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83rd INTERNATIONAL SCIENTIFIC CONFERENCE ON MEDICINE AND HEALTH SCIENCES OF THE UNIVERSITY OF LATVIA: MATERNAL, CHILD HEALTH AND NEUROLOGY

On 25 April 2025, the University of Latvia in Rīga is hosting the International Scientific Conference on Medicine organised within the frame of the 83rd International Scientific Conference on Medicine and Health Sciences of the University of Latvia (see for details: Leja, M., Stonāns, I. 83rd International Scientific Conference on Medicine and Health Sciences of the University of Latvia: Basic Medical Science and Pharmacy, p. 19, this issue).

The section "Maternal, Child Health and Neurology" brings together research dedicated to issues in maternal and paediatric health, as well as advancements in neurological sciences.

Several abstracts in this collection focus explicitly on maternal and infant health, underlining the complex interplay between physical, psychological, and environmental factors. Topics include the psychological impact of childbirth experiences, specifically examining how different modes of delivery influence maternal self-efficacy in breastfeeding and the development of emotional bonding with newborns. Further research explores postpartum depression, identifying critical maternal health indicators and psychological states associated with this prevalent and impactful condition.

In paediatric health, substantial attention is directed toward the early-life microbiome, recognising its profound influence on functional gastrointestinal disorders in infants. Researchers have also addressed the accessibility and utilisation of multisensory therapy for children with developmental disorders, stressing the importance of early, comprehensive therapeutic interventions to improve developmental outcomes.

Several studies address current clinical problems in paediatrics. One contribution is the analysis of histological patterns and clinical presentations of celiac disease in Latvian paediatric populations, providing insights into diagnostic complexities. Another study evaluates the epidemiological and reproductive risk factors associated with endometriosis, emphasising the need for awareness and preventive strategies to mitigate reproductive health burdens among women.

Neurological research within this section presents insights into disease mechanisms, diagnostic tools, and therapeutic interventions. Investigations into epilepsy reveal specific expression patterns of sodium channel NaV1.2 in human brain tissue, contributing to an improved understanding of epilepsy pathology and highlighting potential therapeutic targets. Studies on the side effects of PCV chemotherapy in central nervous system tumour patients address the crucial balance between treatment efficacy and quality of life, offering significant implications for clinical management.

Advances in diagnostic imaging, particularly the reliability of MRI in evaluating treatment responses in brain tumour patients, demonstrate the ongoing refinement of clinical assessment tools essential for precision medicine. Genetic research features prominently, illustrating associations between specific polymorphisms, such as CXCL12 and TNF-α variants, with increased disease invasiveness and susceptibility in conditions like pituitary adenomas and multiple sclerosis, respectively, notably among female patients.

Finally, translational research, exemplified by studies employing Alzheimer's disease mouse models, evaluates novel therapeutic approaches, such as virus-like particle-based vaccines, signalling promising directions for Alzheimer's disease prevention and management.

Daiga Šantare

GENETIC PREDICTORS OF PITUITARY ADENOMA INVASIVENESS IN FEMALES: INSIGHTS FROM CXCL12 POLYMORPHISMS

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Background. Pituitary adenoma (PA) is one of the most common brain tumours, yet its pathogenesis remains unclear [1]. PA varies in invasiveness; some remain confined to the pituitary gland, while others aggressively infiltrate surrounding tissues, leading to more severe clinical complications [2]. Molecular biomarkers indicate biological and pathological processes or therapeutic responses, offering valuable insights for diagnosis and prognosis [3]. CXCL12, a homeostatic chemokine, induces migration and activation of haematopoietic progenitors, endothelial cells, and leukocytes, regulating the tumour microenvironment by promoting angiogenesis and immune cell recruitment, potentially aiding tumour growth [4]. Polymorphisms within the CXCL12 gene, particularly those influencing its expression or function, may affect PA susceptibility, tumour size, invasiveness, and response to treatment [5]. A deeper understanding of the genetic mechanisms underlying CXCL12 may contribute to developing personalised therapeutic approaches and enhancing prognostic tools for PA management.

Aim. The current study aimed to investigate the associations between the CXCL12 rs1801157, rs2297630 polymorphisms, and the PA invasiveness in females.

Methods. A case-control study enrolled 90 females with PA and 160 healthy females. DNA samples from peripheral blood leukocytes were purified by the DNA salting-out method. Single nucleotide polymorphisms (rs1801157, rs2297630) were determined using real-time polymerase chain reaction (RT-PCR). The results were analysed using the IBM SPSS Statistics 29.1 statistical analysis method.

