Semmelweis International Students' Conference 2023

Program overview of Semmelweis International Students' Conference, 2023

11TH FEBRUARY 2023 – SATURDAY

Time								Time
8:30-9:15	Opening ceremony 8:30-9:15							8:30-9:00
9:30-10:00	BASIC SCIENCES A 9:30-12:45	BASIC SCIENCES B 9:30-12:45	BASIC SCIENCES C 9:30-12:45	CLINICAL SCIENCES A 9:30-12:45	CLINICAL SCIENCES B 9:30-12:45	CLINICAL SCIENCES C 9:30-12:45	CLINICAL SCIENCES D 9:30-12:45	CLINICAL SCIENCES E 9:30-12:45	9:00-10:00
10:00-10:30									10:00-10:30
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13:30-14:00									13:30-14:00
14:00-14:30	CLOSING CEREMONY 14:30								14:00-14:30
14:30-15:00									14:30-15:00

Program of Semmelweis International Students' Conference, 2023/ Contens

11TH FEBRUARY 2023 - SATURDAY		
8:30-9:15	**OPENING CEREMONY** Opening speech of *Dr. Szijártó Attila*, president of Studnets' Sceintific Association Lecture of *Dr. Alpár Alán* Vice-Rector for International Studies, Semmelweis University	
BASIC SCIENCES A 9:30-12:45		
9:30-9:45	Anna Birg I.M. Sechenov First Moscow State Medical University General Medicine II., Erfan Mohamadi I.M. Sechenov First Moscow State Medical University Dentistry II.	Analysis of the composition of oral microbiota
9:45-10:00	Bo Young Lee Semmelweis University Medicine V.	Clinical and microbiological characteristics of invasive fungal infections caused by Fusarium and Geotrichum sp. as emerging human pathogens
10:00-10:15	Tatyana Epihina Voronezh State Medical University named after N.N. Burdenko Medicine IV., Svetlana Volkova Voronezh State Medical University named after N.N. Burdenko Medicine IV	Electrocortical data for rapid allocation of attention to threat in the dot-probe task
10:15-10:30	Olga Krupina Peoples' Friendship University of Russia Medicine I.	Genetic causes of pathospermia by specifying the polymorphism of the g-105a gene
10:30-10:45	He Li Shandong University Of tTraditional Chinese Medicine	Identifification of the molecular subgroups in Alzheimer's disease by transcriptomic data
10:45-11:00	Mikhail Vinokurov Federal State Budgetary Educational Institution of the Higher Education "A.I. Yevdokimov Moscow State University of Medicine and Dentistry" of the Ministry of Healthcare of the Russian Federation Medicine V.	Masks of vertebrobasilar insufficiency
11:00-11:15	BREAK	
11:15-11:30	Polina Andronova, Peoples' Friendship University of Russia, Medicine II.	Microdeletions of the sex chromosome in men are a factor in azoospermia
11:30-11:45	Roman Kostin I.M. Sechenov First Moscow State Medical University Medicine V., Ivan Rozhnov I.M. Sechenov First Moscow State Medical University Medicine VI.	Psychological and sociological characteristics of students suffering from nightmares
11:45-12:00	Kyusung Choi Semmelweis University Medicine VI.	The epigenetic role of ascorbate in the pathomechanism of arterial tortuosity syndrome
12:00-12:15	Zhongwen Lu Shandong University of Traditional Chinese Medicine IV., Fei Teng Shandong University of Traditional Chinese Medicine IV.	The Mechanism of Action of Network Pharmacology Integrated with Molecular Docking to Explore Wumei Pills in Treating Gastric Cancer
12:15-12:30	Mariia Frolova I.M. Sechenov First Moscow State Medical University Medicine VI., Vera Smirnova I.M. Sechenov First Moscow State Medical University Medicine VI.	The problem of VDPV excretion by people with primary immunodeficiencies
12:30-12:45	Jiao Song Shandong University of Traditional Chinese Medicine Applied psychology VI.	The relationship between dormitory interpersonal relationship and sleep quality of college students under COVID-19:Moderated mediation models

BASIC SCIENCES B 9:30-12:45		
9:30-9:45	Yang Chen Shandong University of Traditional Chinese Medicine Medicine, Pharmacy, Pharmacology I., Jingwen Men Shandong University of Traditional Chinese Medicine Medicine, Pharmacy, Pharmacolog I.	Astragaloside IV Treatment of Chronic Kidney Disease
9:45-10:00	Egor Moiseev I.M. Sechenov First Moscow State Medical University Pharmacy V.	Development of an intratumoral thermosensitive in situ implant with berberine bisulfate
10:00-10:15	Muxuan Han,Shandong University of Traditional Chinese medicine Psychology III.	Inhalation Administration of Agarwood Incense Rescues Scopolamine-Induced Learning and Memory Impairment in Mice
10:15-10:30	Aida Roudgari Semmelweis University Dentistry IV.	Interpretations of human palatal rugae analogized by ethnicity and sex
10:30-10:45	Shuting Shao Shandong University of Traditional Chinese Medicine Feasibility Study and Application Prospect Analysis of a High Efficiency Purification Method for dried persimmon frost(DPF) of Traditional Chinese Medicine — A Case study of Hermit Village of Linqu, Shandong Province	Feasibility Study and Application Prospect Analysis of a High Efficiency Purification Method for dried persimmon frost(DPF) of Traditional Chinese Medicine — A Case study of Hermit Village of Linqu, Shandong Province
10:45-11:00	Tamara Kobakhidze I.M. Sechenov First Moscow State Medical University Pharmaceutical chemistry and pharmacognosy	HPTLC analysis of the quality control of Violae herba
11:00-11:15	BREAK	
11:15-11:30	Fahed Alzawahreh Peoples' Friendship University of Russia Medicine II., Tatyana Tsvetkova Peoples' Friendship University of Russia Medicine VI.	Left-right asymmetry of cervical vertebrae
11:30-11:45	Tatyana Kakhovskaya Peoples' Friendship University of Russia Medicine IV., Sami Omar Peoples' Friendship University of Russia Medicine	Morphometric analysis of changes in cytoarchitectonics of the temporo-parieto-occipital (TPO) subregion of the cortex in children from birth to 12 years
11:45-12:00	Uliana Chaban I.M. Sechenov First Moscow State Medical University Pharmacy V.	Morphological, anatomical and phytochemical study of the Sideritis taurica herba
12:00-12:15	Ilia Miltykh Penza State University Medicine V.	Observation of "Murray's law" appliance for arterial branching patterns in human kidney
12:15-12:30	Iosif Mikhel I.M. Sechenov First Moscow State Medical University Pharmacy V.	Prospects for the development of an innovative in situ matrix for intranasal vaccine delivery
12:30-12:45	Nikolay Shulga I.M. Sechenov First Moscow State Medical University Pharmacy I	Standardization of triphenylmethanol for certification as a reference standard of potassium losartan impurity
BASIC SCIENCES C 9:30-12:45		
9:30-9:45	Dina Nagimullina I.M. Sechenov First Moscow State Medical University General Medicine VI.	Analysis of blood stain patterns on clean and dusty surfaces
9:45-10:00	Xi Zhang Shandong University of Traditional Chinese Medicine Traditional Chinese Medicine Traditional Chinese Medicine VI., Chengcheng Fan Shandong University of Traditional Chinese Medicine, Traditional Chinese Medicine III.	Analysis of lncRNA-miRNA-mRNA transcription network in pancreatic tissue of in type 2 diabetes mellitus rats intervened by Jianpi Xiaoke Recipe
10:00-10:15	Aaron Wilhelm Sievering Asklepios Campus Hamburg, Semmelweis University Medicine VI.	Comparison of machine learning methods with logistic regression analysis in creating predictive models for risk of critical in-hospital events in COVID-19 patients on hospital admission
10:15-10:30	Keturah Musonda Peoples' Friendship University of Russia General Medicine V., Naimakhon Khoshimova Peoples' Friendship University of Russia Dentistry V.	Development of recommendations to combat stigmatization and discrimination against hiv-infected people
10:30-10:45	Wenli Yan Shandong University of Traditional Chinese Medicine Acupuncture II, Yuxia Ma	Identification of Potential MicroRNA–MRNA Regulatory Relationship Pairs in Irritable Bowel Syndrome with Diarrhea

10:45-11:00	Di Kai Shandong University Of Traditional Chinese Medicine Medicine II.	Progress in the clinical application of pentatone therapy combined with other appropriate techniques of traditional Chinese medicine in the treatment of insomnia
11:00-11:15	BREAK	
11:15-11:30	Tatyana Karpikova Voronezh State Medical University named after N.N. Burdenko Medicine IV.	The effect of speleotherapy on the parameters of visual evoked potentials during a passive orthostatic test
11:30-11:45	Ran An Shandong University of Traditional Chinese Medicine Nursing II., Yongtian Yin Shandong University of Traditional Chinese Medicine nursing VI.	The Relationship between Readiness for Interprofessional Learning and Academic Self-efficacy among Nursing Students
11:45-12:00	Lemir Rami El-Ayoubi Voronezh State Medical University named after N.N. Burdenko Medicine III.	The use of light microscopy in the assessment of morphological properties of human erythrocytes in the presence of doxycycline hydrochloride.
12:00-12:15	Fei Teng Shandong University of Traditional Chinese Medicine Medicine IV., Fei Gao Shandong University of Traditional Chinese Medicine Medicine IV.	Transcriptome Sequencing to Explore the Mechanism of Qiwei Baizhu San in Treating T2DM
12:15-12:30	Guillaume Walford Semmelweis University Medicine V., Gábor Karácsony Semmelweis University Medicine III.	Vitamin D deficiency impairs cerebrovascular adaptation to carotid artery occlusion in ovariectomized mice.
12:30-12:45	Tudor Hîrlea Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca Medicine VI.	Volunteering at the Public Health Department during the COVID-19 pandemic: motivational factors and barriers encountered by students
CLINICAL SCIENCES A 9:30-12:45		
9:30-9:45	Arina Lapina I.M. Sechenov First Moscow State Medical University Medicine VI.	Association of vomiting and nausea syndrome and thrombosis in patients undergoing chemotherapy
9:45-10:00	Svetlana Kochetkova I.M. Sechenov First Moscow State Medical University Medicine II., Alevtina Kiseleva I.M. Sechenov First Moscow State Medical University Medicine I.	Clinical significance of CDH1 and MLH1 gene methylation and MMP7 gene expression for surgical treatment of diffuse gastric cancer.
10:00-10:15	Marat Gripp I.M. Sechenov First Moscow State Medical University Medicine V., Yuri Isaakyan I.M. Sechenov First Moscow State Medical University Medicine V.	Comparative efficacy of metoprolol and lisinopril in postinfarct chronic heart failure
10:15-10:30	Kai Shiida Semmelweis University Medicine V., Zita Éles Semmelweis University Medicine V.	Deep-Learning Based Prediction of Peak Oxygen Uptake in Athletes Using 2D Echocardiographic videos
10:30-10:45	Emily M. Kneller Semmelweis University Medicine V., Christopher Z. Tóth Semmelweis University Medicine V.	Drug coated balloon is more effective in treating late drug eluting stent in-stent restenosis than early
10:45-11:00	Yuliya Glavatskikh Voronezh State Medical University named after N.N. Burdenko Pediatrics V., Valeria Drobysheva Voronezh State Medical University named after N.N. Burdenko Medicine V.	Effects of rehabilitation programme in patients with chf and copd
11:00-11:15	BREAK	
11:15-11:30	Zunqi Kan Shandong University of Traditional Chinese Medicine Medicine II.	Identification of circRNA–miRNA–mRNA Regulatory Network and Crucial Signaling Pathway Axis Involved in Tetralogy of Fallot
11:30-11:45	Yulia Stepanova I.M. Sechenov First Moscow State Medical University Medicine V.	Immunohistochemical assessment of caspase-3 and caspase-9 expression in various types of bladder cancer
11:45-12:00	Darja Sadeghi Asklepios Campus Hamburg, Semmelweis University Medicine VI.	Potential for cure and predictors of long-term survival after radiofrequency ablation for colorectal liver metastases: A 20-years single-center experience
12:00-12:15	Sylvia Spiesshofer Semmelweis University Medicine III.	Proteomic investigation of myocardial reverse and anti-remodelling in the rat model reveals sex-related differences following aortic banding and debanding

12:15-12:30	Valeria Drobysheva Voronezh State Medical University named after N.N. Burdenko Medicine V., Yuliya Glavatskikh Voronezh State Medical University named after N.N. Burdenko Medicine V.	The physical activity effect assessment of functional status, cytokine profile and heart failure course with different ejection fraction
12:30-12:45	Marina Antsupova I.M. Sechenov First Moscow State Medical University, Alevtina Kiseleva I.M. Sechenov First Moscow State Medical University	The role of targeted therapy in the treatment of diffuse-type gastric cancer
CLINICAL SCIENCES B 9:30-12:45		
9:30-9:45	Sofia Budnevskaya Voronezh State Medical University named after N.N. Burdenko Pediatrics V.; Yuliya Glavatskikh Voronezh State Medical University named after N.N. Burdenko Medicine II.	Assessment of the cognitive status and psycho-emotional sphere of women with a diffuse increase in the volume of the thyroid gland according to ultrasound diagnostics
9:45-10:00	Milena Ivanova I.M. Sechenov First Moscow State Medical University Medicine VI.; Alexandra Gorshunova Petrovsky National Research Centre of Surgery Clinical Medicine II.	Comparative evaluation of hybrid and total minimally invasive esophagectomy for benign diseases as a component of the FAST TRACK program.
10:00-10:15	Omer Almog Semmelweis University Medicine V.; Yael Hadani Semmelweis University Medicine V.	Contrast-enhanced endoscopic ultrasound during tissue acquisition may be of aid to inexperienced endoscopists: A systematic review and meta-analysis of randomized controlled trials
10:15-10:30	Yael Hadani Semmelweis University Medicine V.; Omer Almog Semmelweis University Medicine V.	Diagnostic adequacy of needles used in EUS-guided tissue acquisition of solid pancreatic masses – a systematic review and network meta-analysis
10:30-10:45	Ziheng Jin Shandong university of traditional Chinese Medicine School of Nursing II.	Frailty and its association with short-term adverse health events in elderly patients with hemodialysis:A longitudinal study.
10:45-11:00	Anna Nartova I.M. Sechenov First Moscow State Medical University Medicine VI.; Denis Ruchkin I.M. Sechenov First Moscow State Medical University Medicine VI.	Is diabetes mellitus just a co-morbidity or a risk factor for severe COVID-19?
11:00-11:15	BREAK	
11:15-11:30	Heshan de Silva I.M. Sechenov First Moscow State Medical University General Medicine III.	Long-term neurological, cognitive and psycho-emotional complications after surgical reconstructions of the Ascending Aorta and the Aortic Arch
11:30-11:45	Marina-Georgia Balosin Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca Medicine IV.	Link between chronic use of oral contraceptives and bowel ischemia: review
11:45-12:00	Xiaobin Zhang Shandong University of Traditional Chinese Medicine Medicine II.; Qingchang Xia Shandong University of Traditional Chinese Medicine Medicine III.	Medication rule of traditional Chinese medicine in treatment of kneeosteoarthritis by hot ironing based on data mining and its toxicity TCM application
12:00-12:15	Samuel Booth Semmelweis University Faculty of Medicine VI.	Periprocedural Ischemic Brain Lesions in Open vs. Endovascular Carotid Artery Reconstruction, a Propensity Matched Comparison
12:15-12:30	Anastasiya Sinitsyna Peoples' Friendship University of Russia Medicine I.	Posture disorder in young people
12:30-12:45	Clemens Galavics Asklepios Campus Hamburg, Semmelweis University Medicine VI.; Reese Asklepios Campus Hamburg, Semmelweis University Medicine VI.	Sarcopenia influences the kinetic growth rate after ALPPS
CLINICAL SCIENCES C 9:30-12:45		
9:30-9:45	Jing Zhang Shandong University of Traditional Chinese Medicine Psychology I.	Analysis of Influence Factors of Pregnancy Outcome in Patients with In Vitro Fertilization and Embryo Transfer
9:45-10:00	Mirela Tomic Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca General Medicine III.	Assessing personal and health system barriers to breast cancer early diagnosis practices for women over 20 from Cluj-Napoca, Romania

10:00-10:15	Mark Rekecki Semmelweis University medicine VI.	Comparison of DTI and CSD techniques in the preoperative identification of the arcuate fascicle
10:15-10:30	Christopher Z. Toth Semmelweis University Medicine V.; Emily M. Kneller Semmelweis University V.	Conventional versus facilitated hemostatic dressings after radial artery puncture : a systemic review and meta-analysis
10:30-10:45	Lada A. Utochkina Voronezh State Medical University named after N.N. Burdenko Pediatrics V.; Yuliya Glavatskikh Voronezh State Medical University named after N.N. Burdenko medicine II.	Evaluation of the effect of adherence to antihypertensive therapy on the defeat of target organs in patients with arterial hypertension
10:45-11:00	Shirin Hashem Zobaid I.M. Sechenov First Moscow State Medical University Medicine V.	Efficiency of rehabilitation in patients with recurrent atypical hyperplasia and endometrial cancer after radical surgical treatment
11:00-11:15	BREAK	
11:15-11:30	Arina Lazarchuk I.M. Sechenov First Moscow State Medical University Department of Pediatrics V.; Polina Salnikova I.M. Sechenov First Moscow State Medical University Department of Pediatrics V.	The history of reproductive losses associated with antiphospholipid antibodies
11:30-11:45	Hans Ehlich Asklepios Campus Hamburg, Semmelweis University Medicine VI.	Intra-articular Treatment of Digital Osteoarthritis by Radiosynoviorthesis-Clinical Outcome in Long-term Follow-up
11:45-12:00	Polina Salnikova I.M. Sechenov First Moscow State Medical University Department of Pediatrics V.; Arina Lazarchuk I.M. Sechenov First Moscow State Medical University Department of Pediatrics V.	The level of ADAMTS-13 in patients with different obstetric complications
12:00-12:15	XUEMENG SHI Shandong University of Traditional Chinese Medicine fAcupuncture and Tuina III.	Mechanism of Chaihu-guizhi Decoction on Perimenopausal syndrome based on Network Pharmacology
12:15-12:30	Csenge Emese Fogarasi Semmelweis University medicine VI.	Myocardial involvement among rheumatoid arthritis patients using cardiovascular magnetic resonance imaging
12:30-12:45	Zhicheng Jia The First Clinical College, Shandong University of Traditional Chinese Medicine Medicine I.; Ying Guo Shandong University of Traditional Chinese Medicine Medicine I.	Transcriptomic Profiling of human granulosa cells between women with advanced maternal age with different ovarian reserves
CLINICAL SCIENCES D 9:30-12:45		
9:30-9:45	Hanyue Zheng Shandong University of Traditional Chinese Medicine nursing I.	Application of TCM in nursing
9:45-10:00	Ayumi Funao Semmelweis University Medicine VI.	Comparison of embryo development and outcome of IVF treatments in normal weight and obese patients
10:00-10:15	Zifu Yu Shandong University of Traditional Chinese Medicine Rehabilitation Medicine & Physical Therapy II.	Effects of acupuncture synchronized rehabilitation therapy on lower limb motor function and activities of daily living in stroke patients
10:15-10:30	Zoran Trajkovski Peoples' Friendship University of Russia Medicine II.	Ejaculate parameters depending on the hemodynamic type of varicocele
10:30-10:45	Titanilla Takács Semmelweis University Medicine V.; Brigitta Babis Semmelweis University Medicina VI.	Exercise blood glucose response in athletes during a vita maxima treadmill test
10:45-11:00	Amaliia Gulieva I.M. Sechenov First Moscow State Medical University Medicine VI.; Olga Sukhareva I.M. Sechenov First Moscow State Medical University Medicine VI.	Hygienic assessment of eating behavior stereotypes among medical university students in the Russian Federation
11:00-11:15	BREAK	
11:15-11:30	Mahita Darbha Semmelweis University Medicine VI.	Investigation of dermatological parameters and hand hygiene correlations.
11:30-11:45	Valeria Stener I.M. Sechenov First Moscow State Medical University Medicine III.	Impact of COVID-19 vaccination on community adherence to a comprehensive package of measures to prevent infection and control the spread of the SARS-CoV-2 virus.

11:45-12:00	Alexander Grechko Peoples' Friendship University of Russia Medicine II.	Prevalence of age-related hypogonadism in patients with benign prostatic hyperplasia.
12:00-12:15	Kirill Kuzmin I.M. Sechenov First Moscow State Medical University Public Health VI.	The problem of taking biologically active additives by the population of the Russian Federation
12:15-12:30	Attila Kopenetz Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca Medicine VI.	Mycobacterium tuberculosis, patterns of sensitivity and resistance to antitubercular drugs, in extrapulmonary lesions
12:30-12:45	Olívia Bottlik Semmelweis University Medicine VI.; Hanna Oberling Semmelweis University Medicine III.	Sex-related proteomic differences of exercise-induced myocardial hypertrophy
CLINICAL SCIENCES E 9:30-12:45		
9:30-9:45	Emilia Avril Clapp Semmelweis University Medicine VI.	Anatomic and functional outcomes of pars plana vitrectomy performed on eyes with primary rhegmatogenous retinal detachment
9:45-10:00	Anders Vatland Semmelweis University Dentistry V.	Application of "sticky tooth" and extraction site development for preservation of advanced extraction defects. 3D radiographic evaluation
10:00-10:15	Mariia Sotnikova Voronezh State Medical University named after N.N. Burdenko Medicine V.	Breastfeeding from the ancient world to the present.
10:15-10:30	Jingwen Men Shandong University of Traditional Chinese Medicine Medicine, Pharmacy, Pharmacology I.; Yang Chen Shandong University of Traditional Chinese Medicine Medicine, Pharmacy, Pharmacology I.	Chronic Kidney Disease and Oxidative Stress
10:30-10:45	Polina Amelina Voronezh State Medical University named after N.N. Burdenko Medicine V.	Development of a universal method for assessing the loss of skills and quality of life of students from 20 to 22 years old with a directed choice of optical correction in a certain age group "Looking into the future"
10:45-11:00	Xiaoxia Yang Shandong University of Traditional Chinese Medicine nursing II.; Zifu Yu Shandong University of Traditional Chinese Medicine Rehabilitation Medicine & Physical Therapy II.	The experience of COPD patients and their relatives in advance care planning□Fa meta-synthesis of qualitative research
11:00-11:15	BREAK	
11:15-11:30	Anton Dorokhov Voronezh State Medical University named after N.N. Burdenko Medicine IV.; Stanislav Prosvetov Voronezh State Medical University named after N.N. Burdenko Medicine IV.	Fractal phototherapy in correction of color vision deficiency with myopia
11:30-11:45	Viktória Babay Semmelweis University Dentistry IV.; Adél Galvács Semmelweis University Dentistry IV.	Investigation of Cyranose device's applicability in intraoral halitosis
11:45-12:00	Milia Kostadinova Semmelweis University Dentistry V.; Caroline Kelly Semmelweis University Dentistry V.	Functional penetration depth of sodium hypochlorite and hyper-pure chlorine dioxide. An in vitro study.
12:00-12:15	Tumas Tumasyan I.M. Sechenov First Moscow State Medical University Medicine II.; Elena Bedzhanyan I.M. Sechenov First Moscow State Medical University Medicine II.	Microbiome of dental plaque
12:15-12:30	Veronika Medvedeva I.M. Sechenov First Moscow State Medical University Pharmacy V.; Daria Gerasimova I.M. Sechenov First Moscow State Medical University Pharmacy V.	Pharmacoeconomic evaluation of the effectiveness of rheumatoid arthritis therapy with rituximab analogues
12:30-12:45	Kata Erika Erdei Semmelweis University Medicine V.; Veronika Upor Semmelweis University Medicine V.	Variation of melatonin production in children receiving intensive care

Analysis of the composition of oral microbiota

Anna Birg I.M. Sechenov First Moscow State Medical University General Medicine II.,
Erfan Mohamadi I.M. Sechenov First Moscow State Medical University Dentistry II.

Introduction: oral microbiota is a dynamic structure that is formed by the interaction of many factors related to the environment and the state of the macroorganism.

Aim: to explore the qualitative and quantitative composition of oral microflora.

Method: microflora of 138 students who had the sanitized oral cavity was examined. The material for the research was taken from 4 biotops: the dental plaque, tongue surface, oral fluid and buccal mucosa. In order to isolate and identify microorganisms the bacteriological method was used. Microbial contamination was determined by counting colony forming units (CFU) per 1g of the dental plaque, 1ml of the oral fluid and 1 cm^2 of the tongue surface and buccal mucosa. 763 microbial cultures were isolated and identified.

Results: the microbiota analysis showed constant occurrence of streptococcus in all studied oral biotops (100%). The highest contamination of streptococcus was discovered in the dental plaque ($6,8\times10^4$ CFU/g) and oral fluid ($5,5\times10^4$ CFU/ml). *S. salivarius* and *S. mitis* were more often found on the surface of the tongue, buccal mucosa and in the oral fluid (up to 90%) whereas 85% of *S. sanquis* and *S. mutans* were detected in the dental plaque. The frequency of lactobacterium occurrence with the dominance of *L. acidophilus* and *L. brevis* reached 90,27%, especially in the oral fluid and dental plaque. *Staphylococcus* was found in 40% of the cases, mainly on the tongue surface ($7,3\times10^3$ CFU/cm^2) and in the dental plaque ($6,7\times10^3$ CFU/g). Less often staphylococci were isolated from the mucous membranes and from the oral fluid, which is probably due to the activity of lysozyme. *S. epidermidis* (67,7%), S.aureus (24,5%) and S. saprophyticus were identified. S.aureus predominated on the surface of the tongue. Colonization of fungi *Candida averaged* $1,6\times10^2$ CFU/substrate unit. It was mainly found on the tongue surface ($4,8\times10^2$ CFU/cm^2) and in the dental plaque ($4,1\times10^2$ CFU/g) with the dominance of *C. albicans* and *C. crusei.* Bacteroides (23,9%), Corynebacterium (15%), Neisseria (7,9%), Veilonella (5,3%), Leptotrichia (4,4%) and Fusobacterium (3,5%) were found in oral microbiota in smaller quantities.
Conclusions:a variety of microorganisms vegetate in the sanitized oral cavity, the greatest colonization characteristic on gram-positive flora, with its predominance in dental plaque and on the surface of the tongue.

Former publication: no

Supervisor: Kravtsova Elena Olegovna, associate professor, Department of Microbiology, Virology & Immunology, .Sechenov University (I.M.Sechenov First Moscow State Medical University)

Clinical and microbiological characteristics of invasive fungal infections caused by Fusarium and Geotrichum sp. as emerging human pathogens

Bo Young Lee Semmelweis University Medicine V.

Introduction: Evidence about infections caused by Fusarium sp., a hyphomycete mold, and Geotrichum sp., an arthroconidial yeast is scarce.

Aim: Our aim was to evaluate characteristics of hospitalized patients with documented invasive fusariosis or geotrichosis.

Method: A retrospective study evaluating fungal isolates recovered at our microbiology laboratory from invasive clinical samples from physiologically sterile sites (blood, cerebrospinal fluid, biopsy), was performed between 2020-2022. Isolation was done on CHROMID Candida chromagar and Sabouraud agar, identification was done by colony and light microscopic morphology and MALDI-TOF/MS. Fungal susceptibilities for amphotericin-B and azoles (excl. isavuconazole) were tested by broth microdilution, isavuconazole susceptibility was tested by E-test. Interpretations were done following EUCAST recommendations. Clinical data including risk factors for invasive fungal disease were collected following international guidelines.

