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HMAA

Várgesztes Meeting

2025

ABSTRACTS

Contents

Presidential welcome: Dr. Zsolt Garami, President of the HMAA

Ladies and Gentlemen, Dear Students, Greetings to the HMAA Hungary Chapter,

I welcome you to our annual HMAA Hungary Chapter meeting at Vargesztes.
It is a great honor to serve for another 2 years as president of the HMAA, as I was an exchange student in the society long ago. Now, we face challenges in motivating the younger generation and keeping them connected to HMAA after returning from the USA. With the new location and a new HC president, Gabor Horvath, MD, PhD: Congratulations and thank you for your hard work during the previous decades. You have an energized organization, and the team is organizing this HC conference.
I hope you will enjoy our annual HC scientific meeting. We are so excited to learn from each other within the scope of scientific discourse and about personal and professional milestones in our relaxed atmosphere! Let us learn from each other with fruitful discussions after superb presentations.

Our programs:

This year, we are continuing our flagship student exchange program and have reopened the fellowship and observer programs.
I am happy to report that 24 students in Buffalo and 14 in Houston have enrolled in our program for this academic year. You will have the opportunity to meet past and future students in person and listen to their lectures.
We continue to support the HMAA HC student conference. We will welcome the best English Lecture (Drs Irene and Ivan Krisztinicz Award) and the best lecture by a North American student (Dr Peter Forbath Award) Winners at our annual meeting in Sarasota, Florida.

I would also like to thank everyone supporting our organization and programs. Please feel the power of each other's contributions; it will bring great opportunities to assist or challenge our future meetings. Let us all come together to make our annual gathering another great success. And enjoy listening to the lectures from our next generation of Hungarian doctors and researchers.

Enjoy your time with each other, and make new friends!

Dr. Zsolt Garami
President of the HMAA

Presidential welcome: Dr. Gabor Horvath, President of the HMAA Hungary Chapter

Dear Guests, Students, and Friends,

I am glad and excited to welcome you to our 19th Annual HMAA HC Conference. After years of success in Balatonfüred, we began a new chapter in our conference book. We relocated to a new site in Várgesztes last year, allowing us to be closer to one another. This unique opportunity gives us the chance to share opinions outside of the conference sessions, learn from each other, and get to know one another more than ever before.

The primary purpose of our annual student conference is to provide you with the opportunity to try yourself as a presenter in a supportive environment, receive helpful and professional feedback, practice medical and scientific English, and, of course, meet colleagues from the United States.

Our Várgesztes Conference is a meeting with a friendly atmosphere, but also a competition. There will be section winners for each oral and e-poster session. However, the most desired awards are the Irene and Ivan Krisztinicz Award (for the overall best presentation in English), the Istvan Mechtler Award (for the overall best presentation in Hungarian), and the Peter Forbath Award (for the best North American presenter).

We believe that the experience you can gain at Várgesztes could provide motivation for your future scientific and medical path, and also encourage you to apply to our Buffalo or Houston Exchange Programs for your final year rotations. Do not miss this unique and life-changing opportunity! I did experience it, and trust me, they helped me a lot, and I hope I can now motivate you to take part in this fantastic experience!

I wish you an excellent event for the next two days, complete with the scientific programmes, accommodation, meals, and social activities, all at the conference venue.

I want to extend my sincere thanks to Dr. Dorottya Szabó Steigerwald and Dr. Bálint Környei, who are the chief organizers of the conference again this year. I would like to express my sincere thanks and gratitude to all the colleagues and student representatives who have actively participated in the organsation.

I look forward to meeting you from 4th to 6th September, 2025, and having a wonderful time together!

Dr. Gabor Horvath
President of the HMAA HC

THE EFFECTS OF PARACELLULAR BARRIER TIGHTENING ON THE STRUCTURE AND FUNCTIONS OF FOCAL ADHESIONS IN A HUMAN BLOOD-BRAIN BARRIER MODEL (E-POSTER)

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Keywords: blood-brain barrier, tight junctions, focal adhesions, confocal mycroscopy, fluid-force mycroscopy
Aims: Aims: Our research group has identified a molecular combination (cARLA) increasing blood-brain barrier (BBB) properties in human stem cell-differentiated endothelial cells via the increased expression and membrane localization of tight junction protein claudin-5. In cARLA treated endothelial cells we observed subnuclear actin cytoskeletal structures, which we hypothesized to be focal adhesions. Our aim was to investigate the effects of cARLA on the structure and functions of endothelial focal adhesions
Methods: Focal adhesion proteins vinculin, zyxin, p-FAK were immunostained, the actin cytoskeleton was fluorescently labeled, and studied by confocal microscopy (Leica Stellaris). Changes in cell adhesion strength were studied by FluidFM, and adhesion kinetics by a label-free resonant waveguide grating biosensor.
Results: The adhesion kinetics of endothelial cells was changed by cARLA, an early increase (0-2 h), followed by a decrease at the 24 and 48 hour time-points were measured by the optical biosensor. The structure of focal adhesions were reorganized after cARLA treatment. The number of cells with diffuse focal adhesions decreased, while the number of cells with perinuclear adhesions and perinuclear actin increased at 24 and 48 hours. While the overall adhesion energy and the cell-cell adhesion forces were increased, the cell-extracellular matrix adhesion forces, reflecting focal adhesion functionality, did not change as measured by FluidFM.
Conclusions: We described for the first time how tightening of the paracellular barrier affects focal adhesion structure and function in human brain endothelial cells, contributing to a better understanding of cell mechanobiology at the BBB.
Support: National Research, Development and Innovation Office of Hungary (K143766 to M.A.D. and FK143233 to S.V.), Hungarian Academy of Sciences (NAP2022-I-6/2022 to M.A.D.), National Academy of Scientist Education

STOCHASTIC AGENT-BASED MODELING OF SALMONELLA INFECTIONS

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Keywords: Host-pathogen interaction, cell-level dynamics, agent-based modeling, image segmentation, NetLogo
Aims: To develop a stochastic agent-based model to simulate intracellular Salmonella infections in macrophages and to estimate parameters such as incubation time, bacterial load threshold, and infection kinetics.
Methods: RAW 264.7 macrophage cells were infected with Salmonella Typhimurium at low (MOI 10) and high (MOI 50) levels. Cells and bacteria were fluorescently labeled and imaged at 60 time points over 20 hours using confocal microscopy. Cellpose was used for image segmentation. Based on extracted division, infection, and lysis rates, we built a delayed Gillespie-based agent model implemented in NetLogo. Parameter fitting and bacterial load estimation were performed with the genetic algorithm-based tool PyGAD.
Results: At MOI 10, infection appeared after 420 minutes; at MOI 50, 200 minutes. Lysis occurred 200–300 minutes post-infection when 40% cytoplasm was occupied. Released bacteria covered 45 pixels, suggesting 40–

50 bacteria released. Estimated parameters include a death rate of 1.2 × 10−3 s−1, division rate of 2.5 × 10−4 s−1, and infection rate of 2.5–12.5 ×10−5 s−1.
Conclusions: The model closely simulates infection dynamics and offers predictive insights beyond experimental capabilities. It can be adapted for simulations in human-derived macrophage systems.
Support: Biological work was conducted at the Lane Lab, Northwestern University, through the NITMB Summer Research Program 2024, under PhD student Anika Marand and lab director Keara Lane. Modeling was performed at the University of Szeged under the supervision of Dr. Peter Boldog.

CO-ENGINEERING EPIDERMAL GROWTH FACTOR RECEPTOR 2 (HER-2)-SPECIFIC CHIMERIC ANTIGEN RECEPTOR (CAR) MACROPHAGES WITH C-X-C MOTIF CHEMOKINE LIGAND 9 (CXCL9) TO ENHANCE ANTITUMOR ACTIVITY

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Keywords: CAR-macrophage, breast cancer, CXCL9, immunotherapy, macrophage engineering
Aims: While CAR-T cell therapy has transformed hematologic cancer treatment, its efficacy in solid tumors like breast cancer remains limited. Given their natural tumor infiltration capacity, macrophages are emerging as promising carriers for chimeric antigen receptors (CARs). This study aims to engineer CAR-expressing macrophages (CAR-Ms) with enhanced anti-tumor activity by co-expressing immune-modulating factors such as CXCL9.
Methods: Anti-HER2 CAR constructs containing CD3-ζ and 4-1BB signaling domains were introduced into THP-1 cells and primary human monocyte-derived macrophages using lentiviral transduction. To enhance immune cell recruitment and activation, CXCL9 was co-expressed in selected constructs. Transduction efficiency was optimized with co-delivery of the HIV2 Vpx protein. CAR and CXCL9 expression were confirmed by flow cytometry, Western blotting, and ELISA. Ongoing experiments assess the effects on macrophage polarization, surface markers, and effector functions such as phagocytosis, cytotoxicity, cytokine production, and antigen presentation. Transwell assays are used to evaluate CXCL9-mediated recruitment of NK and T cells.
Results: Efficient co-expression of CAR and CXCL9 was achieved in both THP-1 and primary macrophages. Preliminary data suggest that CXCL9 enhances the immunomodulatory profile of CAR-Ms. Functional assays and immunophenotyping are currently underway to determine the biological impact of these modifications.
Conclusions: This study demonstrates the feasibility of generating next-generation CAR-Ms with dual functional enhancements. By co-expressing CXCL9, these engineered macrophages may provide improved immunostimulatory capacity against breast tumors.
Support: This research work was conducted with the support of the National Academy of Scientist Education Program of the National Biomedical Foundation under the sponsorship of the Hungarian Ministry of Culture and Innovation.

PHARMACOLOGICAL BLOCKADE OF A NEUROINFLAMMATORY PATHWAY TO RELIEVE CHRONIC STRESS-INDUCED PAIN IN A MOUSE MODEL

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Presenter's university: University of Pécs

Keywords: fibromyalgia, chronic stress, chronic primary pain, anakinra, MCC950
Introduction: Fibromyalgia, a primary chronic pain condition affecting a significant part of the population, is a therapeutically challenging disease. The exact pathophysiological mechanism remain unclear, but chronic stress is recognized as a major causative factor. Neuroinflammation seems to have an essential role in the development of stress-induced pain, where inflammasomes, as well as proinflammatory cytokines, such as interleukin-1(IL-1), are involved.
Aims: Therefore, we studied MCC950, inhibitor of the NLRP3 inflammasome—a protein complex responsible for the release of IL-1—and the IL-1 receptor antagonist anakinra in a mouse model of chronic restraint-stress-induced fibromyalgia-like pain.
Methods: Male C57Bl/6 mice were exposed to chronic immobilization stress for two weeks. Mechanical hyperalgesia was measured using a dynamic plantar aesthesiometer (DPA), cold hyperalgesia by paw withdrawal latency test of the hind paw weekly. Mice received daily intraperitoneal injections of MCC950 (10 mg/kg) / anakinra (10 mg/kg) or vehicle (n=7–10/group). At the end of the experiment, open field and tail suspension tests were conducted to assess anxiety- and depression-like behaviors.
Results: MCC950 and anakinra abolished the approximately20% stress-induced mechanical pain ($p<0.0001$ and $p=0.0001$). 60-70% cold hyperalgesia was not affected by MCC950 but was significantly reduced by the anakinra treatment by the second week ($p=0.1337$ and $p=0.0008$). No significant differences were observed between groups in anxiety- or depression-like behaviors.
Conclusions: Pharmacological management of fibromyalgia is an unmet medical need; it is essential to develop a targeted and effective therapy that addresses the pathogenesis of the disease. These preclinical findings suggest that anakinra and MCC950 may represent a promising therapeutic strategy for relieving stress-induced pain.
Support: EKÖP-25-2-II-PTE-774, EKÖP-25-4-I-PTE-414, EKÖP-24-3-II, ÚNKP-23-3, NKFIH-FK-146283, NKFIH K 138046, NKFIH FK 137951, RRF-2.3.1-21-2022-00011

TRASTUZUMAB DECREASES THE EXPRESSION OF G1/S REGULATORS AND SYNDECAN-4 PROTEOGLYCAN IN HUMAN RHABDOMYOSARCOMA

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Keywords: rhabdomyosarcoma, syndecan-4, trastuzumab, cell cycle, MyoD
Aims: Rhabdomyosarcoma (RMS) is the most common soft tissue sarcoma in childhood and adolescence, with fusion-negative RMS (FNRMS) displaying diverse genetic alterations. Previously, we demonstrated, that the syndecan-4 (SDC4) gene is amplified in 28% of human FNRMS samples, associated with high mRNA expression, suggesting a tumor driver role. This study aimed to evaluate the role of SDC4 and other heparan sulfate proteoglycans (HSPGs) in FNRMS tumorigenesis and to assess the effects of trastuzumab—a HER2-targeting monoclonal antibody—on SDC4 expression, G1/S checkpoint regulators, and tumor cell behavior in RMS.
Methods: In human rhabdomyosarcoma samples (n = 199), we analyzed genomic and mRNA data for members of the syndecan family (SDC1–4) and other HSPGs. Experimental models included RD (FNRMS) cells, proliferating C2C12 myoblasts, and C2C12 myotubes differentiated for five days. Rac1 activation assays were performed, and protein expression and phosphorylation were examined via Western blotting. RD cells were treated with 20 μg/ml trastuzumab.

Results: SDC4, along with SDC1, SDC2, and glypican-1, showed frequent gene amplification and overexpression in FNRMS samples. RD cells exhibited high SDC4 expression with a lower phospho-SDC4/SDC4 ratio compared to normal myoblasts, leading to elevated Rac1-GTPase activity. In contrast, myotubes showed increased Rac1-GTP with reduced SDC4 expression compared to myoblasts. Trastuzumab treatment reduced SDC4, cyclin D1, cyclin E, and MyoD expression. Unexpectedly, p21 levels also declined post-treatment.
Conclusions: Our findings suggest that SDC4 may play a critical role in FNRMS development, and the reduced phospho-SDC4/SDC4 ratio in RD cells likely contributes to the elevated Rac1 activation. Since HER2 is expressed in about half of RMSs, the trastuzumab-mediated changes observed here may have therapeutic implications.
Support: NKFI FK 134684, TKP2021-EGA-28, National Academy of Scientist Education Program

SUPERNORMAL CARDIAC FUNCTION: EXERCISE VS. DAPAGLIFLOZIN

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Keywords: physiological hypertrophy, active force, dapagliflozin, Cardiac troponin I
Aims: Exercise-induced physiological hypertrophy (athlete's heart) increases myocardial mass. Dapagliflozin, an SGLT2 inhibitor, shows potential in heart failure therapy, but its cardioprotective mechanisms are unclear. This study investigates dapagliflozin's effect on myocardial contractility in a rat model of athlete's heart.
Methods: Using an athlete’s heart rat model, we examined myocardial function with and without dapagliflozin (1 mg/kgBW daily). Isometric force measurements assessed Fmax, pCa50, and Fpassive, while biochemical analyses evaluated cTnI phosphorylation using ProQ Diamond staining and Western blotting.
Results: Exercise training (Ex) and dapagliflozin (DA) significantly improved Fmax values (Control: 16.76±0.74 vs. Ex: 22.81±1.91 vs. Control+DA: 21.07±1.31 vs. Ex+DA: 26.42±2.26 kN/m², $P<0.05$, n=8-10). pCa50 increased in trained rats (5.91±0.01) versus controls (5.85±0.01, $P<0.05$), with no change in DA-treated groups. Fpassive values did not differ among groups. Biochemical studies revealed decreased overall cTnI phosphorylation following physical training (0.69±0.03) and dapagliflozin treatment (Control+DA: 0.66±0.06 vs. Ex+DA: 0.61±0.03) compared to controls (1.00±0.06; n=3, relative units). cTnI was hypophosphorylated at Ser22/23 and Thr144 sites in both trained (0.77±0.02 and 0.61±0.10) and SGLT2 inhibitor-treated animals (Control+DA: 0.70±0.02 and 0.84±0.08 vs. Ex+DA: 0.52±0.04 and 0.58±0.10) relative to untreated groups (Control:1.00±0.04 and Ex: 1.00±0.03; $P<0.05$, n=3, relative units). No differences were detected at the cTnI Ser43 site among groups.
Conclusion: Our findings suggest that the application of the SGLT2 inhibitor dapagliflozin induces supernormal cardiac function, reasulting to functional improvement comparable to exercise.
Support: EKÖP-24-2-DE-167 (R.R.V), EKÖP-24-3-II-DE-302 (E.E) and EKÖP-24-3-II-DE-277 (A.Á.SZ) University Research Scholarship

INVESTIGATION OF THE EFFECT OF SULPIRIDE MICROINJECTED INTO THE VENTRAL PALLIDUM ON SPATIAL LEARNING AND SENSORIMOTOR GATING IN NEUROTYPICAL AND MAM-E17 SCHIZOPHRENIA MODEL RATS

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Keywords: D2DA receptors, ventral pallidum, sulpiride, schizophrenia

Aims: Recently, we have shown that microinjection of D2 dopamine receptor antagonist sulpiride into the ventral pallidum (VP) leads to spatial learning impairments in healthy Wistar rats. It is also known that impaired sensorimotor gating mechanisms reflected by reduced prepulse inhibition (PPI) can be observed in schizophrenia and in MAM-E17 schizophrenia model animals as well. In the present experiment, our goal was to investigate, how the sulpiride microinjected into the VP affects the learning processes and sensorimotor gating mechanisms of MAM-E17 animals.