Results. We found that CXCL12 rs1801157 TT genotype and T allele were statistically significantly more frequent in the non-invasive PA group compared to control group females (8.7 vs. 2.5, $p = 0.043$, 28.3 vs 16.9, $p = 0.014$, respectively). In the invasive PA group, it was found that CXCL12 rs2297630 AA genotype and A allele were statistically significantly more frequent in the control group than in the invasive PA group females (8.1 vs. 0, $p = 0.009$, 29.7 vs. 13.6, $p = 0.002$, respectively). A binary logistic regression analysis evaluated the impact of CXCL12 rs1801157 and rs2297630 on non-invasive/invasive PA development. The analysis revealed that CXCL12 rs1801157 T allele increased the odds of non-invasive PA's development 1.9.-fold under the additive model (OR: 1.951, CI: 1.124–3.386, $p = 0.018$). Moreover, the CXCL12 rs2297630 A allele decreases the odds of invasive PA development 2.8-fold under the additive model (OR: 0.359, CI: 0.183–0.705, $p = 0.003$).

Conclusions. The CXCL12 rs2297630 A allele suggests a potential protective effect against invasive PA development. In contrast, the CXCL12 rs1801157 T allele may be a risk factor for developing non-invasive forms of PA.

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MANAGEMENT AND PREVENTION OF VIOLENCE EXPERIENCED BY NURSES FROM PATIENTS AND THEIR RELATIVES

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Background. Violence against nurses from patients and their relatives is a serious worldwide problem, which leads to significant psychological and physical harm to nurses. Effective management and prevention strategies are crucial to ensuring a safe work environment for nurses and improving the quality of patient care.

Aim. To identify applicable preventive measures for violence experienced by nurses from patients and their rela-

tives and assess their effectiveness from the nurses' perspective.

Methods. A quantitative research method — questionnaire survey was developed by the European Dialysis and Transplant Nurses Association/European Renal Care Association (EDTNA/ERCA). The study included 161 general practice or advanced practice nurses working in two Vilnius healthcare institutions specializing in mental health care. The data was collected from 9 December 2024, to 17 January 2025. The data was processed using Microsoft Excel and the processed data was transferred to IBM SPSS Statistics for analysis. The study was conducted according to the ethical standards.

Results. The highest number of respondents reported the following preventive measures: training on communication skills (94.4%), training on violence avoidance techniques for nurses (91.9%) and written rules or strategies on violence and aggression in the workplace (78.9%). The least used preventive measure is an educational booklet for nurses who have experienced violence and aggression (21.1%).

The most effective measures from nurses' perspective are: periodic training in violence de-escalation techniques, appropriate communication with the patient, including listening, understanding and empathy, and periodic updating of knowledge on the concept of violence management and prevention measures.

Conclusion. The most applicable and effective preventive measures are more practical than theoretical — various periodic training, such as violence de-escalation techniques and appropriate communication with patients, including respect and empathy.

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THE RELIABILITY OF MAGNETIC RESONANCE IMAGING IN EVALUATING TREATMENT OUTCOMES AND COMPLICATIONS OF PRIMARY BRAIN TUMOURS

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Background. The importance of magnetic resonance imaging (MRI) in neuro-oncology is well known by its ability to detect brain tumours earlier than other modalities, provide detailed anatomical context that is vital for accurate diagnosis and treatment planning, but there are certain challenges, including potential false positives and negatives that can arise due to factors such as imaging techniques, patient variability and operator expertise.

Aim. The aim of the study was to understand the accuracy of magnetic resonance imaging in evaluating treatment outcomes and potential treatment complications, using data from perfusion-weighted, diffusion-weighted and contrast-enhanced magnetic resonance imaging, and comparing these findings with histopathological outcomes and disease progression.

Methods. A retrospective observational analysis was performed at a single facility, encompassing 68 patients with 253 MR imaging studies performed, who had histologically confirmed malignant primary brain tumour. Magnetic resonance imaging was performed in the first 48 h after the surgery and the follow-ups were performed every three months.

Results. Among the participants, the most common type of tumour was glioblastoma (n = 44), followed by astrocytoma (n = 13), oligodendroglioma (n = 8), gliosarcoma (n = 1), pleomorphic xanthoastrocytoma (n = 1) and medulloblastoma (n = 1).

A total surgical resection was performed for 35 patients (51.5%), while 17 patients (25%) underwent subtotal resection, and 16 patients (23.5%) had a partial resection. Chemotherapy was administered to 49 (72%) patients, 58 (85%) completed radiation therapy, 7 (10%) did not receive radiation therapy, 2 (3%) did not complete it and 1 (2%) patient refused radiation therapy.

In most cases, suspicion of recurrence was detected on the third MRI (41.3%, n = 26) and second MRI (39.7%, n = 25).

A total of 63 patients underwent repeated surgery based on the MRI and clinical findings. Histological recurrence was confirmed in 84% (n = 53) of the cases, while necrosis was found in 16% (n = 10). For patients with confirmed recurrence, MRI conclusion was combined changes or recurrence for 75.5% (n = 40), with perfusion-weighted imaging being most reliable MRI sequence for detection (54% of cases had high blood volume), false negatives were detected for 20.7% (n = 11), inconclusive findings in 3.7% (n = 2). Contrast enhancement was observed in 86.8% (n = 46).

Conclusion. MRI with intravenous contrast administration is the primary method for evaluating the effectiveness of therapy for primary brain tumours. The most reliable sequence for tumour recurrence detection is MRI perfusion. In most cases, recurrence occurs within the first year, often presenting as combined changes.

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