Results: From 668 non-redundant samples, 7 (1.1%) fungal isolates were recovered: 4/7 (57.1%) *Fusarium proliferatum*, 1/7 (14.3%) *Fusarium solani,* 1/7 (14.3%) *Fusarium chlamydosporum,* 1/7 (14.3%) *Geotricum capitatum.* All Fusarium sp. were in vitro sensitive to amphotericin-B, but resistant to isavuconazole. In vitro susceptibility of *Geotricum capitatum* could not be interpreted due to lack of breakpoints. Invasive fusariosis was diagnosed by blood cultures and skin biopsy in 3-3 cases, respectively. The case of invasive geotrichosis was diagnosed by blood cultures. Median age of patients was 33.0±25.6 (9–88), 4/7 (57.1%) were female, 5/7 (71.4%) had an active haematological malignancy. All patients received parenteral nutrition through central venous catheters. Typical symptoms of invasive fusariosis were skin lesions (4/6, 66.6%) and fever (3/6, 50.0%), empirical treatment consisted of liposomal amphotericin-B (5/6, 83.3%) with isavuconazole (1/6, 16.6%) or posaconazole (2/6, 33.3%), or voriconazole monotherapy (1/6, 16.6%). The case of invasive geotrichosis appeared as septic shock, empirical therapy consisted of liposomal amphotericin-B monotherapy. Five of 7 patients died despite best efforts.

Conclusions: Severely immunocompromised patients are at risk for invasive fusariosis and geotrichosis, two emerging fungal infections with potentially fatal outcomes.

Former publication: no

Supervisor: Bálint Gergely Szabó, assistant lecturer, Departmental Group of infectious diseases, Department of Internal Medicine and Hematology

Electrocortical data for rapid allocation of attention to threat in the dot-probe task

Tatyana Epihina Voronezh State Medical University named after N.N. Burdenko Medicine IV.,
Svetlana Volkova Voronezh State Medical University named after N.N. Burdenko Medicine IV

Introduction: threatening stimuli have been shown to catch the attention using of tasks and measures. There are studies which show that anxiety is a precursor of many mental and somatic diseases, deviant and addictive behavior, which determines the need for its diagnosis at an early stage before the first symptoms of an acute psychosomatic disorder or deviations in behavior.

Aim: analysis of the relationship between individual characteristics of the frontal electrical activity of the brain with different levels of anxiety and different visual attention to threatening stimuli in young people (students).

Method: sensorimotor reaction time in dot-probe test (threatening stimuli); asymmetry of EEG alpha rhythm in frontal leads; endogenous cognitive event-related potentials (ERP).

Results: according to the data of sensorimotor reactions, the subjects were divided into groups: group 1 with attention "to" disturbing visual information (377.1 ± 62 ms for a congruent stimulus, 393.8 ± 61 for an incongruent stimulus, p=0.000000); group 2 with attention "from" disturbing visual information (411.8±91, 394.2±80, p=0.007); group 3 without attention shifts (377.1±43, 377.2±42, p=0.8). The values of the spectral power of the alpha rhythm in the frontal leads: group 1 (F4,F8 12.6±1.7 μV^2/Hz; F3,F7 17.5±2.0 μV^2/Hz; t=-7.6 p=0.000000); group 2 (F4,F8 11.8±1.5 μV^2/Hz; F3,F7 16.6±2.2 μV^2/Hz; t=-4.4 p=0.000095); group 3 (F4,F8 7.7±0.9 μV^2/Hz; F3,F7 10.5±1.0 μV^2/Hz; t=-5.2 p=0.000018). The main ERPs changes were observed in components N2 and LPC.

Conclusions:participants with high levels of personal anxiety had right hemispheric activity in the frontal areas of the brain. High bioelectrical activity in the right frontal areas of the brain affects the shift of a person's attention "to" / "away" threat visual information. The ERPs demonstrated an initial shift of attention to threat-related stimuli, reflected by the N2 ERP component and the late positive potential (LPP). It was shown that the frontal asymmetry of the EEG alpha rhythm and components of event-related potentials, along with clinical (neuroendocrine, immune, etc...) biomarkers and biomarkers obtained when using other methods of neuroimaging (PET and fMRI), are informative method for diagnosing stress and its consequences.

Former publication: no

Supervisor: Angela Astashchenko, associate professor, N.N. Burdenko Voronezh State Medical University

Genetic causes of pathospermia by specifying the polymorphism of the g-105a gene

Olga Krupina Peoples' Friendship University of Russia Medicine I.

Introduction: At the moment, infertility in men is a topical and fairly common problem. Almost 31 million men suffer from infertility, of whom 20-30% suffer from severe forms of pathospermia resulting from gene polymorphisms. Gene can occur in any area of the genome. Most polymorphisms are not change gene expression. However, negative environmental exposure, patient habits and inflammatory diseases may be the cause of abnormal expression, or the production of an abnormal form of protein that encodes this gene. To date, it is known that polymorphisms of the catalase gene, glutathione-transferases are triggers in the occurrence of male infertility.

Aim: Assess whether polymorphism G-105A of the selenoprotein gene (SEPS1) affects the presence of pathospermia among men suffering from infertility in the MO and Moscow.

Method: 139 men were selected for the study. Patients were divided into two groups, in the 1st (n=71) were men with pathological changes in the ejaculate, in the 2nd (n=68) - reproductive healthy. Both groups of patients were examined, and they had the following manipulations: analysis of sex hormones, ultrasound examination of scrotum organs, analysis of ejaculate. Peripheral blood has been studied for polymorphism of G-105A (rs28665122) of the SEPS1 gene through PCR and restriction fragment length polymorphism (PCR-RFLP) analysis of leukocyte DNA samples.Statistical processing of the material was carried out using the program "STATISTICA 8.0". At $p < 0.05$ the differences were significant.In the first group of men, all patients showed severe pathospermia.

Results: Among them: impaired sperm mobility (asthenozoospermia) was diagnosed in 26 (36.6%), teratozoospermia (impaired sperm morphology) in 24 (33.8%), azoospermia (absence of sperm in the ejaculate) in 21 (29.6%). All men from the 1st group were diagnosed with idiopathic infertility due to the fact that during the laboratory and instrumental examination, there were no pathologies in the reproductive system. During the analysis for the presence of polymorphism of the SEPS1 gene, data were obtained that in patients with diagnosed pathospermia allele -105A (GA+AA genotypes) is almost twice as large as in reproductive healthy patients of the 2nd group (53.15% and 31.44%, $p < 0.001$).

Conclusions: Selenoprotein is involved in various functions, providing oxidative-reducing homeostasis in humans.

Former publication: no

Supervisor: Kulchenko Nina, associate professor, Medical Institute

Identifification of the molecular subgroups in Alzheimer's disease by transcriptomic data

He Li Shandong University Of tTraditional Chinese Medicine

Introduction: Alzheimer's disease (AD) is a heterogeneous pathological disease with genetic background accompanied by aging. This inconsistency is present among molecular subtypes, which has led to diagnostic ambiguity and failure in drug development. We precisely distinguished patients of AD at the transcriptome level.

Aim: For a more precise diagnosis of AD.

Method: We collected 1240 AD brain tissue samples collected from the GEO dataset. Consensus clustering was used to identify molecular subtypes, and the clinical characteristics were focused on. To reveal transcriptome differences among subgroups, we certificated specific upregulated genes and annotated the biological function. According to RANK METRIC SCORE in GSEA, TOP10 was defined as the hub gene. In addition, the systematic correlation between the hub gene and "A/T/N" was analyzed. Finally, we used external data sets to verify the diagnostic value of hub genes.

Results: We identified three molecular subtypes of AD from 743 AD samples, among which subtypes I and III had high-risk factors, and subtype II had protective factors. All three subgroups had higher neuritis plaque density, and subgroups I and III had higher clinical dementia scores and neurofibrillary tangles than subgroup II. Our results confirmed a positive association between neurofibrillary tangles and dementia, but not neuritis plaques. Subgroup I genes clustered in viral infection, hypoxia injury, and angiogenesis. Subgroup II showed heterogeneity in synaptic pathology, and we found several essential beneficial synaptic proteins. Due to presenilin one amplification, Subgroup III was a risk subgroup suspected of familial AD, involving abnormal neurogenic signals, glial cell differentiation, and proliferation. Among the three subgroups, the highest combined diagnostic value of the hub genes were 0.95, 0.92 and 0.83, respectively, indicating that the hub genes had sound typing and diagnostic ability.

Conclusions: The transcriptome classification of AD cases played out the pathological heterogeneity of different subgroups. It throws daylight on the personalized diagnosis and treatment of AD.

Former publication:

Li H, Wei M, Ye T, Liu Y, Qi D, Cheng X. Identification of the molecular subgroups in Alzheimer's disease by transcriptomic data. Front Neurol. 2022 Sep 20;13:901179. doi: 10.3389/fneur.2022.901179. PMID: 36204002; PMCID: PMC9530954.

Supervisor: Xiaorui Cheng, professor, Shandong University of Traditional Chinese Medicine, Tianyuan Ye, professor, Shandong University of Traditional Chinese Medicine

Masks of vertebrobasilar insufficiency

Mikhail Vinokurov Federal State Budgetary Educational Institution of the Higher Education "A.I. Yevdokimov Moscow State University of Medicine and Dentistry" of the Ministry of Healthcare of the Russian Federation Medicine V.

Introduction: vertebrobasilar insufficiency (VBI) is a chronic polyetiological condition characterized by poor blood flow to the posterior parts of the brain, which is supplied with blood by two vertebral arteries, which unite to become the basilar artery. Since VBI is widespread in the population (according to various sources, it accounts for from 25 to 40% of all neurological diseases), patients with this diagnosis as a referral quite often enter the emergency departments of city hospitals through the emergency medical channel.

Aim: to analyze the data on incoming patients, to compare the directional and final diagnoses, to make a list of differential diagnoses in order to facilitate the primary diagnosis for the doctors of the emergency department.

Method: The study was conducted on the basis of the Bauman State Medical University No. 29 in Moscow. The data of 612 patients admitted to the neurologist of the emergency department in the period from June to November 2022 were analyzed. The statistical method and the method of analysis were chosen as the main research methods.

Results: in the course of the study, the medical histories of 612 patients were analyzed, of which 161 people were admitted with a directional diagnosis of "IBD". It was found out that the percentage of patients admitted to the hospital by gender is equal to 59 men (37%) and 102 (63%) women. The average age was 51 years for men and 63 years for women. It also became known that out of 161 patients, only 78 were discharged with the final diagnosis of "VBN", "ONMC in VBB" and "OCVN in VBB'. Of these, 47 women (60%) and 31 men (40%), the average age was 64 years for men and 64 years for women. The remaining 83 patients left the walls of the medical institution with other diagnoses, namely: chronic cerebral ischemia of 64 patients (77.1%), stroke in the middle cerebral artery basin of 8 patients (9.6%), transient ischemic attack of 6 patients (7.2%), volumetric brain formation of 3 patients (3.6%), hepetic meningoencephalitis 1 patient (1.25%) and demyelinating disease 1 patient (1.25%).

Conclusions: despite the fact that the diagnosis of „VBI" in the practice of a neurologist is quite common (>25% of cases), the differential diagnosis is quite complex and requires special attention even in the conditions of the reception department of a large multidisciplinary hospital.

Former publication: no

Supervisor: Kharkovski Vadim Aleksandrovich, scientific advisor, Federal State Budgetary Educational Institution of Higher Education «Yevdokimov A. I. Moscow State University of Medicine and Dentistry» of the Ministry of Healthcare of the Russian Federation.

Microdeletions of the sex chromosome in men are a factor in azoospermia

Polina Andronova, Peoples' Friendship University of Russia, Medicine II.

Introduction: Male infertility is a multifactorial and complex disease of the reproductive system. In the general male population, infertility occurs from 12-17%. The characteristics of the disease that attract the interest of modern researchers are genetic mutations. The most common genetic cause of male infertility is related to Y chromosome problems and concerns deletions of the gene that controls azoospermia factor (AZF). The human Y chromosome contains genes responsible for the development of the testicles as well as for initiating and maintaining spermatogenesis. The long arm of the Y chromosome (Yq) contains many amplicon and palindromic sequences, making it predisposed to self-recombination during spermatogenesis and therefore susceptible to intrachromosomal deletions. Such deletions lead to male infertility.

Aim: To determine the frequency of microdeletions in the loci of the AZF gene in azoospermia.

Method: 160 men who complained of the absence of pregnancy in their spouse for 1 year were examined. Inclusion criteria: infertile male patients (n = 160), in whom sperm analysis showed azoospermia. Exclusion criteria: inflammatory diseases of the reproductive system, the presence of female factor infertility, anomalies in the development of male genital organs. All patients underwent genetic studies: karyotyping, PCR diagnostics in order to determine the presence of microdeletions in the Y-chromosome. Statistical processing of the material and results of genetic studies was carried out using the programs "EXCEL" and "STATISTICA 8.0".

Results: Of all the patients examined (160 men), 48 (32%) had a total absence of sperm in the ejaculate - azoospermia. These patients were karyotypized. Normal karyotype without the presence of any deletions - 46XY was in 139 (86%) men from the cohort. The remaining patients (n = 21) were diagnosed with the manifestation of microdeletion on the Y chromosome. As a result of microdeletion in the AZF region, Y chromosomes were registered in 13 (8.1%) patients. In 61.5% (n = 8), microdeletions occur in the AZFc region, 30.9% (n = 4) - in the AZFb region, and 7.6% (n = 1) - in AZFa.

Conclusions: Microdeletions in the AZF region of the Y chromosome were in 8.1% of patients with azoospermia. The most common in male infertility are microdeletions in the loci of the AZFc Y chromosome gene.

Former publication: no

Supervisor: Kulchenko N.G., senior lecturer, Department of Human Anatomy

Psychological and sociological characteristics of students suffering from nightmares

Roman Kostin I.M. Sechenov First Moscow State Medical University Medicine V.,
Ivan Rozhnov I.M. Sechenov First Moscow State Medical University Medicine VI.

Introduction: According to various authors, the incidence of nightmares among medical students ranges from 13.7 to 56.2%. Both insomnia and nightmares significantly increase the risk of developing somatic, mental and cognitive disorders and also reduce self-esteem and self-efficacy.

Aim: To assess the impact of nightmarish dreams on various aspects of medical students' lives.

Method: A sociological survey was conducted among students of 1-6 years of five medical universities using an online form with the Pittsburgh sleep quality index, the Hamburg questionnaire of nightmares, insomnia scale, hospital anxiety and depression scale, Beck depression inventory. Answers were received from 233 respondents. Taking into account the inclusion and exclusion criteria, the total number of people in the sample was 174 people. 65 respondents who claimed they had nightmares at least from time to time filled out the Hamburg questionnaire in full.

The responses were thoroughly analyzed using Microsoft Office 2020 Excel. Statistical data processing was carried out by methods of descriptive statistics: calculation of rank correlation by Spearman's method, determination of the reliability of the difference between groups according to the Pearson agreement criterion. The level of reliability of the differences, which was considered sufficient, was $p<0.05$.

Results: As a result of the correlation analysis, a direct strong correlation $R=0.84$ ($p<0.05$) was found between the frequency of nightmares and the scores of the Pittsburgh Sleep Index. Also a strong direct correlation was found between the occurrence of nightmares and the severity of insomnia: $R=0.83$ ($p<0.05$) and between the frequency of anxious thoughts and the frequency of nightmares ($R=0.99$, $p<0.05$). Students who often and very often complained of nightmares had the highest average scores in the sample 10 and 9 respectively, according to the Pittsburgh Sleep Index.

Conclusions: The results of the study showed a high prevalence of both insomnia and nightmares among medical university students. The high frequency of nightmares was associated with high levels of anxiety and depression. The frequency of nightmares correlated with the deterioration of sleep quality, frequency and degree of its disorders. Nightmarish dreams had a negative impact on the quality of cognitive activity.

Former publication: no

Supervisor: Elena Aleksandrovna Korabelnikova, professor, Sechenov University, Irina Ivanovna Yakushina, associate professor, Sechenov University

The epigenetic role of ascorbate in the pathomechanism of arterial tortuosity syndrome

Kyusung Choi Semmelweis University Medicine VI.

Arterial tortuosity syndrome (ATS) is a rare autosomal recessive connective tissue disorder, mainly characterized by tortuosity and aneurysm formation of the major arteries. ATS caused by loss-of-function mutations in the facilitative glucose transporter GLUT10, which is responsible for dehydroascorbic acid transport from the cytosol to the endomembranes. Ascorbate (Vitamin C) is a well-known antioxidant, however its role in epigenetic regulation has only been recently described. It can cross the cell membranes by various transporters in its reduced and oxidized form as well. Once ascorbate is accumulated in the nucleus, it can work as a cofactor for DNA and histone demethylases.

We hypothesized that altered nuclear ascorbate concentration might be present in cellular and animal models of ATS, which can modify the epigenetic pattern. Therefore, our aim was to characterize the subcellular distribution of ascorbate in our model systems and to investigate the global and site-specific changes in 5-methylcytosine and 5-hydroxymethylcytosine levels.

By using fibroblasts isolated from ATS patients, we found lower nuclear accumulation of ascorbate upon the addition of ascorbate or dehydroascorbic acid compared to fibroblasts from healthy individuals. Analyzing DNA samples of cultured fibroblasts, a lower global 5-hydroxymethylcytosine level was found in ATS fibroblasts, which could not be significantly modified by ascorbate addition. A GLUT10 knockout(KO) mice model was also analysed to model ATS on animals, but these mice didn't resemble the symptoms of ATS. GLUT10 KO mice didn't show any phenotypic changes, no altered redox homeostasis and normal intracellular distribution of ascorbate were detected. Generation of double KO mice – that besides GLUT10, lacks L-gulonolactone oxidase, an enzyme catalyzing the final step in ascorbate biosynthesis – have also been developed. The double KO mice can represent some of the features of ATS, especially at the molecular level.

In summary, our results of altered DNA hydroxymethylation pattern in ATS patient fibroblasts accompanied with decreased nuclear accumulation of ascorbate suggests the epigenetic role of ascorbate in the pathomechanism of ATS. These findings might initiate the novel idea to consider ATS as an ascorbate compartmentalization disorder.

Former publication: no

Supervisor: Éva Margittai, associate professor, Institute of Translational Medicine

The Mechanism of Action of Network Pharmacology Integrated with Molecular Docking to Explore Wumei Pills in Treating Gastric Cancer

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Fei Teng Shandong University of Traditional Chinese Medicine IV.

Objective: This study aimed to explore the mechanism of action of Wumei Pills (WMP) in treating gastric cancer (GC) based on network pharmacology and molecular docking.

Methods: Gastric cancer was searched for union from four disease databases, the traditional Chinese medicine ingredients were imported into Swiss target predition and Materscape database to predict the targets, the predicted targets was intersected with the disease targets, and the PPI protein interaction network was constructed into the String database, and it was imported into Cytoscape to obtain the core targets. In Cytoscape, the "traditional Chinese medicine-ingredient-target" network was constructed to obtain the core components, and the core components were molecularly docked with the core targets to perform survival analysis on the core targets.

Result: We intersected the drug prediction targets with the disease targets to obtain 99 common targets.And we used Cytoscape to construct the "traditional Chinese medicine-componence-disease target" network diagram, and obtained the key components: beta-sitosterol, obacunone, palmidin A, and stigmasterol[(1S)-3-[(E)-but-2-enyl]-2-methyl-4-oxo-1-cyclopent-2-enyl](1R,3R)-3-[(E)-3-methoxy-2-methyl-3-ox oprop-1-eny L] - 2,2 - dimethylcyclopropane - 1 - carboxylate; We import 99 common targets into String database to obtain PPI protein interaction network diagram, and import it into Cytoscape to obtain the core target: ALB,EGFR, SRC, ESR1, HSP90AA1, and MAPK1; Finally, molecular docking between core components and core targets was carried out, and the docking results were good. Both components could be bonded together in the form of hydrogen bond. Finally,we made the survival analysis.

Conclusion: Stigmasteriol, beta sitosterol, Obacunone and other compounds in the ingredients of WMP play an important role in GC treatment by regulating
Epithallian cell signaling in Helicobacter pylori infection, FoxO signaling pathway and other pathways, laying a direction and foundation for future drug control cancer research and medical diagnosis.

Former publication:
Zhongwen Lu,Shuang Zhang, Fei Teng, Xuanhe Tian, Xijian Liu,Xiaochun Han. 2022IEEE(BIBM)
[This paper has been accepted by 2022IEEE(BIBM) and will be published in February 2023.]

Supervisor: Xiaochun Han, associate professor, Shandong University of Traditional Chinese Medicine, Xijian Liu, associate professor, Shandong University of Traditional Chinese Medicine

The problem of VDPV excretion by people with primary immunodeficiencies

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Vera Smirnova I.M. Sechenov First Moscow State Medical University Medicine VI.

Introduction: Launched in 1988, the Global Polio Eradication Initiative (GPEI) aimed to eliminate the wild polio virus. Despite initiative's great achievements, by 2022, wild type 1 polio virus is still circulating in endemic countries, in addition, there is a problem of the spreading of vaccine-derived polioviruses (VDPV).

Aim: To identify and describe the role of people with primary immunodeficiencies in the excretion of vaccine-derived polioviruses.

Method: Data from the sites of the Global Polio Eradication Initiative, the World Health Organization, USIDNET, LASID, ESID were analyzed, scientific articles of PubMed and Scopus were analyzed. Statistical processing was made in Microsoft Excel.

Results: The usage of oral polio vaccine has led to widespread circulation of vaccine-drived polioviruses. According to the GPEI, such viruses have been found in environmental objects. In total, in 2022, 263 cases: 64 of them is VDPV1, 165 is VDPV2, 34 is VDPV3. Also, in 2022, cases of excretion of these viruses from humans continue to be recorded, in total 528 cases: 77 of them is VDPV1, 450 is VDPV2, and 1 is VDPV2. Cases are registered in countries that are relevant for our region: Israel, Great Britain.

An important source of VDPV are people with primary immunodeficiencies (PID). Many forms of PID do not show up and are not diagnosed in the first years of life due to the lack of mass screening, and, as a result, children receive oral polio vaccine. Live vaccine strains of poliovirus are remodeled by inadequate reactogenicity of the immune system, due to which they are able to infect other people. To date, there are 44,181 cases of PID worldwide, excluding non-reporting countries. Adequate statistics of VDPV cases from patients with PID (iVDPV) are not being collected. Only case reports or case series can be found in the public domain, which makes it difficult to estimate prevalence.

Conclusions: The continuing circulation of the wild virus, as well as the widespread circulation of VDPV, confirms the need to strengthen surveillance measures, increase immunization coverage. Since at this stage of the GPEI it is impossible to abandon OPV, it is necessary to strengthen surveillance, especially for iVDPV and for patients with PID and to launch newborn screening programs when usage of OPV due to the high risk of virus mutation.

Former publication: no

Supervisor: Olga Chernyavskaya, associate professor, I.M. Sechenov First Moscow State Medical University (Sechenov University)

The relationship between dormitory interpersonal relationship and sleep quality of college students under COVID-19:Moderated mediation models

Jiao Song Shandong University of Traditional Chinese Medicine Applied psychology VI.

Introduction: Due to the high infectivity of COVID-19, timely school closure and control can limit the spread of the virus, which has greatly changed the lifestyle of college students. Based on the bio-psycho-social model, this study investigated the influence and mechanism of dormitory interpersonal relationship on sleep quality of college students, which has both theoretical and practical significance for improving sleep quality of college students.

Aim: To investigate the influence of dormitory interpersonal relationship on sleep quality of college students under the COVID-19 pandemic, and to further explore the mediating role of emotional intelligence and the moderating role of social support, so as to provide guidance for the physical and mental health intervention of college students under the COVID-19 pandemic.

Method: In May 2022, 500 college students in a Shandong university were tested by dormitory interpersonal relationship scale, Pittsburgh Sleep Quality Index scale, emotional intelligence Scale and perceptive Social support scale.

Results: Correlation analysis showed that college students' dormitory interpersonal relationship, emotional intelligence, social support and sleep quality are significant between the two ($r = | | 0.218 \sim 0.625$, $p < 0.01$). Emotional intelligence played a partial mediating role between dormitory interpersonal relationship and sleep quality (95%CI: 0.002,0.064), with an effect value of 0.028. Social support moderated the first half path of the mediation model (β=0.016, t=11.276, $P < 0.01$), and strengthened the predictive effect of dormitory interpersonal relationship on emotional intelligence.

Conclusions: Dormitory interpersonal relationship can not only directly predict sleep quality, but also indirectly affect sleep quality through the mediating effect of emotional intelligence. Social support plays a moderating role in the influence of dormitory interpersonal relationship on emotional intelligence. College student management departments should not only pay attention to the individual factors, ecological environmental factors, but also pay attention to the combined effect of these factors to promote the physical and mental health of college students.

Former publication:

Li L, Huang H, Song J, Yu Y, Jia Y, Wang Y, Dang X, Huang L, Liu X. Network Meta-Analysis of the Effects of Different Types of Traditional Chinese Exercises on Pulmonary Function, Endurance Capacity and Quality of Life in Patients With COPD. Front Med (Lausanne). 2022 Feb 2;9:806025.
Li L, Yang M, Song J, Yu Y, Huang H. Network Meta-Analysis of the Antihypertensive Effect of Traditional Chinese Exercises on Patients with Essential Hypertension. J Healthc Eng. 2022 Aug 17;2022:9419037.

Supervisor: Zhang Ying-Jie, professor, Institute of Health Industry

Astragaloside IV Treatment of Chronic Kidney Disease

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Jingwen Men Shandong University of Traditional Chinese Medicine Medicine, Pharmacy, Pharmacolog I.

Introduction: As an essential public health problem, chronic kidney disease (CKD) damages up to 13% of adults in America and worldwide. In recent years, some evidence indicated that Astragaloside IV (AS-IV) has significant renal protective effects and can attenuate renal fibrosis. In addition, AS-IV has been reported to attenuate cisplatin-induced acute kidney injury and drug-associated chronic nephropathy.

Aim: To study the therapeutic effect of AS-IV against 1-deoxySL-induced cytotoxicity in vitro and in rats with CKD.

Method: HK-2 cells were exposed to 1-deoxysphinganine (1-deoxySA) or 1-deyxySA+AS-IV. 1-deoxySA-induced mitochondrial dysfunction and oxidative stress were evaluated by immunostaining, real-time PCR, oxidative stress sensor, and transmission electron microscopy. The effects of AS-IV on kidney damage were evaluated in a rat 5/6 nephrectomy (5/6 Nx) model of CKD.

Results: In vitro study showed that 1-deoxySA induced mitochondrial damage, oxidative stress, and apoptosis. AS-IV reduced the level of mitochondrial reactive oxygen species, lowered apoptosis, and improved mitochondrial function. Treatment with AS-IV significantly induced the phosphorylation of p62 and the nuclear translocation of Nrf2 as well as its downstream anti-oxidant genes. p62 knock-down fully abolished Nrf2 nuclear translocation in cells with AS-IV treatment. Moreover, p62 knock-down did not abolish TBHQ-induced Nrf2 nuclear translocation, indicating that AS-IV ameliorates 1-deoxySA-induced oxidative stress through modulation of p62 phosphorylation and Nrf2 nuclear translocation.