Methods: By means of stereotaxic surgery, bilateral guide cannulas were implanted, 0.5mm above the VP in neurotypical and MAM-E17 male Wistar rats. We established four-four neurotypical and MAM-E17 groups, which received 0.1 µg, 1.0 µg and 4.0 µg of sulpiride solution in 0.4 µl volume per side. The control animals received vehicle. To examine spatial learning, Morris water maze (MWM) test was used. Seven days later, we investigated the sensorimotor gating mechanisms using the PPI paradigm. Drug administrations were performed only during the MWM test, while in the PPI test, we examined the long-term effects of sulpiride.

Results: Sulpiride impaired spatial learning in a dose-dependent manner only in MAM-E17 animals. Additionally, the impaired prepulse inhibition observed in MAM-E17 animals was dose-dependently improved by sulpiride microinjected into the VP.

Conclusion: Our results suggest that the increased number of conditionings can compensate the learning-impairing effects of sulpiride in neurotypical animals. In contrast, MAM-E17 model animals exhibit increased sensitivity to sulpiride. Furthermore, sulpiride microinjected into the VP restores the sensorimotor gating mechanisms in MAM-E17 animals.

CHARACTERIZATION OF THE STRUCTURAL ORGANIZATION OF BIOLOGICAL MEMBRANES BY VARIOUS ENVIRONMENT SENSITIVE FLUOROPHORES

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Keywords: cholesterol, dipole potential, fluidity, hydration, membrane

Aims: The structure and function of transmembrane proteins are influenced by lipids in biological membranes either through direct ligand-like interactions or indirect modulation of membrane biophysical properties. While direct effects have been clarified using crystallography and molecular dynamics, indirect effects remain less explored. These membrane properties are largely determined by lipid composition, especially sterols, and can be studied in living cells using fluorescence-based techniques with environment-sensitive fluorophores. Although these fluorophores are assumed to provide equivalent information, a comprehensive comparative analysis of these fluorophores is yet to exist. Our aim was to compare the most frequently used fluorophores - TMA-DPH, Laurdan, PY3174, and di-8-ANEPPS - in living cells.

Methods: We measured TMA-DPH anisotropy and Laurdan generalized polarization with spectrofluorometry, and PY3174 generalized polarization and di-8-ANEPPS excitation ratio with confocal microscopy. To manipulate membrane properties, CHO cells were sterol-depleted using methyl-β-cyclodextrin (MBCD) or loaded with cholesterol (CHOL), 7-dehydrocholesterol (7DHC), or 6-ketocholestanol (6KC) via sterol-MBCD complexes.

Results: Our findings revealed significant fluorescence parameter alterations post-treatment, with varying magnitudes among sterols (TMA-DPH fluorescence anisotropy: CHOL ≈ 7DHC >> 6KC ≈ MBCD; Laurdan generalized polarization: CHOL > 7DHC > 6KC > MBCD; PY3174 generalized polarization: 6KC >> CHOL > 7DHC > MBCD; di-8-ANEPPS excitation ratio: 6KC >> CHOL > 7DHC ≈ MBCD)
Conclusions: Despite their similar chemical structures, these sterols differentially influenced membrane organization. Moreover, results suggest fluorophores previously considered equivalent capture information from distinct membrane depths, warranting careful selection in experimental applications.
Support: EKÖP-24-2-DE-298, EKÖP-24-4-II-DE-74, OTKA FK143400, OTKA FK146740

IN VITRO AND IN VIVO METABOLIC CHARACTERISTICS OF ALPHA-KETOGLUTARATE-DEHYDROGENASE E2+/- AND E3+/- DOUBLE HETEROZYGOUS KNOCKOUT MICE

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Keywords: mitochondria, alpha-ketoglutarate-dehydrogenase, ROS production, oxidative metabolism, cognitive functions
Aims: The alpha-ketoglutarate-dehydrogenase-complex (αKGDHc) catalyses a highly regulated step in the mitochondrial citric acid cycle, producing succinyl-CoA and NADH supporting energy production. αKGDHc dysfunction has been described in many diseases such as neurodegeneration and cancer. Being in the crossroad of oxidative metabolism, our aim was to test how the heterozygous knockout of the dihydrolipoamide succinyltransferase (E2) and dihydrolipoamide dehydrogenase (E3) subunits of the enzyme impact the mitochondrial bioenergetic status, the reactive oxygen species (ROS) production, the whole-body metabolism, and the cognitive functions.
Methods: The in vivo experiments were carried out on brain mitochondria isolated from 200-day old male double heterozygous knockout (DKO) and wild-type (WT) mice. Enzyme activities, ATP synthesis, oxygen consumption, and hydrogen peroxide synthesis were measured. In vivo fatigue-treadmill test, echocardiography, behavioural tests were carried out, furthermore brain histology samples were also collected.
Results: The DKO mitochondria showed decreased ATP synthesis and oxygen consumption compared to the WT. During succinate-induced reverse electron transfer, the H2O2 production was reduced in the DKO group compared to the WT. On the treadmill test, the DKO mice performed significantly worse than their controls, with their resting echocardiography showing a slightly decreased cardiac output. The behavioral tests showed a cognitive decline in the DKO mice, with microgliosis and mitochondrial impairment observed with histology.
Conclusions: Our conclusion is that the decreased ATP synthesis and oxygen consumption observed in the DKO mice can be in connection with the decrease in endurance and the microgliosis, which could have led to the cognitive impairment.
Support: This work was supported by the Hungarian Scientific Research Fund (OTKA
grant 143627, to A.A.) and National Research, Development and Innovation Fund (TKP2021-EGA-25 grant, to A.A.).

INHIBITION OF THE FRACTALKINE CHEMOKINE RECEPTOR CX3CR1 REDUCES SPONTANEOUS PAIN AND HISTOPATHOLOGICAL DAMAGE IN MICE

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Keywords: Analgesia, CX3C Chemokine Receptor 1, pain, osteoarthritis

Aims: Fractalkine chemokine receptor 1 (CX3CR1) is primarily expressed on immune cells (e.g. monocytes, macrophages, T cells), synoviocytes, osteoclast precursors and microglia. Its activation mediates inflammatory processes in both the peripheral and central nervous system and is involved in the sensitization of brain areas responsible for pain perception. As few data are available on its role in osteoarthritis, this is the focus of our present study.

Methods: Osteoarthritis was induced by injection of monoiodoacetate (MIA) into the right knee joint of male C57BL/6J mice. Mice were treated with CX3CR1 antagonist AZD8797 (2x1 mg/kg/day, i.p.) or vehicle during the 21-day experimental period. Weight distribution of the hind limbs was determined by dynamic weight bearing apparatus, paw withdrawal thresholds by aesthesiometer, knee edema by digital caliper, neutrophil myeloperoxidase (MPO) activity by in vivo luminescence imaging, structural bone alterations by micro-CT, histopathological damage by semiquantitative scoring.

Results: MIA induced 10% dynamic weight bearing decrease, 40% paw withdrawal threshold decrease (hyperalgesia), 70% knee diameter increase, neutrophil MPO activity increase, structural bone alterations such as resorption and cortical erosions, and histopathological damage such as structural disorganization, hypocellularity, decreased matrix staining and synovial hyperplasia in vehicle-treated mice. Daily AZD8797 treatment reduced the dynamic weight bearing decrease, the bone resorption and the histopathological damage damage ($g>0.8$). No difference was found regarding mechanical hyperalgesia, knee edema, MPO activity increase and cortical erosions.

Conclusions: Inhibition of CX3CR1 may provide a new analgesic and disease-modifying perspective in osteoarthritis.

Support: OTKA K-138046, RRF-2.3.1-21-2022-00015, TKP2021-EGA-16, Hungarian Research Network (Chronic Pain Research Group).

AGE-RELATED CHANGES IN DOPAMINERGIC AREAS OF THE MESENCEPHALON IN WILD-TYPE AND PACAP GENE KNOCKOUT MICE

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Keywords: Dopamine, PACAP, Neurodegeneration, Aging, Microglia

Aims: The neuroprotective effect of pituitary adenylate cyclase-activating polypeptide (PACAP) has been demonstrated in several Parkinson's disease models, and its absence accelerates aging in PACAP gene knockout (KO) mice. In previous studies, we investigated dopaminergic regions in wild-type and PACAP KO mice up to 8 months of age. In the substantia nigra (SN), we observed no dopaminergic cell loss but noted an increase in microglia, whereas in the ventral tegmental area (VTA), significant dopaminergic cell loss was seen with aging, particularly in KO mice, along with a continuous decrease in microglia until 8 months.

Methods: In this study, we compared the SN and VTA regions in 4-month-old and 1.5-year-old wild-type (n=5-5) and PACAP KO (n=8-9) mice. Dopaminergic neurons were labeled with tyrosine hydroxylase (TH) and microglia with Iba1, categorizing their activity based on morphology. Additionally, we assessed the expression of the PACAP-specific PAC1 receptor.

Results: Our results showed a significant age-related reduction in dopaminergic cells in the SN, with notably fewer TH+ cells detected in both regions of 1.5-year-old KO mice compared to wild-type controls. The number of both active and inactive microglia increased significantly in aged KO mice, while in wild-type mice, age-related microglial increases were confined to the VTA. Expression of the PAC1 receptor was minimal in all groups.
Conclusions: The pronounced reduction in dopaminergic cells in older PACAP KO mice suggests increased vulnerability to age-related neurodegenerative processes, similar to those seen in Parkinson's disease. The observed increase in number and activity of microglia in aged KO mice may result from the loss of PACAP's immunosuppressive effects, contributing to dopaminergic cell death. These findings indicate that, in the absence of endogenous PACAP, age-related morphological changes associated with Parkinson's disease advance more rapidly, highlighting PACAP's potential role in neurodegeneration.

EFFECTS OF HYPERCHOLESTEROLEMIA ON CARDIAC FUNCTION IN MALE AND FEMALE RATS

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Keywords: hypercholesterolemia, heart failure, diastolic dysfunction, pressure-volume catheter, echocardiography
Introduction: Heart failure has an increasing prevalence among adults and affects both sexes. Previous studies have shown that a cholesterol-rich diet induces diastolic dysfunction in male rats; however, comparable preclinical data on females are lacking.
Aims: The objective of this study was to investigate whether a cholesterol-rich diet induces functional and/or structural cardiac alterations in female rats.
Methods: 8-week-old male (n=16) and female (n=16) Wistar rats were fed either a cholesterol-rich (HChol) or standard chew diet (NChol) for 12 weeks. Transthoracic echocardiography was performed on week 11. At the end of the feeding period, a catheter was inserted into the left ventricle of the heart and pressure-volume (PV) loops were recorded.
Results: Hypercholesterolemia was more pronounced in females than males (male NChol: 2.6±0.3, HChol: 5.0±0.5; female NChol 2.0±0.1, HChol 8.1±0.7 mM). Echocardiography showed that hypercholesterolemia had no effect on structural or functional parameters of the heart in either sex. PV analysis revealed significantly elevated Tau values and end-diastolic pressure (EDP) — indicators of diastolic dysfunction — in HChol males versus controls (EDP: 5.22 ± 0.77 vs. 1.17 ± 1.17 mmHg). Nevertheless, no significant differences were observed in females (EDP: NChol 0.99 ± 1.07 vs. HChol 2.83 ± 1.3 mmHg). According to the results of the ANOVA analysis, systolic function was unchanged among groups.
Discussion: Cholesterol-rich diet induces higher level of hypercholesterolemia in females than in males; however, high blood cholesterol has no significant effect on cardiac function in females. Our research confirmed that hypercholesterolemia leads to diastolic dysfunction in males.
Support: National Academy of Scientist Education (National Biomedical Foundation), NKFIH K143889, TKP2021-EGA-32

QUALITY OF LIFE ASSESSMENT IN PATIENTS UNDERGOING SURGERY FOR BREAST TUMORS - USING A MODIFIED EORTC QLQ-BR45 QUESTIONNAIRE

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Keywords: breast cancer, quality of life, mastectomy, breast-conserving surgery, EORTC QLQ-BR45
Aims: This study aimed to assess Quality of Life (QoL) in women undergoing surgery for breast tumors, focusing on the comparative impact of breast-conserving surgery (BCS) and mastectomy (MT).

Methods: The study was conducted in 2024 at the Department of Surgery, University of Debrecen Clinical Center. Women aged 18–70 who underwent surgery for benign or malignant breast tumors were enrolled (n=120). Four months postoperatively, patients completed a modified 30-item version of the EORTC QLQ-BR45 questionnaire. Demographic and perioperative data were also collected. Participants were divided into two groups based on surgical procedure (BCS, MT), and responses were analyzed using SPSS software.
Results: The mean age was 53.9 years; 65.9% underwent BCS and 34.1% MT. Body image was significantly influenced by the type of surgery ($p=0.002$). Although the overall impact on sexual life was not statistically significant ($p=0.077$), 70% of BCS patients reported no change, compared to 30% in the MT group. Skin-related complaints were more frequent after BCS ($p<0.001$), while cosmetic satisfaction was significantly higher in the BCS group ($p=0.008$). Other areas such as pain and sleep quality were not related to surgery type. The overall QoL was rated as good. The Cronbach's alpha was 0.6 due to the questionnaire's brevity and the heterogeneity of its items.
Conclusion: Surgical technique significantly affects body image and cosmetic outcomes. The modified EORTC QLQ-BR45 questionnaire is a suitable tool for QoL assessment in breast surgery patients.
Support: This study received no external funding.

CONTEMPORARY THERAPEUTIC MANAGEMENT OF PINEAL REGION TUMORS

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Keywords: minimally invasive neurosurgery, pineal region tumors, endoscopic third ventriculostomy, radiotherapy
Aims: This study aims to present the long-term results of a combined endoscopic and radiotherapy-based approach in the management of pineal region tumors.
Methods: In this retrospective clinical study, we analyzed the data of 23 adult patients who underwent endoscopic third ventriculostomy with concurrent biopsy of pineal region tumors between 2014 and 2023 at the Neurosurgical and Neurointerventional Clinic, Semmelweis University. The data analysis included the application of descriptive statistics, Kaplan–Meier survival analysis, Student's t-test, and Fisher's exact test.
Results: Following the endoscopic intervention, clinical improvement was observed in 78.3% of cases, with a marked reduction in symptoms related to increased intracranial pressure and hydrocephalus that were characteristic prior to surgery. Comparison of pre- and postoperative conditions using the Karnofsky Performance Scale demonstrated a significant improvement in the post-therapeutic period ($p = 2.755e-5$). Radiotherapy resulted in either tumor size regression or, in some cases, disease stabilization.

