtual patient (VP) involved numerous phases, including preparation, design, development, and integration into the virtual environment. The VP was constructed with the assistance of the OpenLabyrinth platform. Feedback regarding acquired knowledge, skills, motivation, and satisfaction was gathered through a questionnaire completed by 31 midwifery students. Descriptive statistic was utilized to evaluate the final response.

Results: We have developed content in the form of a „summary" for the VP, which includes both correct and incorrect answers concerning oral health issues. In feedback, the vast majority of students have rated VP positively. The average ratings on the Linker scale ranging from 1 (fully agree) to 4 (strongly disagree) varied from 1.06 to 1.42. The strongest agreement was observed in the clarity question (1.06), providence of a complex outlook on a given issue (1.06), and the enhancement of knowledge acquisition effectiveness (1.06), as well as facilitating flexible and rapid knowledge acquisition (1.06). The weakest agreement was found in the preference for the teaching method over the internal form of study (1.42) and in the contribution to motivation for learning (1.39).

Conclusion: In midwifery, VP serves a valuable role in the promotion of oral health among pregnant women as it can attractively mediate theoretical knowledge, addressing and dispelling various problems and myths associated with oral well-being during pregnancy. VP helps pursue accurate awareness and care practices for women's oral health during pregnancy by preparing and guiding midwifery students.

TEAMWORK IN LONG-TERM CARE FACILITIES

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Introduction: Effective teamwork creates a positive prerequisite for resident´s safety and quality of health care. An ineffective teamwork increases the risk of adverse events that can significantly threaten the resident´s safety in long-term care facilities. The aim of this study was to evaluate the level of teamwork in long-term care facilities and to find out how teamwork affects the respondents and thus the entire level of safety culture.

Material and methods: Data was collected from December 2022 to February 2024 using the NTS tool (Kalisch 2008). The total research sample consisted of 161 respondents from 12 different long-term care facilities. The data was further processed using descriptive statistics, Spearman's correlation coefficient rho at a significance level of 5% and linear regression analysis.

Results: The total average value of team cooperation was found to be 3.50±0.65 out of a possible 5. This average value shows us that in long-term care facilities, the level of team cooperation is at an acceptable level. Significant relationship was found out between the job position and the level of team cooperation ($p \leq 0.05$). Significant relationships were also found out between team cooperation and the level of resident´s safety ($p \leq 0.05$), team cooperation and quality of care ($p \leq 0.05$), team cooperation and satisfaction of respondents ($p \leq 0.05$).

Conclusion: Based on our results, it was found that to strengthen team cooperation and thus also the culture of safety, it is necessary to focus on strengthening respect between individual health workers, to supervise the acceptance of each health worker into the team, to improve multidisciplinary cooperation between nurses and practical nurses/assistances and emphasize the acceptance of feedback that health professionals give to each other.

UNFINISHED NURSING CARE IN LONG-TERM CARE FACILITIES

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Introduction: Unfinished nursing care refers to nursing care that was not completed as intended or requested. The consequences of unfinished nursing care, such as an increased risk of infections, falls, pressure ulcers, and medication administration errors, can lead to deterioration of patients' health and prolongation of their treatment. Unfinished nursing care has a negative impact on the quality of care provided, and therefore, it is important to solve this problem and improve conditions in long-term care facilities. The aim of our study was to describe the activity of unfinished nursing care in long-term care facilities.

Material and methods: Empirical data collection took place from February to November 2023 using a questionnaire called Basel Extent of Rationing of Nursing Care for Nursing Homes (BERNCA-NH). The questionnaire contains 21 items grouped into four dimensions. The research group consisted of 100 respondents working in the position of nurse or practical nurse. We processed the obtained empirical data in Microsoft Excel and in the statistical program SPSS 27.

Results: The prevalence of unfinished nursing care was 1,78 ± 0,83. The best results were shown in the Activities of daily living dimension by the item entitled: *"Were you unable to adequately assist patients unable to eat or drink independently?"* (1,36 ± 0,63). The Social care dimension achieved the worst results in the evaluation of dimensions. (2,08 ± 0,93). The worst rated item by the respondents was: *"Couldn't you start working with the client (e.g. go for a walk or go shopping)?"* (2,22 ± 0,90). In our research, we confirmed a significant relationship between unfinished care and the quality of care provided ($p \leq 0{,}001$).

Conclusion: Unfinished nursing care can negatively affect patients and thus the entire quality of long-term care. For that aspect, it is necessary to identify weaknesses and then take measures to ensure the minimization of this fact.

WOMEN'S EXPERIENCES WITH FATHERS' PARTICIPATION IN PREGNANCY, CHILDBIRTH AND CHILD CARE

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Introduction: Paternity begins already during a woman's pregnancy, then it continues with childbirth and subsequently in child care. Because the involvement of a father has positive health outcomes for mother and child, our goal was to explore womens' experience with fathers' involvement during pregnancy, childbirth and child care.