Conclusions: Our study identifies AS-IV activates Nrf2 antioxidant pathway in a p62 dependent manner. The anti-oxidative stress effect and the further mitochondrial protective effect of AS-IV represent a promising therapeutic strategy for the progression of CKD.

Former publication: no

Supervisor: Zhibo Gai, associate professor, Chinese Medicine Innovation Institute

Development of an intratumoral thermosensitive in situ implant with berberine bisulfate

Egor Moiseev I.M. Sechenov First Moscow State Medical University Pharmacy V.

Introduction: The treatment of cancer has been one of the most studied issues. This research includes the discovery of new molecules and the creation of the most optimal dosage forms. For example, berberine bisulfate, a natural alkaloid of the isoquinoline series, is very promising for the treatment of various oncological diseases because of its extensive number of mechanisms of effect on tumor cells. However, due to the poor solubility and low bioavailability of berberine bisulfate, one of the most optimal solutions for its use is intratumoral in situ implantation.

The aim of the study was defined as the development of the composition and technology of an intratumoral thermosensitive implant of berberine bisulfate.

Aim: The development of the composition and technology of an intratumoral thermosensitive implant of berberine bisulfate.

Method: A 105.5 % substance of berberine bisulfate (VIFITEKH, Russia) was used for the studies. Block copolymers of ethylene oxide and propylene oxide - Kolliphor® P188, Kolliphor® P124 (BASF, Germany), polyvinylpyrrolidone, polysorbate-80, as well as polyethylene glycols of different molecular weight and polyvinylcaprolactam-polyvinylacetate-polyethylene glycol copolymer - Soluplus® (BASF, Germany) were considered as solubilizers.

Solubilization of berberine bisulfate was performed by adding surfactants and their combinations, solid dispersions, fusion and liquid-liquid extraction methods.

Results: The studies determined the most effective way of solubilization of berberine bisulfate - obtaining a solution with the addition of Kollisolv® P124 2% and Kolliphor® P407 15% increased the solubility of the active ingredient to 0.013 g/ml.

The obtained solution demonstrated aggregation stability when stored for 3 months at +5/+8 °C.

Based on a stable berberine bisulfate solution, an experimental composition of a thermosensitive in situ implant was developed with the phase transition temperature measured 1 week after manufacture - 37-38 °C.

Conclusions: In the course of the experiments the optimal solubilization technique of berberine bisulfate was substantiated and the stable concentration of 0.013 g/ml was determined. Thermosensitive implant developed on the basis of the solubilized substance of the active substance demonstrated the phase transition at the temperature of - 37-38 °C . The studies will be continued.

Former publication: no

Supervisor: Bakhrushina Elena Olegovna, associate professor, Department of Pharmaceutical Technology, A.P.Nelyubin Institute of Pharmacy

Inhalation Administration of Agarwood Incense Rescues Scopolamine-Induced Learning and Memory Impairment in Mice

Muxuan Han, Shandong University of Traditional Chinese medicine Psychology III.

Introduction: Agarwood, a type of herbal medicine widely used in Asian countries, is noted in traditional medicine for its intelligence-enhancing effects. Agarwood incense is traditionally administered by oral and nasal inhalation. To verify whether agarwood incense can exert its intelligence-enhancing effects in this way to rescue learning and memory impairment, typical clinical manifestations of dementia, we conducted a set of behavioral tests related to learning and memory.

Aim: To test whether traditional herbal medicine agarwood has the ability to improve learning and memory, providing a new, safe and effective complementary alternative therapy for the clinical treatment of dementia.

Method: C57BL/6 mice were divided into six groups. In addition to the control and model groups, we added a donepezil treatment group to evaluate the effect of three different agarwood administration doses. After a week of administration, scopolamine was injected 30 min before each behavioral test to create a learning and memory impairment model. A series of behavioral tests [the Morris water maze test (MWM), the novel object recognition test (NOR), and the step-down test (SDT)] were used to assess their learning ability, as well as their spatial and recognition memory.

Results: After scopolamine injection, the model group showed significant learning and memory impairment (i.e., longer latencies, lower crossing times, and lesser distance travelled in the target quadrant in MWM; a lower recognition index in NOR; and longer latencies and higher error times in SDT). The other four treatment groups all showed improvements in these indicators, and the overall therapeutic effect of agarwood was superior.

Conclusions: The inhalation administration of agarwood can significantly improve the learning and memory impairment caused by scopolamine in mice, and the therapeutic effect varied between doses.

Former publication:
Han Muxuan et al., Frontiers in Pharmacology, 2021(12).

Supervisor: Wei Sheng, professor, Experimental Center, Shandong University of Traditional Chinese Medicine

Interpretations of human palatal rugae analogized by ethnicity and sex

Aida Roudgari Semmelweis University Dentistry IV.

Introduction: The palatal morphology is distinctive in every individual. Intraoral optical scanners (IOS) can capture palate with high accuracy and create a digital database that can be used for antemortem data. Antemortem and postmortem data comparison is an invaluable tool in human identification. Our investigation strives to compare the palatal digital scan and the geometry of distinct ethnicities that do not convey a line of ancestry.

Method: Twenty-three (16 females and 7 males) subjects from Asia and Europe were recruited. Their palate was scanned three times by an IOS. The GOM software was utilized to trim (retaining only the anterior area), superimpose the scans, and measure the geometry (width, length, height). The ratio of the integrated absolute distance and the area of valid distance led to estimating the mean absolute distance (MAD) between 2 superimposed scans. The precision MAD was calculated from the differences between repeats of the same individuals. The between-subject MAD was calculated from the discrepancy between participants' scans. The longitude and latitude data estimated the distance between countries of origin. The relationship between ethnicity and MAD was computed by multiple linear regression analysis considering the sex difference. Ultimately, the discriminative potential of the geometry parameters was assessed by sensitivity and specificity using the classification function developed previously on the Hungarian population.

Results: The median precision of the scan was 25 [10-40] μm. The precision ranged between 11-93 μm, whereas the between-subject MAD ranged from 214 to 1068 μm. A weak negative correlation was found between distance and MAD ($r=-0.13$, $p<0.035$) without the effect of sex ($p=0.231$). 1711 combination of scan pairs were made. The square difference was calculated for each pair and replaced the parameters of the original classification function. The sensitivity of matching an individual was 91%, and the specificity was 97%.

Conclusions: The superimposition of palatal IOS scans can distinguish individuals with high accuracy. Furthermore, the classification function results in high and similar accuracy in mixed ethnical populations as it was measured previously in single ethnicity. Therefore, the discriminative potential of palatal scans can be extended to a broader international population.

Former publication: no

Supervisor: Dr. Arvin Shahbazi, senior lecturer, Department of Anatomy, histology and embryology

Feasibility Study and Application Prospect Analysis of a High Efficiency Purification Method for dried persimmon frost(DPF) of Traditional Chinese Medicine — A Case study of Hermit Village of Linqu, Shandong Province

Shuting Shao Shandong University of Traditional Chinese Medicine Feasibility Study and Application Prospect Analysis of a High Efficiency Purification Method for dried persimmon frost(DPF) of Traditional Chinese Medicine — A Case study of Hermit Village of Linqu, Shandong Province III., Xiaojia Sun Shandong University of Traditional Chinese Medicine Feasibility Study and Application Prospect Analysis of a High Efficiency Purification Method for dried persimmon frost(DPF) of Traditional Chinese Medicine — A Case study of Hermit Village of Linqu, Shandong Province II.

Introduction: Dried persimmon frost (DPF), a traditional Chinese medicine name, is the condensation of sugar oozing with the evaporation of pulp water when drying persimmon. DPF has a significant effect on lung heat and phlegm cough, sore throat and dry throat, sore mouth and tongue sores, blood vomiting, hemoptysis, hemorrhoids bleeding and other diseases. Especially suitable for the elderly. Long food can also eliminate facial spots. Linqu hermit Village, Shandong province, known as the "hometown of persimmon" since ancient times, has excellent quality, large sales, and has excellent geography, history, culture and other conditions for the DPF industry development, but limited to the TCM knowledge structure and technical support restrictions, its DPF has not been effectively developed and further developed, did not give full play to the value of DPF. By using the new persimmon drying process, improve the persimmon frost yield and DPF purity, and study whether the process operator is feasible, in order to improve the exploitation and promotion of TCM DPF.

Aim: By adopting the new persimmon drying process, improve the persimmon frost yield and DPF purity, study whether the process operator is feasible, so as to improve the exploitation and promotion of TCM DPF, analyze its application prospects to provide high-quality forgiveness for disease treatment and promote the development of DPF industry, and improve farmers' income.

Method: comparison

Results: The new persimmon drying process is adopted to improve the persimmon frost yield and DPF purity, and study whether the process operator is feasible, so as to improve the exploitation and promotion of TCM DPF, analyze its application prospect to provide high-quality forgiveness for disease treatment and promote the development of DPF industry and improve farmers' income.

Conclusions: The new persimmon drying process improved the persimmon frost yield and DPF purity.

Former publication: no

Supervisor: Xieqi assistant lecturer Shandong University of Traditional Chinese Medicine

HPTLC analysis of the quality control of Violae herba

Tamara Kobakhidze I.M. Sechenov First Moscow State Medical University Pharmaceutical Chemistry and Pharmacognosy

Introduction: Medicinal plants have been used for thousands of years, but there are still many issues related to quality control, standardization and effectiveness of herbal medicines. Violae herba has long been used in the treatment of infectious and inflammatory diseases of the respiratory system.

Aim: Quantitative analysis of rutin using high-performance thin-layer chromatography (HPTLC), as well as comparison of the results of quantitative determination of rutin using the spectrophotometric method.

Method: Extraction: Crushed samples of medicinal plant raw materials (1 g) were extracted with of 70% ethanol and of 96% ethanol. The extracts were then filtered using filter paper. Extraction was carried out with a reverse refrigerator in a water bath at a temperature of 99.9 ° C.

Quantitative analysis by the HPTLC method: Samples with a volume of 3 µl were applied to the plates of the HPTLC Silica gel 60 F254 (5×10 cm) using a Nanomat 4 applicator (Camag). The plates were developed using vertical double-chute developing chambers with ethyl acetate: formic acid anhydrous: water (32.5:7.5:10, v/v/v) as the mobile phase. The solvent front developed until it passed a distance of 80 mm (25 minutes). After drying the plates at a temperature of 105 °C, the bands were examined using a TLC visualizer (Camag) at UV wavelengths of 365 nm. The BioVision analysis program was used to quantify the concentration (in pixels) of the bands.

Quantitative analysis by spectrophotometric method: optical density was measured on an Agilent Cary 60 at a wavelength of 410 nm.

Results: The experimental goal of this work was to develop a simple and reliable procedure for the quantitative determination of routine in extracts of Violae herba. The first step in the development of the chromatographic method was the selection of a suitable mobile phase. Sharp separation is achieved using a mixture of solvents ethyl acetate: formic acid anhydrous: water in a ratio of 32.5:7.5:10 (v/v/v). A light-yellow zone at Rf = 0.36 is detected on the HPTLC plates, corresponding to rutin.

Conclusions: The percentage of rutin using the HPTLC method in the ethanol (96%) extract is 3.168%, in the ethanol (70%) extract is 1.653%. The percentage of rutin, respectively, using the spectrophotometric method is 3,201% and 1,823%. The developed methodology was validated by the linearity indicator.

Former publication: no

Supervisor: Galina Ramenskaya, professor, Sechenov University, Institute of Pharmacy named after A.P. Neluybin, Department of Pharmaceutical and Toxicological Chemistry named after A.P. Arzamastseva

Left-right asymmetry of cervical vertebrae

Fahed Alzawahreh Peoples' Friendship University of Russia Medicine II.,
Tatyana Tsvetkova Peoples' Friendship University of Russia Medicine VI.

Introduction: Left-right asymmetry of the cervical vertebrae leads to static and dynamic instability of the spine.

Aim: The aim is to reveal the left-right asymmetry of the cervical vertebrae.

Method: The height, surface areas of body surfaces and articular facets of cervical vertebrae of one vertebral column were measured.

Results: The transverse size of both the superior and inferior surfaces of the cervical vertebral bodies in most cases was greater than their longitudinal size.

Two vertebrae showed the height of the right side body surface was greater than the left one, the difference varied from 3 to 7 mm. The remaining vertebrae had no right-left asymmetry. The body height of the posterior side surface was slightly greater than that of the anterior side surface.

In most cases the inferior surface area of the vertebral bodies was greater than the superior one with range difference from 1 mm2 to 90 mm2. In two vertebrae, the surface area of the same parts on both surfaces of the vertebral body was greater in comparison with contralateral parts. In other three vertebrae, the relationship between the surface areas of the left-right parts of the superior and inferior surfaces was cross-sectional. The difference between the surface area of right and left parts of the superior surface of the body of most vertebrae ranged from 7 mm2 to 16 mm2, and on the inferior surface – from 16 mm2 to 32 mm2. Moreover, a significant left-right part asymmetry in surface areas of the inferior surface of the vertebral body most often combined with a small left-right part difference of surface areas of the superior surface.

Conclusions: Thus left-right asymmetry of morphometric indicators was revealed in all cervical vertebrae.

Former publication: no

Supervisor: Tsvetkova Tatyana Yurevna, associate professor, Federal State Autonomous Educational Institution of Higher Education "Peoples' Friendship University of Russia",

Morphometric analysis of changes in cytoarchitectonics of the temporo-parieto-occipital (TPO) subregion of the cortex in children from birth to 12 years

Tatyana Kakhovskaya Peoples' Friendship University of Russia Medicine IV.,
Sami Omar Peoples' Friendship University of Russia Medicine

Introduction: One of the least studied cortical areas is the temporo-parieto-occipital subregion within the posterior associative cortex.

The aim is to study age-related changes in cortical thickness and layers in the temporal-parieto-occipital subregion of the human neocortex (TPO).

Method: we studied cortical fragments from 7 left hemispheres of the cerebrum of male neonates and 6 boys aged 12 years who died without brain damage. In the TPO we distinguished subfield 37ac, which is related to visual-spatial perception of moving objects, subfield 37a, which is involved in face recognition, and subfield 37d, which is related to emotion differentiation. The thickness of the cortex (TC), layers III and V (TIII and TV) were measured on Nissl stained sections. We calculated the mean value, standard error, and checked for normality of the distribution of the values in the compared samples. Significance of differences between the averages was determined using Student's t-test at $p<0.05$.

Results: TC in neonates had no regional differences and averaged 1477±28 μm in 37a, 1480±18 μm in 37d, and 1400±32 μm in 37ac. By 12 years the relative postnatal increase in TC compared with newborns had significant differences between subfields and averaged 80.1±2.0% in 37a, 69.9±3.7% in 37d, and 87.1±2.0% in 37ac. We observed the greatest TIII in neonates in 37a and 37ac, it was 451±14 μm and 460±24 μm, respectively, and the least in 37d, where it did not exceed 360±18 μm. We observed the greatest relative postnatal gain in 37d, where the thickness of layer III increased by 140.8±5.8% by 12 years compared with newborns; in 37a and 37ac it was 100.9±3.8% and 98.9±8.5%, respectively. The highest TV in newborns was in 37d, where it averaged 210±8 μm, the lowest in 37ac, where it did not exceed 182±7 μm, and in 37a the TV was 202±10 μm. By 12 years of age, the relative increase in TV in 37a was 148.5±6.2%, in 37d, 128.6±3.4%, and in 37ac, 163.2±5.2%.

Conclusions: differences in the intensity of cortical cross-sectional growth and layers III and V indicate morphofunctional heterogeneity of the temporo-parieto-occipital subfields of the neocortex.

Former publication: no

Supervisor: Sami Omar, assistant lecturer, Peoples' Friendship University of Russia, Moscow, Russia

Morphological, anatomical and phytochemical study of the Sideritis taurica herba

Uliana Chaban I.M. Sechenov First Moscow State Medical University Pharmacy V.

Introduction: Sideritis taurica L. belongs to the Lamiaceae family is an endemic species in the Crimean peninsula.Sideritis taurica herb has a number of valuable pharmacological effects (anti-inflammatory and analgesic, immunomodulatory, adaptogenic, etc.) and is a promising resource for the manufacture of phytopreparations, however, the current lack of regulatory documentation for this type of raw material significantly slows down its introduction into official medical practice.

Aim: To study the external signs of whole and crushed herb of the Sideritis taurica;

To study the qualitative composition of BAS of the Sideritis taurica herb.

To determine the quantitative content of BAS in the grass of the Sideritis taurica

To analyze the composition of BAS in the infusion of the Sideritis taurica herb.

Method: Determination of the moisture content of medicinal plant raw materials

Determination of the content of extractive substances in medicinal plant raw materials and medicinal plant preparations

Determination of the content of tannins in medicinal plant raw materials and medicinal plant preparations

The content of flavonoids was determined spectrophotometrically by an adapted technique specified in SP XIV "St. John's Wort herb". Spectrophotometric determination was carried out on the Varian CARY 4000 device.

Determination of the coefficient of water absorption and consumption coefficient of medicinal plant raw materials».

Sideritis taurica herbawas prepared in accordance with SP "Infusions and decoctions

Statistical processing of the results of the study was carried out in accordance with the requirements of the requirements of the SP "Statistical processing of experimental results"

Results: Humidity of various samples of the Sideritis taurica herb 5-8%

The content of extractive substances extracted by water 21-31%

The content of the amount of tannins in terms of tannin 2-4%

The content of the sum of flavonoids in terms of rutin 0,5-2,5%

The content of the dry residue in infusions 1,14-1,26%

The content of the sum of tannins in terms of tannin in infusions 0,06-0,19

Determination of the amount of flavonoids in terms of rutin in infusions 0,02

Conclusions: The analysis of the literature data showed the prospects of studying the Sideritis taurica herb a new type of medicinal plant raw materials.

Former publication: no

Supervisor: Ulyana Chaban, associate professor, the Department of Pharmaceutical Natural Sciences

Observation of "Murray's law" appliance for arterial branching patterns in human kidney

Ilia Miltykh Penza State University Medicine V.

Introduction: The problem of the functional anatomy of arterial branching was formulated by Wilhelm Roux in 1878. Based on that Cecil Murray proposed a formula describing the relations between the radii in arterial branching of parent vessel and daughter vessels – "Murray's law". There are many works that prove that arterial systems follow "Murray's law" and works that prove otherwise by results of morphometry of real arterial vasculatures.

Aim: To check the applicability of the "Murray's law" to the dichotomies in the arterial vasculature of the human kidney.

Method: Morphometric data was obtained by arterial vasculature corrosive casting of 32 kidneys, 5 372 arterial branches.

Results: It was found that dichotomies predominate in the structure of the arterial vasculature (86%), trichotomies make up 13%, tetratomies – 1%. Dichotomies with î=3 make up only 6,7% of the total number. In 93,3% of cases î is not equal 3.

Conclusions: The obtained results are in contradiction with "Murray's law". Usually, dichotomies for which this theory is inapplicable are referred to as "anomalous". However, the presence of large amounts of these dichotomies, their strict arrangement by generations and division levels suggests that there are other principles of optimal arterial vasculature structure of kidneys, which are not related to the macroscopic characteristics but could be related to the local blood flow. That is why the morphology of the arterial bed of the kidneys needs further studying to propose new principles of optimal structure of the arterial vasculature of the kidneys.

Former publication:

Zenin, O. K., Miltykh, I. S., Dmitriev, A. V., & Iurchenko, O. O. Siberian Journal of Life Sciences and Agriculture, 2021, 13 (3).

Zenin, O. K., Overko, V. S., Dmitriev, A. V., & Miltykh, I. S. Siberian Journal of Life Sciences and Agriculture, 2021, 13(2)

Supervisor: Oleg K. Zenin, professor, Department of Human Anatomy

Prospects for the development of an innovative in situ matrix for intranasal vaccine delivery

Iosif Mikhel I.M. Sechenov First Moscow State Medical University Pharmacy V.

Introduction: Nowadays, many studies have been devoted to the development and study of drugs for vaccination. The popularity of this topic is due to the COVID-19 pandemic. Intranasal administration of vaccines has significant advantages over invasive vaccination methods: high patient compliance, rapid onset of action, competitive bioavailability. In order to avoid exposure to mucociliary clearance, it is possible to use innovative in situ systems as matrices for vaccine delivery. Such delivery systems are capable of a controlled directional phase transition at the application site, changing their aggregate state from liquid form to gel. The most promising polymers for providing in situ phase transition are thermoreversive and ion-selective polymers.

Aim: The aim of this study is to develop an in situ matrix for intranasal vaccine delivery.

Method: In situ matrices were developed using gellan gum, cellulose derivatives, ethyleneoxide and propylene-oxide block copolymers (poloxamers). VLP (virus-like particles) obtained from The Gamaleya National Center of Epidemiology and Microbiology were used as a model immunobiological substance. The in situ matrix was autoclaved for 30 minutes at a temperature of 121° C, and VLP was introduced into the sterile substrate under aseptic conditions.

To assess the quality of the developed matrix, the following were used: Ostwald capillary viscometer, pH-meter (Ohaus ST2100-E), in vitro model of the nasal cavity (developed in the Institute o Pharmacy in the Sechenov University)

Results: All the resulting formulations had optimal viscosity and pH, in in vivo trials without causing a ciliotoxic effect on the mucosa. The most complete retention on the surface of the in vitro model was shown by an ion-selective matrix containing gellan gum and phosphate buffer (90%).

Conclusions: Based on the results of the studies, it can be concluded that the most promising in situ matrix for intranasal delivery of VLP are ion-selective polymers. In situ gel has been shown to be safe in in vivo tests in mice, as well as activating the T-cell immune response. Further research is needed.

Former publication: no

Supervisor: Elena O. Bakhrushina, professor, Department of Industrial Pharmaceutical Technology

Standardization of triphenylmethanol for certification as a reference standard of potassium losartan impurity

Nikolay Shulga I.M. Sechenov First Moscow State Medical University Pharmacy I

Introduction: The quality control of medicines includes the assessment of the content of related impurities in an active pharmaceutical ingredient (API) or a drug. Losartan potassium is a competitive, selective inhibitor of the angiotensin II receptor. It is used as a first–line drug in the treatment of hypertension along with thiazide diuretics and ACE inhibitors. This fact poses an important task for pharmaceutical chemistry in quality control and evaluation of the safety and effectiveness of this drug.

Aim: This work describes the standardization of one of the impurities of potassium losartan – triphenylmethanol. This can be useful for further certification as a reference standard of the impurity and entering into the bank of reference standard.

Method: IR spectrometry, NMR spectroscopy and mass spectrometry - were chosen to identify and prove the structure of the triphenylmetalon sample. To determine the mass fraction of the triphenylmethanol substance in the substance, the material balance method was used, which involves calculating the mass fraction of the base substance by subtracting from 100% the content of related impurities, sulfate ash, water and residual organic solvents.

The following equipment was used for the study: IR-Fourier spectrometer IRTracer-100 (Shimadzu, Japan), Chromato-mass spectrometer GCMS-QP2010 SE (Shimadzu, Japan), NMR spectrometer AVANCE III TM 400 MHz (Bruker, Germany), liquid chromatograph 1290 Infinity (Agilent, USA).

Results: The obtained spectral data were analyzed. The spectra did not contradict the structure and properties of triphenylmethanol, and confirmed the authenticity of the compound.

The mass fraction of the basic substance of the standard sample of triphenylmethanol was determined by the material balance method according to the formula:

X=100-Xsa-Xw-Xos-Xrc

Where: X is the mass fraction of the main substance, Xsa is the mass fraction of sulfated ash, Xw is the mass fraction of water, Xos is the mass fraction of residual organic solvents, Xrc is the mass fraction of related compounds.

Conclusions: As a result of the study, the mass fraction of triphenylmethanol in the sample was calculated, which amounted to 99.2%, as well as the statistical uncertainty of the result. Triphenylmethanol substance is recommended for certification as a standard sample of potassium losartan impurity.

Former publication: no

Supervisor: Vladimir Gegechkori, associate professor, I.M. Sechenov First Moscow State Medical University (Sechenov University).

Analysis of blood stain patterns on clean and dusty surfaces

Dina Nagimullina I.M. Sechenov First Moscow State Medical University General Medicine VI.

Introduction: Bloodstain patterns are important physical evidence at the crime scene. Features of patterns carry extensive information and are determined by a complex of various conditions. Some of these factors are smoothness, roughness, grease and dustiness of the surface.

Aim: Analyze the features of the blood stain patterns on clean and dusty surfaces.

Method: Patterns of the blood drops with a volume of 80±1.3 μl were obtained when falling from a height of 10, 50, 100 and 150 cm onto the surface of smooth glass. The volume of drops was dosed using a digital pipette. In the first series, the surface was cleaned and degreased with an alcohol solution; in the second series, a dusty surface was used. The ImageJ program analyzed the elements of each blood trace according to the criteria: shape, diameter, and the presence of spatter. Statistical analysis was carried out using the STATISTIKA program for a personal computer.

Results: Differences in patterns on clean and dusty surfaces are revealed.

Conclusions: In Series I, clear glass was used. When falling from a height of 10 cm, the pattern had a round shape, smooth edges, and a diameter of 1.75 ± 0.02 cm. No splashing was observed. When falling from a height of 50 cm, the diameter was 2.37 ± 0.05 cm. There was splatter 0.5-1.0 cm from the edge of the main drop pattern. When falling from a height of 100 cm, the diameter was 2.26 ± 0.17 cm. From a height of 150 cm, splashing elements were detected, splatter at a distance of 0.16 cm from the edge of the main pattern. The diameter was 2.73±0.1 cm.

In Series II, a dusty glass surface was used. At a height of 10 cm, the patterns had a round shape with diameter – 1.76±0.04 cm. When falling from a height of 50 cm, the patterns had a round shape with the diameter 2.14±0.1 cm. When a drop fell from a height of 100 cm, splatter was observed. The diameter of the main patterns was 2.36±0.07 cm. At a fall height of 150 cm, splashing elements were observed at a distance of 0.15 cm. The diameter was 2.48±0.04 cm. Thus, it was found that the presence of the dust on the surface changes blood stain patterns.

Former publication: no

Supervisor: Elena Leonova, professor, Department of Forensic Medicine

Analysis of lncRNA-miRNA-mRNA transcription network in pancreatic tissue of in type 2 diabetes mellitus rats intervened by Jianpi Xiaoke Recipe

Xi Zhang Shandong University of Traditional Chinese Medicine Traditional Chinese Medicine Traditional Chinese Medicine VI.,
Chengcheng Fan Shandong University of Traditional Chinese Medicine, Traditional Chinese Medicine III.

Aim: To study the effect of Jianpi Xiaoke Recipe on the long noncoding RNA (lncRNA) - microRNA (miRNA) - messenger RNA (mRNA) transcription network of pancreatic tissue in type 2 diabetes rats, and to explore its mechanism of action in treating T2DM.

Method: SPF male Wistar rats were randomly divided into the control group, model group, and Jianpi Xiaoke prescription group (6.46 mg/(kg * d)). Except the control group, the other groups were fed with streptozotocin and a high-sugar and high-fat diet to induce the T2DM model. After 8 weeks of drug intervention, fasting blood glucose (FBG) measurement and detecting fasting insulin (FINS) and serum glucagon (GC) by ELISA to evaluate the efficacy of Jianpi Xiaoke prescription, The method of high-throughput sequencing was used to screen differentially expressed lncRNAs, miRNAs and mRNAs. The main biological processes involved in differential genes were analyzed through gene ontology (GO) function and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway enrichment. The results of sequencing were verified by qRT-PCR. Finally, the lncRNA miRNA mRNA transcription network and protein interaction network were constructed.