Conclusions: Our findings suggest that combined endoscopic and radiotherapeutic management constitutes a safe and clinically effective alternative strategy to direct surgical resection in the treatment of pineal region tumors. We propose that direct microsurgical resection be considered a second-line therapeutic option, particularly in cases of residual, progressive or radioresistant tumors.
Support: The research did not receive any funding.

THE ROLE OF ARTIFICIAL INTELLIGENCE IN THE DIAGNOSIS OF OBSTRUCTIVE SLEEP APNEA

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Keywords: Obstructive Sleep Apnea, Artificial Intelligence, Machine Learning
Introduction: Obstructive sleep apnea (OSA) is characterized by partial or complete upper airway obstruction during sleep, leading to hypoxia, hypercapnia, and sleep fragmentation. Untreated OSA is associated with cardiovascular and metabolic disorders. Although nearly one billion people worldwide are affected, the rate of undiagnosed cases remains high due to limitations in current diagnostic methods.
Aims: Our research aimed to improve the diagnosis of OSA using soft tissue MRI of the neck, supported by artificial intelligence (AI).
Methods: In this prospective study, 92 patients (68 men, 24 women; mean age ± SD: 40.63 ± 12.7 years) with suspected sleep apnea or snoring were examined at the Department of Otorhinolaryngology and Head and Neck Surgery, Semmelweis University. All participants underwent polysomnography, soft tissue neck MRI and anthropometric measurements. Based on the polysomnography results, patients were divided into control (n=30) and OSA (n=62) groups. On the MRI scans, eight predefined parameters were measured, including upper airway length and volume, the antero-posterior, latero-lateral diameter and length of the retropalatal and retroglossal regions.
Results: Using conventional statistical analysis, significant differences were found between the OSA and control groups in upper airway length ($p<0.05$), retropalatal length ($p<0.05$), and the latero-lateral diameters of the retropalatal and retroglossal regions ($p<0.05$). A machine learning model trained on these parameters predicted OSA with 90% accuracy (92% specificity, 87% sensitivity).
Conclusion: Measurements of upper airway structures on soft tissue neck MRI can be used to predict the presence of OSA with the help of AI. It may allow OSA to be screened by reusing existing neck MRI scans, without placing further burden on the healthcare system.

SELECTIVE NEURONAL AND MICROGLIAL CHANGES IN SORL1-DEPENDENT ALZHEIMER'S DISEASE IN HUMAN AND MOUSE BRAIN TISSUE

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Keywords: neurodegeneration, neuroimmunology, Alzheimer, microglia
Introduction: Alzheimer's disease (AD) is a progressive neurodegenerative disorder and the most common cause of dementia, yet its pathomechanism remains unclear. Recently, increasing attention has been given to the role

of microglia—the brain's immune cells—in neurodegeneration. Our study investigates disease-associated changes in microglia and excitatory neurons, particularly in the context of SORL1 (sortilin-related receptor) loss-of-function mutations that cause hereditary early-onset AD.
Aims: The aim of our translational study is identifying selective neuronal and microglial changes in SORL1-dependent AD, both resembling and differing from changes in sporadic AD.
Methods: We performed single-cell RNA sequencing on human temporal cortex samples from controls and AD patients with or without SORL1 mutations. Data were analysed in R using the Seurat package. In mice, we developed a CRISPR/Cas9 targeting strategy combined with in utero electroporation to achieve deletion of SORL1 in a subpopulation of cortical neurons in PSEN1//App_swe//tauP301L triple transgenic male AD model mice. Histological analyses were conducted using immunohistochemistry and confocal microscopy.
Results: Using RNA profiling, we identified distinct human microglial and neuronal subtypes linked to both AD and SORL1 mutations, marked by synaptic protein loss, disrupted microglial mitochondrial function, and key differences between the two groups. In our porated AD model mice, microglia interacting with SORL1-KO neurons showed morphological changes, including fewer but 21% longer processes, while microglia-neuron contact surface was also reduced by 55%.
Conclusions: Overall, SORL1 loss-of-function mutations cause a distinct pathomechanism, differing from Braak-matched AD cases. Our study offers better insights into AD development and suggests a potential key role for microglia.
Support: SORLA-FIX JPND to HH, OMA, AD; Szent Györgyi Scholarship to SV

DIAGNOSTIC VALUE OF CRP AND PCT IN PEDIATRIC ONCOLOGY PATIENTS WITH INVASIVE FUNGAL INFECTIONS: A RETROSPECTIVE STUDY

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Keywords: fungal infection, aspergillosis, CRP, PCT, pediatric oncology
Aims: Invasive fungal infections (IFIs) carry a high mortality risk in immunocompromised pediatric oncology patients. Our aim was to evaluate the diagnostic role of C-reactive protein (CRP) and procalcitonin (PCT) in IFIs, parameters are not included in current diagnostic guidelines.
Methods: We retrospectively analyzed 21 pediatric patients treated at the Oncohematology Unit of the Department of Pediatrics, University of Pécs Medical School over the past 20 years who developed proven or probable IFIs. CRP and PCT values from the fungal infection episode were compared to values during a documented bacterial infection in the same patient. Statistical evaluation included ROC analysis to assess diagnostic performance and determine optimal cutoff values.
Results: CRP levels were generally elevated in both infection types, while PCT remained low in IFIs but increased in bacterial cases. ROC analysis revealed the CRP/PCT ratio at the second measurement time point had an AUC of 0.961, indicating excellent diagnostic performance. The optimal cutoff value for the CRP/PCT ratio was 172.75, with 90.9% sensitivity and 100% specificity for distinguishing IFIs from bacterial infections.
Conclusions: The CRP/PCT ratio, especially at early stages in patiens with clinical symptoms, shows high potential as a diagnostic tool for differentiating between fungal and bacterial infections in pediatric oncohematology patients. Given its accessibility, it could complement existing diagnostic protocols and facilitate earlier, more targeted treatment.

THE EFFECT OF MATERNAL VITAMIN SUPPLEMENTATION ON THE HEALTH OF CHILDREN CONCEIVED VIA IN VITRO FERTILIZATION

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Keywords: In Vitro Fertilization, infant, mother's vitamin supplementation, antropometrics

Introduction: With the increasing prevalence of In Vitro Fertilization (IVF), monitoring the health of IVF-conceived children has become increasingly important. Studies suggest that IVF mothers are more aware of the role of perinatal vitamin supplementation in newborn health.

Objective: To compare vitamin intake before and during pregnancy between women who conceived spontaneously and via IVF, and to explore associations between maternal vitamin intake and child anthropometric parameters up to 2 years of age.

Methods: We studied 51 spontaneously conceived (Control group) and 46 IVF-conceived mother–child pairs. Postpartum, mothers completed a questionnaire on vitamin supplementation before and during pregnancy, and maternal anthropometric data (weight, height) were recorded. Child measurements (weight, height, waist circumference) were taken at 1 day, 6, 12, and 24 months. Independent samples t-tests were used for statistical analysis.

Results: No significant differences were found in maternal pre-pregnancy BMI or gestational age at delivery between the groups. IVF mothers reported significantly higher intake of folic acid (624.6±925.1 vs. 151.6±239.3 µg/day), vitamin D (1589.5±1867.6 vs. 921.4±1511.9 IU/day), vitamin A (392.1±555.9 vs. 194.3±425.3 µg/day), vitamin E (44.0±134.5 vs. 15.8±60.0 mg/day), and vitamin B12 (18.9±53.1 vs. 6.2±22.2 µg/day) in the 3 months prior to pregnancy (all $p<0.001$). During pregnancy, vitamin intake did not differ significantly. No significant differences were found in child anthropometric outcomes at any time point between the groups.

Conclusion: Higher pre-pregnancy vitamin intake in IVF mothers did not lead to significant differences in child growth during the first two years, suggesting that additional factors may influence early growth trajectories beyond maternal supplementation alone.

OS4. Interdisciplinary Oral Session IV. (Radiology-Dermatology-Cardiology-Internal Medicine-Family Medicine)

RELIABILITY ASSESSMENT OF SPECTRAL ABSORPTION CURVE MEASUREMENTS FOR DIFFERENTIATING BETWEEN MUCINOUS AND NON-MUCINOUS PANCREAS CYSTS

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Keywords: photon-counting CT, spectral imaging, virtual monoenergetic imaging, pancreas cystic lesion, pancreas cystic neoplasm

Aims: Differentiating pancreatic cystic lesions (PCLs) remains challenging. Spectral imaging with photon-counting detector CT (PCD-CT) enables virtual monoenergetic images (VMI) at
different keV levels, allowing spectral measurements. This study assessed whether mucinous and non-mucinous PCLs show distinct postcontrast spectral absorption patterns that could aid diagnosis. We also evaluated the most

informative postcontrast phase, interobserver reproducibility, and the optimal number of ROI measurements needed.
Methods: We included 53 mucinous and 23 non-mucinous PCLs with available arterial, pancreatic, and venous phase PCD-CT scans. Densities were measured at 40keV and 70keV by placing ROIs in cyst fluids. We calculated HUΔ40-70keV (difference of averages) and assessed diagnostic performance via ROC analysis. Intra- and interobserver reproducibility were evaluated. The optimal number of ROIs was determined with bootstrap sampling and repeated 5-fold cross-validation based on the robustness of predicted probabilities, optimal classification thresholds, and the resulting sensitivities, specificities, and accuracies across the number of ROI measures.
Results: Mucinous PCLs showed significantly higher HU Δ40-70keV values than non-mucinous PCLs for both arterial ($p=0.017$), pancreatic ($p<0.0001$), and venous phases ($p<0.0001$). The pancreatic phase showed the best performance (AUC 0.93, accuracy 82%, sensitivity 75%, specificity 96%) with intra- and interobserver ICCs of 0.94 and 0.82, respectively. At least four ROIs per patient with mean aggregation yielded robust results, with validation AUCs of 0.88–0.89 and stable predicted probabilities, optimal thresholds, and decision certainties.
Conclusions: Assessing HUΔ40-70keV of cyst fluids on VMI reconstructions may serve as a promising, non-invasive adjunct for distinguishing mucinous from non-mucinous PCLs.
Support: The authors thank Siemens Healthcare for providing the software for spectral curve assessment.

USES OF DERMOSCOPICALLY-GUIDED HIGH-FREQUENCY ULTRASOUND IN DERMATOLOGY

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Keywords: high-frequency ultrasound, basal cell carcinoma, melanoma, hidradenitis suppurativa
Aims: This study aimed to explore the utility of dermoscopically guided high-frequency ultrasound (HFUS) in dermatological diagnostics and treatment planning. Specific objectives included: differentiating basal cell carcinoma (BCC) subtypes, preoperative Breslow tumor thickness assessment in melanoma malignum, surgical margin planning in BCC, evaluation of hidradenitis suppurativa (HS), and monitoring hyaluronic acid (HA) filler position.
Methods: Dermoscopic evaluation was combined with the Dermus Skinscanner, a HFUS (33 MHz) to examine lesions in a prospective cohort. Histopathology served as the gold standard for BCC and melanoma cases. For HS, imaging findings were correlated with clinical staging. Serial HFUS scans assessed HA filler position post-injection.
Results: HFUS significantly outperformed traditional evaluation in BCC subtype differentiation. Aggressive histological subtypes (HSTs) were identified with a sensitivity of 82.4% and specificity of 91.3%, compared to 40.1% sensitivity and 73.1% specificity via combined macroscopic and dermoscopic methods. In melanoma malignum, HFUS achieved a sensitivity of 91.8% and specificity of 96.0% in Breslow thickness estimation, offering valuable preoperative insight. HFUS guided surgical margin delineation with improved precision in BCC excisions. In HS, it revealed insights into microscopic anatomy. HA filler localization could be well visualized post-treatment.
Conclusions: Dermoscopically guided HFUS proves to be a highly effective, non-invasive diagnostic and planning tool in Dermatology, with superior accuracy in key oncologic parameters and evolving applications in aesthetic and inflammatory conditions.
Support: This research was supported by ÚNKP and EKÖP grants, as well as Dermus Kft.

TYROSINASE EXPRESSION MODULATES SENSITIVITY TO GPX4 INHIBITION AND GLUTATHIONE LEVELS IN MELANOMA

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Keywords: ferroptosis, glutathione, melanoma, tyrosinase, lipid-ROS

Aims: Ferroptosis is a lipid ROS-dependent form of cell death with therapeutic relevance in melanoma. Pigmentation has been proposed to alter the ROS-state of melanoma cells; therefore, we investigated whether expression of tyrosinase, the rate-limiting factor for pigmentation, may modulate glutathione levels and GPX4 activity, thereby affecting ferroptosis sensitivity.

Methods: We studied the connection between pigmentation and ferroptosis by altering tyrosinase (TYR) activity in human and mouse melanoma cell lines. TYR was inactivated genetically using CRISPR-Cas9; tyrosinase-deficient clones were confirmed by absence of TYR mRNA. Additionally, pigment synthesis was suppressed pharmacologically via prolonged treatment with 200 µM propylthiouracil (PTU). Cells were treated with ferroptosis-inducing compounds, including GPX4 inhibitors. Viability was assessed using CellTiter-Glo Luminescent Assay. Lipid peroxidation was quantified using Bodipy C11 staining after RSL3 treatment, with fluorescence captured via Leica microscopy and analyzed using ImageJ.

To evaluate redox regulation, intracellular glutathione was measured using a commercial assay. GPX4 was analyzed at transcriptional and protein levels by qPCR and Western blotting.

Results: Loss of tyrosinase activity, genetically or pharmacologically, altered the redox environment and sensitivity to GPX4 inhibition. Pigmented cells showed distinct glutathione dynamics and GPX4 expression patterns compared to non-pigmented counterparts, with enhanced lipid ROS accumulation in response to ferroptotic stimuli.

Conclusions: Tyrosinase-driven pigmentation affects ferroptosis sensitivity by modulating glutathione and GPX4 activity, a regulatory axis with therapeutic relevance in resistant melanoma.

Support: HCEMM Grant 2022-27, OTKA KFI Grant 2021-25, Lendület Grant (LP2024-12/2024)

ELECTROPHYSIOLOGICAL EFFECTS OF SGLT2 INHIBITORS IN CANINE AND HUMAN CARDIAC PREPARATIONS

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Keywords: SGLT2 inhibitors, electrophysiolgy, arrhythmia, heart failure, action potential

Aims: Sodium-glucose cotransporter 2 (SGLT2) inhibitors have been shown to improve the clinical outcome of chronic heart failure and atrial fibrillation, and reduce the risk of arrhythmias and sudden cardiac death. Despite the outstanding clinical efficacy of SGLT2 inhibitors, the underlying mechanisms for their antiarrhythmic effects are poorly understood. We aimed to investigate the potential cardiac electrophysiological effect of two clinically proven cardioprotective SGLT2 inhibitors, Empagliflozin (EMPA) and Dapagliflozin (DAPA).

Methods: Action potential (AP) measurements were carried out by the conventional microelectrode technique using healthy canine and failing human (explanted) ventricular preparations. Several parameters of AP were recorded. Nav1.5 ion channel expression was examined by immunocytochemistry in canine ventricular myocytes. After the experimental studies, we plan to interpret the results using in silico models.

Results: Compared to control, EMPA increased the maximal rate of depolarization (+24.3% n=9) and the AP amplitude (+6.1% n=9) while decreasing the conduction time (-9,3% n=7) and slightly lengthening APD90 (+2.8% n=12) in canine preparations. In the case of human samples, similar tendencies were observed.

The effect of DAPA both in canine and human samples showed similar tendencies as in the case of EMPA, however, the differences were not significant.

Conclusions: Based on our results, EMPA - and maybe other SGLT2 inhibitors as well - have the potential to increase the depolarization of AP via the peak sodium current (INa) activation. Theoretically, this effect could increase the impaired conduction velocity in heart failure, which could contribute to the SGLT2 inhibitors' overall antiarrhythmic effect.