Material and methods: The design of cross-sectional quantitative study was selected. The research group consisted of 355 female respondents with an average age of 30.80 (± 4.92). A self-created questionnaire was used for data collection. Descriptive and inductive statistics were used for the data analysis.

Results: We found out that 43.38% of fathers participated in prenatal care and 10.99% of fathers participated in psychophysical preparation for a childbirth. Majority of the women were satisfied with the support of the child's father during pregnancy. 71.27% of the fathers were present during the childbirth, however only 24.51% of the fathers had been preparing for the childbirth. For most of the women we noted satisfaction with the child father's participation in childbirth and a positive perception of their usefulness. 89.58% of women agreed with the usefulness of fathers in the postpartum period, 81.21% of women agreed with their involvement in breastfeeding support, and 90.71% of women agreed with their involvement in child care. Most women expressed satisfaction with the participation of the father in child care. We found a significant relationship between women's satisfaction with father's overall support during pregnancy and their participation in prenatal care ($p = 0.018$), as well as their participation in psychophysical preparation courses for childbirth ($p = 0.037$) and between women's satisfaction with father's participation in care for child and father's participation in childbirth ($p = 0.024$).

Conclusion: The results imply that meaningful support of the father's involvement by motivating him to prenatal education, offering education adapted to his needs and leading father to actively and efficiently participate in taking care of mother's needs in her sensitive and demanding periods is required from the midwives.

PATIENT SAFETY IN LONG-TERM CARE FACILITIES

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Introduction: Patient safety is one of the most important parts of safe medical care. It is defined as prevention of adverse events during the treatment of patients, and aims to maximize patient safety and provide safer medical care. However, there are not many studies regarding safety of the patient. That is why we focus our goals of this study on patient safety in the facilities of long-term care in Slovakia.

Material and methods: Our research was conducted upon 80 different medical personnel (nurses, practitioners and medical assistants) of Slovak long-term care facilities. Data collection started from August 2023, and ended in February 2024. This data was collected with the help of the HSOPSC NH system, which consists of 41 categories spread across 12 dimensions. Afterwards, it was analyzed using methods of descriptive statistics and correlation analysis, with the help of IBM SPSS 27.0 program.

Results: The degree of patient safety discovered during this research was in a range of 3.97 ± 0.80, which we consider to be a very good level. Dimensions which yielded the best results were following: Overall perceptions of resident safety (88.74%), Feedback & Communication About Incidents (86.86%), Handoffs (81.25%), Supervisor Expectations & Actions Promoting Resident Safety (75.83%), and Management Support for Resident Safety (75.00%). Dimensions which results were deemed unsatisfactory were following Staffing (43,67%). In our research, we have successfully confirmed significant positive relationships between safety, the quality of care provided (p≤0,001), and between safety and job satisfaction (p≤0,001). We efficiently identified markedly unfavourable relationships between safety and overtime in the study (p≤0,001).

Conclusion: Assessment of patient safety level has pointed out weaknesses in patient safety in long-term care. It is necessary to highlight this and implement measures to enhance patient safety in the facilities of long-term care in Slovakia.

UNMET CARE NEEDS OF OLDER PEOPLE

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Introduction: Understanding and identifying unmet needs is crucial for enhancing the quality of health and social care. Yet, research specifically examining the unmet needs of older adults in Slovakia is insufficient, underscoring the necessity for further research into this pressing issue. Therefore, our study aimed to explore the prevalence of unmet care needs of older individuals living in community and home care setting in Žilina region and to identify influencing factors.

Material and methods: Data collection took place between September to November 2023. Data were collected through a specific questionnaire aimed at assessing the needs of older people, the Camberwell Assessment of Need Short Appraisal Schedule - Patient (CANSAS-P) 2nd edition. The study included 160 older individuals.

Results: The mean score of unmet care needs of older individuals living in community settings was 6.49 (SD = 3.24), out of 22 and in home care settings, the mean score was 2.51 (SD = 2.35). The most frequently perceived unmet needs of individuals living in community settings were related to household care (55.7%) and physical health (51.9%), and were influenced by age, education, perceived health status, wearing glasses, mobility problems ($p \leq 0.05$). Unmet needs of older individuals living in home care settings accounted for the highest percentages in the areas of physical health (23.5%) and mental health difficulties (22.2%), and were influenced by age, education, marital status, having a chronic disease, medication intake, problems with eyesight, wearing glasses, problems with hearing, and mobility problems ($p \leq 0.05$).

Conclusion: Our results suggested that socio-demographics influence the unmet needs of older people. We found that the most commonly occurring unmet needs among older people living in community settings include household care and physical health needs. In the home setting, unmet needs for physical health and mental health difficulties were most prevalent. Recommendations for practice include conducting regular needs assessments using met/unmet needs assessment tools to monitor the evolving needs of older people and implement targeted interventions based on the assessment of older people's needs.

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