Results: The increase of FBG and GC and the decrease of FINS in T2DM rats can be reversed by strengthening the spleen and quenching thirst. According to the sequencing results, 385 differentially expressed lncRNAs and 492 differentially expressed mRNAs were screened out in model rats, and 354 differentially expressed lncRNAs, 590 differentially expressed mRNAs and 32 differentially expressed miRNAs were detected after treatment with Jianpi Xiaoke formula. A ternary transcription network consisting of 33 lncRNAs, 16 miRNAs and 87 mRNAs was constructed. Bioinformatics analysis showed that these targets may play a role through biological functions such as glycolipid metabolism, sphingolipid metabolism, regulation of adipocyte lipolysis, FoxO signaling pathway, PI3K-Akt signaling pathway, etc.

Conclusions: Jianpi Xiaoke prescription could improve pancreatic function and regulate blood glucose by affecting the lncRNA-miRNA-mRNA transcription network system in the pancreatic tissue of rats with T2DM. The transcription network involves multiple pathways and biological processes.

Former publication:

1 Identification of Potential Therapeutic Targets and Pathways of Liraglutide Against Type 2 Diabetes Mellitus (T2DM) Based on Long Non-Coding RNA (lncRNA) Sequencing

2 Probe into the Target and Mechanism of Jianpi Xiaoke Prescription for TreatingType 2 DiabetesMellitus through miRNA Expression Profiling

Supervisor: Yunsheng Xu,professor Dean of the Second Affiliated Hospital of Shandong University of Traditional Chinese Medicine, Shandong University of Traditional Chinese Medicine, Yanqin Huang associate professor, Shandong University of Traditional Chinese Medicine

Comparison of machine learning methods with logistic regression analysis in creating predictive models for risk of critical in-hospital events in COVID-19 patients on hospital admission

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Introduction: Machine learning (ML) algorithms have been trained to early predict critical in-hospital events from COVID-19 using patient data at admission, but little is known on how their performance compares with each other and/or with statistical logistic regression (LR).

Aim: This prospective multicentre cohort study compares the performance of a LR and five ML models on the contribution of influencing predictors and predictor-to-event relationships on prediction model μs performance.

Method: We used 25 baseline variables of 490 COVID-19 patients admitted to 8 hospitals in Germany (March– November 2020) to develop and validate (75/25 random-split) 3 linear (L1 and L2 penalty, elastic net [EN]) and 2 non-linear (support vector machine [SVM] with radial kernel, random forest [RF]) ML approaches for predicting critical events defined by intensive care unit transfer, invasive ventilation and/or death (composite end-point: 181 patients). Models were compared for performance (area-under-the-receiver-operating characteristic-curve [AUC], Brier score) and predictor importance (performance-loss metrics, partial-dependence profiles).

Results: Models performed close with a small benefit for LR (utilizing restricted cubic splines for non-linearity) and RF (AUC means: 0.763–0.731 [RF–L1]); Brier scores: 0.184–0.197 [LR–L1]). Top ranked predictor variables (consistently high- est importance: C-reactive protein) were largely identical across models, except creatinine, which exhibited marginal (L1, L2, EN, SVM) or high/non-linear effects (LR, RF) on events.

Conclusions: Although the LR and ML models analysed showed no strong differences in performance and the most influencing predictors for COVID-19-related event prediction, our results indicate a predictive benefit from taking account for non-linear predictor-to-event relationships and effects. Future efforts should focus on leveraging data-driven ML technologies from static towards dynamic modelling solutions that continuously learn and adapt to changes in data environments during the evolving pandemic.

Former publication:
Sievering et al., BMC Medical Informatics and Decision Making

Supervisor: Stang, Axel professor Department of Hematology, Oncology and Palliative Care Medicine, Asklepios Hospital Barmbek, Rübenkamp 220, 22291 Hamburg, Germany.

Development of recommendations to combat stigmatization and discrimination against hiv-infected people

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Naimakhon Khoshimova Peoples' Friendship University of Russia Dentistry V.

Introduction: People living with the human immunodeficiency virus (HIV) often face stigmatization and discrimination from society and even medical personnel. It is proved that this negatively affects the quality of life, as well as the results of treatment. Stigmatization is a negative attitude and prejudice towards people with HIV, while discrimination is treating them differently than those who do not have HIV.

Aim: to assess the prevalence of stigmatization and discrimination of HIV-infected people among residents of Africa and Russia and develop recommendations to combat this problem.

Method: Two comparative retrospective studies were conducted using Google forms, in which 183 people, 85 Africans and 98 Russians, 57 men and 126 women, aged 17 to 68 years, participated. Statistical data processing was done using IMB SPSS program version 22.0.

Results: To the question, have you ever faced negativity after others know of your HIV status, the one infected African replied - No, never, and the one infected Russian - Yes, always. The study showed that 56.5% of Africans and 5.1% of Russians are acquainted with an HIV-infected person. 71.8% of Africans and 58.2% of Russians would agree to meet such a person. 74.1% of Africans and 30.6% of Russians would agree to live with such a person. 95.3% of Africans and 68.4% of Russians would agree to study with such a student. 71.8% of Africans and 50.0% of Russians, if they were medical professionals and had a choice, would treat such patients. 70.6% of Africans and 44.9% of Russians would buy food from such a seller. 89.4% of Africans and 67.3% of Russians would be friends with such a person. 82.4% of Africans and 50.0% of Russians would hire such a person. 52.9% of Africans and 8.2% of Russians would go for a manicure or other cosmetic procedures to such a master.

Conclusions: 5.1% of Russians and 56.5% of Africans are familiar with an HIV-infected person, which is reflected that Africans are more willing to accept people living with HIV and interact with them. To combat stigmatization, it is important to fight outdated and untrue ideas about living with HIV and myths about how you can get infected. This can be achieved by raising awareness, organizing open discussions, and educating the population about HIV, about living with HIV and living with an HIV-infected person

Former publication: no

Supervisor: Kaverina Elena V., associate professor, Department of Public health, Healthcare and Hygiene, Institute of Medicine, RUDN university

Identification of Potential MicroRNA–MRNA Regulatory Relationship Pairs in Irritable Bowel Syndrome with Diarrhea

Wenli Yan Shandong University of Traditional Chinese Medicine Acupuncture II, Yuxia Ma

Introduction: Irritable bowel syndrome (IBS) is the most common gastrointestinal disease worldwide with diarrhea-predominant irritable bowel syndrome (IBS-D) being the prevalent subtype. However, its pathogenesis remains unclear. Research has increasingly focused on identifying genetic factors in the mechanisms underlying IBS.

Aim: We aimed to explore key gene nodes and potential microRNA–mRNA regulatory pairs of IBS-D using bioinformatics methods.

Method: We downloaded the GSE36701 microarray dataset from the Gene Expression Omnibus database and obtained 1358 differentially expressed mRNAs by analyzing mRNA profiles using the GEO2R analysis tool. Based on our previous study, we used TargetScan, miTarBase, and miRDB to predict the downstream genes of three known microRNAs (hsa-let-7b-5p, hsa-miR-19b-3p, and hsa-miR-20a-5p), and the microRNA–mRNA regulatory network was visualized using Cytoscape.

Results: A total of 795 downstream target genes were found in TargetScan, miRTarBase, and miRDB databases, and 50 candidate genes were obtained. The Metascape and STRING databases were used to perform enrichment analysis and construct a protein–protein interaction network of candidate genes. Finally, we constructed a network of 3 microRNAs and 50 candidate mRNAs, among which 28 negative relationship pairs and 5 key axes (hsa-miR-20a-5p/VEGFA, hsa-let-7b-5p/MSN, hsa-let-7b-5p /PPP1R16B, hsa-19b-3p/ITGA2, and hsa-19b-3p/PIK3R3) were identified.

Conclusions: We report five novel microRNA–mRNA regulatory axes in IBS-D pathogenesis and speculated that PIK3R3, negatively regulated by hsa-miR-19b-3p, may regulate NF-κB production through the PI3K/Akt pathway, which accounts for the occurrence of clinical symptoms in IBS-D patients. Our findings may offer key biomarkers for IBS-D diagnosis and treatment.

Former publication: no

Supervisor: Yuxia Ma professor Assistant dean Department of Acupuncture-Moxibustion and Tuina, Shandong University of Traditional Chinese Medicine, China

Progress in the clinical application of pentatone therapy combined with other appropriate techniques of traditional Chinese medicine in the treatment of insomnia

Di Kai Shandong University Of Traditional Chinese Medicine Medicine II.

Introduction: To investigate the clinical application of pentatone therapy combined with other appropriate techniques of traditional Chinese medicine in the treatment of insomnia, in order to provide a more effective and beneficial method for the clinical treatment of insomnia.

Aim: To investigate the clinical application of pentatone therapy combined with other appropriate techniques of traditional Chinese medicine in the treatment of insomnia, in order to provide a more effective and beneficial method for the clinical treatment of insomnia.

Method: By searching the relevant literature on the combination of pentatone therapy for insomnia in the past 10 years, the treatment course and efficacy of the treatment were summarized according to different appropriate techniques of traditional Chinese medicine.

Results: The conclusion that five-tone therapy combined with other appropriate techniques of traditional Chinese medicine can effectively improve the sleep condition and sleep quality of insomnia patients.

Conclusions: Pentatone therapy combined with other appropriate techniques of traditional Chinese medicine has achieved definite efficacy in the clinical application of insomnia, and this study can fill the research gap in this field in China and provide theoretical support for the related research of pentatonic therapy.

Former publication: no

Supervisor: Wei Guo professor Shandong University Of Traditional Chinese Medicine

The effect of speleotherapy on the parameters of visual evoked potentials during a passive orthostatic test

Tatyana Karpikova Voronezh State Medical University named after N.N. Burdenko Medicine IV.

Introduction: Conducting a passive orthostatic test is one of the most accessible methods for monitoring the indicators of the cardiovascular system and the level of activation of the autonomic nervous system. The use of the technique of visual evoked potentials (vEP) can be useful for studying the central mechanisms of the passive orthostatic test.

Aim: Purpose - to study the changes in vEP for an outbreak during a passive orthostatic test under the influence of speleoclimate.

Method: The study involved 24 students. The study met ethical standards. Each participant signed an agreement to participate in the experiment. During the passive orthostatic test, vEP were registered in the horizontal position of the subject, with verticalization by 75 degrees, when he returned to the horizontal position - before the course, on the 3rd and 10th days of speleotherapy. The analysis of the obtained data was carried out using StatPlus Pro.

Results: An analysis of the vEP waves amplitude during a passive orthostatic test before the influence of the speleoclimate showed an increase in the vEP amplitude during verticalization and a decrease upon transition to a horizontal position. The amplitudes of the N2 waves (Me=2.09, Q1=1.43, Q3=2.83 at rest and Me=4.0, Q1=2.23, Q3=6.0 during verticalization, z=-1.98, p=0.048) and P2 on the left (Me=2.76, Q1=0.952, Q3=5.34 at rest and Me=6.60, Q1=1.51, Q3=11.7 during verticalization, z=-2.43, đ=0.015) and N2 (Me=1.80, Q1=1.41, Q3=3.07 at rest and Me=3.81, Q1=2.22, Q3=5.78 during verticalization, z=-2.13, p=0.033) on the right increase significantly. During the transition from the vertical to the horizontal state, the amplitudes of the N2, P3 waves on the left significantly decrease (đ<0.05). The duration of the vEP waves per flare changes insignificantly in this case.

On the third day of speleotherapy the time of conducting and processing the visual signal at all levels of vEP formation also significantly changes (p<0.05) during a passive orthostatic test. On the tenth day of speleotherapy only the amplitude of the N2 wave changes during verticalization, p<0.05.

Conclusions: We revealed the dynamics of the parameters of the vEP during a passive orthostatic test. A full course of speleotherapy (10 days) leads to a minimization of the central response to the passive orthostatic test.

Former publication: no

Supervisor: V.A. Semiletova, associate professor, Voronezh State Medical University named after N.N. Burdenko, Department of Normal Physiology, E.V. Dorokhov, associate professor, Voronezh State Medical University named after N.N. Burdenko, head of department of Normal Physiology

The Relationship between Readiness for Interprofessional Learning and Academic Self-efficacy among Nursing Students

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Yongtian Yin Shandong University of Traditional Chinese Medicine nursing VI.

Introduction: Modern medicine emphasizes that nursing students demonstrate interprofessional collaborative ability to better meet the diverse needs of patients. Nursing educators worldwide should consider training qualified inter-professional nursing students as their responsibility. They should focus on interprofessional learning attitude of nursing students.

Aim: This study aims to explore the relationship between the readiness for interprofessional learning (RIPS) and academic self-efficacy (ASE) in nursing students.

Method: A cross-sectional survey design on a sample of 741 undergraduate nursing students in Jinan, Shandong Province, China, from November to December 2021. The social-demographic questionnaire, the RIPL Scale and ASE Scale were used for data collection. Data analysis was performed using SPSS 25.0. Normally distributed measurement data were expressed as Mean±SD. Differences in RIPL and ASE scores were analyzed using t-test and one-way ANOVA. Further, the relationship between the two variables was analyzed using Pearson's correlation. The hierarchical regression analysis was used to further analyze the relationship between ASE and RIPL. First, in regression model 1, demographic variables with statistical differences in RIPL were included. Second, in regression model 2, ASE was added. The level of significance was set at 0.05 for all two-tailed t-tests.

Results: The RIPL mean score was (3.91±0.44), and the ASE mean score was (3.47±0.42) in Chinese nursing students.There were statistically significant differences in the RIPL among nursing students of different genders, grades, choice of nursing profession and frequency of communication with students with health-related majors (p<0.05□Cp<0.001). Pearson correlation analysis showed that ASE was positively related to RIPL (r=0.313□Cp<0.01). The hierarchical regression analysis results showed that ASE was positively related to RIPL (β=0.303, p<0.001) when controlling for gender, grade, choice of the nursing profession, and frequency of communication with students with health majors. The model explained 15.9% of variance in RIPL (F =27.761, p <0.001).

Conclusions: Nursing students' RIPL is associated with their ASE. We suggest that nursing educators improve the ASE of nursing students while cultivating their interprofessional learning abilities.

Former publication:
Ran An, et al. Journal of Nursing research, 2022
Ran An, et al. Journal of Chinese Medical Ethics, 2022
Ran An, et al. Journal of Career and Health, 2022

Supervisor: Ran An college associate professor Shandong University of Traditional Chinese Medicine, Lixia District, Jinan City, Shandong Province, China, School of Nursing

The use of light microscopy in the assessment of morphological properties of human erythrocytes in the presence of doxycycline hydrochloride.

Lemir Rami El-Ayoubi Voronezh State Medical University named after N.N. Burdenko Medicine III.

Introduction: Doxycycline (DC) hydrochloride is a semi-synthetic antibiotic belonging to the tetracycline group. With the growing interest in this antibiotic, we made observations during research of DC action on RBCs using a method of scanning electron microscopy.

Aim: The purpose of this study was to develop an approach to sample preparation of RBC for their better visualization in the field of a light microscopy (LM).

Method: The surface architectonics of RBC of donor's blood in the presence of DC (Sigma Aldrich) at a concentration of 8.3x10-5 mol/L by the method of LM was studied. The evaluation of RBCs' parameters was carried out on an automatic hematological analyzer Sysmex. RBCs were washed three times from plasma with a saline solution of sodium chloride. The resulting suspension of RBCs was incubated for 2, 5, 10, 20, 30, 60 min and 1 day with DC. Morphological characteristics of native and DC-modified RBCs were studied using a Nikon Eclipse Ni-e LM. Considering that the use of a solid substrate can lead to the appearance of artifacts in the form of a falsely increased number of echinocytic cells, we carried out preliminary sample preparation of RBC along the way of fixing the shape of donor RBC with 2.5% glutaraldehyde solution and subsequent drying of RBCs in a series of ethanol solutions of ascending concentration of 30%, 50%, 70%. The obtained samples were applied to special substrates and viewed at varying degrees of magnification of the samples.

Results: When analyzing the data obtained, the reversible and irreversibly transformed cell forms were counted to establish differences in control and experimental samples. RBCs of the control sample were characterized by the absolute majority of discocytes (96.7±0.4%). RBCs modified with DC underwent morphological changes determined by the time of interaction with the modifier, the number of which increased over time by 10%. The most pronounced changes in the surface architectonics of RBCs were recorded during prolonged (60-minute) and daily incubation with DC. Based on the literature in the field, such changes in the morphological characteristics of RBCs may be associated with intracellular oxidative processes.

Conclusions: Our method of preliminary preparation of RBCs can be used to assess qualitative and quantitative morphological RBC properties in conditions of special sample preparation.

Former publication: no

Supervisor: Yelena S. Bayeva, associate professor, Department of Normal Physiology

Transcriptome Sequencing to Explore the Mechanism of Qiwei Baizhu San in Treating T2DM

Fei Teng Shandong University of Traditional Chinese Medicine Medicine IV.,
Fei Gao Shandong University of Traditional Chinese Medicine Medicine IV.

Aim: To explore the mechanism of Qiwei Baizhu San in treating T2DM.

Method: T2DM rats made by STZ + high fat and high sugar diet were divided into control group, model group and Qiwei Baizhu San treatment group.Three rats from each of the groups were taken for transcriptome sequencing. The targets of T2DM were searched through databases, and the PPI network , GO and KEGG enrichment analysis were carried out after crossing with the model-blank group differential genes of transcriptome sequencing data. These targets were intersected with the genes of Qiwei Baizhu San reversing T2DM to obtain the genes of treating.The mechanism of Qiwei Baizhu San for treating T2DM was explored through PPI network , GO and KEGG enrichment analysis network pharmacology and molecular docking technology.

Results: 13891 disease target genes of T2DM were obtained by the disease database, and 507 differential genes were obtained from the blank group and the model group by transcriptome sequencing data.The differential genes were intersected with T2DM target genes, and 295 targets were obtained.These targets were used to construct a PPI network with 254 nodes and 1367 edges.The GO analysis included 986 entries of biological process (BP), 125 entries of molecular function (MF), and 88 entries of cellular component (CC).

Compared with the model group, Qiwei Baizhu San reversed the expression of 140 differential genes. After homologous transformation of these genes and intersected with 295 targets of T2MD, and 56 important target genes were obtained.The PPI network was drawn with these important targets. According to the Degree value, the key targets can be founded: PTPRC, IRF4, BTK, IKZF3 and IL21R.56 common targets were enriched with GO, including 179 entries for BP, 15 entries for MF, and 18 entries for CC.The "component-target" network were constructed by network pharmacology.Based on the Degree value, the core targets were obtained: AR, MMP12, PDE4B and the core components were obtained: 16alpha-Hydrohydrotetrametric acid, Cerevisterol, poric acid C. Molecular docking showed that the core components all had good binding activities with the core targets.

Conclusions: Qiwei Baizhu San can obviously improve T2DM, and its treatment has the characteristics of multi-target and multi-channel, which provides a theoretical basis for the further study.

Former publication: no

Supervisor: Xiao-chun Han, college associate professor, Shandong University of Traditional Chinese Medicine, Liang-qing Guo, college associate professor, Shandong University of Traditional Chinese Medicine

Vitamin D deficiency impairs cerebrovascular adaptation to carotid artery occlusion in ovariectomized mice.

Guillaume Walford Semmelweis University Medicine V., Gábor Karácsony Semmelweis University Medicine III.

Introduction: Vitamin D deficiency has recently been associated with cerebrovascular disorders. For instance, impaired cerebrovascular adaptation to unilateral common carotid artery occlusion (CAO), a common cause of ischemic stroke, has been reported in vitamin D receptor deficient (KO) male mice. However, gender (i.e sex steroids) might influence the cerebrovascular effects of vitamin D deficiency, which has yet to be elucidated.

Aim: We aimed to investigate the simultaneous effect of vitamin D deficiency and female reproductive hormonal changes on the cerebrovascular adaptation to CAO in ovariectomized (OVX) and KO mice.

Method: Adult females KO and wild-type (WT) littermate mice underwent bilateral ovariectomy (OVX-WT and OVX-KO). The investigation of the Cerebrocortical Blood Flow (CoBF) changes after CAO was performed five weeks later using in vivo laser speckle imaging. The changes in CoBF were measured in four cortical regions (frontal, parietal, temporal and zone of pial anastomosis) and were expressed as a percentage of baseline CoBF. Physiological parameters (e.g blood pressure, oxygen saturation) were monitored throughout the experiments.

Results: Conversely to males, no significant difference was observed in the cerebrovascular adaptation of intact KO female mice after CAO when compared to intact WT animals. In contrast, OVX-KO mice showed a delayed recovery in the zone of pial anastomosis compared to OVX-WT mice (for instance, decrease in CoBF four minutes after CAO : 9% for OVX-KO and 4% for OVX-WT). The CoBF reduction was significantly more pronounced in the temporal cortex of OVX-KO mice in comparison to intact KO and OXV-WT mice (for instance, decrease in CoBF four minutes after CAO: 12% for OVX-KO, 8% for intact KO and 6% for OVX-WT).

Conclusions: These results indicate a protective effect of female sex hormones on the cerebrovascular system. Although, OVX-KO mice showed impaired adaptation to CAO, surprisingly, their adaptational capacity was not aggravated to the extent previously observed in KO males. Consequently, the decreased vulnerability of vitamin D deficient female mice compared to males is most likely due to the lower androgen concentrations rather than the presence of estrogens.

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Former publication: no

Supervisor: Éva Pál, senior lecturer, Institute of Translational Medicine, Semmelweis University; ELKH-SU Cerebrovascular and Neurocognitive Disorders Research Group, Dorina Nagy, PhD student, Institute of Translational Medicine, Semmelweis University

Volunteering at the Public Health Department during the COVID-19 pandemic: motivational factors and barriers encountered by students

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Introduction: In Romania, county-level public health departments were assigned a key role during the COVID-19 pandemic in the prevention of new infections, by means of case investigations and contact tracing. Volunteering in Public Health Departments could lower the burden on the healthcare workers and could offer students an alternative to clinical practice by conducting epidemiological investigations.

Aim: This study aims to take a closer look at the motivational factors and barriers that influenced the students' decisions to be involved in a volunteering activity and continue their work at the Public Health Department of the Cluj County, Romania, using a self-developed questionnaire.

Method: For this retrospective study, all 113 student volunteers that have worked at the Public Health Department of the Cluj County were recruited. The access to the questionnaire was offered via pre-existing social media groups used for the communication of student volunteers. For comparisons between different groups of the 5-Point Liker Scale answers, Mann-Whitney U test has been used and for the comparison of dichotomous variables, Chi-square test has been used. The significance level was 5% for all analyses.

Results: 51 participants answered the questionnaire. The most commonly identified motivational factors were the desire to help other people, the need to be involved in the control of the pandemic and the feeling of being useful. On the other hand, external incentives were not depicted as relevant. The lack of time due to university related activities and the technical difficulties were significant barriers the volunteers encountered. The student-coordinators reported more often high fatigue levels compared to the student-volunteers ($p<0.05$). The students with prior volunteering experience reported a higher level of frustration regarding the lack of flexibility of public institutions ($p<0.05$).

Conclusions: Our work confirms the results of other studies, supporting the fact that student volunteers were mainly motivated by intrinsic factors, whereas the extrinsic factors, such as material and curricular benefits played a less relevant role. These results confirm that students are a highly motivated source of health workers during crisis situations and the studied motivational factors and barriers should be kept in mind when developing such initiatives.

Former publication: no

Supervisor: Lucia Lotrean, professor, Community Medicine, Hygiene

Association of vomiting and nausea syndrome and thrombosis in patients undergoing chemotherapy

Arina Lapina I.M. Sechenov First Moscow State Medical University Medicine VI.

Introduction: Nausea and vomiting syndrome is common in people undergoing chemotherapy. It has been noted that thromboses (VTE, etc.) are also frequently detected in such patients. Based on this information, there is a possibility of correlation of these factors.

Aim: The main purpose of the work is to identify the correlation of the manifestation of thrombosis against the background of nausea and vomiting syndrome and, if positive, to predict the frequency of this reaction.

Method: To investigate the association between vomiting syndrome and thrombosis, a group of 147 patients undergoing and/or having undergone chemotherapy were selected to detect cases of thrombosis in the background of the proposed syndrome. Positive results were observed in 95 cases.

Results: After careful calculation of the data obtained, a correlation of nausea and vomiting syndrome and thrombosis compiled by 64.6%, due to dehydration and changes in electrolyte balance, while taking highly emetogenic drugs such as cisplatin and carboplatin.

Conclusions: Study finds unconditional association of nausea and vomiting syndrome with thrombosis manifestations in palliative chemotherapy patients.

Former publication: no

Supervisor: Alexander Vorobev, associate professor, Department of Obstetrics, Gynecology and Perinatal Medicine

Clinical significance of CDH1 and MLH1 gene methylation and MMP7 gene expression for surgical treatment of diffuse gastric cancer.

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Alevtina Kiseleva I.M. Sechenov First Moscow State Medical University Medicine I.

Introduction: Neoplasms of gastrointestinal tract according to WHO occupies 4th place. With the development of DNA-technologies became possible to define molecular markers in biopsies of mucous membrane of stomach, which shows to us structural and functional changes in genome of cancer cell.

Aim: To improve the results of treatment of patients with gastric cancer by introducing into clinical practice the study of methylation of the CDH1, MLH1 genes and MMP7 gene expression in determining the surgical management of patients.

Method: The study included 178 patients from 2004 to 2021 with a diagnosis of stomach cancer. Selection criteria: patients over 18 years of age with an established diagnosis of sporadic diffuse gastric cancer according to the Lauren classification. Control group included 50 persons without gastric cancer. All patients underwent endoscopic biopsy of the stomach tumor, as well as blood plasma sampling. In all samples, methylation of the CDH1 and MLH1 genes and expression of the MMP7 gene was carried out. Isolation of genomic DNA from tumor material to determine abnormal methylation using methyl-sensitive restriction enzyme HpaII. Methylation of the CpG islands of the promoter regions of the genes was determined using methylation-specific PCR (MSP). And the definition of MMP7 gene expression, that is, the transformation of information recorded in the gene in the form of a sequence of DNA nucleotides into a functional product - RNA. The nucleotide sequences of the genes were taken from the GenBank database. An analysis of the correlation of the levels of the studied molecular markers was carried out with the main clinical indicators and morphological characteristics of the stomach tumor.

Results: No relationship was found between MLH1 methylation, MMP7 expression, and gender, age, tumor size, tumor differentiation, lymph node metastasis, and TNM stage. Overall survival was higher in the unmethylated MLH1 group compared to the methylated MLH1 group (log-rank, $p = 0.046$). MLH1 may be a predictive biomarker for patients with gastric cancer. CDH1 hypermethylation levels and increased MMP7 expression from gastric mucosal tumors are significantly higher compared to normal gastric mucosa.

Conclusions: CDH1and MLH1 hypermethylation and increased MMP7 expression significantly correlate with the risk of gastric cancer.

Former publication: no

Supervisor: Kiseleva Alevtina Eduardovna, PhD student, Sechenov University

Comparative efficacy of metoprolol and lisinopril in postinfarct chronic heart failure

Marat Gripp I.M. Sechenov First Moscow State Medical University Medicine V.,
Yuri Isaakyan I.M. Sechenov First Moscow State Medical University Medicine V.