CIRCULATING MATRIX METALLOPROTEINASES AS PREDICTORS OF EXERCISE-INDUCED CARDIOPULMONARY RESPONSE IN SYSTEMIC SCLEROSIS

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Keywords: Scleroderma, Echocardiography, Exercise Test, Matrix Metalloproteinase 2, Matrix Metalloproteinase 9

Aims: We investigated the alterations in hemodynamic parameters and their relationship with the resting activity of matrix-metalloproteinases during exercise in patients with SSc.

Methods: In our single-centre prospective study, 15 SSc patients without resting pulmonary hypertension or moderate to severe pulmonary fibrosis were enrolled. Using a standardized protocol, all subjects underwent resting and exercise echocardiography on a semi-recumbent bicycle ergometer, with incremental workload to maximal tolerated exercise, during which left ventricular diastolic function and right ventricular hemodynamics were assessed, and serum levels of MMP-2 and -9 were measured by gelatin zymography.

Results: Compared to baseline, pulmonary systolic pressure (PASP, $p<0.001$) and pulmonary vascular resistance (PVR, $p<0.05$) were significantly increased, while the right ventricular-pulmonary arterial coupling (PVR-PA coupling, <0.005) was significantly decreased. Left ventricular E/e' was also increased on exercise ($p<0.001$). MMP-9 activity was also significantly negatively correlated with PASP ($p<0.05$), RV coupling ($p<0.05$) and TAPSE/PASP ratio at rest and during exercise ($p<0.05$). MMP-2 levels were negatively correlated with resting PASP ($p<0.05$) and MMP-9 levels were negatively correlated with resting PVR ($p<0.05$). No significant associations were found between MMPs and left ventricular parameters.

Conclusion: Circulating MMP-9 levels predict exercise-induced hemodynamic responses in SSc. MMPs may serve as biomarkers for detecting early changes in the cardiopulmonary involvement as part of routine clinical practice.

Support: This research work was conducted with the support of the National Academy of Scientist Education Program of the National Biomedical Foundation.

The research work was supported by the National Research, Development and Innovation Office and the European Union.

INVESTIGATION OF INFLAMMASOME ACTIVITY IN A RODENT MODEL OF DECOMPENSATED HEART FAILURE

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Keywords: inflammation, inflammasomes, heart failure, biomarker

Aims: Inflammasomes — intracellular danger signal detecting complexes — are emerging as potential therapeutic targets. Our previous work showed increased expression of the AIM2 (absent in melanoma 2) inflammasome

protein in the left ventricle. However, little is known about how protein expression changes during decompensation. Therefore, we investigated the expression patterns of inflammasome proteins in pressure-overload induced HF rodent model from the heart, the lungs, the liver and the kidneys.
Method: Transversal aortic constriction (TAC) was performed on rats, then impaired pump function was verified with echocardiography. According to a point scoring system based on clinical symptoms, animals were classified into mild (TAC-M) and decompensated (TAC-HF) groups, then expression levels of inflammasome proteins [e.g. NLRP3 (NLR family domain containing 3), NLRC4 (NLR family containing a CARD 4)] were measured by immunoblotting.
Results: Due to decompensation, the left and right ventricles featured elevated levels of AIM2 (p=0.0388; p=0.0018) and NLRC4 (p=0.0098; p=0.0022). Decompensation lead to elevated levels of NLRP3 (p=0.0003). Liver paradoxically featured reduced levels of inflammasome components, meanwhile the kidney featured no inflammasome-induced inflammation. In contrast to decompensation, mild HF groups were presented with less pronounced protein levels.
Conclusions: The role of inflammasomes in decompensation is more prominent in the heart and in the lung. These patterns imply the use of sensor proteins as specific drug targets and biomarkers in advanced HF.
Support: RRF-2.3.1-21-2022-00003, TKP2021-EGA-23, European Union's Horizon 2020 Research and Innovation Programme (grant agreement no. 739593), Momentum Research Grant LP-2021-14, NKFIH K134939 and FK134751, ÚNKP-22-3-I SE-7, ÚNKP-23-4-II-SE-26

WS1. Kovács György JD: Fullbright: Program rond table discussion

WS2. György Kovács JD: AI in Clinical Decision-Making: Liability, Legal Frameworks, and Best Practices

WS3. Péter Kanizsai MD: Emergency quiz

WS4. Tárnoki Ádám MD & Tárnoki Dávid MD: Lung imaging and radiomics

WS5. Zsolt Garami MD: Houston exchange

A NOVEL SOMATOSENSORY PATHWAY THAT TERMINATES AGGRESSION

Botond Drahos, Tamás Láng, Ingrid Csordás, Dávid Keller, Valery Grinevich, Árpád Dobolyi (Laboratory of Neuromorphology, Department of Anatomy, Histology and Embryology, Semmelweis University)

Keywords: Aggression, PIL, MPOA, chemogenetics, vGATE

Introduction: The posterior intralaminar thalamic nucleus (PIL) has been implicated in regulating social behaviour in rats. We propose that PIL neurons modulate intermale aggression through specific neuronal pathways.

Methods: We used the vGATE viral system to express DREADDs in PIL neurons previously activated by social interaction (c-Fos+). Behavioural testing assessed changes in aggression following chemogenetic activation or inhibition of specific brain regions. c-Fos expression changes to chemogenetic manipulation were measured in the PIL and its projections with immunostaining. To dissect functional pathways, an anterograde virus was injected into the PIL or VMH, and cannulas were implanted in the MPOA or PIL to locally activate DREADDs. To examine the potential target neurons of the PIL-MPOA pathway, we used OTR-Cre transgenic rats to selectively target and manipulate oxytocin-receptor (OTR) positive neurons in the MPOA.

Results: Inhibition of socially tagged PIL neurons increased aggression and reduced c-Fos expression in both the PIL and MPOA. Suppressing the PIL-MPOA pathway or MPOA OTR neurons increased aggression and reduced the duration of positive-valence social interactions. Conversely, their activation reduced aggression. In contrast, stimulation of the VMH-PIL pathway increased aggression and reduced PIL activity.

Conclusion: PIL neurons suppress aggression by acting through MPOA OTR-positive neurons, promoting prosocial behaviour. Activation of the VMH-PIL pathway decreases PIL activity, thereby reducing its prosocial influence. The results identify a distinct thalamic pathway that modulates aggressive behaviour and suggest that PIL circuits promote social interactions with positive valence.

THE ROLE OF INTRAAMYGDALOID OXYTOCIN IN NOVEL OBJECT RECOGNITION IN VALPROATE INDUCED AUTISM RAT MODEL

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Keywords: autism, amygdala, oxytocin, memory

Aims: Autism spectrum disorder is a neurodevelopmental disorder affecting around 1.5-2% of children, and its incidence shows an increasing tendency. Its treatment is currently not resolved. In autism research, we used the widely accepted valproate-induced rodent model. We have recently shown that intraamygdaloid oxytocin can ameliorate some autism symptoms. In this research, we sought an answer to what effects intraamygdaloid oxytocin has on memory processes in the novel object recognition in valproate-induced autism rat model.

Methods: Bilateral guide cannulae were implanted above the central nucleus of the amygdala using the stereotaxic technique in male Wistar rats showing autistic signs and neurotypical control, and examined in novel object recognition test. We investigated the effect of intraamygdaloid oxytocin (10 ng, Sigma–Aldrich Co., O6379) and oxytocin receptor antagonists (20 ng, Sigma–Aldrich Co., L-368-899).

Results: Valproate-treated rats that received 10 ng oxytocin performed significantly better on the discrimination index in the novel object recognition paradigm in the test phase, than those valproat-treated rats, who did not receive oxytocin. A pre-administered 20 ng oxytocin receptor antagonist blocked the positive effect of 10 ng oxytocin on memory processes. The 20 ng oxytocin receptor antagonist alone did not affect the discrimination index.

Conclusion: Our results show that intraamygdaloid oxytocin improves the memory processes on rats showing autistic signs and that this effect is oxytocin receptor specific.

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INVESTIGATION OF THE ROLE OF TRANSIENT RECEPTOR POTENTIAL ANKYRIN-1 AND VANILLOID-1 IN THE HIBERNATION-LIKE STATE TORPOR

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Keywords: Hypothermia, Torpor, TRPA1, TRPV1
Aims: Hibernation or torpor is a hypothermic, hypometabolic, and hypoactive state entered by some species, including mice, in response to environmental challenges such as cold weather and scarce food. However, the molecular mechanisms of this thermoregulatory phenomenon remained unknown. We investigated the role of the thermosensitive transient receptor potential (TRP) ankyrin-1 (A1) and vanilloid-1 (V1) channels in torpor.
Methods: TRPA1 and TRPV1 knockout (KO) and wild type (WT) mice were fasted for 36 hours, then they were acutely exposed to cold (18°C). The mice were rewarmed 90 minutes after torpor was observed. The change in body mass, body temperature (Tb), and activity were recorded.
Results: The body mass of the mice decreased significantly after fasting in a similar manner in all genotypes (by 16-17%; $p<0.05$). TRPA1 KO and WT mice entered torpor 2 hours after starting cold exposure, reaching Tb as low as 23.8±1.8°C and 25.5±2.1°C, respectively. During rewarming, the rate of Tb recovery and locomotor activity were attenuated in TRPA1 KO mice compared WT controls ($p<0.05$ in both). TRPV1 KO mice entered torpor 1.5 hours earlier than WT mice, and their Tb decreased to a nadir of 23.6±3.2°C, whereas only to 31.4±0.6°C in WT mice ($p<0.05$). The TRPV1 KO mice were hyperactive compared to WT mice before entering torpor ($p<0.05$).
Conclusions: This study highlights the possible roles of TRPA1 and TRPV1 channels in torpor, which should be further studied. Our findings also identify these channels as potential targets for the induction of a controlled hypothermic state in mammals.

EXAMINING THE ROLE OF HEMOKININ-1 IN MEMORY IMPAIRMENT IN OLD AGE

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Keywords: Hemokinin-1, Age, Memory, C57BL/6í
Introduction: Memory impairment in old age and its consequences significantly impair the quality of life of the elderly. Tachykinins have a regulatory function in the nervous system and periphery, including hemokinin-1 (HK-1), which is found in high concentrations in the hippocampus and reproductive organs.
Aims: In our study, we investigated its role in memory impairment in old age and possible gender differences in 3-4, 12, and 18-month-old C57BL/6 wild-type (WT) and HK-1-deficient (Tac4 KO) male and female mice (n=12-18/group).
Methods: In the Y maze (YM), the animals must explore the three arms of the device in the correct order. In the novel object recognition (NOR) test, the mice must identify the new object as opposed to the old object. In the radial arm maze (RAM) test, the rodents must find rewards hidden in the maze.
Results: We found no differences between the groups in the YM. In the NOR, the memory function of WT females deteriorated significantly by 18 months of age ($p<0.01$), and older WT females had significantly worse memory than males ($p<0.001$). Young male Tac4 KO animals performed significantly better than WT ($p<0.01$), while in females, memory deteriorated earlier, at 12 months of age, due to gene deficiency ($p<0.05$). In the RAM, 18-month-old WT females performed significantly worse ($p<0.05$) than males. Due to gene deficiency, memory deteriorates by 12 months of age compared to young animals ($p<0.05$) in males, and in females we also see a significant difference between WT and Tac4 KO animals at 12 months of age ($p<0.05$).

Conclusions: We have demonstrated that HK-1 plays a regulatory role in age-related memory decline and that gender differences can be observed in the development of memory impairment. Further studies are needed to elucidate the mechanism of action of HK-1 and its interactions with sex hormones.
Support: National Research, Development and Innovation Office - OTKA FK137951 and OTKA K138046, Hungarian Research Network (Chronic Pain Research Group), Pécs, National Brain Research Prog

TREADMILL TRAINING AND CALORIC RESTRICTION DELAY AGE-RELATED CHANGES IN CENTRAL UROCORTIN 2 EFFECTS ON ENERGY BALANCE.

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Keywords: urocortin 2, ageing, obesity
Introduction: Middle-aged obesity and cachexia of the elderly are increasing burdens of health care. Both age-related obesity and aging cachexia are observed in animal models indicating a potential role of age-related regulatory changes in their development. Alterations in the central responsiveness to urocortin2 (Ucn2) a potent anorexigenic and hypermetabolism-inducing corticotropin during aging, may contribute to both middle-aged obesity and aging cachexia. Central Ucn2-anorexia failed in the middle-aged group, whereas hypermetabolic effects increased with aging. Caloric restriction (CR) and physical activity (TR) can improve body weight and body composition. Previous observations suggest that CR and TR may delay age-associated regulatory changes.
Aims and methods: The effects of a 12-week TR (TR12) or a 12-week 30% CR (CR12) on the hypermetabolic and anorexigenic responsiveness to centrally applied Ucn2 were tested in middle-aged, obese, male Wistar rats (NF12). Training and CR started at age 9-month. Training sessions (45-min) took place 5 days/week. Central thermoregulatory effects of Ucn2 were tested by indirect calorimetry (OxyletPro). Core temperature was detected by colon thermocouples linked to a Benchtop Thermometer (Cole-Parmer). Central anorexigenic efficacy of Ucn2 was tested in a FeedScale system in TR12. (BA/35/66-6/2020)
Results: Hyperthermic/hypermetabolic responses of CR12 or TR12 rats to Ucn2 were smaller than those of NF12. However, Ucn2 induced a short-term anorexia in TR12.
Conclusions: The Ucn2-induced hypermetabolism/hyperthermia in the TR2 and CR12 groups resembled those of the young adult 3-month rats. Trained middle-aged rats also showed Ucn2-induced amorexia, unlike NF12. Life-style interventions may delay age-related alterations of energy balance.

CHARACTERIZATION AND ONTOGENY OF COLON MUCOSAL SOX10+ CELLS USING CHICKEN EMBRYOMANIPULATION AND TRANSGENIC METHODS

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Keywords: Embriomanipulation, enteric nervous system, glia cell, ontogeny
Aims: In previous experiments, we found that the mucosal layer of the intestinal connective tissue of chicken embryos contains a large number of SOX10+ glia cells. My current aim is to characterize the development and differentiation capacity of enteric glial cells, using the lamina propria layer of ganglion-free colon created with chicken embryo manipulation method as well as colon samples from Hirschsprung's disease mouse model.
Methods: Embryonic (n=12) and postnatal (n=8) chicken colon sections were labelled with SOX10 (stem cell/glial marker) and beta III-tubulin immunofluorescence markers and were examined under confocal microscopy. Glia cells in the colon of postnatal Wnt1:tdT and Wnt1:tdT;EdnrB-KO mice were labelled with SOX10 and S100 specific antibodies. The differentiation of SOX10+ cells in the ganglion-free chorioallantoic membrane (CAM) grafts after GDNF treatment were also tested.
Results: SOX10+ mucosal glia cells are detectable from embryonic day 15 onwards in the colon lamina propria of chicken embryos. S100+ glial cells were identified in the ganglion-free colon of Wnt1:tdT-EdnrB mutant mice.

Embryomanipulation results show that mucosal SOX10+ cells are present in the experimental aganglionic colon, suggesting their sacral neural crest-derived extrinsic nerve origin.

Conclusions: SOX10+/S100+ mucosal glia are derived from a cell source that is introduced into the connective tissue of the colonic mucosa along extrinsic fibres, as demonstrated by embryo manipulation experiments. Culture of CAM grafts allows us to determine the differentiation capacity of mucosal glia.

Support: This research is supported by the National Academy of Scientific Education as I am the part of the Szent-Györgyi Student Scholarship.