Introduction: Chronic heart failure (CHF) is the most common complication of many heart diseases. Deceleration of CHF progression by protecting the heart from remodeling is of paramount importance. Angiotensin-converting enzyme inhibitors (ACEIs) and β-adrenoblockers (β-ABs) can be considered as traditional treatments for CHF.

Aim: to conduct an experimental comparative study of the effectiveness of CAD and β-adrenoblocker in the treatment of chronic heart failure.

Method: CHF was simulated by ligation of left coronary artery (LCA) on 30 male rats. The animals were divided into 3 groups of 10 individuals each. Group 1 included animals with CHF without treatment, group 2 included animals receiving lisinopril at a dose of 10 mg/kg, and group 3 received metoprolol at a dose of 10 mg/kg. Therapy was started 30 days after ACL ligation. The doses of drugs were increased up to the full dose within a month.

After 1 and 3 months, echocardiography (EchoCG) was performed and physical endurance was assessed by treadmill.

Physical endurance was studied by placing the animals once on a treadmill with a belt speed of 0.5 m/s.

Results: EchoCG analysis one month after modeling heart failure in animals of all studied groups had increased left ventricular size and decreased shortening fraction (FS) and ejection fraction (EF).

After 3 months of observation, a further decrease in PV and EF was noted in group 1 animals. Group 2 had increased atrial size, LV size and LV indices did not change Group 3 had worsened LV function (Table 1).

Treadmill endurance after 3 months was highest in rats treated with metoprolol (223 ± 89 s, $p<0.05$), it was significantly higher than in animals of groups #1 (194 ± 47 s, $p<0.05$), #2(204 ± 57 s, $p<0.05$).

Data: (1) FS% after 1 month, (2) FS% after 3 months, (3) EF% after 1 month, (4) EF% after 3 months, (5) HR (bpm) after 1 month.

Group No1 (without treatment): (1) 23,0±8,6, (2) 18,1±7,6, (3) 44,2±12,5, (4) 39,6±11,6, (5) 398±19.

Group No2 (Lisinopril): (1) 23,1±10,4, (2) 26,2±8,9, (3) 49,9±15,1, (4) 54,3±15,5, (5) 412±28.

Group No3 (Metoprolol): (1) 23,6±9,8, (2) 15,2±5,1, (3) 49,8±16,6, (4) 33,4±9,7, (5) 409±61.

Conclusions: The β-adrenoblocker metoprolol in the short-term (3 months of therapy) experiment was slightly more effective than lisinopril.

Former publication: no

Supervisor: Elena Stepanova associate professor head of the laboratory, Pavlov First St. Petersburg State Medical University

Deep-Learning Based Prediction of Peak Oxygen Uptake in Athletes Using 2D Echocardiographic videos

Kai Shiida Semmelweis University Medicine V.,
Zita Éles Semmelweis University Medicine V.

Introduction: Cardiopulmonary exercise testing (CPET)-derived peak oxygen uptake (VO2/kg) is a well-established parameter of exercise capacity allowing the quantification of athletic performance. Although VO2/kg is mainly influenced by anthropometric and demographic factors, several studies demonstrated strong associations between resting echocardiography-based measures and VO2/kg. Artificial intelligence could incorporate information from both features, thus enabling a more accurate prediction of exercise capacity in athletes.

Aim: Accordingly, we aimed to implement a deep-learning (DL) model that uses 2D echocardiography (2DE)-based apical 4-chamber view videos on top of the anthropometric features (age, sex, body surface area [BSA]) to predict VO2/kg and then assess the model's performance in a large cohort of athletes.

Method: We retrospectively identified 422 competitive athletes (15.4±7.3 training hours/week) who underwent resting 2DE evaluation and then CPET to determine VO2/kg (52.7 ± 7.7 mL/kg/min). To predict VO2/kg values, we trained a deep neural network (DNN) that can process both modalities of the inputs (i.e. 2DE videos and anthropometric data such as age, sex and BSA) simultaneously. We applied 5-fold cross-validation and used mean squared error (MSE), mean absolute error (MAE), and R squared (R2) metrics to measure our model's performance. Then, we compared the results with a linear regression (LR)-based model that was trained using only the 3 anthropometric factors (age, gender, BSA).

Results: Using 2DE videos, our DL-based model was able to achieve an accurate prediction of VO_2/kg with an MSE of 35.27, MAE of 4.62, and an R2 of 0.393. In comparison, the LR-based model using only anthropometric factors had a worse predictive performance in all metrics with an MSE of 40.51, MAE of 4.88, and R2 of 0.303. In addition, we compared the predictive performance of the DL- and the LR-based models by their respective squared error values using the Wilcoxon test. Our DL-based model that uses 2DE videos had a significantly better predictive performance compared to the LR model using only age, sex and BSA (Wilcoxon p=0.006).

Conclusions: Using our DL-based approach on our large athlete database, we were able to implement a model that incorporated 2DE videos to predict VO2/kg more accurately compared to solely using anthropometric factors.

Former publication: no

Supervisor: Alexandra Fábián, PhD student, Városmajori Szív- és Érgyógyászati Klinika, Ádám Szijártó, PhD student, Városmajori Szív- és Érgyógyászati Klinika

Drug coated balloon is more effective in treating late drug eluting stent in-stent restenosis than early

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Christopher Z. Tóth Semmelweis University Medicine V.

Introduction: Although drug-eluting stents (DES) are effective in reducing rates of in-stent restenosis (ISR) after percutaneous coronary intervention, DES-ISR still occurs in 5-10% of patients. The main treatment options are a new layer of DES or drug-coated balloon (DCB) therapy. Recent studies have shown that the latter comes with promising results, without the further elevated risk of recurrent ISR or stent thrombosis.

Aim: The aim of this meta-analysis is to investigate the long-term outcome of DCB therapy at early vs. late timing of DES-ISR.

Method: Eligible data from four studies involving 783 patients in total were found through systematic search using Medline, Web of Science, Scopus, and Embase. The QUIPS tool is used to assess the risk of bias from the selected four studies. The rate of major adverse cardiac events (MACE) such as target lesion revascularization (TLR), myocardial infarction and cardiac death after 12 months since DCB therapy were examined.

Results: The rate of MACE was significantly lower in the late DES-ISR (1.68 OR; CI 1.57-1.80, $p < 0.01$), as well as for TLR (1.69 OR; CI 1.18-2.42 $p < 0.01$). This analysis demonstrates the statistical significant difference in DCB utilization in early versus late DES-ISR, which implies that DES-ISR that appears before 12 months (early DES-ISR), would expect to have worse outcomes than in late DES-ISR cases after 12 months from the index procedure.

Conclusions: Based on these findings, DCB treatment is preferred for DES-ISR revascularization specifically in populations with the late developing one.

Former publication: no

Supervisor: Dr. Péter Márton Kulyassa, PhD student, Cardiology, Dr. Ferenc István Édes, associate professor, Cardiology

Effects of rehabilitation programme in patients with chf and copd

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Valeria Drobysheva Voronezh State Medical University named after N.N. Burdenko Medicine V.

Chronic obstructive pulmonary disease (COPD), associated with chronic heart failure (CHF), is a frequent combination of pathologies in patients with CHF. The comorbidity of these diseases often results in a pronounced deterioration in the well-being of such patients as well as a deterioration in the long-term prognosis, which requires further study of the progression mechanisms of CHF, Improving the diagnosis and treatment of this category of patients.

Numerous advantages of physical exercises are described, but they are not widely used due to various factors, despite significant improvements in physical fitness, quality of life, and risk of hospitalization

Aim: Evaluate the influence of physical training on clinical flow, laboratory and instrumental indicators in đatients with comorbid current of CHF and COPD with different ejection fraction. In accordance with the presence of comorbid COPD, the study included a cohort of patients with comorbid course of CHF and COPD.

During 12 weeks after inclusion all patients were examined by researchers to monitor the absence of symptoms of CHF decompensation and COPD exacerbation. After a year of observation of the selected cohort, the patients underwent a second examination, which included laboratory methods: the serum levels of NT-proBNP, Hs-CRP and pro-inflammatory cytokines (IL-1β, IL-6, TNF-α.), clinical and instrumental research methods.

The higher levels of pro-inflammatory cytokines in the CHF with preserved EF and CHF subgroups compared to the subgroups with CHF with reduced EF may reflect the significance of the contribution of systemic inflammation to the development and progression of HF.

At the same time, the high level of pro-inflammatory cytokines observed in patients with comorbid COPD and CHF shows an amplification of systemic inflammation and therefore a close pathogenetic relationship between the two pathologies.

The follow-up survey shows a reliable statistically significant improvement in the functional status of patients who have undergone additional physical rehabilitation, as assessed in the 6MWT.

Physical rehabilitation of patients with comorbid COPD and CHF is accompanied by significant improvement of hemodynamic performance during load tests, decrease of pro-inflammatory cytokines, Hs-CRP, NT-proBNP.

Former publication: no

Supervisor: Roman Tokmachev, associate professor, Faculty therapy, Andrey Budnevskiy, professor Faculty therapy

Identification of circRNA–miRNA–mRNA Regulatory Network and Crucial Signaling Pathway Axis Involved in Tetralogy of Fallot

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Introduction: Tetralogy of Fallot (TOF) is one of the most common congenital heart diseases (CHD). Due to some deficiencies in prenatal diagnosis and surgical treatment of TOF, a growing number of researchers have focused on identifying the mechanisms of TOF. Competing endogenous RNA (ceRNA) refers to the competition between long non-coding RNAs (lncRNAs), circular RNAs (circRNAs), mRNAs, and pseudogenes within the same pool of miRNAs. Studies have begun to explore the expression and regulatory role of ncRNAs in TOF, such as the expression of small nucleolar RNAs, miRNAs and lncRNAs, and the regulatory network of ceRNA related to lncRNAs or circRNAs.

Aim: This study aimed to construct a circRNA–miRNA–mRNA and protein–protein interaction (PPI) regulatory network by combining related circRNAs, miRNAs, and mRNAs from the Gene Expression Omnibus (GEO) database using bioinformatics methods.

Method: We obtained the human TOF gene, miRNA, and circRNA expression profiling datasets from the GEO database. After data pretreatment, differentially expressed mRNAs (DEmRNAs), microRNAs (DEmiRNAs), and circRNAs (DEcircRNAs) were identified between the TOF and healthy groups, and a global triple ceRNA regulatory network was constructed. A functional enrichment analysis was performed on the Metascape website to explore the biological functions of the selected genes. Then, we constructed a PPI network and identified hub genes using the cytoHubba and MCODE plug-ins in the Cytoscape software.

Results: A triple network of DEcircRNA–DEmiRNA–DEmRNA was then constructed. A total of seven hub genes were identified. Additionally, a circRNA–miRNA–hub gene subnetwork was established, and its enrichment analysis results indicated that the extrinsic apoptotic signaling pathway, JAK-STAT signaling pathway and PI3K-Akt signaling pathway may be involved in the pathogenesis of TOF.

Conclusions: We comprehensively analyzed two microarray datasets and one RNA-seq dataset to identify specific circRNAs, miRNAs, and mRNAs that may be key nodes of TOF. Then we established a circRNA–miRNA–mRNA regulatory network and screened seven hub genes in TOF. In addition, we propose that the hsa_circ_000601/hsa-miR-148a/BCL2L11 signaling pathway axis may play a crucial role in regulating TOF progression.

Former publication:
Kan Z, Yan W, Wang N, Fang Y, Gao H, Song Y. Identification of circRNA-miRNA-mRNA Regulatory Network and Crucial Signaling Pathway Axis Involved in Tetralogy of Fallot. Front Genet. 2022 Jul 7;13:917454. doi: 10.3389/fgene.2022.917454. PMID: 35873466; PMCID: PMC9300927.

Supervisor: Yongmei Song professor Shandong University of Traditional Chinese Medicine

Immunohistochemical assessment of caspase-3 and caspase-9 expression in various types of bladder cancer

Yulia Stepanova I.M. Sechenov First Moscow State Medical University Medicine V.

Introduction: Bladder cancer prevails among malignant neoplasms of the urinary system and accounts for 70% of their number; it occurs in men 3-4 times more often than in women. One of the key mechanisms of tumor transformation and uncontrolled cell growth is the dysfunction of apoptosis processes. The study of the characteristics of caspase cascade disorders in various types of bladder cancer plays an important role in early diagnosis, further prognosis, and treatment of the disease. Aim: Immunohistochemical evaluation of caspase-3 and caspase-9 expression in various types of bladder cancer. Methods:The study was conducted on archival material (n=257; men - 33, women - 17; mean age 54 ± 8 years, 35–77 years) in the period from 2016 to 2020. Patients with diagnoses: squamous cell carcinoma (n=5), adenocarcinoma (n=5), muscle-invasive (n=25) and non-muscle-invasive (n=25) urothelial cancer. Control - autopsy material of normal kidneys (n=30). Method - immunohistochemical study (antibodies to caspase-3 and caspase-9).

Results: Decreased expression level of caspase-3 in bladder squamous cell carcinoma (75.2±0.1%, $p<0.05$), adenocarcinoma (18.3±0.3%, $p<0.05$), muscle-invasive (54.2±0.3%, $p<0.05$) and non-muscle-invasive (89.1±0.2, $p<0.05$) urothelial cancer compared with control (91.1±0.1%, $p<0.05$). Decreased expression of caspase-9 in preparations of bladder squamous cell carcinoma (24.1±0.2%, $p<0.05$), adenocarcinoma (68.3±0.03%, $p<0.05$), muscle-invasive (17.5±0.2%, $p<0$ .05) and non-muscle-invasive (64.2±0.5%, $p<0.05$) urothelial cancer compared with control (78.2±0.2%, $p<0.05$). Conclusions: In the main histological variants of bladder cancers, atypical cells have low apoptotic activity. At the same time, urothelial and squamous cell carcinomas are characterized by a high degree of the terminal phase of apoptosis, and adenocarcinoma is characterized by a low degree, that is, it is the most aggressive.

Former publication: no

Supervisor: Grigory Demyashkin, professor, National Medical Research Radiological Centre of the Ministry of Health of the Russian Federation

Potential for cure and predictors of long-term survival after radiofrequency ablation for colorectal liver metastases: A 20-years single-center experience

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Introduction/Background: Additional radiofrequency ablation (RFA) of liver-limited colorectal liver metastases (CRLM) improves overall (OS) and recurrence-free survival (RFS) over systemic therapy alone. We aimed to assess the potential and predictive factors of long-term survival and cure to optimize patient selection for RFA application.

Methods: Retrospective review of a prospectively maintained single-center database of consecutive patients undergoing RFA for liver-limited CRLM after systemic therapy between 2002 and 2020. Clini- copathologic characteristics and KRAS/BRAF-genotype data (tested routinely since 2010) were correlated to RFS and OS. Cure was defined as >10-years RFS (long-term survival as >5-years OS) following RFA.

Results: For the entire cohort of 158 patients (median follow-up 13.6 years), co-occurrence of three factors, RECIST-defined response, number of < 3 CRLM, and < 3 cm maximum size determined a survival plateau that distinguished cured from non-cured patients (10-years RFS: 15.5% vs 0%, p < 0.0001). Among 59 patients (37.3%) being tested, 4 (6.8%) were BRAF-mt, 15 (25.4%) KRAS-mt, and 40 (67.8%) KRAS/BRAF-wt. OS (median follow-up 8.3 years) was estimated to be higher with KRAS/BRAF-wt compared to a mutant KRAS or BRAF status (5-years OS: 22.8% vs 3.4%, p 1/4 0.0018).

Conclusion: This study indicates about 15% chance of cure following RFA of low-volume liver-limited CRLM after downsizing by systemic therapy and a negative effect of KRAS or BRAF mutation on long-term survival after CRLM ablation. These findings may improve clinical decision-making in patients potentially candidate to RFA of CRLM and encourage further investigations on molecular factors determining an oligometastatic state of CRLM curable with focal ablative therapy.

Former publication: no

Supervisor: Prof. Dr. med. Axel Stang, professor, Department of Hematology and Oncology, Asklepios Hospital Barmbek, Hamburg, Germany, Dr. med. Michael Lipp, senior lecturer, Department of General and Abdominal Surgery, Asklepios Hospital Barmbek, Hamburg, Germany

Proteomic investigation of myocardial reverse and anti-remodelling in the rat model reveals sex-related differences following aortic banding and debanding

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Introduction: The physiological discrepancy in cardiovascular adaptation between males and females limits investigation into the molecular effects of pressure unloading therapy in the clinical setting. As left ventricular myocardial hypertrophy (LVH) develops due to pressure overload (PO) of the left ventricle (LV), the induction of PO provides a basis for understanding the effects on myocardial remodelling.

Aim: Based on a rat model, we aimed to examine the sex-related differences in myocardial reverse remodelling on a molecular level.

Method: Aortic banding (AB) was performed in order to induce LV PO in male and female rats. Sham-operated animals served as controls (CO). After 6 weeks of AB , aortic debanding (DB) resulted in pressure unloading. In weeks 6 and 12, reverse remodelling and LV remodelling were detected by echocardiography, pressure-volume analysis, and explorative proteomics.

Results: At week 6, both male and female AB rats exhibited an increase in myocardial hypertrophy, as well as impaired diastolic function and preserved systolic function. However, a decompensation of systolic, and further decompensation of diastolic function only occurred in male AB rats at week 12. Debanding led to reduced hypertrophy, recovery of diastolic function, and proteomic changes to a similar extent in both sexes, as evidenced by post-proteomic analysis using supervised data dimensionality reduction methods (sPLS-DA). This analysis revealed a nearly equal magnitude of significantly up- and downregulated proteins (male: 485, female: 475, AB vs. CO). This correlated with decreased lipid metabolism enzymes in both sexes and upregulation of proteins related to actin cytoskeleton in males. More pronounced proteomic reversal of myocardial remodelling in the female sex was identified through subsequent gene ontology analysis. This is supported by a stark discrepancy in the number of proteins presenting residual differences after debanding (male: 235, female: 37, DB vs CO).

Conclusions: Through applying pressure-unloading therapy, we have found sex-specific differences in myocardial adaptation. In males, myocardial remodelling was linked to an increased expression of actin cytoskeletal proteins, while in females, reverse remodelling led to a normalisation of lipid metabolism.

Former publication:
Ruppert M, Barta BA, Korkmaz-Icöz S, Loganathan S, Oláh A, Sayour AA, Benke K, Nagy D, Bálint T, Karck M, Schilling O, Merkely B, Radovits T, Szabó G. Sex similarities and differences in the reverse and anti-remodeling effect of pressure unloading therapy in a rat model of aortic banding and debanding. Am J Physiol Heart Circ Physiol. 2022 Jul 1;323(1):H204-H222.

Supervisor: Dr. Bálint András Barta, PhD student, Heart and Vascular Centre, Budapest, Semmelweis University, Dr. Mihály Ruppert, PhD, assistant lecturer, Heart and Vascular Centre, Budapest, Semmelweis University

The physical activity effect assessment of functional status, cytokine profile and heart failure course with different ejection fraction

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Yuliya Glavatskikh Voronezh State Medical University named after N.N. Burdenko Medicine V.

Relevance: Decompensation of HF is the leading cause of hospitalizations in admissions.One of the treatment components is physical rehabilitation.

Objective: to evaluate the physical rehabilitation effect as a component of HF treatment.

Materials and methods: The study included 160 patients with HF.All patients were divided into two groups,the first group with HFpEF (EF>50%),the second with HFrEF (EF<50%).Then we made an additional division of each group into two subgroups.Subgroups 1A and 2A:patients underwent a pharmacological program in combination with physical rehabilitation. In subgroups 1B and 2B patients underwent only a pharmacological program.

Results: Just after the inclusion the mean hs-CRP levels in patients with HFpEF was higher than in patients with HFrEF.A year later it was revealed that in both groups there was a decrease in the hs-CRP levels.But in the subgroups 1A and 2A, it decreased more than in the groups 1B and 2B.Cytokine profile: indicators were higher in group of patients with HFpEF, which indicates the contribution of systemic inflammation to the clinical course of HFpEF.After a year of treatment and rehabilitation, the indicators decreased in all studied groups, while in patients in subgroups 1A and 2A, there was a significant more pronounced decrease than in subgroups 1B and 2B.In patients of all groups, the level of NT-proBNP was above the threshold values, which confirmed HF. A year after there was a decrease in this parameter in all subgroups.In subgroups 1A and 2A, there was a greater decrease than in groups 1B and 2B.There were also improvements in the functional status in patients who have undergone physical training, assessed by the 6MWT (6MWD was greater).Indicators characterizing exercise tolerance (HR and SpO2 after the test) were also better.

Conclusion: In groups with rehabilitation the mean level of systemic inflammation biomarkes decreased greatly. A statistically significant decrease in NT-proBNP in groups of patients 1A and 2A may indicate a positive effect of properly selected physical activity on the course of HF. There was a significant improvement in the functional status of patients undergoing physical rehabilitation, assessed by 6MWD.

Former publication: no

Supervisor: Tokmachev R. E., associate professor, department of faculty therapy

The role of targeted therapy in the treatment of diffuse-type gastric cancer

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Alevtina Kiseleva I.M. Sechenov First Moscow State Medical University

Introduction: Gastric cancer (GC) is characterized by high morbidity and mortality, the sixth most common type of cancer and the fourth the fourth leading cause of cancer-related death worldwide (GCO 2020). More than 95% of gastric cancer are adenocarcinomas with various localizations, histological, genetic and molecular types. According to Lauren's classification, diffuse, intestinal, mixed and unclassified types are distinguished on the basis of histological features. The diffuse-type has the poorest prognosis. Diffuse gastric cancer is the least sensitive to chemotherapy. Over the last decades, there has been a trend to use targeted therapy both as monotherapy and in combination with chemotherapy in first- and second-lines therapy. This approach has improved overall survival and progression-free survival.

Aim: To compare the results of chemotherapy therapy alone and chemotherapy therapy with the addition of targeted drugs in diffuse-type gastric cancer treatment.

Method: We conducted a systematic review of literature in several electronic databases - Embase, MEDLINE and Cochrane, PubMed. Randomized studies from 2020 to 2022 were selected for analysis, which examined the use of targeted therapy in combination with chemotherapy and chemotherapy alone in the treatment of diffuse-type gastric cancer. We used the following keywords: «stomach cancer»; «diffuse type»» «targeted therapy»; «chemotherapy»; «HER2»; «VEGFR». A total of 250 articles were considered. All studies used the same chemotherapy drugs and selection criteria.

Conclusion: In this systematic review, we investigated the role of targeted therapy in the treatment of diffuse-type gastric cancer by comparing targeted therapy in combination with chemotherapy and chemotherapy alone. The main conclusion of the study is the significant benefit of overall survival (OS: HR 0.823; PFS: HR 0.762) for targeted therapy in general, particularly antiangiogenic and anti-HER2 agents.

We believe that targeted therapy has every reason to use it in the treatment of diffuse -type gastric cancer both as monotherapy and in combination with chemotherapy. This approach in treatment will help to make the treatment more personalized and improve patient survival.

Former publication: no

Supervisor: Reshetov Igor Vladimirovich, RAS Academician, M.D., Professor, Sechenov University Department of Oncology, Radiotherapy and Reconstruction Surgery

Assessment of the cognitive status and psycho-emotional sphere of women with a diffuse increase in the volume of the thyroid gland according to ultrasound diagnostics

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Yuliya Glavatskikh Voronezh State Medical University named after N.N. Burdenko Medicine II.

In the structure of endocrine diseases, one of the main places is occupied by the pathology of the thyroid gland. The development of the intellectual and personal sphere is represented by the priority of the social level of the organization of the individual, which can change in case of violations of the somatic sphere. The role of thyroid pathologies remains one of the leading disorders of the psycho-emotional and cognitive spheres in the clinical picture, which leads to a decrease in the quality of life of these patients.

The purpose of the study is to identify a violation of the psycho-emotional sphere and the cognitive status of women with ultrasound signs of an increase in the volume of the thyroid gland compared to women who have its normal volume.

122 women were examined at an outpatient appointment with a district general practitioner with further determination of the thyroid gland volume using ultrasound examination on the Vivid brand. The cognitive status of patients was assessed using the Schulte test. The severity of depression was diagnosed according to the Hamilton Depression Scale (HDRS). Quality of life was assessed according to the subjective asthenia rating scale (MFI-20).

According to the results of the diagnosis, 54% of the surveyed women showed an increase in the volume of the thyroid gland (19.01 ± 0.64 cm3) When analyzing the data obtained, there was a deterioration in the results of questionnaires to assess cognitive status, quality of life, as well as depression scale indicators in women with an identified increase in thyroid volume.

Detection of ultrasound disorders - indicators of the thyroid gland correlates with a decrease in indicators of psycho-emotional, cognitive spheres, as well as an increase in asthenic manifestations according to questionnaires. Among the surveyed patients, 54% showed an increase in the volume of the thyroid gland. In these patients, non-specific complaints about the deterioration of the general condition and the psycho-emotional sphere were confirmed by the data of the questionnaires used. All women who took part in the study were further examined, referred to the appropriate specialists and received the necessary treatment.

Former publication: no

Supervisor: Olga Deryaeva associate professor Urgent and faculty surgery; Alena Deryaeva assistant lecturer

Comparative evaluation of hybrid and total minimally invasive esophagectomy for benign diseases as a component of the FAST TRACK program

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Alexandra Gorshunova Petrovsky National Research Centre of Surgery Clinical Medicine II.

Introduction: Current trends in the development of esophageal surgery for benign diseases are aimed at reducing the frequency of complications and reducing the time of postoperative rehabilitation of patients. Minimally invasive technologies are an essential component of fast track protocols.The surgeon's arsenal includes both complete MIE and the so-called "hybrid" MIE, which combines thoracoscopic access with open intervention on the abdominal cavity through laparotomy.

Aim: The aim of this retrospective study is to investigate the efficacy of complete MIE compared with a hybrid technique in the implementation of the fast track program in patients with benign diseases of the esophagus.

Method: The analysis of medical records has been carried out. The inclusion criteria - the presence of a benign disease of the esophagus, MIE(hybrid or complete), perioperative management of patients according to fast track protocol. The exclusion criteria - the lack of information in the medical documentation. From 2010 to 2021 in the department of thoracoabdominal surgery of the Russian scientific center of surgery 38 radical reconstructive interventions on the esophagus were performed in patients with benign esophageal diseases (achalasia, benign strictures). Hybrid MIE (hMIE) was performed in 23patients, MIE – 15.The McKeown-type was the operation of choice in all cases.

Results: The duration of the operation was statistically significantly longer in the hybrid MIE group ($p = 0.0027$), due to the shorter duration of the abdominal stage ($p < 0.0001$) with the same duration of the transthoracic one.When performing a complete MIE, statistically significantly more patients were discharged within 10 days (10 out of 14), $p = 0.038$, while the average duration did not differ.The time spent in the ICU decreased from 48 hours to 15 hours ($p = 0.103$), while the number of patients transferred from the ICU on the first postoperative day was statistically significantly higher ($p = 0.0018$).The incidence of failure and mortality in the groups did not differ.

Conclusions: It has been shown the combined use of the fast track protocol and full MIE can reduce the time of surgical intervention and discharge more than 60% of patients within up to 6 days with a minimum stay in the ICU. However, further analysis and research in patients with benign esophageal disease is still required.

Former publication: no

Supervisors: Irina Tarasova associate professor Federal State Autonomous Educational Institution of Higher Education I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation (Sechenov University), Department of Hospital Surgery No2
Shestakov Alexey professor Petrovsky National Research Centre of Surgery,Department of thoraco-abdominal surgery and oncology

Contrast-enhanced endoscopic ultrasound during tissue acquisition may be of aid to inexperienced endoscopists: A systematic review and meta-analysis of randomized controlled trials

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Yael Hadani Semmelweis University Medicine V.

Introduction: Solid pancreatic masses are most commonly evaluated via tissue acquisition by endoscopic ultrasound (EUS). Contrast-enhanced harmonic endoscopic ultrasound (CEH-EUS) is an EUS technique that may increase diagnostic adequacy rates.

Aim: To assess the rate of diagnostic sampling when using CEH-EUS compared to conventional EUS.

Method: In April 2022, five major databases (Medline via PubMed, Embase, CENTRAL, Scopus and Web of Science) were searched. Randomized controlled trials comparing CEH-EUS to conventional EUS for fine needle biopsy or aspiration of solid pancreatic masses were eligible for inclusion. Outcomes sought were diagnostic adequacy of the sample, number of needle passes, technical failures, adverse events, diagnostic accuracy, and sensitivity. Risk of Bias was assessed using the Cochrane Collaborations Risk of Bias tool for randomized controlled trials (RoB2), the level of evidence was assessed using the GRADE approach, and Risk Ratios (RR) with 95% Confidence Intervals (CI) were calculated and pooled using a random-effects model. Heterogeneity was assessed using the i2 statistic.

Results: The search identified 343 records, of which three were included. RR for adequacy was insignificantly in favor of CEH-EUS. One study was significantly in favor of CEH-EUS for the first pass when performed by inexperienced endoscopists. Using the second pass from their study, the RR showed no difference. Excluding it completely, there was no difference. Adverse events and technical failures could not be pooled due to a low event rate but were equal in both arms. Diagnostic sensitivity and accuracy RRs equally showed no difference between the interventions.

Conclusions: No difference was found in diagnostic adequacy, accuracy, or sensitivity when using CEH-EUS compared to EUS. One individual study found a clinically and statistically significant difference in diagnostic adequacy when the intervention was performed by inexperienced endoscopists, who may benefit from this technique.

Former publication: no

Supervisor: Marie Engh PhD student Translational Medicine Center Balint Eross senior lecturer Translational Medicine Center

Diagnostic adequacy of needles used in EUS-guided tissue acquisition of solid pancreatic masses – a systematic review and network meta-analysis

Yael Hadani Semmelweis University Medicine V.;
Omer Almog Semmelweis University Medicine V.

Introduction: Several needle designs are available for endoscopic ultrasound-guided tissue acquisition (TA) of solid pancreatic masses, and they offer different efficacy and safety profiles. However, no clear guidelines exist for the choice of needle for TA in this context.

Aim: To compare the diagnostic yield, adequacy, and technical failures of all the needles used in EUS-guided TA through a network meta-analysis.

Method: Randomized controlled trials, comparing at least two needles of a specified gauge for TA of solid pancreatic masses, were eligible for inclusion. Odds ratios were calculated, a random effects model applied and the P-score (0 to 1) was calculated to rank the needles.

Results: 3665 records were identified, and 35 were included for analysis. For the outcome of histological adequacy, the 25G and 22G Fork-tip performed best, the 25G and 22G Menghini were the least favorable. For the outcome of cytological adequacy, the best performing needles were the 22G Fork-tip and 25G reverse-bevel, and least favorable were the 22G reverse-bevel and 22G Menghini. For adverse events, the 25G reverse-bevel and 20G forward-bevel performed best, the 22G Franseen and 19G Menghini the least favorable. For technical failures, the best needles were the 25G and 22G Franseen; the least favorable were the 22G reverse-bevel and 19G Menghini needles

Conclusions: Based on our results, fork-tip needles can be recommended for their higher diagnostic adequacy but with a slightly increased risk of adverse events. Menghini needles performed inferiorly for nearly all outcomes.

Former publication: no

Supervisor: Marie Engh PhD student Translational Medicine Center Balint Eross senior lecturer Translational Medicine Center

Frailty and its association with short-term adverse health events in elderly patients with hemodialysis:A longitudinal study.

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Introduction: Frailty is an age-related clinical condition characterized by a reduction in biological functional reserves,which raises the risk of adverse health events such as death,fall,and hospitalization.The prevalence of frailty in elderly hemodialysis(HD) patients was about 34.7%,and increased the risk of adverse health events. However, there are few studies on the effect of frailty on short-term adverse health events in elderly HD patients.

Aim: This study aimed to determine the prevalence of frailty in elderly HD patients and to assess the degree to which frailty was associated with short-term adverse health events,including death,fall,and hospitalization.

Method: An observational and longitudinal study was conducted in elderly HD patients with a 6-month follow-up.Frailty was measured using the Frailty Phenotype in elderly HD patients at two tertiary hospitals in Jinan,Shandong Province,China at baseline,3 months,and 6 months.A self-made clinical adverse outcome record sheet was used to record the incidence of adverse health events every 3 months from baseline.Cox survival analysis was conducted to evaluate the association of frailty and short-term adverse health events.

Results: A total of 264 elderly HD patients involved in this study,and the prevalence of frailty was 35.98%. Short-term follow-up Cox survival analysis showed that frailty was an independent risk factor for death [odds ratio (OR): 5.620, 95% confidence interval (CI):1.134-27.845, P=0.034] and hospitalization (OR:2.582, 95%CI: 1.039-6.419, P=0.041) within 3 months, and it was an independent risk factor for death (OR=6.740, 95%CI [1.855, 24.493], P=0.004), fall (OR: 3.346, 95%CI: 1.216-9.209, P=0.019) and hospitalization (OR:2.026, 95%CI: 1.013,4.051, P=0.046) within 6 months.

Conclusions: Frailty was an independent indicator of death and hospitalization in elderly HD patients within 3 and 6 months,and it was also an independent indicator of fall in elderly MHD patients within 6 months.Given the paucity of literature on the China population,further work was warranted.

Former publication:
Lu Xiaohan et al, Chin J Nurs Educ□C2022

Supervisor: Song jie professor geriatric nursing Shandong university of traditional Chinese Medicine

Is diabetes mellitus just a co-morbidity or a risk factor for severe COVID-19?

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Denis Ruchkin I.M. Sechenov First Moscow State Medical University Medicine VI.

Introduction: It is relevant to determine the role of diabetes mellitus (DM) as a risk factor for COVID-19 severity and mortality in the Russian population. The effect of metformin in DM patients on COVID-19 mortality is being studied.

Aim: This study was aimed to determine it.

Method: We analyzed 386 case histories of patients hospitalized between 02.02.2020 and 21.03.2021 with COVID-19. Patients were divided into 2 groups according to the presence or absence of DM. Their disease severity and clinical outcomes were compared.

DM patients were divided into 2 groups: the first didn't take metformin, the second took metformin. Their clinical parameters were compared.

Results: Structure of comorbidities: 64.8%of patients had arterial hypertension, 40.9% had obesity, 22.5% had chronic kidney disease, 21.0% had DM, 10.9% had coronary heart disease, 10.6% had chronic respiratory disease, 10.4%had atrial fibrillation. Hospitalization duration was 15.17±21.43 days in the group without diabetes vs 13.68±5.85 days with diabetes (p=0.633), hospitalization in the ICU 7.9% vs 13.6% (p=0.114), outcomes (9.5% died without diabetes, 14.8% with diabetes, p=0.168).

Patients with diabetes had lower saturation on admission (94.30±3.5 vs 93.15±4.58, p=0.005), higher C-reactive protein (71.55±61.89 vs 106.09±83.24, p<0.001), they required respiratory support more frequently (p=0.027, 39.35% vs 56.7% received it: 32.8% vs 45.7% was on oxygen therapy, 0.65% vs 2.5% on noninvasive ventilation, 5.9% vs 8.6% on invasive ventilation), administration of biological agents (18.0% vs 28.4%,p=0.039) and acticoagulants (90.5% vs 97.5%, p=0.044).

No statistically significant differences were found between the groups of patients not taking metformin and those taking it: length of hospitalization (14.06±4.86 vs 13.09±6.25,p=0.232), ICU (16.7% vs 7.5%, p=0.262), mortality 22.2% and 7.5%, p=0.089.

Conclusions: DM has no effect on the severity and mortality of COVID-19. Treatment of DM with metformin wasn't associated with a reduction in mortality from COVID-19.

Former publication: no

Supervisor: Anna Nartova PhD student General Medicine
Denis Ruchkin PhD student General Medicine

Long-term neurological, cognitive and psycho-emotional complications after surgical reconstructions of the Ascending Aorta and the Aortic Arch

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Introduction: This study is based on data collected over a long period of time and includes patients' results for up to 10 years postoperatively.

Aim: To identify neuro-cognitive and psycho-emotional disorders in the immediate and late postoperative periods and to improve neurological and cognitive results of treatment in patients with Ascending Aorta and the Aortic Arch surgery.

Method: The prospective study included 100 patients. Group I (n=50) underwent aortic arch surgery with antegrade cerebral perfusion (ACP) and hypothermic circulatory arrest (26°C). Group II (n=50) survived ascending aortic replacement with extracorporeal circulation (EC) and moderate hypothermia (32°C). Before and after surgery all patients underwent cognitive function, anxiety and depression testing: the Montreal Cognitive Assessment (MOCa), The Hospital Anxiety and Depression Scale (HADS) and Covi anxiety Scale. For postoperative Delirium testing The Richmond Agitation-Sedation Scale (RASS), the Confusion Assessment Method (CAM) and the Intensive Care Delirium Screening Checklist (ICDSC) were used. 78% of patients were examined 5 years after surgical treatment, 64% - 10 years. Median duration of follow-up was 7,5 years. Differences between groups were considered significant at the confidence level of 0.05 (p).We used relative risks to study predictors of long-term cognitive impairments.

Results: Changes in the neurological and cognitive spheres are presented on the picture. Long-term mental disorders were associated with age, baseline presence of mild cognitive impairment, episodes of intraoperative microembolism, episodes of decreased cerebral perfusion and delirium. Also, for patients of group I increased duration of EC for more than 180 minutes or ACP more than 48 minutes correlated with the risk of neurocognitive impairment.

Conclusions: The main attention should be paid to the early detection of the patient's neurological impairment and diagnostic of delirium, including subsyndromal form, in the immediate postoperative period. Dynamic testing can identify disorders and cause therapy correction to improve results of cognitive state after surgical treatment. The intellectual deficit can be aggravated by anxiety-epressive disorders or proceed under their mask.

Former publication: no

Supervisor: Olga Drakina associate professor Operative surgery, Sechenov University(First Moscow State Medical University named after I.M. Sechenov), Moscow, Russian Federation

Link between chronic use of oral contraceptives and bowel ischemia: review

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Introduction: Partial or total necrosis of the bowel is a frequent cause of obstruction of the mesenteric artery or vein. Mesenteric ischemia is usually the consequence of other associated pathologies of the patient and most often revealed by acute intestinal obstruction.

Venous mesenteric thrombosis is frequent in patients with portal hypertension, intraabdominal infections, any kind of trauma and other hypercoagulability conditions. Thrombosis of the portal and superior mesenteric axis not associated with liver cirrhosis or tumoral disease is the second cause of portal hypertension in the western world.

3 main factors influence the induction of such thromboses:

1. modification of blood coagulation,
2. modification of vessels' walls,
3. immunologic role of oral contraceptives(OCs).

Aim: 30-40% of Portal Vein Thrombosis(PTV) remains of unknown origin, thus, it is of utmost importance to recognize the risk factors and treat all conditions that might have a link with a hypercoagulability state.

Acute mesenteric ischemia is a pathology difficult to treat due to the nonspecific symptomatology and late diagnosis consequently,resulting a mortality in over 50% of the cases.

Method: All consecutive patients with non-cirrhotic PVT were recorded at the time of inclusion. Patients' characteristics and risk factors were recorded.

Patients without any other medical history of either haematological or thromboembolic conditions are presented with acute-onset upper abdominal pain.

Results: Medication history included the long-term use of an oral contraceptives. Computer Tomography(CT) and flow Doppler ultrasonography revealed PVT and superior mesenteric vein thrombosis.

Identified risk factors in patients' case for the thrombus formations were oral contraceptive medication and obesity. Other secondary causes of SMV and PV thrombosis were inversigated but the results of a hypercoagulability examination were unremarkable leading to the incrimination of obesity and chronic use of oral contraceptives.

Conclusions: Rare, life-threatening complications of chronic medication such as venous mesenteric thrombosis and bowel ischemia are unanticipated. Thus, it is crucial to diagnose complications and risk factors as soon as possible whose resolutions will make it possible to prolong survival of many patients. Identification of populations at risk is therefore vital.

Former publication: no

Supervisor: Ionescu Calin professor Municipal Hospital, Cluj-Napoca

Medication rule of traditional Chinese medicine in treatment of kneeosteoarthritis by hot ironing based on data mining and its toxicity TCM application

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Qingchang Xia Shandong University of Traditional Chinese Medicine Medicine III.

Introduction: Aim: To explore the medication rules and toxic traditional Chinese medicine (TCM) application of TCM in the treatment of knee osteoarthritis (KOA) by hot ironing, so as to provide reference for clinical application and establishment of new hot ironing prescriptions.

Method: The databases of CNKI, Wanfang, VIP. China Biomedical Literature Database and PubMed were searched. According to the inclusion and exclusion criteria, the prescriptions of TCM in treatment of KOA by hot ironing were screened. Microsoft Excel 2019, IBM SPSS Modeler 18.0□CCytoscape 3.8.2 and SPSS Statistics 25.0 software were conducted for data analysis and processing.

Results: A total of 241 prescriptions were included after screening, with a total of 219 TCMs, including 37 toxic TCMs. All the TCMs with high frequency of use were Honghua□Tougucao□Shenjincao□Duhuo□Niuxi, etc. The high frequency use of toxic TCM were Trberculate Speranskia Herba, Chuanwu, Caowu and so on. All the TCMs and toxic TCM had similar dosing characteristics. The drug efficacy was given priority to with dispelling wind and dampness drugs. The drug meridian was given priority to with liver meridian. The four qi was given priority to with warm nature, and the five flavors were given priority to with pungent. The toxicity classification showed that there were six kinds of big toxic TCMs□C12 kinds of small toxic TCMs and 19 kinds of toxic TCMs. The most frequently in order of big toxic TCMs, small toxic TCMs and toxic TCMs were Trberculate Speranskia Herba, Aconiti Radix and Zhichuanwu. Association rules analysis showed that there were 42 pairs of drug groups. Cluster analysis found four potential new prescriptions of T CM in the treatment of KOA by hot ironing.

Conclusions: The prescriptions of TCM medicine in the treatment of KOA by hot ironing are mainly dispelling wind and dampness drugs and promoting blood circulation and removing blood stasis drugs, as well as tonifying deficiency drugs, which have the characteristics of dispelling pathogenic factors first and tonifying deficiency second. Ruxiang-Moyao is the most common. Toxic TCM is widely used in the treatment of KOA by hot ironing, with large dosage. Although it can enhance the curative effect, it is necessary to strictly control the dosage to prevent the occurrence of poisoning.

Former publication:

Zhang Xiaobin, Ma Yuning, Yan Xiao, Zhou Yue, Xia Qingchang, Lu Yunping, Ma Yuxia. Chinese herbal medicine, 2022(05): 1483-1493. DOI:10.7501/j.issn.0253-2670.2022.05.024.

Supervisor: Ma Yuxia professor Professor, Deputy Dean, School of Acupuncture and Tuina, Shandong University of Chinese Medicine, Doctoral Supervisor School of Acupuncture and Tuina, Shandong University of Chinese Medicine;
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Periprocedural Ischemic Brain Lesions in Open vs. Endovascular Carotid Artery Reconstruction, a Propensity Matched Comparison

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Introduction: The optimal revascularization strategy for carotid artery stenosis has been largely debated and remains a contentious topic.

Aim: The purpose of this study was to compare baseline characteristics and periprocedural ischemic brain lesions in patients who underwent carotid artery stenting (CAS) and carotid endarterectomy (CEA).

Method: In our retrospective single-center matched case-control study, we enrolled patients between 1st January 2019 and 11th January 2021. Pre-procedural computed tomography angiography was acquired, and quantitative plaque characteristics were determined using VascuCAP (Elucid Bioimaging) carotid plaque image analysis software. CAS was performed with embolic protection device and local anesthesia; CEA was performed in general anesthesia with near-infrared spectroscopy neuromonitoring and selective shunting. A neuroradiologist evaluated post-procedural MRI for the presence of new diffusion-weighted imaging (DWI) and chronic ischemic brain lesion volume and number. Propensity score matching (PSM) was performed in a 1:1 ratio to compare outcomes in patients treated with CEA and CAS based on 7 clinical and 7 plaque characteristics.

Results: A total of 111 patients (78 CEAs and 33 CAS), who underwent carotid interventions, were enrolled. Significant differences were detected between the groups in both baseline patient (hypertension $p<0.001$, diabetes $p<0.001$) and plaque characteristics (calcium volume $p=0.01$ and plaque lengths $p=0.04$). PSM resulted in 21 appropriate pairs of patients undergoing CEA and CAS interventions. There was no statistically significant difference in chronic lesion volume between the two groups. There was no perioperative neurological event in any of the groups. In the CAS group, 10 patients had new ischemic lesions, while 3 patients with new lesions were documented in CEA group ($p=0.02$). Total DWI lesion volume was also significantly higher in the CAS group ($p=0.04$).

Conclusions: Patients who underwent CAS and CEA differed significantly; however, propensity matching alleviated the differences between the groups. The absolute number of patients with new and chronic DWI lesions was higher in the group that received CAS, with preliminary statistical analysis revealing no significant differences. The procedure-related new ischemic lesions were significantly higher in the CAS group.

Former publication: no

Supervisors: Zsuzsanna Mihaly PhD student Varosmajor Heart and Vascular Centre; Peter Sotonyi professor Varosmajor Heart and Vascular Centre

Posture disorder in young people

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Introduction: digitalization of education, the increasing flow of information fosters the development of independent learning skills, but leads to a decrease in physical activity of students. This invariably affects the state of the skeleton, muscle tone, person's posture, leading to the formation of scoliosis.

Scoliosis is a curvature of the spine (the back may curve in different directions in the frontal plane in an "S" shape). It can be developed over time: often begins manifesting at the age of 10-14, when most children have intense growth. Many students sometimes do not suspect that they have scoliosis, but, as the disease progresses, postural abnormalities begin to appear. It leads to back pain.

Aim: to estimate the frequency and degree of posture disorders in young learners.

Method: the examination of the spinal column, posture among of the 1st year students of Peoples' Friendship University of Russia was carried out. First, a survey was handed out to all trainees, that contained such questions as: "How many hours a day do you spend at the university?", "How many hours a day do you spend on doing your homework?", "Do you do exercises in the morning?" etc. Next, the spinal column and all areas of the back were examined. Respondents with scoliosis were analyzed for back pain on a 10-point Visual Analog Scale (VAS).

Results: there were more females among the respondents. Among girls and boys, scoliosis occurred in equal degree. No gender differences in the degree of curvature of the spinal column were revealed. 43% of students have scoliosis. For scoliosis of degree 0-1 the VAS scores were 3.2±0.8, and for curvature of degree 1-2 - 5.3±1.2. Almost all students played sports in childhood, ″ of young people play sports now. Types of sports have changed: in adolescence respondents most often attended swimming, football, in university - fitness. All people with scoliosis showed low physical activity: students spend about 7 hours at university, 4-6 - doing homework; only L' do exercise in the morning (1/2 do it regularly).

Conclusions: scoliosis is more common in females. Girls are more diligent, but they spend less time doing sport. It is recommended to pay more attention to the prevention of scoliosis. It is necessary to pay attention of students to the exclusion of sitting during breaks and physical exercises contraindicated for scoliosis.

Former publication: no

Supervisor: Nina Gennadiyevna Kulchenko senior lecturer Medical Institute

Sarcopenia influences the kinetic growth rate after ALPPS

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Introduction: Associating liver partition and portal vein ligation for staged hepatectomy induces rapid and effective hypertrophy of the future liver remnant to prevent postoperative liver failure. The aim of this study was to determine cofactors, including sarcopenia, influencing the kinetic growth rate, and subsequently future liver remnant, in terms of safety, complications, and posthepatectomy liver failure.

Method: Patients undergoing associating liver partition and portal vein ligation for staged hepatectomy between 2010 and 2020 were included in this study. Kinetic growth rate was defined as the quotient of the degree of hypertrophy and the time interval between the 2 steps. The sarcopenia muscle index was defined as the skeletal muscle area of both psoas major muscles normalized to the patient's height.

Results: During the study period, 90 patients underwent associating liver partition and portal vein ligation for staged hepatectomy. The association between kinetic growth rate and posthepatectomy liver failure indicates a significant nonlinear effect (P = .02). The incidence of posthepatectomy liver failure significantly increased at a kinetic growth rate below 7% per week (31%) compared to patients with a kinetic growth rate >7%/week (7%, P = .02). In patients with a low kinetic growth rate (<7%/week), the sarcopenia muscle index was significantly lower compared to patients with a high kinetic growth rate (>7%/week). Furthermore, a low sarcopenia muscle index and a high body mass index turned out to independent risk factors for a low kinetic growth rate.

Conclusions: After the first step of the associating liver partition and portal vein ligation for staged hepatectomy procedure, a low kinetic growth rate (<7%/week) increases the risk of posthepatectomy liver failure. The presence of a low sarcopenia muscle index and a high body mass index are profoundly correlated with clinically substantial impaired liver regeneration, which can result in increased liver dysfunction after associating liver partition and portal vein ligation for staged hepatectomy.

Former publication:

Clemens Galavics et al., Surgery, 05/21/2022 (Volume 172, Issue 3, p781-1038, e25-e36)

Supervisors: Karl J. Oldhafer professor Department of Surgery, Division of Hepatobiliary and Pancreatic Surgery, Asklepios Hospital Barmbek, German; Tim Reese assistant research fellow Department of Surgery, Division of Hepatobiliary and Pancreatic Surgery, Asklepios Hospital Barmbek, German

Analysis of Influence Factors of Pregnancy Outcome in Patients with In Vitro Fertilization and Embryo Transfer

Jing Zhang Shandong University of Traditional Chinese Medicine Psychology I.

Introduction: Many studies have judged the effect of anxiety and depression on pregnancy outcome, but no consistent results. This study added general information was to assess the effect factors of pregnancy outcome.

Aim: To investigate the status of anxiety and depression in IVF-ET patients, and analyze the effect of anxiety, depression and other factors on pregnancy outcome.

Method: 118 IVF-ET patients were enrolled in the study. Data were collected by General Information Questionnaire, Self Rating Anxiety Scale (SAS), Self Rating Depression Scale (SDS). SPSS 25.0 was used for statistical analysis. Multivariate logistic regression analysis was used to analyze the effect factors of pregnancy outcome in IVF-ET patients.

Results: Among the 118 IVF-ET patients, 14.4% had anxiety and 52.5% had depression, 67 patients (56.8%) showed successful pregnancy. There were statistically significant differences between the successful pregnancy group and the failed pregnancy group in terms of age, medication-or-not, number of births, endometrial thickness and number of embryos (all $P<0.05$). Among them, the endometrial thickness and number of embryos in the successful pregnancy group were significantly higher than those in the failed group, while the age and number of births were significantly lower than those in the failed group, and the proportion of patients taking medication was significantly lower than that in the failed group; There was no significant difference between the two groups in terms of job-or-not, annual family income, education level, previous medical history, years of infertility, years of treatment, anxiety and depression, etc (all $P>0.05$). Multivariate logistic regression analysis showed that there were statistical significance between age, medication-or-not, endometrial thickness, number of embryos and pregnancy outcome of IVF-ET patients (all $P<0.05$). The adjusted ORs were 0.855 (95% CI 0.964-0.957), 0.285 (95% CI 0.117-0.694), 1.485 (95% CI 1.082-2.039) and 2.815 (95% CI 1.168-6.785), respectively.

Conclusions: Patients with IVF-ET have high anxiety and depression, but anxiety and depression have no significant impact on the pregnancy outcome of patients. Age, medication-or-not, endometrial thickness and number of embryos are the effect factors on pregnancy outcome of IVF-ET patients.

Former publication:
Wang CZ et al, DNA Cell Biol, 2022(4)

Supervisor: Zhang Yingjie professor corresponding author Shandong University of Traditional Chinese Medicine

Assessing personal and health system barriers to breast cancer early diagnosis practices for women over 20 from Cluj-Napoca, Romania

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Introduction: In Romania, females are diagnosed with breast cancer(BC) in stage 4 with limited treatment options. Women don't perform monthly breast self-examinations (BSE) or mammography(MMG) because of personal and health system barriers. Adressing them, will increase the chances of participating in a screening program.

Aim: The general aim of the study is to assess women's barriers to BSE and MMG. The objectives are to identify personal and health system barriers. COVID-19 is believed to be a barrier in accessing MMG. The final objective is to explore women's views regarding factors that prevent them from practicing BSE and MMG and facilitators.

Method: A quantitative cross-sectional research design was applied. The study population was women between 20 -65 years old from Cluj-Napoca, Romania. After obtaining the Human Subject Protection Certificate, an online survey was created in Qualtrics. It had sectioned about the practice of BSE and MMG in terms of frequency, time, way of practicing, and system barriers toward MMG, using the 2016 European Patient Forum Health Access Survey and referring specifically to MMG as a healthcare service. The analysis was performed using the IBM SPSS Statistics version 23. Descriptive statistics were conducted on the general sample description.

Results: 184 women were the sample size, 94.6% being BC-free women. Most of the respondents declared practicing BSE when it came to their mind (57.2%), and only (35.5%) did it monthly. Lack of knowledge, mistrust in own examination, and fear of finding a lump were the identified personal barriers to BSE. A chi-square test was run, and there was a statistically significant association between the practice of BSE and level of education - $X2$ (0.047, $N = 184$), $p = 0.003$. So, women with a high educational level did at least once a BSE, but incorrectly. Affordability and accessibility were the identified system barriers. Kendall's tau-b correlation showed a negative correlation between affordability and an increase in the chance to practice an MMG if it was free screening program, which was statistically significant ($\tau b = - 156$, $p = .025$). Fischer exact test showed no statistically sisignificant association between postponing an MMG due to COVID-19 and the accessibility barrier ($p=0.094$).

Conclusions: Educational campaigns and a national screening will overcome the noted barriers.

Former publication: no

Supervisor: Oana Blaga associate professor Cluj School of Public Health, Babes-Bolyai University

Comparison of DTI and CSD techniques in the preoperative identification of the arcuate fascicle

Mark Rekecki Semmelweis University medicine VI.

Introduction: The arcuate fascicle (AF) is the fibre tract which connects Wernicke's and Broca's speech areas. Its damage can cause severe aphasia therefore accurate visualization before brain surgery is a must. DTI (Diffusion Tensor Imaging) and CSD (Constrained Spherical Deconvolution) tractography techniques based on diffusion MR (dMRI) can be used for this purpose.

Objective: Comparison of the two different tractography methods, based on the AF's imageability, geometric and anisotropy properties.