ANALYSIS OF THE CLASSICAL AND EXTENDED SYNERGY TRANSCRIPTIONAL PROGRAMS IN MACROPHAGES IN THE PRESENCE AND ABSENCE OF THE BACH1 TRANSCRIPTION FACTOR

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Keywords: macrophage, immunosuppression, BACH1, gene repression, inflammation
Aims: Macrophages (MF) play a fundamental role in maintaining organ and tissue integrity and defense. They continuously monitor their microenvironment via cytokine and pattern recognition receptors (PRR). Sequential activation of cytokine receptors and PRRs can induce synergistic signaling pathways and transcriptional programs in macrophages, modulating inflammatory responses. BACH1 is a chromatin-bound heme sensor and transcriptional repressor of heme catabolism genes. Preliminary data showed that BACH1 deficiency modifies PRR-induced inflammatory responses in bone marrow-derived (BMDM) and tissue-resident macrophages. Based on previous results, this study aimed to investigate BACH1's role in the inflammatory transcriptional programs of macrophages, focusing on classical (interferon gamma/IFNg and lipopolysaccharide/LPS) and extended (interleukin/IL-4 and LPS) synergies.
Methods: BMDM from control and Bach1 knockout (KO) mice were cultured with M-CSF and primed with either IFNg or IL-4 for 24hrs, followed by a three-hour LPS-treatment in either regular DMEM medium or DMEM medium enriched with metastatic melanoma supernatant for simulating physiological and immunosuppressive microenvironments respectively. Following RNA isolation, relative expression of classical and extended synergistic target genes was measured by qRT-PCR.
Results: BACH1 deficiency modulated the relative expression of genes associated with classical and extended synergistic transcriptional programs in a tumor microenvironment-dependent manner.
Conclusion: BACH1 regulates synergistic transcriptional processes in macrophages, modulated by tumor-derived immunosuppressive microenvironments. Our findings suggest that BACH1 increasingly represses select target genes in the presence of IL-4.
Support: Hungarian Ministry of Culture and Innovation - National Research, Development and Innovation Fund (KKP-129909), the University of Debrecen OTKA Bridging Fund (BFBK247), NTP-SZKOLL-23-0058, DETEP.

MOLECULAR CLASSIFICATION AND GENETIC PROFILING OF DIFFUSE LARGE B-CELL LYMPHOMA

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Keywords: diffuse large B-cell lymphoma, genetics
Aims: Diffuse large B-cell lymphoma (DLBCL) accounts for 30–40% of non-Hodgkin lymphomas. While first-line chemo-immunotherapy cures approximately 60% of patients, the remaining patients experience refractory/relapsed DLBCL. The absence of predictive biomarkers and the clinical and molecular heterogeneity of

the disease contribute to its variable prognosis. This study aimed to perform comprehensive genetic profiling of Hungarian DLBCL patients to support prognostic assessment and treatment planning.
Methods: We used next generation sequencing (NGS) with a custom-designed "SU-DLBCL Predictor" panel to determine the mutation status of 251 genes, four translocation breakpoints, and copy number variations (CNVs) in patient samples.
Results: Eighty-three % of the 117-patient cohort was successfully assigned to GC or non-GC subtypes using the Hans algorithm. The LymphGen classification system enabled further categorization of 50.4% of patients. The highest mutation rates were observed in the KMT2D and FAT4 genes. Frequent copy number gains involved the BCL2 and BCL6 proto-oncogenes. Analysis of CNV locations, chromosome 4 was mainly characterized by deletions, while chromosome 12 mostly acquired copy number gains. TET2 mutations, typically associated with myeloproliferative disorders, were found in 13% of cases, and TP53 mutations in 18%, losses affecting the TP53 gene were present in 2% of cases.
Conclusions: In our study we characterised the genetic landscape of DLBCL in a Hungarian cohort. The findings enhance our understanding of the molecular profile of the disease and may inform future research on liquid biopsy applications and the use of targeted therapies.
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MRI-BASED EVALUATION OF TREATMENT RESPONSE IN CERVICAL CANCER

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Keywords: Cervical cancer, Pelvic MRI, Radiotherapy response, Chemoirradiation, Radiomics
Aims: MRI plays a critical role in the diagnostic and therapeutic management of these patients. The aim of this research is to evaluate both pre and post-therapeutic MRI-derived texture and radiomic parameters and how they may offer further prognostic insights to guide personalized treatment strategies in cervical cancer.
Methods: We retrospectively analyzed pelvic MRI data from 1,789 patients examined at the Gynecologic Oncologic Surgical Centre of the National Institute of Oncology between 2012 and 2021. Among them, 496 women (mean age 58.0±12.4 years) with confirmed cervical cancer were included. Both pre-treatment and post-treatment MRI scans were evaluated and correlated with clinical outcomes.
Results: Histological analysis showed that 56.3% of patients had squamous cell carcinoma, 15.1% had adenocarcinoma, and 28.6% had other histologic types or dysplasia (e.g., CIN I–III, adenosquamous). In terms of imaging distribution, 38.7% (n=192) had pre-therapy MRIs, and 61.3% (n=304) underwent post-treatment MRI.
Among those treated with radiation alone (n=14), 71.6% (n=10) showed partial regression, and 28.6% (n=4) demonstrated complete regression. Of the patients who received combined chemoirradiation (n=109), 52.3% (n=57) exhibited partial regression, 41.2% (n=45) achieved complete regression, while 6.4% (n=7) showed no measurable regression on follow-up imaging.
Conclusions: Pelvic MRI remains the gold standard for evaluating and monitoring cervical cancer. Partial regression emerged as the most frequent response pattern following both irradiation and chemoirradiation. Future research will focus on radiomics to identify imaging biomarkers predictive of therapeutic outcomes.

ASSOCIATIONS BETWEEN BREAST CANCER AND GUT MICROBIOME COMPOSITION IN HUNGARIAN TWINS

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Keywords: breast cancer, gut microbiome, twins, 16S rRNA, breast density

Aims: To investigate associations between breast cancer and gut microbiome composition in Hungarian twin pairs.
Methods: We recruited 28 twin pairs (11 monozygotic, 3 dizygotic; mean age: 54.2±14.3 years) from the Hungarian Twin Registry. At least one twin in each pair had a breast cancer diagnosis, including two with active disease. Participants underwent breast imaging (mammography and ultrasound), genetic testing (for cancer predisposition), blood sampling (for DNA and epigenetic analyses), lifestyle questionnaires, and stool collection for microbiome profiling. Microbiome composition was assessed using 16S rRNA sequencing.
Results: Actinobacteria were more abundant in breast cancer cases, while Proteobacteria predominated in non-cancer individuals. The order Rhodospirillales appeared more frequently in non-cancer twins of discordant pairs. At the genus level, Bifidobacterium was more abundant in cancer patients, while Agathobacter was higher in non-cancer samples, though this varied between pairs. No significant microbiome differences were observed between hereditary and sporadic cancer cases. Concordant pairs did not show more similar microbiome profiles than discordant pairs.
Conclusions: Gut microbiome composition may exhibit associations with breast cancer, particularly with respect to Proteobacteria and Bifidobacteria. Such microbial differences could potentially modulate breast tissue characteristics, including density, thereby indicating possible implications for risk stratification and personalized preventive strategies.

CELL BASED THERAPIES IN NEUROVASCULAR AGING RELATED PROCESSES

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Keywords: Aging, neurovascular unit, Endothelial precursor cell, Senolitics

Introduction: During aging, the most impactful problem affecting quality of life is the decline of cognitive abilities, which can be linked to the improper functioning of cerebral capillaries. Endothelial progenitor cells (EPCs) play a role in maintaining the proper function of cerebral microvessels. These are mesenchymal-derived, blood-circulating cells capable of integrating into vessel walls. The main goal of our research is to thoroughly understand the function of these cells and investigate their potential for therapeutic use. Our experiments aimed to study the effect of senolytic pre-treatment on EPC integration, to investigate the role of EPCs in tissue repair after hypoxic injury, and to examine the communication between EPCs and cells of the neurovascular unit (NVU).
Methods: EPCs were introduced into the circulation of mice via injection through the common carotid artery. To investigate the effect of senolytics, two different treatments were administered orally to the animals. To induce hypoxic injury, both common carotid arteries were occluded. To determine the target cells for EPC communication, EPCs expressing Cre-recombinase were injected into Cre-recombinase-dependent reporter mice.
Results: Senolytic pre-treatment significantly increased the number of attached cells in both young and old animals; however, more cells were found in young animals, but the relative increase was consistent between the two groups. Following hypoxic injury, in EPC-injected animals, significant tissue regeneration was observed, along with a substantial increase in the number of EPCs integrated into the capillary network. In our communication experiments, using an endocytosis inhibitor resulted in significantly fewer activated cells

Conclusions: Our experiments established that EPC treatment is a viable option for aging related disorders and hypoxic injuries.

ASSOCIATION BETWEEN CENTRAL NERVOUS SYSTEM MICROCIRCULATORY STATUS AND MOTOR-COGNITIVE PERFORMANCE IN MIDDLE-AGED PARTICIPANTS OF THE SEMMELWEIS STUDY

Emese Győrffy, Anna Ungvári, Ráhel Kiss, Attila Kállai, Ágnes Lipécz, Tamás Csípő (Institute of Preventive Medicine and Public Health, Semmelweis University)

Keywords: vascular cognitive impairment, motor-cognitive performance, gait analysis, early diagnosis
Aims: Vascular cognitive impairment represents an increasing public health challenge among aging populations. The Semmelweis Study is a longitudinal occupational cohort investigating factors contributing to unhealthy aging. Retinal vessel assessments have recently emerged as a tool to assess cardiovascular health, and decreased retinal arteriovenous ratio (AVR) is associated with increased cardiovascular disease risk. Retinal vessels share embryologic origins with cerebral vessels and may be suitable for assessing cerebrovascular health. Dual-task (DT) gait requires the brain to simultaneously manage motor and cognitive tasks. We aimed to investigate the association between retinal arteriovenous ratio (AVR) and DT gait performance in middle-aged adults.
Methods: 110 participants (45-60 years) from the Semmelweis Study cohort underwent gait assessments under normal and DT conditions (with counting tasks). DT gait performance was characterized by gait speed changes induced by cognitive tasks. Gait variability was assessed using gait variability index (GVI) calculated from five gait parameters. AVR was determined through fundus photography measurements. Participants were stratified into tertiles based on AVR, and gait performance was compared between upper and lower tertiles.
Results: The low AVR tertile showed significantly reduced gait speed during DT (-15.5±13%) versus the high AVR tertile (-9.5±9.8%, p=0.0257). While normal gait GVI was similar between groups, DT conditions revealed significantly higher variability in the low AVR group (122.81±16.26) compared to high AVR participants (115.42±11.15, p=0.026).
Conclusions: Reduced AVR was associated with impaired motor-cognitive performance during dual-task conditions, suggesting that combined DT gait and retinal vessel examinations may enable early detection of vascular cognitive impairment.
Support: TKP2021-NKTA-47

PS3. Interdisciplinary EPOS session III. (Sport Sciences-Prevention-Health Sciences-Sport Sciences)

CORRELATIONS BETWEEN BODY COMPOSITION AND AEROBIC FITNESS IN ELITE YOUTH WATER POLO PLAYERS

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Keywords: CPET, body composition, DEXA, water polo, female athlete

Aims: Body composition analysis and cardiopulmonary exercise testing (CPET) are widely used in athlete monitoring, but limited data exist on their correlation. We aimed to examine how body composition parameters influence cardiopulmonary performance.

Method: We studied 70 elite youth female water polo players (age:16.1±1.6y; training:16.8±5.3h/w). Body composition was measured via dual-energy X-ray absorptiometry (DEXA), while treadmill-based maximal intensity CPET was performed using a sport-specific protocol with continuous respiratory gas analysis, 12-lead ECG, blood pressure and lactate measurements. Data were analyzed in R using multivariate linear regression, adjusted for age and height.

Results: Lean body mass (LBM) showed a positive correlation with maximum absolute oxygen consumption (VO_2abs-max)(Est:7.7e-5,SE:6.9e-6,p<0.001) and maximum exercise ventilation (VE-max)(Est:1.3e-3,SE:6.1e-4,p<0.05). Body fat mass (BFM) and body weight negatively correlated with maximum relative oxygen consumption (VO_2rel-max)(Est:-4.8e-4,SE:1.2e-4,p<0.001;Est:-2.0e-1,SE:7.9e-2,p<0.05). BFM and bone mineral content (BMC) negatively correlated with maximal exercise duration (Est:-2.2e-4,SE:8.0e-5,p<0.01;Est:-3.2e-3,SE:1.4e-3,p<0.05). Body composition parameters did not affect resting, maximum, or recovery heart rates/lactate values.

Conclusions: Our findings indicate that body composition significantly affects CPET parameters, supporting its role in personalized assessment.

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ADVANCING DETECTION OF RETINAL VASCULAR DYSFUNCTION ASSOCIATED WITH AGE-RELATED VASCULAR COGNITIVE IMPAIRMENT: DEVELOPMENT OF A COMPREHENSIVE VASCULAR ASSESSMENT FOR A WORKPLACE-BASED COHORT (THE SEMMELWEIS STUDY)

Attila Kállai, Ágnes Lipécz, Anna Ungvári, Péter Mukli, Ádám G. Tabák, Andriy Yabluchanskiy, Zoltán Ungvári, Tamás Csípő (Institute of Preventive Medicine and Public Health, Semmelweis University; Vascular Cognitive Impairment, Neurodegeneration and Healthy Brain Aging Program, Department of Neurosurgery,

University of Oklahoma Health Sciences Center; UCL Brain Sciences, University College London, London, U.K.)

Keywords: retinal vessel imaging, vascular cognitive impairment, dementia, VCID, prevention
Aims: With an aging population across the EU, age-related diseases linked to unhealthy aging pose significant public health challenges. The Semmelweis Study (SeS), an occupational cohort study in Hungary, aims to uncover determinants of unhealthy aging by investigating the complex interplay of lifestyle, environmental factors, and the development of chronic age-associated conditions, including vascular cognitive impairment and dementia (VCID). This pilot study aimed to establish the connection between retinal vascular parameters representing cerebrovascular health and domain-specific cognitive function.
Methods: 49 healthy volunteers aged 23 to 87 years participated in this study. Cognitive function was assessed using the automated Cambridge Neuropsychological Test Automated Battery (CANTAB), focusing on memory, attention, and psychomotor speed. Retinal microvascular health, which mirrors cerebral circulation, was analyzed through static and dynamic retinal vessel imaging, assessing arteriolar and venular diameters as structural and functional markers relevant to VCID.
Results: The arteriolar-to-venular diameter ratio (AVR) of the retina was significantly associated with memory test errors ($r = 0.489$; $p = 0.01$), while retinal neurovascular coupling (arteriolar dilation in response to flicker light stimulus) correlated with attention-psychomotor speed accuracy ($r = -0.451$; $p = 0.003$). Both correlations remained significant even after correction for age.
Conclusions: The vascular evaluation conducted in this study successfully identified associations between vascular dysfunction and domain-specific cognitive impairment. These findings underscore the importance of including retinal vessel assessment in the SeS methodology to enable early detection and monitoring of vascular contributions to age-related cognitive decline, ultimately supporting preventive strategies promoting healthy aging.
Support: TKP2021-NKTA-47

LINKING MICROVASCULAR HEALTH TO COGNITIVE DECLINE: DUAL-TASK GAIT AND LSCI FINDINGS FROM THE SEMMELWEIS STUDY

Anna Ungvari, Attila Kállai, Tamás Csípő MD (Department of Public Health, Semmelweis University)

Keywords: Vascular Cognitive Impairment (VCI), Semmelweis Study, Workplace Health Assessment
Aims: Vascular cognitive impairment (VCI) is an emerging public health concern in Hungary, particularly with the increasing age of the population. It significantly affects quality of life and functional independence. The Semmelweis Study, a longitudinal workplace cohort study, explores contributors to unhealthy brain aging and VCI. This study examined whether microvascular dysfunction, measured via laser speckle contrast imaging (LSCI) during post-occlusive reactive hyperemia (PORH) testing, correlates with dual-task gait impairments, providing insights into the microvascular basis of cognitive decline.
Methods: Seventy-five middle-aged adults (28 men, 47 women; aged 45–60) from the Semmelweis cohort completed gait testing under single- and dual-task conditions. The DT involved a cognitive subtraction task. Dual-task cost (DTC) for gait velocity was calculated, and Functional Ambulation Performance (FAP) scores assessed gait adaptability. Microvascular reactivity was measured non-invasively via LSCI, with participants stratified into tertiles based on DTC.
Results: Higher DTC (greater cognitive-motor interference) was linked to lower FAP scores ($rho = 0.49$; $p < 0.01$), indicating reduced functional gait under cognitive load. Those in the bottom tertile of gait velocity DTC (most impaired dual-task performance) demonstrated significantly lower microvascular reactivity compared to the top tertile (1.35 [1.17, 1.55] vs. 1.74 [1.37, 1.91]; $p = 0.02$).
Conclusions: This study establishes a relationship between dual-task gait impairments, a marker of cortical inefficiency, and microvascular dysfunction. These findings underscore the potential of dual-task gait testing and non-invasive microvascular assays as accessible, early indicators of vascular contributions to cognitive decline.

SLEEP QUALITY, STRESS AND HEART RATE VARIABILITY IN MIDDLE-AGED ADULTS: INSIGHTS FROM THE SEMMELWEIS STUDY

Ráhel Kiss, Emese Győrffy, Attila Kállai, Anna Ungvári, Tamás Csípő (Institute of Preventive Medicine and Public Health, Semmelweis University)

Keywords: sleep quality, perceived stress, heart rate variability, middle-aged adults
Aims: Sleep disturbances and changes in heart rate variability (HRV) are both associated with cardiovascular disease (CVD). The Semmelweis Study is a longitudinal occupational cohort study investigating factors contributing to unhealthy aging. We aimed to assess the associations between HRV, stress levels, and sleep quality on workdays and days off in middle-aged adults.
Methods: In total, 114 participants (aged 45–60) underwent a 10-minute resting ECG to assess HRV. Standard deviation of normal R-wave intervals (SDNN), low-frequency/high-frequency ratio (LF/HF), and stress index (SI) were calculated. Stress was measured using the 10-item Perceived Stress Scale (PSS). Sleep quality on workdays and days off was assessed using the Pittsburgh Sleep Quality Index (PSQI). To examine the effect of sleep quality differences, a PSQI difference score was calculated, and its association with HRV parameters was assessed.
Results: Sleep disturbances (PSQI ≥5) were present in 52 participants. This group reported higher perceived stress (PSS: 16.0±4.8 vs. 11.9±5.1) and elevated LF/HF ratios (2.4±1.9 vs. 1.8±1.1) were observed. Among men, greater PSQI difference was associated with lower SDNN (rho = –0.38, p = 0.02) and higher SI (rho = 0.41, p = 0.01). No significant associations were found in women (SDNN: rho = 0.06, p = 0.64; SI: rho = –0.06, p = 0.62).
Conclusions: Sleep disturbances were linked to higher stress and altered HRV, indicating increased sympathetic activity. Poorer sleep on workdays was associated with lower HRV and higher SI in men. Improving sleep quality in middle-aged adults may help reduce CVD risk.
Support: TKP2021-NKTA-47

PREVALENCE OF MALIGNANT DISEASES IN HUNGARIAN RESIDENTIAL CARE HOMES

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Keywords: cancer epidemiology, cancer incidence, Hungary, aged 65 and older
Aims: Several scientific studies have demonstrated a relationship between nutrition and aging, identifying it as a major factor in the development of common age-related diseases, including cancer. Although cancer is more common in older adults, it can affect individuals of all ages. Residential care homes provide services for elderly individuals with officially assessed care needs who do not require regular inpatient medical treatment and have reached the statutory retirement age. The aim of this study was to assess the prevalence of cancer among elderly residents living in residential care homes, with a focus on the most common malignancies.
Methods: In November 2024 (nDay2024), we enrolled 1727 voluntary participants aged 65years or older (24.4% men and 75.6% women; mean age 79.8±7.6 years) from 35 residential care homes. Health and nutritional status were assessed using the validated nDay questionnaire. Data analysis used two-sample t-tests and linear regression.
Results: Among residents aged 65 and older living in residential care homes, the overall prevalence of malignant diseases was 4.1%. The most frequent cancers were prostate (2.4%) and breast (1.2%). Head and neck cancers had a prevalence of 2.3%, gastrointestinal tumors (0.9%), lung tumors (0.2%), and other malignancies (0.4%). By age (years): 2.2% (65-70), 2.9% (71-80), 4.7% (81-90), and 8.4% (91+).
Conclusions: While cancer prevalence increased with age, both site- and age-specific rates were lower than in elderly individuals living alone or with family. To identify the underlying causes, further research and analysis are planned. Nutritional assessment may support personalized care and cancer-related rehabilitation.

THE PREVALENCE OF MENISCAL TEARS AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION AMONG ATHLETES

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Keywords: athletes, anterior cruciate ligament reconstruction, meniscal tear, return to play
Aims: Among athletes, the incidence of anterior cruciate ligament (ACL) rupture is showing an increasing trend. As a result, ACL reconstruction has become one of the most commonly performed procedures in musculoskeletal surgery. Postoperatively, rotational stability may decrease, which increases the risk of secondary injuries—such as meniscal tears and ACL graft failure—making it more difficult for athletes to return to their pre-injury performance level. This analysis aimed to determine the frequency of meniscal injuries following ACL reconstruction in our patient population and to compare these results with international data to evaluate the potential need for combined surgical techniques that enhance rotational stability.
Methods: In this retrospective analysis, we collected data from patients who underwent ACL reconstruction at our clinic between 2016 and 2024 and subsequently sustained a meniscal tear.
Results: A total of 226 patients (90 females, 136 males; mean age: 29.5 years) underwent ACL reconstruction. Among these, 23 patients experienced a subsequent meniscal tear or injury. On average, the time interval between ACL reconstruction and the meniscal injury was 961 days (2.6 years). Nearly 80% of the affected patients were either professional or amateur athletes. Overall, 10.2% of ACL reconstructions required secondary surgery due to meniscal tear.
Conclusion: The incidence of meniscal injury following ACL reconstruction in our patient cohort aligns with rates reported in the international literature. Our findings underscore the potential need for adjunct surgical procedures that enhance rotational stability—particularly in sports involving sudden directional changes—to reduce the risk of secondary injuries.

THE BLIND LEADING THE BLIND

Lili Gerzsenyi, Gréta Dobszai, Rebeka Borsos, István Kiss, Zsuzsanna Lelovics (Department of Public Health Medicine, University of Pécs)

Keywords: credibility, education degree, influencers, social media
Aims: Online content is available anytime, in unlimited amounts, often anonymously. Social media enables anyone to become an influencer. Instagram connects users with fitness and lifestyle figures. While many seek healthy lifestyle information online (84.2%), only a minority (36.5%) consult qualified professionals.
Methods: Our study analyzed Hungarian-language social media accounts of lifestyle and fitness influencers (n=13). We examined follower numbers, professional background, and how long these platforms have existed to understand how qualifications might affect popularity and the quality of shared information.
Results: Our study shows the following: Of 6 male influencers, 1 has a PE-university degree; 2 have medium-level qualifications; and 3 have no professional qualifications at all. The number of male influencers with a university degree is the lowest (n=10,000), while the number of those without qualifications is the highest (100,000, 212,800). One of the female influencers has a university diploma, but no PE-related qualification. Four completed medium-level training courses in coaching. Male influencers have significantly more followers than female influencers (74 thousand vs. 26 thousand on average, $p<0.05$). The success of physical exercise posts does not depend on the qualification of the influencer. Half of the platforms of the influencers in the study were launched about five years ago and cannot be said to be based on credible information.
Conclusions: Free-to-use platforms cannot be considered credible sources since no external validation of content accuracy exists. Their potential in supporting lifestyle change and health education is high, but information quality must be verified.

PS4. Interdisciplinary EPOS session IV. (Otorhinolaryngology-Otrhopedics-Ophthalmology-Anesthesiology-Intensive Care-Emergency Care-Surgery - Traumatology - Neurosurgery)

THE EFFECT OF THE COVID-19 PANDEMIC ON INITIAL NODAL STATUS AND 2 PATIENT DELAY AMONG HEAD AND NECK CANCER PATIENTS IN HUNGARY

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Keywords: head and neck cancer, COVID-19 pandemic, nodal status, patient delay, stage

Aims: Hungary ranks among the leading countries worldwide in terms of both the incidence and mortality of head and neck cancers. The COVID-19 pandemic placed a significant burden on the healthcare system. Our study aims to investigate its impact on Hungarian head and neck cancer patients by analyzing changes in stage at presentation, patient delay, and overall survival due to the pandemic.

Methods: A retrospective cohort study analyzing patients' medical records from a tertiary head and neck surgical center in Hungary. The inclusion criteria required the tumor to be a squamous cell carcinoma of the oral cavity, oropharynx, hypopharynx, or larynx. Based on the timing of restrictive measures due to the pandemic, patients were divided into two groups: Group A: pre-COVID-19 (09/2012 – 03/2020) and Group B: post-COVID-19 onset (03/2020 – 12/2022) The latter group was further subdivided into Group C: during-COVID-19 (03/2020 – 06/2021) and Group D: post-COVID-19 (06/2021 – 12/2022).

Results: 620 patients met the inclusion criteria. Group A had 427 patients, Group B had 193, Group C had 69, and Group D had 124. Compared to Group A (54.1%), there was a higher proportion of N+ status patients in Group B (69.6%), Group C (63.8%), and Group D (73.0%), with a significant difference throughout. The frequency of T3-4 tumors and the patient delay slightly increased in Group B. No significant difference in overall survival was observed between the study groups.

Conclusions: There are limited publications available on this topic in Europe, especially studies that compare the periods before, during, and after the COVID-19 pandemic restrictions. Head and neck cancer patients presented with more advanced clinical nodal disease after the COVID-19 onset, and a slight increase in patient delay. In the future, it would be advisable to develop an action plan to ensure that the care of oncology patients remains uninterrupted.

Support: No funding was received for this study.

COMPARATIVE SAFETY AND FUSION OUTCOMES OF OLIF AND TLIF IN LUMBAR SPINE SURGERY

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Keywords: OLIF, TLIF, adverse events, perioperative outcomes, spinal fusion surgery

Aims: Transforaminal (TLIF) and oblique lateral (OLIF) lumbar interbody fusion techniques are surgical options for treating degenerative lumbar segmental instability. Procedures are defined not only by intraoperative parameters and perioperative complication profiles, but also by their long-term outcomes, which are closely linked to the stability achieved. This study aims to compare the safety of OLIF and TLIF techniques based on surgical-related parameters, intraoperative complications, postoperative adverse events (AEs), and 1-year radiographic fusion outcomes.

Methods: We retrospectively reviewed 268 L3–L5 fusions performed in a tertiary center (201 TLIF, 67 OLIF). Demographics, perioperative variables, early AEs (<40 days), reoperations, and fusion rates were compared. The AEs were also categorized according to SAVES-V2 score. A comorbid subcohort (Charlson Comorbidity Index ≥ 5;

n = 32) was also analyzed. Fusion rates were assessed at one-year follow-up CT, based on the Bridwell grading system. For statistical comparison, we used the Chi-square test, Fisher's exact test and Welch's t-test.
Results: Baseline characteristics were comparable. OLIF was associated with longer operative time than TLIF (182 min vs 135 min, $p < 0.001$) but resulted in lower blood loss (134 vs 382 mL, $p < 0.001$) and a shorter hospital stay (6.5 vs 7.3 days, $p = 0.044$). The overall incidence of AEs did not differ (13.4 % OLIF vs 17.4 % TLIF, $p = 0.70$) and AE distribution across SAVES-V2 categories was also comparable. Early reoperation rates were similar (4.5 % vs 4.0 %). Solid segmental bony fusion was achieved (92.5 % and 90.0 %).
Conclusions: TLIF and OLIF provide comparable safety profiles, similar reoperation rates, and high fusion success. The choice of surgical approach may be guided by anatomical considerations and surgeon preference, even in medically complex patients.
Support: No financial support or sponsorship was received for the conduct of this research.

THE PROGNOSTIC ROLE OF BOWMAN'S MEMBRANE RUPTURE IN KERATOCONUS

Krisztina Kiss, Eszter Szalai (Department of Ophthalmology, University of Pécs)

Keywords: keratoconus, Bowman's membrane, confocal microscopy
Aims: In vivo confocal microscopic examination of the Bowman's membrane fragmentation, investigating its potential role as a prognostic marker in different stages of keratoconus. Keratoconus is a progressive corneal ectasia. The Bowman's membrane, located beneath the corneal epithelium, plays a key role not only in the diagnosis of the disease but also in monitoring its progression and treatment. Although previous histopathological studies have identified the rupture of Bowman's membrane as an early sign of keratoconus, observing it in 71–91.6% of cases, more recent research is investigating whether fragmentation might only appear in the later stages of the disease.
Methods: In our study, we analyzed 15 eyes of 12 patients. Based on topographic examinations of the cornea (maximum keratometry, posterior radius of curvature, pachymetry) patients were divided into moderately advanced (n=7) and advanced (n=8) keratoconus groups. Subsequently, all patients in both groups underwent in vivo confocal microscopic examination.
Results: During the in vivo confocal microscopy examination, an intact Bowman's membrane was observed in each case with moderately advanced keratoconus. Fragmentation was present in 3 of the 15 eyes examined (20%), all from the advanced group.
Conclusions: Since no damage to the Bowman's membrane was observed in any of the early-stage, moderately advanced patients, we concluded that Bowman's membrane fragmentation is characteristic of advanced keratoconus and could therefore serve as a late prognostic marker.
Support: The study received no external funding.

PROTOCOLIZED SEDATION MAY REDUCE VENTILATION AND SEDATION REQUIREMENTS IN THE PEDIATRIC INTENSIVE CARE UNIT: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Keywords: Conscious sedation, Intensive care unit, Pediatrics, Critical care, Duration of therapy

Aims: To evaluate the effectiveness and safety of protocolized sedation compared to conventional sedation regimens in mechanically ventilated pediatric intensive care unit (PICU) patients.
Methods: A comprehensive systematic review and meta-analysis was conducted across MEDLINE, CENTRAL, Embase, Web of Science, and Scopus databases from inception to October 18, 2023. Twenty-six studies (15,214 participants), including randomized controlled trials and observational studies comparing protocol-directed sedation management with conventional sedation in pediatric patients requiring invasive mechanical ventilation for >24 hours, were analyzed.
Results: Protocolized sedation demonstrated statistically significant reductions in invasive mechanical ventilation duration (median difference -13.88 hours; 95% CI, -25.46 to -2.29; P=0.022) and PICU length of stay (-0.64 days; 95% CI, -1.26 to -0.02; P=0.045). Significant reductions were observed in benzodiazepine duration (-1.28 days; 95% CI, -2.26 to -0.31; P=0.016) and peak dose (-0.05 mg/kg/hr; 95% CI, -0.11 to 0.002; P=0.044). However, increased odds of unplanned extubation were noted (OR 1.13; 95% CI, 1.02 to 1.26; P=0.029).
Conclusions: Protocolized sedation may reduce ventilation requirements and PICU length of stay, though these findings require confirmation through randomized controlled trials. The approach shows promise for reducing sedative exposure but requires careful monitoring for unplanned extubation risk.
Support: No specific funding was received from public, commercial, or not-for-profit sectors. K. Horváth was supported by the János Bolyai Research Scholarship from the Hungarian Academy of Sciences

THE EFFECT OF SALINE PRE-TREATMENT AT VARIOUS TEMPERATURES ON BONE CEMENT LEAKAGES DURING PERCUTANEOUS VERTEBROPLASTY: A PROSPECTIVE STUDY

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Keywords: PVP, cement leakage, treatment, saline
Aims: Cement leakage remains a significant challenge in percutaneous vertebroplasty (PVP). Leakage can lead to serious complications, including spinal cord compression, pulmonary embolism, and nerve root irritation. While several techniques have been proposed to minimize leakage, an effective and simple solution is still needed. This study aims to reinforce our previous retrospective research where a significant reduction in cement leakages was found after pre-washing vertebral bodies with cold saline before cement injection.
Methods: A prospective analysis was conducted on patients who underwent PVP for osteoporotic vertebral compression fractures. Patients were divided into three groups: (1) conventional PVP, (2) PVP with room-temperature saline pre-injection, and (3) PVP with cold saline (4 ◦C) pre-injection. Cement leakage was assessed using intraoperative fluoroscopy and postoperative computed tomography (CT), categorized into paravertebral, intervertebral, retrograde, spinal canal, and distant venous leakage. Statistical analysis was performed to compare leakage rates among the groups.
Results: A total of 112 patients with 370 treated vertebrae were analyzed. Opposed to our previous retrospective study, cold saline pre-treatment has not reduced significantly the cement leakage rates compared to conventional PVP and room-temperature saline pre-injection ($p > 0.01$). CT imaging detected significantly more cement extravasation than fluoroscopy ($p < 0.01$). The incidence of retrograde and venous leakage was lowest in the cold saline group, but we couldn't find significant differences. ($p > 0.01$)
Conclusions: We need to include more patients and investigate further this promising therapeutic technique, because it is simple, cost-effective and may enhance surgical safety while improving patient outcomes.