Method: We retrospectively investigated 38 preoperative functional and dMRI examination's image data, collected at the Semmelweis University Medical Imaging Centre, between February 2019 and October 2022. The dMRI data package consisted of b=800 s/mm^2 (32 directions) suitable for the DTI method and b=2000 s/mm^2 (64 directions) optimized for the CSD method, which was analysed with the ExploreDTI® software. After standard pre-processing (thorough motion and eddy current corrections, etc.), the posterior third of the AF in both hemispheres was segmented using manually marked logical gates from the results of whole brain tractography. The results are not distorted by the arborization characteristic of the frontal lobe, making it suitable for comparison between subjects. From the tract segments, after resampling at uniform step intervals, we calculated the number of fibres, the average value of FA (fractional anisotropy) along the tracts, and lateralization indices.

Results: In two of the 38 examinations the tractography was not successful due to the extent of space-occupying lesion and the oedema surrounding it. In three of the remaining 36 examinations, the DTI method failed to reconstruct the right AF. In all cases, the CSD method identified a larger number of fibres (Wilcoxon test p=1.6803×10-7) and higher FA value along the tracts (Wilcoxon test p=0.0224). The lateralization indices based on CSD were significantly lower (Wilcoxon test p=0.0072), their average value was 0.3133 for CSD, and 0.4561 for DTI.

Conclusion: The AFs in the left hemispheres were larger with both procedures, as expected. CSD allows more reliable reconstruction with more precisely identified fibres tracts, making it a better option in the planning of radio-, or surgical therapy.

Former publication: no

Supervisors: Gyula Gyebnár PhD research fellow Medical Imaging Centre; Lajos Kozák MD PhD associate professor Medical Imaging Centre

Conventional versus facilitated hemostatic dressings after radial artery puncture : a systemic review and meta-analysis

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Introduction: If clinical evidence of coronary artery disease is present, in most of the cases invasive coronary angiography is needed to be performed. The gold standard access site for invasive diagnostics and minimal-invasive therapy is the radial artery. Radial artery puncture is performed in huge numbers, though the complication rate is acceptable, with little decrease we could improve patient care a lot.

Aim: The aim of this meta-analysis is to determine if better outcomes can be expected with the novel facilitated hemostatic devices in terms of radial artery occlusion, radial artery damage and local bleeding events than with conventional mechanical compression devices.

Method: A systematic search was performed in Medline, Central Web of Science, Scopus and Embase. From 8 randomized controlled trials, a total of 3712 patients were examined.

Chitosan, potassium-ferrate covered hemostatic dressings and other drug covered or facilitated hemostatic devices were compared with conventional mechanical compression devices.

The primary endpoint was radial artery occlusion (RAO), while the secondary endpoints were radial artery damage (dissection, pseudoaneurysm), hematoma and local bleeding events.

Results: This meta-analysis involved 3712 patients. In the facilitated hemostatic dressings group (1775 patients) 80 patients developed RAO and 57 developed hematomas. In the conventional mechanical compression device group (1747 patients) 97 developed RAO and 41 developed hematomas. Statistical analysis is in progress at the time of abstract submission.

Conclusions: There is numerical, but probably no statistical difference in the included studies regarding the examined outcomes, while the time for hemostasis might differ. More randomized controlled clinical trials are needed in the subject.

Former publication:

Kulyassa, P., Németh, B. T., Ehrenberger, R., Ruzsa, Z., Szük, T., Fehérvári, P., Engh, M. A., Becker, D., Merkely, B., & Édes, I. F. (2022). The design and feasibility of the: Radial artery puncture hemostasis evaluation – Raphe study, a prospective, randomized, Multicenter Clinical Trial. Frontiers in Cardiovascular Medicine, 9. https://doi.org/10.3389/fcvm.2022.881266

Supervisors: Dr. Kulyassa Péter Márton PhD student Semmelweis University Cardiology; Dr. Édes István Ferenc associate professor Semmelweis University Cardiology

Evaluation of the effect of adherence to antihypertensive therapy on the defeat of target organs in patients with arterial hypertension

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Yuliya Glavatskikh Voronezh State Medical University named after N.N. Burdenko medicine II.

Arterial hypertension is accompanied by damage to target organs, which lead to a sharp deterioration in the quality of life of people, and are also a significant cause of mortality in the population. It is possible to avoid complications of arterial hypertension with the constant intake of drugs that normalize blood pressure figures, as well as having a protective effect on target organs. But, unfortunately, compliance remains low.

Among the surveyed patients, only 38% were committed to treatment, in this group the defeat of target organs was significantly less. The purpose is to study the effect of compliance with antihypertensive therapy in patients with hypertension who underwent COVID-19 on reducing the rates of damage to target organs.

We studied and analyzed the outpatient records of patients of VGKB No14 who underwent COVID-19 to identify indicators of antihypertensive therapy, adherence to treatment, clinical symptoms. A questionnaire of the compliance scale, indicators of biochemical blood analysis, tonometry was performed. The data was processed using the Student t-criterion with the calculation of the average value, standard deviation, the differences were considered significant at $p \leq 0.05$. The average the age of the patients was 67.9±1.39 years. The average duration of arterial hypertension was 15.4±1.42 years according to outpatient card data. As a result of the study, it was revealed that 62% of patients are not adhered to the prescribed therapy, 38% take drugs daily according to the prescriptions of the attending physician. Among the drugs taken, the leading role belongs to the group of angiotensin-converting enzyme (ACE) inhibitors - 71%.

Despite the prevalence of arterial hypertension at present and the stepwise approach to treatment, the indicators of damage to target organs remain at a fairly high level. One of the reasons is low adherence to treatment, untimely intake of medications and lack of the desired result.

Former publication: no

Supervisor: Alexander Pertsev associate professor Faculty therapy; Olga Deryaeva associate professor Urgent and faculty surgery

Efficiency of rehabilitation in patients with recurrent atypical hyperplasia and endometrial cancer after radical surgical treatment

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Introduction: Rehabilitation is a method to improve the QoL of oncogynecological patients

Aim: Evaluation of rehabilitation efficiency in patients with recurrent atypical hyperplasia (rAEH) and endometrial cancer (EC) after radical surgical treatment

Method: A prospective cohort randomized study with intervention was perfomed. Study included 119 patients with rAEH - group I and 58 with stage IA of EC - group II, randomly divided into “active” and “passive” rehabilitation groups: IA group - 27 ptx with rAEH, IB 31 ptx with rAEH, IIA - 29 ptx with EC and II B - 32 ptx with EC. The “active” rehabilitation program included individual and group psychotherapy, balanced diet, dosed physical activity, medication support, physiotherapy.

Subjective assessment of the state was carried out using questionnaires FACT-En, HADS and FSFI, an objective assessment included measument of BMI, IL-6, TNF-α rates.

Results: The dynamics of QoL according to the questionnaire FACT-En during 12 months in IA was 99.74 to 139.37 in IIB 97.79 to 141.31, in the absence of rehabilitation: in IB 98.516 to 112.54 and in IIB 96.0 to 112.84 respectively. According to the HADS scale, the level of anxiety and depression significantly decreased in IA and IIA groups, reaching the lowest level by the 12th month ($p<0.001$). Anxiety and depression scores differed significantly between groups, corresponding to normal values in the “active” and subclinical values in the “passive” rehabilitation. The analysis of sexual function (FSFI) showed significant difference ($p<0.05$) between the groups: IA improves the score from 2,52 to 16,57 and IIA from 10,38 to 24,93. With passive rehabilitation the dinamics was in IIB from 2,39 to 11,65 and IIB 10,51 to 13,39 only.

During “active” rehabilitation a significant ($p<0.05$) decrease in BMI was observed: IA from 33,45 to 30,8 and IIA from 33,6 to 31,14. Without rehabilitation, there was an increase in BMI: IB from 33,6 to 35,0 and IIB 33,37 to 35,07. These data correlated with decrease in the levels of inflammatory markers (TNF-α and IL-6) from the 3rd month.

Conclusions: The “active” rehabilitation demonstrated its socio-economic efficiency: social activity was noted in patients with rAEH in 85.2%, with EC in 82.8%, in the absence of rehabilitation in 51.6% and 46.9% respectively

Former publication: no

Supervisor: Vorobev Alexander associate professor I.M. Sechenov First Moscow State Medical University (Sechenov University), Department of Obstetrics, Gynecology and Perinatal Medicine

The history of reproductive losses associated with antiphospholipid antibodies

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Introduction: Circulating antiphospholipid antibodies (aPL) produce a multifaceted impact on the hemostatic system, leading to preeclampsia, late reproductive loss, and intrauterine fetal growth retardation. This heterogeneous family of antibodies includes lupus anticoagulant (LA), anti-cardiolipin (aCL), and anti-beta2 glycoprotein I (b2GPI). Even more remarkably, that these antibodies can be detected in the majority of the healthy population, but significant increase in aPL titers should be considered as risk factor for various obstetric complications.

Aim: To identify how the pregnancy course and outcome and the history of reproductive losses are associated with the level of antiphospholipid antibodies, including lupus anticoagulant, anti-cardiolipin, anti-beta2 glycoprotein I and prothrombin antibodies.

Method: The study included 208 participants divided into two groups, depending on the presence (n=155) or absence (n=65) of reproductive losses history. We evaluated the presence of obstetric complications performed an aCL ELISA to assess the antiphospholipid antibodies level. The statistical analysis involved Statistica 12 and SPSS 26.

Results: We used Mann-Whitney U-test and ROC curve analysis for results interpretation. We found a significant association ($p<0.05$) between live birth and IgM/IgG levels to anti-cardiolipin. The lower antibody values were associated with a lower risk of the fetal loss. IgM >5 U/ml and IgG >9 U/ml antibody levels to cardiolipin can be used to predict pregnancy outcome with an accuracy of 80.9% for IgM and 74.7% for IgG anti-cardiolipin.

Higher IgM levels of anti-beta2 glycoprotein I were observed in the patients with the history of reproductive loss, so these aPL can also be used to predict the presence or absence of late pregnancy loss with 67.7% accuracy.

The remaining associations between pregnancy outcomes were insignificant, and application of multivariate logistic regression did not suggest an acceptable prediction model.

Conclusions: Overall, we were able to identify certain association between the presence of aPL and reproductive losses. Anti-cardiolipin and anti-beta2 glycoprotein I levels were associated with significantly increased risk of adverse pregnancy outcomes. Further research is necessary to examine the risks of other obstetric complications in order to prevent them.

Former publication: no

Supervisor: Vorobev Alexander associate professor Department of Obstetrics, Gynecology and Perinatal Medicine

Intra-articular Treatment of Digital Osteoarthritis by Radiosynoviorthesis-Clinical Outcome in Long-term Follow-up

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Introduction: This retrospective study analyzed the long-term effects of radiosynoviorthesis (RSO) with special emphasis to local joint pain in patients from 4 different RSO centers in Germany and Austria.

Aim: The aim of this study was to show the effect of radiosynoviorthesis in patients suffering from osteoarthritis.

Method: A total of 168 finger joints in 147 patients with digital joint OA were investigated. The indication for RSO was based on both clinical complaints and a proven synovitis, despite anti-inflammatory pharmacotherapy and previous intra-articular corticosteroid injections. Radiosynoviorthesis was performed according to international guidelines. A numeric visual analog scale (VAS) before and after treatment was used to measure the outcome. Follow-up was done for at least 2 years after treatment, in some patients even over 10 years.

Results: Radiosynoviorthesis resulted in a significant reduction of VAS values in most of the patients, lasting for the whole period of follow-up. Two-thirds of the treated joints showed clinically relevant improvement, if a reduction of 30% in VAS values was defined as a reasonable cutoff. The best results were achieved in thumb base joints.

Conclusions: This article confirms that RSO is a suitable treatment option for digital joint OA with a proven synovitis. The analgesic effect is long-lasting and comparable to the success of RSO in patients with rheumatoid arthritis.

Former publication:

Kampen WU, Hellweg L et al., Eur J Nucl Med Mol Imaging, 2005
Kampen WU, Boddenberg-Pätzold B, Fischer M, et al., Eur J Nucl Med Mol Imaging, 2021
Gabriel M, Pöppel TD, Freudenberg LS, et al., Nuklearmedizin, 2021

Supervisor: Prof. Dr. med. Dipl.-Biol. Willm Uwe Kampen Radiologische Allianz Hamburg

The level of ADAMTS-13 in patients with different obstetric complications

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Introduction: ADAMTS-13 level is highly relevant in practical medicine. It can be used to diagnose thrombotic thrombocytopenic purpura (TTP), also produces an impact on the development of pathological conditions such as sepsis, acute myocardial infarction and ischemic stroke. ADAMTS-13 deficiency has particular significance in pregnancy and it's associated with fetal loss syndrome, late reproductive losses and HELLP syndrome. Low ADAMTS-13 level has an essential impact on the development of critical conditions in pregnancy, such as preeclampsia and placenta abruption.

Aim: To analyze the level and effect of ADAMTS-13 in patients with fetal loss syndrome, late reproductive losses, early neonatal death and intrauterine growth retardation (IUGR).

Method: The research involved 175 participants at different stages of physiological pregnancy, 129 of them had ADAMTS-13 level less than 12 U/ml. At the same time, 111 patients had fetal losses. The function, level, and activity of ADAMTS-13 were investigated by immunofluorescence assays of plasma and aggregometry. The statistical analysis was performed with Statista 12 and SPSS 26 programs. We used the Mann-Whitney U-test.

Results: The statistical analysis revealed the OR = 2.43 (CL = 1.08-5.47 95%) suggesting significant association between fetal loss syndrome and low ADAMTS-13 values. We found significant association ($p<0.05$) between different modes of delivery and ADAMTS-13 concentration levels. The patients after the caesarean section have lower ADAMTS-13 concentration.

Conclusions: The study results suggest that plasma ADAMTS-13 deficiency produces a substantial effect on the development of fetal loss syndrome and late reproductive losses, early neonatal deaths, intrauterine growth retardation. Further research is necessary to identify if ADAMTS-13/vWF ratio can be crucial in developing different obstetric complications. ADAMTS-13 level is important in cesarean section planning since the metalloproteinase index decreases after this procedure.

Former publication: no

Supervisor: Vorobev Alexander associate professor Department of Obstetrics, Gynecology and Perinatal Medicine

Mechanism of Chaihu-guizhi Decoction on Perimenopausal syndrome based on Network Pharmacology

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Aim: To investigate the mechanism of Chaihu-guizhi Decoction on Perimenopausal syndrome based on network pharmacology.

Method: The Chinese medicine system pharmacology database and analysis platform (TCMSP) was used to search for all active compound components and targets of the nine herbs in the Chinese herbal compound of Chaihu-guizhi Decoction; The targets of perimenopausal syndrome were collected by DrugBank , and OMIM. Then disease targets were merged with the therapeutic targets of the drug to obtain the targets of the drug for the disease. A targets' PPI network was built by using STRING, the core targets of the drug for the disease were built by calculating degree by using CytoHubba. The ClueGO and DAVID database were used for GO biological process (GO-BP) analysis and KEGG enrichment analysis .

Results: Oral bioavailability (OB) ≥30%□drug- likeness (DL) ≥0.18 and half- life (HL) ≥8 h were chosen as the active compounds screening conditions. A total of 136 active components and 2916 component targets were obtained. 273 disesse targets were obtained and 27 targets were mapped to the drug targets successfully, of which quercetin, kaempferol, Liquiritin, Stigmasterol, Fumarine, etc. can act on more target genes□DThe common targets were mainly concentrated in 62 GO-BP and 12 KEGG signaling pathways to play a role in the treatment of PMS. GO function analysis found that key target genes in BP are mainly involved in the response to alpha-adrenergic receptor activity□Csteroid hormone mediated signaling pathway, synaptic transmission of dopaminergic, regulation of ventricular cardiac muscle cell membrane repolarization,etc. Enrichment analysis of the KEGG pathway showed that cGMP-PKG signaling pathway, adrenergic signaling in cardiomyocytes, retinol metabolism, calcium signaling pathway, metabolism of xenobiotics by cytochrome P450 were involved.

Conclusions: The theory and method of systemic pharmacology confirm the multi- components, multi- targets and multi- pathways treatment characteristics of Chaihu-guizhi decoction, which predicted that the possible mechanism of the treatment of PMS may be related to activating estrogen receptors, regulating monoamine neurotransmitter levels, inhibiting ventricular muscle cell complexity,which provide reference and theory for the basic research of the disease simultaneously.

Former publication: no

Supervisor: Yuxia MA professor Shandong University of Traditional Chinese Medicine

Myocardial involvement among rheumatoid arthritis patients using cardiovascular magnetic resonance imaging

Csenge Emese Fogarasi Semmelweis University medicine VI.

The assessment of myocardial involvement among rheumatoid arthritis patients using cardiovascular magnetic resonance imaging.

Introduction: Rheumatoid arthritis (RA) is a systemic autoimmune disease which affects the joints, but it has several extraarticular manifestations as well. RA patients are characterized by a high burden of vascular risk factors and a sedentary lifestyle. In addition, the leading cause of death among RA patients is cardiovascular disease. However, the effect of RA on the cardiovascular morphology, function and tissue characteristics is incompletely understood.

Aims: We aimed to assess the cardiac involvement of patients with RA using cardiovascular magnetic resonance (CMR) examination.

Methods: We examined adult RA patients who were diagnosed with the disease more than five years ago and have no cardiovascular disease. We recorded their medical history, anti-cyclic-citrullinated peptide concentration, disease activity score-28 (DAS-28) and cardiovascular risk factors. We performed the following sequences during the CMR examination: cine movie images for the assessment of the morphology, function and deformation of the heart, T1 and T2 mapping to identify tissue alterations of the myocardium as well as adenosine stress tests. We compared our results with sex- and age-matched controls (n=16).

Results: We involved 19 RA patients (six men, average age: 58±8.1years) whose diagnosis have established an average 20.16±12.1 years ago. Their DAS-28 score was 4.6±1.3. There was no difference in LV volumes between RA patients and controls, whilst we found slightly worse LV function among RA patients characterized by marginally lower LVEF (62.5±5.7 vs 66.1±4.6%; p=0.050), and a significantly decreased left ventricular global longitudinal strain (-22.5±2.4 vs -25.2±2.4%; p=0.002). RA patients had slightly increased T1 mapping values (974±32.1 vs 954.5±21.6 ms; p=0.046). Interestingly we also found a positive correlation between the T1 mapping time and the duration of the illness (r=0.569; p= 0.014).

Conclusions: Our initial results from the first comprehensive Hungarian study to assess the cardiovascular involvement of RA patients using CMR has shown a slightly decreased left ventricular systolic function of RA patients compared to age- and sex matched controls. Critically, our results suggest that the T1 mapping values increase with the progression of the disease, which may be because of the gradual fibrotic remodelling of the extracellular space of the myocardium.

Former publication: no

Supervisors: Hajnalka Vágó MD PhD associate professor Heart and Vascular Centre, Semmelweis University; Liliána Szabó MD PhD research fellow Heart and Vascular Centre, Semmelweis University

Transcriptomic Profiling of human granulosa cells between women with advanced maternal age with different ovarian reserves

Zhicheng Jia The First Clinical College, Shandong University of Traditional Chinese Medicine Medicine I.; Ying Guo Shandong University of Traditional Chinese Medicine Medicine I.

Introduction: Age alone has an effect on fertility. Women older than 35 are traditionally defined as women with advanced maternal age (AMA). The diminished ovarian reserve (DOR) is one of the most significant reasons for AMA infertility. Age-related diminished ovarian reserve is not absolute. Some AMA still have normal ovarian reserve(NOR).Most studies focused on comparing differences in fertility between women of childbearing age and the AMA. However, few studies have focused on the mechanisms of fertility differences between AMAs with different ovarian reserves.

Exploring the transcriptomic profile of human granulosa cells(GCs) between AMA with different ovarian reserves could lead to new ideas for mitigating age-related diminished ovarian reserve.

Aim: The purpose of this study was to analyze the transcriptomic profile of human GCs between AMA with different ovarian reserves.

Method: In this study, we collected GCs derived from AMA (age ≥35 years) of two different ovarian reserve cohorts.The study group (n = 15) comprised AMA with DOR. The diagnostic criteria adopted POSEIDON criteria:(a)age ≥35 years (B) AFC <5 or AMH <1.2 ng/ml. The control group (n = 15) was AMA with NOR and pure male factor infertility. RNA sequencing and bioinformatic tools were used to identify differentially expressed genes between GCs from two AMA cohorts.

Results: In total, 3531 statistically significant DEGs (|log2fc| >1,q < 0.05) were screened from the two groups, among which 1724 genes were up-regulated and 1807 genes were down-regulated in the DOR group.

Bioinformatics analysis revealed that the DEGs were considerably enriched in “immune system process,” “immune response,” “cell adhesion,” and “signal transduction”. Meanwhile, DEGs revealed the possible involvement of the “mitochondrial” , “PI3K-Akt signalling pathway” , “Apoptosis”and"MAPK signalling pathway" in age-related diminished ovarian reserve.

Conclusions: We presented the first data showing that the transcriptomic profile in GCs between AMA with different ovarian reserves. Combined with clinical ART data and pregnancy outcomes, we tried to provide a more intuitive and in-depth understanding of age-related diminished ovarian reserve with regard to immune response and apoptosis.

Former publication: no

Supervisor:

Application of TCM in nursing

Hanyue Zheng Shandong University of Traditional Chinese Medicine nursing I.

Introduction: Traditional Chinese medicine culture has a long history, extensive and profound. It sums up the experienced medical methods and has saved countless lives since ancient times. We have the responsibility and obligation to carry on and carry forward it to serve the people. In recent years, the state attaches great importance to the cause of TCM nursing. The Outline of the National Nursing Development Plan (2016-2020) proposes to promote the development of TCM nursing and give full play to the role of TCM nursing in disease treatment. The knowledge of TCM is increasingly widely used in the nursing field.

Aim: Through the integration of the field of traditional Chinese medicine and nursing, promote the characteristics of Chinese medicine nursing key specialty construction, to carry out the standardization of TCM nursing theory and skills training, various forms of Chinese medicine nursing scheme and suitable technology, to carry out specialized scientific research, promote scientific and technological innovation, let the characteristics and advantages of traditional Chinese medicine nursing get full play, and is widely used in clinical.

Method: 1. Strengthen talent training and establish a reasonably structured academic team

(1) Establish clear ideas and objectives of talent training:

(2) Attach importance to the construction of teachers.

(3) Reform the training methods of cultivating nursing talents.

(4) Adopt the phased target teaching method.

2. Vigorously carry out TCM nursing technology, attach importance to the inheritance of TCM and the cultivation of nursing skills.

3. Develop extended services and hold training courses.

4. Run the TCM nursing specialty website to carry out multi-directional exchanges.

Results: 1. Patient satisfaction.

2. Satisfaction with medical care.

3. Promotion of TCM knowledge

Conclusions: TCM nursing technology is an indispensable part of TCM culture, which is the key and foundation for the completion of TCM diagnosis and treatment. TCM nursing technology is established on the basis of TCM theory, has a profound cultural heritage, and requires nursing staff to have certain professional knowledge to standardize TCM nursing technology. At the same time, the addition of traditional Chinese medicine care, will improve the treatment effect, and reduce the pain of patients

Former publication: no

Supervisors: Wang Xuexia senior lecturer Lecturer in Nursing College of nursing;
Pan Yuling senior lecturer Anatomy lecturer College of Traditional Chinese Medicine

Comparison of embryo development and outcome of IVF treatments in normal weight and obese patients

Ayumi Funao Semmelweis University Medicine VI.

Introduction: Obesity is considered as the risk of infertility and abortion. Such adverse effects on fertility are including anovulation, longer time to conception, and miscarriage. These demonstrated effects in clinical outcomes may reflect the embryo development. The morphokinetic evaluation of embryos created in IVF treatment may help to understand the effect of obesity on early embryo development.

Aim: Herein we aimed to compare the characteristics of embryo development and IVF treatment outcomes in obese and normal weight patients.

Method: Data of 61 normal weight (18.5<BMI<25) and 61 obese (30<=BMI) patients were compared in this case-controll study. IVF cycles were paired according to female age, BMI, diagnosis, number of oocytes collected and number of embryos transferred. Fertilization rate, kinetics of embryo development, embryo morphology, pregnancy and implantation rate were compared in the two groups.

Results: BMI was 22.0±1.7 in normal weight group while it was 33.6±3,5 in obese group (P<0,001). Female age, length of hormonal stimulation and number of collected oocytes did not differ between groups. ICSI was performed less often in normal weight group compared to obese patients (39.3 vs 59.0, P=0,029) but the fertilization rate was similar in the two group. Speed of embryo development was comparable between groups. However, morphology score on day 2 was significantly higher in normal weight group (2.41±0.81 vs 2.24±0.76; P=0,0475). We also observed a tendency of higher blastocyst formation rate (63,8% vs 60.8%) and blastocyst quality (32.5% vs 30.4%) in normal weight patients compared to obese patients' group, but these differences was not significant. Implantation rate (23.8% vs 20.5%) and clinical pregnancy rate (29.5% vs 26.2%) was also higher in the normal weight group but differences did not prove to be statistically significant either.

Conclusions: In this case-control study we found a similar embryo development in normal weight and obese patient. However, we observed a tendency of better blastocyst morphology, and higher implantation and clinical pregnancy rate in normal weight patients. These findings should be proved by a further study with higher case numbers.

Former publication: no

Supervisor: Péter Fancsovits senior research fellow Faculty of Medicine Department of Obstetrics and Gynecology Division of Assisted Reproduction

Effects of acupuncture synchronized rehabilitation therapy on lower limb motor function and activities of daily living in stroke patients

Zifu Yu Shandong University of Traditional Chinese Medicine Rehabilitation Medicine & Physical Therapy II.

Introduction: Most stroke patients have varying degrees of somatic motor dysfunction, among which balance and lower limb motor dysfunction have a significant impact on walking ability, independence in daily living, and quality of life in stroke patients.

Aim: To observe the effects of acupuncture synchronized rehabilitation therapy on motor function and activities of daily living in stroke patients.

Method: Fifty-six patients with hemiplegia after stroke admitted to the rehabilitation department of the Affiliated Hospital of Shandong University of Traditional Chinese Medicine from December 2021 to August 2022 were selected as study subjects. The patients were divided into control group (n=28) and experimental group (n=28) using the random number table method. The control group was treated with conventional rehabilitation therapy, and the experimental group was treated with acupuncture synchronized rehabilitation therapy (i.e., head acupuncture and intradermal acupuncture were performed simultaneously with conventional rehabilitation therapy). Treatment was given 5 days a week for 8 weeks. Before treatment and after 8 weeks of treatment, the Fugl-Meyer Assessment-Lower Extremities (FMA-LE), Berg Balance Scale (BBS) and Modified Barthel Index (MBI) were compared between the two groups, and the center-of-pressure motion trajectory length and motion ellipse area within 30 s were measured using the PRO-KIN balance meter.

Results: All patients successfully completed the rehabilitation training without adverse events. After 8 weeks of treatment, FMA-LE, BBS, and MBI in both groups were significantly improved compared with those before treatment ($t > 4.479$, $P < 0.001$), and motion trajectory length and motion ellipse area in both groups were significantly decreased ($t > 38.236$, $P < 0.001$), and FMA-LE, BBS, motion trajectory length, motion ellipse area and MBI in the experimental group were significantly better than those in the control group ($t > 2.075$, $P < 0.05$).

Conclusions: Acupuncture synchronized rehabilitation therapy can promote the recovery of lower limb motor function and activities of daily living in stroke patients.

Former publication:

Yu zifu et al.Effects of acupuncture movement therapy on motor function and activities of daily living in stroke patients :A meta-analysis [J]. Chin J Phys Med Rehabil.2022,44(05):446-449.