GASTROINTESTINAL BLEEDING AS A RARE PRESENTATION OF LOCALLY ADVANCED RENAL CELL CARCINOMA

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Keywords: Renal cell carcinoma, Whipple, Nephrectomy, Gastrointestinal bleeding

This report presents two rare cases of severe gastrointestinal (GI) bleeding caused by direct invasion of renal cell carcinoma (RCC) into the GI tract, managed surgically with en bloc resection. A literature review on diagnostics and treatment of locally advanced RCC with GI or liver involvement is also included.

Patient 1: A 59-year-old man presented with fatigue, melena, and severe anemia. Endoscopy revealed a bleeding duodenal mass. CT showed a large right renal tumor (13.2 × 8.4 × 13.6 cm) invading the duodenum and psoas muscle, with lung metastases. He underwent right radical nephrectomy with enbloc pancreatoduodenectomy (Whipple procedure).

Patient 2: A 57-year-old man with a history of renal biopsy and laparoscopic partial nephrectomy (R0 resection) for renal cell carcinoma (RCC). Follow-up CT showed local recurrence, but he did not receive further treatment at that time. A year later he presented with melena and severe anemia. Imaging revealed a 4.8 cm recurrent renal mass invading the colon and liver. He initially underwent angioembolization for bleeding, followed by right radical nephrectomy, hemicolectomy, and liver resection.

Literature review indicates that RCC invasion into the GI tract is extremely rare but should be considered in cases of unexplained GI bleeding, especially in patients with RCC history. Multidisciplinary teams should evaluate treatment options. For surgically fit patients, referral to an experienced tertiary center is recommended, as en bloc resection offers the best chance for cure or palliation.

PS5. Interdisciplinary EPOS session V. (Neurology-Dermatology-Cardiology-Dermatology-Pediatrics)

THE RELATIONSHIP BETWEEN VITAMIN B12 LEVELS AND RESTING-STATE FUNCTIONAL MRI BRAIN CONNECTIVITY

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Keywords: Vitamin B12, fMRI? neuropsychology

Introduction: Vitamin B12 deficiency impairs cognition, but the mechanisms remain unclear. While timely supplementation can reverse symptoms, the current lower limit for serum B12 is based on preventing megaloblastic anemia, not neuropsychiatric symptoms.

Objective: To explore how B12 levels affect resting-state brain functional connectivity (rs-fMRI) and identify the threshold below which cognitive symptoms emerge.

Methods: We studied 86 patients who underwent serum B12 testing, neuropsychological assessments, and rs-fMRI. We analyzed three fMRI parameters: local correlation (LCOR), intrinsic connectivity (IC), and fractional amplitude of low-frequency fluctuations (fALFF).

Results: Higher B12 levels correlated with better performance on the Trail Making Test B (TMT-B) and the Addenbrooke's Cognitive Examination (ACE), peaking at B12 levels 40% above the current minimum. Below this threshold, B12 levels negatively correlated with TMT-B times (p=0.007) and positively with total ACE scores (p=0.016) and memory subscores (p=0.023). B12 levels were also significantly associated with fALFF in the Default Mode Network (DMN).

Discussion: Cognitive performance is linked to B12 levels even above the established deficiency threshold. Memory decline appears to drive lower ACE scores and may relate to altered DMN connectivity. Findings suggest

the current B12 reference range may need revision—raising the lower limit by 40% could help prevent cognitive symptoms.

GENE EXPRESSION SIGNATURES PREDICTING RESISTANCE TO IMMUNOTHERAPY IN MELANOMA

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Keywords: melanoma, biomarkers, immunotherapy resistance

Aims: Melanoma is the most lethal skin cancer due to its aggressive metastatic potential. In the past decade, immune checkpoint inhibitors have emerged as the leading treatment option. Predicting which patients will not respond to this therapy remains a challenge, there is a pressing need to identify biomarkers. Our goal was to identify potential biomarkers in melanoma samples that could play a crucial role in predicting therapeutic resistance, thereby guiding treatment decisions and improving patient outcomes.

Methods: Eight candidate genes (YAP1, PLS3, RHOQ, CLDN12, KCTD15, MPZL1, SPIN1, and TOMM20) were selected by our collaborator based on previously reported involvement in immune modulation and tumor progression. To evaluate their clinical relevance in the context of immunotherapy resistance in melanoma, we analyzed publicly available gene expression and survival data from the cohorts of David Liu, TCGA, and Van Allen et al. Associations between gene expression levels and clinical outcomes were assessed — Kaplan–Meier survival curves were generated to visualize progression-free survival (PFS) and overall survival (OS), and statistical differences were assessed using log-rank tests in relation to gene expression levels.

Results: Our analyses revealed a statistically significant association ($p<0.05$) between the expression levels of the KCTD15 and MPZL1 genes and the above survival parameters (PFS, OS).

Conclusions: Our preliminary findings suggest a potential association between KCTD15 and MPZL1 and immunotherapy resistance. However, further studies are required to validate these findings on independent cohorts. We are currently conducting validation analyses on primary melanoma samples from our clinical cohort to validate our results further.

ASSESSING THE VALUE OF ROUTINE PREPROCEDURAL CT ANGIOGRAPHY IN CRYOBALLOON PULMONARY VEIN ISOLATION

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Keywords: atrial fibrillation, pulmonary vein isolation, cryoballoon, computed tomography angiography, coronary artery disease

Aims: We aimed to evaluate the impact of routine preprocedural left atrial and coronary computed tomography angiography (CTA) on procedural strategies and clinical outcomes in patients undergoing cryoballoon pulmonary vein isolation (PVI).

Methods: In this prospective, propensity score–matched study, we analyzed patients who underwent cryoballoon PVI at our institution between January 2019 and March 2023. Patients were assigned to either a CTA group, where preprocedural CTA was performed, or a control group, where PVI was guided by fluoroscopy alone. To minimize selection bias, 1:1 propensity score matching (PSM) was applied based on baseline characteristics, including age, sex, left atrial diameter, BMI, and AF type. Coronary artery disease (CAD) was assessed in the CTA group, and three-dimensional left atrial reconstruction images assisted the operator during the procedure.

Results: After PSM, 320 patients (160 per group) were included in the final analysis. Procedural time was comparable between the CTA and control groups (52±13 min vs. 51±15 min, p=0.36), as was left atrial dwell time (39.9±11 min vs. 40.5±13 min, p=0.63). Acute pulmonary vein isolation rates (96% vs. 92%, p=0.23) and 12-month arrhythmia-free survival (CTA: 75% vs. control: 75.6%, p=0.90) did not significantly differ. However, previously undiagnosed CAD was identified in 84 patients (52.5%) in the CTA group, leading to 23 (27.4%) referrals for invasive coronary angiography.
Conclusions: Routine preprocedural CTA did not significantly impact procedural efficiency or clinical outcomes in cryoballoon PVI. However, the high prevalence of previously undiagnosed CAD underscores the potential value of coronary assessment in this population.
Support: The authors declare that there are no conflicts of interest and no specific funding was received for this work.

COMPARISON OF PULMONARY VEIN RECONNECTION PATTERNS AFTER POINT-BY-POINT VERSUS SINGLE-SHOT ABLATION IN ATRIAL FIBRILLATION

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Keywords: Atrial fibrollation, point-by-point, single shot, pulmonary vein reconnection,
Aims: During electrophysiological interventions for atrial fibrillation (AF), pulmonary vein isolation (PVI) is performed via catheter ablation to electrically disconnect the pulmonary veins (PVs) from the left atrium (LA). Despite successful PVI, recurrent arrhythmias may occur, often due to PV reconnection. Our study aimed to compare PV reconnection patterns in repeat procedures following initial PVI performed using either point-by-point (PP) or single-shot (SS) techniques.
Methods: We retrospectively analyzed data from 105 consecutive patients who underwent a repeat electrophysiological study due to recurrent AF between September 1, 2021, and August 1, 2024, at our center. Based on the technique used during their initial PVI, patients were divided into two groups: point-by-point radiofrequency ablation (PP group, n=65) and single-shot device ablation (SS group, n=40). Reconnection patterns were compared between the two groups.
Results: There was no significant difference in the proportion of patients without PV reconnection between the groups (PP: 19/65 vs. SS: 7/40, p=0.18), nor in the number of reconnected PVs (105/260 vs. 75/160, p=0.3). Reconnection of the right-sided pulmonary veins was significantly more frequent in the SS group compared to the PP group (37/65 vs. 31/40, p=0.03). Procedural parameters during repeat electrophysiological studies differed between the groups.
Conclusions: In our cohort of patients undergoing repeat electrophysiological procedures following PVI for AF, no PV reconnection was observed in approximately one-quarter of the cases. Among patients with reconnection, right-sided PVs were more frequently involved following initial ablation with a single-shot technique.

RESTORATION, BUT NOT MAINTENANCE OF SINUS RHYTHM BY AMIODARONE PREDICTS THE SUCCESS OF PULMONARY VEIN ISOLATION IN PERSISTENT ATRIAL FIBRILLATION

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Keywords: atrial fibrillation, amiodarone, sinus rhythm, pulmonary vein isolation, recurrence
Aims: Our aim was to evaluate whether amiodarone response before the ablation has predictive value in patients with persistent atrial fibrillation (AF) undergoing pulmonary vein isolation (PVI).
Methods: We retrospectively collected data from patients with persistent AF who underwent PVI between 2013 and 2023, and who received temporary amiodarone therapy, with or without electrical cardioversion (ECV) to restore and maintain sinus rhythm (SR) prior to the intervention.

Results: 353 patients (70% male, mean age 63.76±9.28 years) were included in the study. Conversion to sinus rhythm was achieved by amiodarone therapy (AmioConv group) in 96 patients (27%), while 257 patients (73%) required additional ECV (ECV group). There were no differences regarding the baseline characteristics between the AmioConv and the ECV group, but the AmioConv group had a shorter AF history (2.22±2.96 years vs. 3.74±4.64 years, p<0.01). Over a mean 3,01±2,4-year follow-up, AF recurrence was lower in the AmioConv group (17% vs. 33%, p<0.01), with longer recurrence-free survival (5.21±0.45 years vs. 3.6±0.35 years, p=0.006). Conversion by amiodarone therapy was an independent predictor of ablation success (OR 1.96, 95% CI 1.10-3.49, p=0.022). AF episodes during the amiodarone pretreatment were not predictive of recurrences post-PVI (p=0.57).
Conclusions: In patients with persistent AF, the success of PVI is predicted by the spontaneous restoration, but not the maintenance of SR during amiodarone pretreatment.

THE REDUCED EXPRESSION OF BRAIN-DERIVED NEUROTROPHIC FACTOR IN PSORIATIC NON-LESIONAL KERATINOCYTES CONTRIBUTES TO SUPPRESSION OF KERATINOCYTE PROLIFERATION

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Keywords: psorisis, BDNF, non-lesional skin
Aims: Psoriasis is chronic inflammatory skin disease, where symptomless/non-lesional (NL) skin areas may exhibit certain alterations that can predispose or act as protective factor to lesion formation. Given that tissue environment of NL skin can influence the development of psoriatic lesions, our aim was to investigate processes that may play a role in the maintenance of NL state.
Methods: Using a protein array, we examined the expression of cytokines, chemokines, proteases, and protease inhibitors in skin samples from healthy and NL areas of psoriatic patients with mild and severe psoriasis. BDNF immunofluorescence (IF) staining was performed on healthy, mild and severe psoriatic non-lesional, lesional and clinically resolved skin sections. The role of BDNF in keratinocyte proliferation was investigated using HaCaT keratinocytes in different cell cycles, followed by siRNA-mediated silencing. MTT assay and CytoSmart Lux2 analysis was used to measure metabolic activity and cell behaviour.
Results: The expression of BDNF in the psoriatic non-lesional vs, healthy skin was reduced. In contrast, the reduced level of BDNF was notobserved in the lesional and resolved skin. We also observed that BDNF expression is higher in proliferating HaCaT keratinocytes, and siRNA mediated silencing of BDNF resulted in decreased metabolic activity and proliferation rate.
Conclusions: Our results demonstrate the importance of BDNF in the regulation of HaCaT cell proliferation. Additionally, the decreased expression of BDNF in the non-lesional psoriatic epidermis may also contribute to sustaining a non-hyperproliferative state. Thus, we identified protective alteration that could help to maintain the uninvolved state.
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ASSOCIATION BETWEEN PEDIATRIC INTENSIVE CARE UNIT PRACTICES, SLEEP DISRUPTION, AND PSYCHOLOGICAL OUTCOMES IN CHILDREN

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Keywords: Pediatric Intensive Care Unit, Sedation Practices, Sleep-wake cycle, Psychological outcomes, Quality of Life

Aims: This study investigates the impact of Pediatric Intensive Care Unit (PICU) practices on children's sleep-wake patterns and psychological well-being, focusing on long-term quality of life.

Methods: Our prospective, single-center observational cohort study included PICU patients aged 1–17 years who underwent invasive mechanical ventilation for at least 24 hours. After extubation, sleep-wake cycles were measured by actigraphy, and the Daytime Activity Ratio Estimate (DARE) was calculated. Parents completed SDQ and PedsQL questionnaires at admission and two months after discharge to assess psychological and quality of life outcomes. Sedation and clinical data were collected from medical records. Analyses included descriptive statistics and linear regression

Results: Among the cohort, actigraphy showed a 100% deviation in DARE from normal values in children over 6 years. The mean PedsQL score at admission (n=22) was 24.68 (SD=17.86), dropping slightly at two months (n=9). The SDQ total difficulties score at admission (n=22) was 14.5 (SD=3.47), with ongoing deviations from healthy norms, especially in peer relationships (90%) and conduct problems (80%) at follow-up. No significant associations were found between DARE, sedation, gender, age, and questionnaire results.

Conclusions: PICU practices significantly disrupt sleep-wake cycles and contribute to ongoing psychological difficulties in children. These findings highlight the importance of sedation strategies that minimize negative effects on sleep and mental health, and support interventions to maintain circadian rhythm and improve long-term outcomes for critically ill children.

Support: No specific funding was received. K. Horváth was supported by the János Bolyai Research Scholarship from the Hungarian Academy of Sciences.

VALIDATION OF A VOLUMETRIC ABSORPTIVE MICROSAMPLING (VAMS) TECHNIQUE IN INFANTS WITH PERINATAL ASPHYXIA AND THERAPEUTIC HYPOTHERMIA

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Keywords: volumetric absorptive microsampling, clinical validation, perinatal asphyxia, cortisol, hypothermia

Aims: This study aimed to validate the use of the capillary blood volumetric absorptive microsampling (CB-VAMS) technique for measuring cortisol and cortisone levels in neonates undergoing therapeutic hypothermia due to hypoxic-ischemic encephalopathy (HIE) following perinatal asphyxia, and to assess its potential in the early diagnosis of relative adrenal insufficiency (RAI) in this vulnerable population.

Methods: In a prospective study conducted at Paediatric Centre Semmelweis University between November 2023 and October 2024, 16 asphyxiated neonates were enrolled. During therapeutic hypothermia, 10 µL capillary blood samples were collected using VAMS and compared to 200 µL arterial blood samples. Cortisol and cortisone levels were determined by ultra-high-performance liquid chromatography–tandem mass spectrometry (UHPLC-MS/MS). The level of agreement between CB-VAMS and arterial sampling was assessed using Bland-Altman analysis.

Results: A total of 51 paired CB-VAMS and arterial samples were analysed. CB-VAMS cortisol levels were on average 1.7 µg/dL lower (95% CI: -16.5 to 13.0), while cortisone levels were on average 1.6 µg/dL higher (95% CI: -2.6 to 5.7) compared to arterial samples. RAI, defined as cortisol <15 µg/dL, was identified in 5 neonates, and all cases were also detected via CB-VAMS.

Conclusions: Despite individual variability between paired samples, CB-VAMS demonstrates potential as a reliable and minimally invasive tool for the early diagnosis of RAI, even in critically ill neonates with limited blood volume. Further validation is planned in preterm and hemodynamically stable infants.
Support: Sampling devices were provided by Trajan Scientific and Medical Ltd.

PS6. Interdisciplinary EPOS session VI. (Internal Medicine-Family Medicine-Rheumatology)

EFFICACY AND SAFETY OF SINGLE OPERATOR CHOLANGIOSCOPY-GUIDED INTRADUCTAL LITHOTRIPSY IN DIFFICULT BILIARY STONES

Bálint Czakó, Gábor Mohácsi, Viktória Terzin, Máté Tajti, Zoltán Szepes, Dóra Illés, László Czakó (Center of Gastroenterology, Department of Medicine, University of Szeged)

Keywords: Difficult biliary stone, ERCP, Cholangioscopy, Intraductal lithotripsy
Aims: Our objective was to compare the clinical and financial outcomes of Cholangioscopy-assisted electrohydraulic lithotripsy (CA-EHL) and conventional endoscopic therapy (CET) in the management of difficult biliary stones.
Methods: Patients with difficult biliary stones diagnosed via endoscopic retrograde cholangiopancreatography (ERCP) were retrospectively allocated into two groups: Group I: CET (January 1, 2022 – December 31, 2022), and Group II: CA-EHL (January 1, 2023 – January 31, 2025). Patient characteristics, success rate of stone removal, complication rates, mortality, unplanned readmissions within 30 days, intensive care unit (ICU) admissions, length of hospital stay, and cumulative treatment costs were analyzed.
Results: Group I included 37 patients, as did Group II. There were no significant differences between the groups in terms of median age (73 vs. 74 years), gender distribution (male:female = 16:21 vs. 13:24), or Charlson comorbidity index (median: 4 vs. 3; $P>0.05$). The success rate of stone clearance was significantly higher in Group II (32.4% vs. 91.9%; $P<0.001$). Surgical intervention was significantly more common in Group I (32.4% vs. 5.4%; $P=0.006$). Patients in Group II spent significantly less time in the surgical ward (average: 2.9 vs. 0.4; $P=0.0466$). There were no significant differences between the groups in the number of complications (9 vs. 11 cases, $P=0.452$), time spent in the internal medicine ward (median: 6 vs. 8 days; $P=0.704$), mortality, 30-day unplanned readmission, or ICU admission rates ($P>0.05$). The cumulative treatment cost was significantly higher in Group II (4,499 vs. 11,761 $/patient; $P<0.001$).
Conclusions: CA-EHL represents a safe and effective approach for managing difficult biliary stones refractory to standard endoscopic techniques.
Support: Supported by the ÚNKP-23-2 new national excellence program of the ministry for culture and innovation from the source of the national research, development and innovation fund.

CARE OF CHRONIC KIDNEY DISEASE: ASSESSING GENERAL PRACTITIONERS' KNOWLEDGE AND ATTITUDES TO SUPPORT THE DEVELOPMENT OF SPECIALIST TELECONSULTATION SERVICES

Dorottya Gaspar (Department of Family Medicine and Occupational Health)

Keywords: CKD, general practitioner, primary care, nephrology, questionnaire
Aims: Chronic kidney disease (CKD) affects an estimated 1.4 million people in Hungary, yet it remains underrepresented in professional training and public health initiatives. This study aims to assess the CKD-related knowledge of Hungarian general practitioners (GPs) and provide targeted, interactive training based on the

findings. A long-term goal is to establish an online consultation platform with nephrologists for participants who complete the training.

Methods: We used a questionnaire adapted from a 2022 Polish study conducted among GPs. Respondents completed it during a tutor meeting and a resident consultation. The first section gathered sociodemographic data, while the second assessed specific professional knowledge.

Results: Ninety-six physicians participated (41 men, 55 women), with an average age of 43.9 years. Out of them, 42 were residents and 54 were certified specialists. Participants were categorized by gender, qualification, weekly hours in primary care, and the population size of their workplace location. We analyzed group differences using Shapiro-Wilk and Kolmogorov-Smirnov tests, Spearman correlations, Mann-Whitney and Kruskal-Wallis tests, and chi-square tests for categorical variables.

Significant differences emerged in two questions: more specialists identified albumin as the key diagnostic marker for CKD, while more residents correctly recognized the limitations of urine dipsticks in detecting proteinuria. Less than half of the participants answered correctly on 7 of 13 CKD-related questions, and one question received no correct responses.

Conclusions: These findings highlight the need to strengthen CKD knowledge among primary care providers in Hungary. Improving early detection and management could notably enhance quality-adjusted life years for CKD patients.

Support: University of Debrecen

HOME PARENTERAL NUTRITION IN MALIGNANT INTESTINAL FAILURE – A NOVEL INDICATION IN PALLIATIVE CARE?

Mohácsi Gábor, Czakó Bálint, Zsilák-Urbán Mihály, Lada Szilvia, Illés Dóra, Tajti Máté, Czakó László (Center of Gastroenterology, Department of Medicine, University of Szeged)

Keywords: Home parenteral nutrition, Malignant intestinal failure, Nutritional status, Survival, Oncology

Aims: Malignant intestinal failure (MIF) results in inadequate enteral nutrient absorption due to cancer progression, surgery, or chemotherapy, leading to impaired nutritional intake. This study aimed to evaluate the effectiveness of home parenteral nutrition (HPN) in MIF patients, focusing on nutritional status, survival outcomes, and complication rates.

Methods: We conducted a retrospective observational study of 17 patients treated with HPN between 2015 and 2025. Nutritional effectiveness was assessed using anthropometric data (weight, BMI, skeletal muscle mass), biochemical markers (albumin, lymphocyte count, CRP), and nutritional indices (Nutritional Risk Index [NRI], Geriatric Nutritional Risk Index [GNRI], Prognostic Nutritional Index [PNI]). Survival was analyzed using Kaplan–Meier curves and Cox proportional hazards regression.

Results: The mean age was 59.1 ± 11.9 years; 82.3% were female. HPN indications included type I short bowel syndrome (29.4%), type II (11.8%), and tumor-related bowel obstruction (58.8%). According to GLIM criteria, 64.7% of patients were classified as malnourished at baseline. Median survival was 9 months. No significant changes were observed in weight, BMI, skeletal muscle mass, or ECW ratio. Notably, despite advanced malignancy, patients successfully maintained their anthropometric parameters through targeted nutritional intervention. A total of four complications were reported: one case of port malfunction, one instance of skin necrosis, and two catheter-related infections.

Conclusions: Home parenteral nutrition is a highly effective and well-tolerated therapeutic strategy for patients with malignant intestinal failure. It enables the preservation of nutritional status even in the context of progressive oncologic disease and contributes to clinical stability. HPN should be considered a cornerstone of supportive therapy in palliative oncology.

Support: No external funding was received.

POSSIBLE OBSTACLES TO EFFICIENT CONTINUOUS GLUCOSE MONITORING IN TYPE 1 DIABETIC PATIENTS (ORAL)

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Keywords: type 1 diabetes, diabetes distress, continuous glucose monitoring, cross-sectional study, Hungary
Aims: This study aimed to examine the self-management of T1DM patients incorporating both physiological (HbA1c) and behavioural (self-reported) self-management indicators. We investigated differences between continuous glucose monitoring sensor users and non-users across these variables.
Methods: The retrospective cross-sectional study included 108 adult T1DM patients receiving care at Semmelweis University. Participants completed validated self-report measures, including the Diabetes Distress Scale (DDS), Diabetes Self-Management Questionnaire (DSMQ), and Audit of Diabetes-Dependent Quality of Life (ADDQoL-19). HbA1c values and CGM data were retrieved from medical records. Statistical analysis included structural equation modelling (SEM), two step cluster analysis and non-parametric Mann-Whitney U test.
Results: Overall, 71% of participants used a CGM sensor, while 29% did not. No significant differences were found between CGM users and non-users regarding DD, DSMQ, HbA1c and QoL. The average CGM usage rate was 70.98% (SD = 26.91) in the CGM user group. Cluster analysis identified two distinct subgroups: efficient CGM users (n = 44, mean usage = 89.89%) and non-efficient CGM users (n = 21, mean usage = 35.57%). Significant differences were observed between these subgroups regarding DD, regimen-related distress, HbA1c, glucose management index (GMI), time in range (TIR), glucose variability and age of diagnosis.
Conclusions: Integrating routine DD screening and psychological interventions into diabetes care may enhance the effectiveness of CGM usage. If used consistently, continuous glucose monitoring has the potential to significantly improve glycaemic control in type 1 diabetic patients.
Support: The authors received no financial support for the research.

FACTORS DETERMINING GLYCEMIC CONTROL IN TYPE 2 DIABETES

Bence Majláty, Vivien Anna Farkas, József Rinfel MD, John Ahn MD, Csenge Hargittay MD, Bernadett Márkus MD, Zoltán Lakó-Futó MD, Krisztián Vörös MD(Department of Family Medicine, Semmelweis University, Faculty of General Medicine; Primary Care Institute, University of Pécs, Faculty of General Medicine)

Keywords: DSMQ, ideal glycemic control, T2DM, prospective study, 5-year follow-up
Introduction: Diabetes-related mortality and complications can be reduced by achieving adequate glycemic control. The aim of our study was to analyze which factors are most decisive for achieving ideal glycemic control, which can help us to manage patients more effectively.
Methods: In this prospective study we included 98 patients from the Diabetes Self Management Questionnaire (DSMQ) validation cohort for follow-up between 2015 and 2018. The data analyzed were the number and value of HbA1c measurements, medication treatment and adherence, and clinical inertia.
Results: Data from 68 of the 95 patients were available (four moved away, 23 died).
At the time of data collection, 55.2% of patients had an HbA1c value below 7%, which decreased to 47.1% by the end of the follow-up period. 71.6% of patients had higher HbA1c values at the end of follow-up than at baseline, with the mean HbA1c value increasing from 7.13±0.92% to 7.59±1.58% ($p=0.032$), despite more intensive treatment (from 2.58±1.48 points to 3.28±1.51 points, $p<0.001$).

In logistic regression, the predictor of HbA1c reduction was a higher score on the DSMQ Physical Activity (DSMQ-PA) subscale (p=0.007). The determinants of higher HbA1c area under the curve at five years of follow-up were younger age (p=0.002) and the presence of clinical inertia (p<0.001). Clinical inertia occurred in 36.8% of patients. The mean medication adherence of patients was 90.2%. Adherence was significantly higher in the COVID-19 years compared to other years (p=0.036).
Conclusions: Many diabetic patients were not at target during the follow-up and there was no improvement in this direction despite intensified antidiabetic treatment. A positive attitude towards exercise within the self-care of patients can help improve carbohydrate metabolism. Adherence to medication was excellent. Clinical inertia - especially in young people - plays an important role in the persistence of suboptimal glycemic control.

CRANIOPHARYNGIOMAS: ENDOCRINE MANAGEMENT AND PRESENTATION

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Keywords: craniopharyngioma, intracranial tumor, neurosurgery, hormone substitution, endocrinology
Aims: Craniopharyngiomas are rare, benign intracranial tumors derived from embryological remnants of Rathke's pouch. Clinical signs at presentation include compressive symptoms related to the tumor's suprasellar location, such as headache and visual disturbances. The primary curative therapy is surgical resection, which often results in endocrine deficiencies such as hypopituitarism. Our aim is to analyze the clinical characteristics and long-term management of craniopharyngioma patients.
Methods: Retrospective analysis of 30 craniopharyngioma patients followed at two outpatient clinics at Semmelweis University Department of Internal Medicine and Oncology, 1980 - 2025.
Results: 30 craniopharyngioma patients had long-term data for analysis. 17 (57%) patients were male and 13 (43%) female. The youngest patient at diagnosis was 2 years old, the oldest 79 with bimodal distribution with peaks at ages 11-20 and 41-50. The main symptoms at presentation were headache and visual disturbances. All 30 patients were operated on, and 11 (37%) required multiple surgeries. Post-surgery 4 patients (13%) underwent radiotherapy. 3 patients (10%) developed hydrocephalus managed with permanent ventriculoperitoneal shunt placement. Most patients (40%) required triple hormonal substitution (mainly glucocorticoid, thyroid, and sex hormones). In 25 cases (83%) ADH deficiency developed, managed with desmopressin.
Conclusions: Among our cohort of craniopharyngioma patients, no significant gender predilection was noted. Age at the time of diagnosis had bimodal distribution ranging between 11-20 and 41-50. Compressive symptoms were commonly detected, including persistent headache and significant neurological deficits including vision loss. The diagnosis and curative therapy required expert surgical care, frequent follow-up for recurrence, and long-term endocrinological management.
Support: none

ADAPTATION AND VALIDATION OF THE SCLERODERMA SKIN PATIENT-REPORTED OUTCOME QUESTIONNAIRE INTO HUNGARIAN

Panna Pytel, Ágnes Ágoston-Szabó, Attila Szabó, Gábor Kumánovics, Gabriella Nagy (University of Pécs, Clinical Centre, Department of Rheumatology and Immunology)

Keywords: systemic sclerosis, quality of life, skin involvement, adaptation and validation, OMERACT filter
Aims: To adapt and validate the Scleroderma Skin Patient-Reported Outcome (SSPRO) questionnaire into Hungarian, enabling the assessment of skin involvement and its impact on health-related quality of life in systemic sclerosis (SSc) patients.
Methods: A total of 60 patients with SSc [female n=53, male n=7, mean age 58.1 ± 13.4 years, diffuse cutaneous SSc (dcSSc) n=31 (51.67%)] and 30 age- and sex-matched healthy controls were enrolled. The 18-item SSPRO questionnaire was translated and culturally adapted using the OMERACT filter.

Results: The questionnaire significantly differentiated between SSc patients and healthy controls (20,5 points [11–32] vs. 11 points [7–17], $p < 0.007$). No significant difference was found between limited cutaneous SSc and diffuse cutaneous SSc subgroups. A strong correlation was observed between SSPRO scores and reference questionnaires (Health Assessment Questionnaire Disability Index: rho=0,499, $p< 0,001$; Short Form Health Survey 36 Physical Component: rho=-0.570, $p< 0.001$; Dermatology Life Quality Index: rho=0,754, $p< 0,001$, respectively). During the assessment of reproducibility, a high intraclass correlation coefficient was found (Cronbach's alpha=0,894, $p<0,001$). Principal component analysis grouped the items into three subdomains.
Conclusions: The adaptation and validation of the Scleroderma Skin Patient-Reported Outcome questionnaire into Hungarian was successful. The questionnaire is a quick, simple, and highly discriminative tool for assessing health-related quality of life.
Support: University of Pécs, Medical School, Undergraduate Research Society (PTE ÁOK TDK).

WS.6. Bálint Környei MD: US hands-on workshop

WS.7. Gábor Horváth MD: How to prepare for an interview? Followed by HMAA exchange exit interview

WS8. Klara Vandermark DBH: Psychiatric care in the USA

Notes

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EDITOR'S NOTE:

All abstracts available to the Editorial Office as of August 28, 2025 are included in this edition of the Archives of the Hungarian Medical Association of America.

The help of the Program Dr. Gábor Horváth and Dóra Julianna Szabó is appreciated in forwarding and editing the abstracts they received. No alterations in content were carried out.

With questions or suggestions, please contact the Editor at ssomkuti@gmail.com*.*

Thank you,
István Somkúti MD PhD

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