Supervisor: Liu xihua professor the Affiliated Hospital of Shandong University of Traditional Chinese Medicine rehabilitation department

Ejaculate parameters depending on the hemodynamic type of varicocele

Zoran Trajkovski Peoples' Friendship University of Russia Medicine II.

Introduction: Varicocele is an enlargement of the veins in the spermatic cord. It is a prevalent disease of the male urogenital system, and it has been proven that in more than 30% of cases leads to impaired sperm fertility. The incidence of varicocele increases by about 10% during each decade of life and exceeds 70% by age 80.

Aim: Evaluate semen analysis parameters depending on the hemodynamic type of varicocele.

Method: The study included 62 male patients. Inclusion criteria: age from 18 to 50 years, presence of varicose veins of the spermatic cord confirmed by scrotum palpation. We assessed the hemodynamic types of varicocele (renospermatic, ileospermatic, mixed) using functional tests performed during scrotal ultrasound examination. Ultrasound of the scrotum was performed in both grey-scale and triplex scanning modes. We paid particular attention to the blood flow in the veins of the spermatic cord and the measurement of the size of the testis. We assessed the presence of infertility in men by changes in the spermiogram. Statistical processing of the material was carried out using STATISTICA 8.0.

Results: The average age of all patients was 34±16 years. According to ultrasound data, the renospermatic type of varicocele was detected in 47 (75.8%) patients, the ileospermatic type - in 6 (9.6%), and the mixed type of varicocele in the remaining 9 (14.5%) patients. In most cases, in men with renospermatic and ileospermatic types of varicocele, testicular volume was within the reference values (24.2±1.3 cm3). In men with mixed type of varicocele, the average testicular volume was 16.9±24 cm3. Among patients with renospermatic type of varicocele, oligozoospermia was detected in 2 (4.2%) men, asthenozoospermia in 38 (80.9%), teratozoospermia in 4 (8.5%) and azoospermia in 3 (6.3%). Among patients with ileospermatic type of varicocele, asthenozoospermia was detected in 1 (16.7%) patient, teratozoospermia in 3 (50%), and azoospermia in 2 (33.3%). Among patients with a mixed type of varicocele, oligozoospermia was detected in 1 (11.1%) man, asthenozoospermia in 2 (22.2%), teratozoospermia in 3 (33.3%), azoospermia in 3 (33.3%).

Conclusions: The renospermatic type of varicocele is the most frequent (75.8%). The mixed type of varicocele has the highest impact on reproductive function in men, proven by the severity of the impairment of spermatogenesis.

Former publication: no

Supervisor: Kulchenko N.G. senior lecturer Department of Human Anatomy

Exercise blood glucose response in athletes during a vita maxima treadmill test

Titanilla Takács Semmelweis University Medicine V.;
Brigitta Babis Semmelweis University Medicina VI.

Introduction: Muscle glycogen is considered to be the most important energy substrate for muscles during exercise. As sport performance, muscle work efficiency and fatigue can be affected by muscle glycogen deposits therefore a well-designed diet is essential for athletes to reach their best performance.

Aim: Our aim was to study the blood glucose response to exercise and the correlations with cardiopulmonary exercise testing parameters, especially blood lactate and VO2max during vita maxima treadmill test.

Method: Sports cardiology screening exams: patient history, laboratory tests, ECG, echocardiography, body composition analysis, cardiopulmonary exercise test with 2 minute lactate measurements and blood glucose measurements at rest, peak exercise, and at 5-minute recovery. 4 groups were created according to exercise glucose response based on the rest-peak and peak-recovery change: decrease-increase (De-In), increase-increase (In-In), increase- decrease (In-De), decrease-decrease (De-De).

Results: 353 tests of 227 elite athletes (19,4 ± 5,8 years; 188 male; 97 basketball players, 91 swimmers, 39 football players) were included. Athletes with resting blood glucose level between 4.3-6.0 mmol/L (n =291) had lower peak lactate (8.8 ± 2.4 vs. 9.6 ± 3.0 mmol/L, $p<0.05$) than those with blood glucose above 6.0 mmol/L (n = 62). Based on blood glucose response to exercise, the distribution of the 4 groups are: De-In, n = 176 (50%); In-In, n = 165 (47%); In-De, n = 11 (3%); De-De, n = 1. The De-In group had better performance (352.3 ± 68.2 vs. 336.6 ± 72.8 watts, $p<0.05$) and lower peak lactate (8.6 ± 2.5 vs. 9.4 ± 2.5 mmol/L, $p = 0.001$) compared to the In-In group. Male swimmers in the In-In group had higher VO_2max compared to the male swimmers in the De-In group (59.8 ± 4.2 vs. 57.4 ± 5.3 ml/min/kg, $p <0.05$). Male swimmers in the In-In group had lower body fat percentage compared to the male swimmers in the De-In group (9.7 ± 2.3 vs. 11.0 ± 3.3%, $p<0.05$).

Conclusions: In half of the cases peak exercise blood glucose level was lower than resting, which was associated with better performance and lower peak lactate values. Measuring blood glucose and optimizing sports nutrition strategies can help athletes to get personalized diets in order to increase performance.

Former publication: no

Supervisors: Dr. Nóra Sydó senior lecturer Heart and Vascular Centre- Faculty of Cardiology and Sports Medicine;
Dr. Emese Csulak PhD student Heart and Vascular Centre-Faculty of Cardiology

Hygienic assessment of eating behavior stereotypes among medical university students in the Russian Federation

Amaliia Gulieva I.M. Sechenov First Moscow State Medical University Medicine VI.;
Olga Sukhareva I.M. Sechenov First Moscow State Medical University Medicine VI.

Introduction: Noncommunicable diseases cause 60% of deaths on the planet. Nutrition plays a significant role in the emergence and development of a number of noninfectious diseases, and suboptimal stereotype of eating behavior underlies the pathogenesis of such noninfectious diseases as obesity, type 2 diabetes, etc.

Aim: To assess the stereotype of eating behavior of medical university students in the Russian Federation as a risk factor for the development of diet-related diseases.

Method: The stereotype of eating behavior in 104 medical university students aged 21 to 33 years (68 women and 36 men) was studied. Data of specially designed questionnaires with assessment of anthropometric indices, frequency and intervals of meals in the periods of school (retrospectively) and university, frequency of food use in the diet of the recommended daily and weekly choice, as well as sources of added sugar and hidden fat were analyzed.

Results: It was found that most of the students (54.8%) live separately from their parents, preferring to eat in cafes during the day, 35.6% of them do not eat breakfast before classes at the university. A negative tendency was revealed regarding the inclusion of products recommended for daily consumption in the diet: only 27,9% of the respondents include vegetables in their daily diet, 35,6% include fruits, 51% include meat and meat products, and 33,7% include milk and dairy products. At the same time 48-69% of students daily include in their diet sugary soft drinks, juices and 29%-fast food. The analysis of anthropometric indicators revealed that 68% of the studied have normal body weight (BMI=21.8±1.8), 19.4% have excessive body weight or obesity (BMI=29.2±4.3) and 12.6% have body weight deficit (BMI=17.7±0.5).

Conclusions: The study showed that a significant proportion of students have impaired basic eating habits related to the formation of the principles of healthy eating, such as the frequency of inclusion of the main groups of products of daily choice (milk, meat, vegetables and fruit) and the frequency of meals during the day. An important role in the prevention of diet-related non-infectious chronic diseases is played by food habits established in the family at a young age, a significant proportion of students (19.4%) have excess body weight or obesity, which is a consequence of already formed suboptimal eating behavior.

Former publication: no

Supervisor: Denisova E.L. associate professor I. M. Sechenov First Moscow State Medical University

Investigation of dermatological parameters and hand hygiene correlations.

Mahita Darbha Semmelweis University Medicine VI.

Introduction: Hand hygiene is an essential practice for healthcare workers (HCWs) in delivering safe patient care. HCWs can enhance patient safety by decreasing the risk of infections and microbial transmission with effective hand hygiene methods. Individuals' dermatological parameters in relation to alcohol based hand rubs (ABHRs) physical and chemical properties may impact the application time and efficacy of hand rubs. Currently there are no studies that can explain whether dermatological parameters can influence hand rub application time and spread.

Aim: In this study we examined whether there is any change in coverage of ABHRs based on dermatological parameters such as hand size, skin temperature, hydration and oil content.

Method: This study was performed on 87 medical students in a clinical setting. The skin (both palm and dorsum) parameters that were investigated included temperature, hydration, oil content, hand size. The temperature was measured with a digital thermometer (CTR1000, Wika, Canada); hydration and oil content were measured using a hygrometer (skin moisture monito, BGJOY, China). Disinfected hand coverage was assessed by utilising fluorescent-traced ABHRs (liquid, gel and foam) and a digital, fully automated system, Semmelweis Scanner (HandInScan Zrt, Debrecen, Hungary). Application times of the ABHRs were measured with a stopwatch. The dripping was examined with UV photography.

Results: Our results showed that with a volume of 1.5ml ABHR, liquids had a higher missed hand surface coverage (5.6% missed) in comparison to gel (3.1%) or foam (2.1%). Similar results were also seen with 3ml volume of ABHRs. Liquids had worse coverage with increased hand temperature with dropping pass rates (42% at >34°C to 11% at >36°C), while gels achieved better results (5% at >34°C to 13% at >36°C). In general, the drying time of the ABHRs were shown to be decreased as the skin temperature increased. The experiments were performed in winter and summer and due to the strong seasonal effects, the results of the hydration of hands varied greatly.

Conclusions: In conclusion, some formulations of ABHRs can achieve better outcomes in relation to different dermatological parameters. However, it is important to consider for the external environment as it can have an influence on the skin as well as ABHR formulation.

Former publication: no

Supervisor: Dr. Constantinos Voniatis assistant research fellow Department of Surgery,Transplantation and Gastroenterology, Semmelweis University.

Impact of COVID-19 vaccination on community adherence to a comprehensive package of measures to prevent infection and control the spread of the SARS-CoV-2 virus.

Valeria Stener I.M. Sechenov First Moscow State Medical University Medicine III.

Introduction: Studies of evolutionary strains of SARS-CoV-2 allow us to conclude that each new variant is highly contagious. The maximum efficiency in reducing the incidence, breaking the chain of infections can be achieved by implementing the entire range of preventive measures. Vaccination, together with the entire comprehensive package of measures, can significantly reduce the incidence of not only COVID-19, but also other respiratory diseases.

Aim: Identify and assess the expected impact of COVID-19 vaccination on community adherence to a comprehensive infection prevention package.

Method: An indirect continuous anonymous sociological survey has been conducted since November 2021 to February 2022. From a random sample of 1,000 respondents the response rate was 37%. All respondents were divided into two groups: vaccinated 66% and un vaccinated 34%. The survey was aimed at studying the reasons for compliance with protective measures during the introduction and lifting of quarantine measures. In the group of vaccinated, the refusal after the course of vaccination was additionally studied. The awareness of respondents about the safety of the vaccinated in terms of virus transmission was studied. The received information was processed by standard methods of applied statistics.

Results: After the lifting of quarantine restrictions 20% of the non-vaccinated group ceased to comply with protective measures. After the completion of the vaccination course 9% of the respondents ceased to comply with protective measures, then a decrease to 7%. Comply with protective measures due to responsibility for the health of other people 61% of the vaccinated and 48% of the un vaccinated. 58% of the vaccinated and 55% of the un vaccinated are convinced that vaccinated people are carriers of the virus. They are also taking protective measures. But 39% of the vaccinated and 35% of the un vaccinated consider a vaccinated person to be completely safe for others.

Conclusions: The results of the study demonstrated a social responsibility of vaccinated citizens. But the population underestimates the need for comprehensive measures to combat the spread of the virus, especially after a course of vaccination. To achieve maximum effectiveness in preventing the spread of COVID-19, it is necessary to increase the awareness of protective measures among the population.

Former publication: no

Supervisor: N.L.Yamschikova associate professor I.M. Sechenov First Moscow State Medicine University under Ministry of Health of the Russian Federaton (Sechenov University)

Prevalence of age-related hypogonadism in patients with benign prostatic hyperplasia.

Alexander Grechko Peoples' Friendship University of Russia Medicine II.

Introduction: increasing the number of elderly people requires special attention to their health and quality of life. Late - onset hypogonadism , lower urinary tract symptoms (LUTS) associated with benign prostatic hyperplasia (BPH) are the most common diseases in older men.

Aim: To reveal the prevalence of the late - onset hypogonadism in patients with BPH.

Method: We examined 180 men with complaints of difficulty urinating over 50 years. We conducted clinical examination, survey on IPSS, QOL questionnaires, ultrasound of all patients. We evaluated the androgen status of men according to the AMS questionnaire and determination of total testosterone.

Results: In 78(43.3%) men with BPH, the average score for the AMS questionnaire was 28.0+6.3. Of these, 62(34.4%) men had total testosterone within the normal range. In the remaining 16 (8.8%) patients, total testosterone was < 10.2+0.6 nmol/l, we decided that this is late - onset hypogonadism ($p<0.05$). In other 102 (73.3%) patients with BPH, the average score in the AMS questionnaire was 47.3+9.1 ($p<0.05$). They had an average total testosterone level of 7.3+0.7 nmol / l ($p<0.05$).

Conclusions: in men with BPH and late - onset hypogonadism occurs in 67.7% of cases.

Former publication: no

Supervisor: Nina G. Kulchenko professor Department of Human Anatomy, Peoples' Friendship University of Russia, Moscow, Russia

The problem of taking biologically active additives by the population of the Russian Federation

Kirill Kuzmin I.M. Sechenov First Moscow State Medical University Public Health VI.

Introduction: Recently, the popularity of the use of biologically active food additives has grown in many segments of the population. Often people start taking such funds under the wagging of advertising. The problem of uncontrolled intake of biologically active additives (dietary supplements) is the ambiguous effect on health without medical control of the consumption of certain components of biologically active additives, which often have interactions of synergism, combined action, antagonism.

Aim: The purpose of this work was to assess the consumption of biologically active additives by the population of the Russian Federation.

Method: Methods of logical and literary analysis were used. The survey was conducted in the format of a formalized telephone interview on 08.04.2021, in which 1,600 respondents in the age group of 18 years and older took part.

Results: According to the survey, 52% of respondents have taken any vitamins or minerals over the past year. At the same time, the percentage of women who used supplements was higher than among men – 61% against 40% of respondents. Also, older age groups are less likely to take vitamins than young and middle-aged people (49%-53%).

The priority supplements were vitamin D3 (24%) and vitamin complexes, multivitamins, multivitamins (17%). 58% go to the doctor before taking vitamins, but only 10% of them take tests before taking them. The survey showed that 36% of Russians consider it possible to take vitamins without a doctor's appointment.

Conclusions: The problem of micronutrient deficiency remains urgent. It can be caused by a low content in the diet of the main food sources of certain vitamins and minerals, an increased need for a number of nutrients due to external factors, diseases, lifestyle, as well as a violation of the assimilation and metabolism of these nutrients. Before taking dietary supplements, a medical correction of the micronutrient status is necessary, which consists in assessing the degree of deficiency of vitamins and minerals, identifying the causes of this deficiency and developing a program of dietary correction, including the use of dietary supplements.

Former publication: no

Supervisor: Anna Makarova scientific advisor Institute of Public Health

Mycobacterium tuberculosis, patterns of sensitivity and resistance to antitubercular drugs, in extrapulmonary lesions

Attila Kopenetz Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca Medicine VI.

Introduction: In Romania there is a significant number of pathology associated with Mycobacterium tuberculosis (MTB), that is why this country is classified as an endemic region. Consequently an early diagnosis followed by an efficient treatment, including Rifampicin, Isoniazid, Pyrazinamide, Ethambutol, is needed so that the infection is kept under control. A concerning factor is represented by the growing number of MTB strains, that are resistant to the antitubercular drugs. These can present resistance to one specific drug or to be multi drug resistant (MDR), in that case both Rifampicin and Isoniazid are ineffective.

Aim: In this study, I would like to research and determine the presence and frequency of these drug resistant strains from several extrapulmonary tuberculous lesions to have a global image of their widespread in this region.

Method: Samples from different organs were collected (including pleural fluid, urine etc.), during 2018-2020 from suspected patients, that were analyzed by the Reference laboratory of Leon Daniello Hospital in Cluj. The presence of MTB was confirmed by Ziehl-Neelsen staining, Löwenstein-Jensen culture. The pathogen's sensitivity for Rifampicin and Isoniazid was determined by molecular tests, detecting genes involved in genotypical resistance: GenXpert (rpoB), Genotype (rpoB, inhA, katG) and by antibiograms, for the phenotypical resistance.

Results: 1787 samples were tested, of which 100(5,59%) were found positive, which belonged to 87 patients. In 45 cases out of 100, the specimens were tested for their sensitivity for antitubercular drugs, 1 was found to be resistant to Rifampicin (2,22%), 1 to Isoniazid (2,22%), and one to be an MDR (2,22%).

Conclusions: Tuberculosis is still present in our society, because of the growing number of drug-resistant stains it will imply a huge effort of the medical community to keep it under control and to minimize it's effect on our life. Furthermore scientific research in this field, should be supported so that new drugs could be developed in the upcoming years.

Former publication: no

Supervisor: dr. Luminiţa Matroş associate professor Department of Microbiology

Sex-related proteomic differences of exercise-induced myocardial hypertrophy

Olívia Bottlik Semmelweis University Medicine VI.; Hanna Oberling Semmelweis University Medicine III.

Introduction: Regular physical activity contributes to the alteration of cardiac structure and function. However, the extent of exercise-induced left ventricular (LV) hypertrophy and functional changes shows significant sex-related differences, the molecular background of which is not fully elucidated.

Aim: We aimed at providing the proteomic characterization of long-term, intense exercise-induced LV myocardial hypertrophy in a rat model, focusing on sex-related differences.

Method: Young, adult Wistar rats were divided into trained (FEx) and control female (FCo), as well as trained (MEx) and control male (MCo) groups. In the trained groups, athlete's heart was induced by a 12-week swimming protocol. We confirmed myocardial hypertrophy by echocardiography and functional adaptation by pressure-volume analysis. Proteomic measurements were performed on proteins isolated from our LV myocardial samples, based on liquid chromatography-coupled mass spectrometry.

Results: Exercise was associated with significant myocardial weight increase, proven by echocardiographic evaluation and post-mortem heart weighting. Exercise-induced hypertrophy was more pronounced in females (tibial length-normalized LV muscle mass: +17.4% ME vs. MC, +31.0% FE vs. FC). LV contractility improved to the same extent in both trained groups. Relative expression of 3074 proteins was measured. We observed significant changes in the expression of 229 proteins in males, and 599 in females after exercise, compared to the level of same-sex controls. Based on our gene ontological analysis, physiological LV remodelling in females is characterized by upregulation of proteins in cellular respiration and fatty acid oxidation, whereas in males, proteins that bind to the actin cytoskeleton are increased primarily.

Conclusions: Our data suggests that physiological LV hypertrophy due to regular, balanced exercise is associated with sex-specific changes in the myocardial proteome. Our analysis could contribute to understanding the development of physiological myocardial hypertrophy.

Former publication: no

Supervisors: Attila Oláh MD assistant lecturer Heart and Vascular Center. Department of Cardiology Semmelweis University; Bálint András Barta MD PhD student Heart and Vascular Center, Department of Cardiology, Semmelweis University

Anatomic and functional outcomes of pars plana vitrectomy performed on eyes with primary rhegmatogenous retinal detachment

Emilia Avril Clapp Semmelweis University Medicine VI.

Introduction: Retinal detachment is an ophthalmological emergency and its primary method of treatment is pars plana vitrectomy (PPV). Without the aid of official treatment guidelines, it is particularly relevant to understand the risk factors for surgical and functional failure in order to customise surgery for optimal results.

Aim: Our aim was to investigate possible risk factors for anatomic and functional failure of PPV performed on eyes with primary rhegmatogenous retinal detachment (RRD).

Method: We retrospectively reviewed all cases of RRD undergoing PPV performed by five surgeons at the Semmelweis University Ophthalmology Department, between January 2017 and June 2020. Exclusion criteria were: previous vitreoretinal surgery; follow-up time <6 months; tractional or exudative etiology. Primary anatomic success was determined at the final follow-up and defined as retinal reattachment after a single operation. Final anatomic success was defined as retinal reattachment having undergone one or more retinal reattachment procedures. Functional success was estimated using the best corrected visual acuities (BCVA) during the follow-up period. Statistical analysis was performed using SPSS.

Results: 394 eyes of 394 patients were included in our investigation. Primary anatomic success was achieved in 75.6% eyes (298/394), whereas final anatomic success was 98.7% (389/394). Mean postoperative BCVA was 0.39 ±0.48 logMAR. Factors associated with primary anatomic failure of PPV were: older age ($p=0.036$), pseudophakia ($p=0.011$), extent of detachment ($p=0.031$), multiple breaks ($p=0.001$), inferior location of breaks ($p=0.021$) and postoperative proliferative vitreoretinopathy (PVR) ($p<0.001$). Functional success was associated with macular attachment ($p<0.001$); smaller detachments ($p<0.001$); the absence of preoperative PVR ($p<0.001$); a lesser number of breaks ($p=0.001$); higher preoperative BCVAs ($p<0.001$); and the absence of postoperative PVR ($p=0.001$).

Conclusions: We demonstrated that reasonable anatomic success rates and high functional outcomes can be attained with PPV in a series of retinal detachments of any complexity. While we found several significant risk factors for the failure of PPV, it is a future research challenge to disclose the pathomechanism of the failure of RRD surgery and to propose effective measures to counter these difficulties.

Former publication: no

Supervisor: András Papp associate professor Semmelweis University Department of Ophthalmology

Application of "sticky tooth" and extraction site development for preservation of advanced extraction defects. 3D radiographic evaluation

Anders Vatland Semmelweis University Dentistry V.

Introduction: Human autogenous tooth bone grafts (ABT) could be considered as a potential alternative to xenogeneic grafting materials or autogenous bone grafts for the preservation of extraction site. As it was presented previously, with both osteoconductive, osteoinductive and osteogenic properties it could facilitate the formation of trabecular bone within the extraction socket. However, to further enhance the positive effect of ATB it may be combined with specific surgical processes.

Aim: Hence, the aim of the study was to evaluate the efficacy of combined effects of ATB mixed with autogenous platelet rich fibrin (PRF) and the extraction site development (XSD) technique for the preservation of advanced extraction defects.

Method: A total of 4 patients presenting for extraction were enrolled in the current examination. Additionally, to the original XDS approach, the extraction site was filled and over augmented with the mixture of ATB and PRF ("stick tooth"). Cone-beam computed tomography scans were acquired prior and 6 months following surgery and results were evaluated with 3D subtraction analysis.

Results: After 6 months hard tissue formation was present at the extraction site in all cases. The average volumetric hard tissue gain was 0.45 ± 0.16 cmł. Dental implants could be placed in all sites without further hard tissue augmentation.

Conclusions: Application of autogenous tooth bone grafts proved to be effective for alveolar ridge preservation in advanced extraction defects. However, prospective studied are necessary to further evaluate the clinical and radiographic results.

Former publication: no

Supervisor: Prof. Dr. Windisch Péter Heaf of Department Department of Periodontology

Breastfeeding from the ancient world to the present.

Mariia Sotnikova Voronezh State Medical University named after N.N. Burdenko Medicine V.

Introduction: Breastfeeding has had its own traditions at different times. As modern views on child feeding evolve, we realize that breast milk provides the best nutrition from birth.

Aim: To study the history of breastfeeding from ancient times to the present and the policy of breastfeeding at the present stage, including in the Voronezh region.

Method: collective, analytical, historical and descriptive.

Results: In the ancient world, breastfeeding lasted 24-36 months. In Ancient Egypt there were prescriptions to increase lactation. Also, in Ancient India, they started feeding with ghee and breastfeeding on the fifth day of the baby's life. In Ancient China it was believed that "the only food for a child is milk". In Ancient Greece, colostrum was considered dangerous. In Europe during the Middle Ages, breastfeeding was allowed from the 14th day of the baby's life. In the 12th century in France, noblemen's children were mainly breastfed by nurses. The concept of "feeding on demand" was first introduced in England in the 18th century.

Using the baby-led feeding method, peasants in Russian villages fed their children for up to two years. In Russia, there were "Milk Drop" baby consultations. In the Soviet Union, there were nurseries, but breastfeeding was recommended in the first six months of a baby's life.

WHO and UNICEF launched the Baby-friendly Hospital Initiative in 1991. The Regional Breastfeeding Support Center was established in 2015 on the basis of Voronezh City Polyclinic No. 1 to promote breastfeeding in the Voronezh region. The Center provides training in breastfeeding, certification and recertification as a "Baby-Friendly Hospital," and nutrition evaluation for children of the first year of life.

Conclusions: "History is the witness that testifies to the passing of time; it illuminates reality, vitalizes memory, provides guidance in daily life, and brings us tidings of antiquity." Cicero. Views on breastfeeding have changed through the ages. However, one thing does not change—breastfeeding is the best nutrition for babies from birth! Because of the Baby Friendly Hospital Initiative, medical organizations try to help support and promote breastfeeding. The Regional Breastfeeding Support Center has been working in Voronezh since 2015 to help mothers with breastfeeding issues.

Former publication: no

Supervisors: Moshurova Larisa Vasilevna associate professor The Faculty of Paediatrics. The Department of Propaedeutics of Children's Diseases and Polyclinic Paediatrics; Ivanova Anna Alexandrovna assistant lecturer The Faculty of Paediatrics. The Department of Propaedeutics of Children's Diseases and Polyclinic Paediatrics

Chronic Kidney Disease and Oxidative Stress

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Introduction: According to the World Health Organization (WHO), as many as 10 million people die of kidney disease worldwide every year. By 2040, chronic kidney disease (CKD) is expected to be the fifth leading cause of death in the world. Chronic kidney disease can lead to increased risk of cardiovascular complications, renal failure and mortality. There is a lot of evidence that oxidative stress plays a key role in the pathogenesis of CKD. In the progression of CKD, oxidative stress plays an important role in renal injury and subsequent nephron loss, renal function decline, and eventual end-stage renal disease (ESKD). Oxidative stress is commonly observed in several kidney diseases through elevated levels of intracellular reactive oxygen species (ROS) and / or reactive nitrogen (RNS). Although researchers have shown that ROS levels are elevated in CKD patients and animal models of renal injury, the potential source of increased ROS and the affected signaling mechanisms (leading to renal injury) are still unclear. We have previously reported that intracellular oxidative stress is associated with increased 1-deoxysphingolipids in CKD patients in vivo and in vitro. Therefore, exploring 1-deoxysphingolipids and related cytotoxicity processes is an important direction for studying oxidative stress and preventing chronic kidney disease.

Aim: Chronic kidney disease (CKD) leads to elevation of 1-deoxysphingolipids (1-deoxySL). The increase of 1-deoxySL in turn results in mitochondrial damage and oxidative stress, and the further progression of CKD. The purpose of this study was to investigate the effect of 1-deoxy SL on cytotoxicity.

Method: In this study, we performed an untargeted metabolomic analysis and a series of functional tests to reveal that 1-deoxysphinganine (doxSA) induced mitochondrial ROS following mitochondrial damage and inhibition of mitochondrial energy production.

Results: Abnormal 1-deoxysphingolipid levels exert cytotoxic effects leading to mitochondrial damage and oxidative stress in renal tubule cells.In addition, quantification of ATP, the final product of mitochondrial citrate cycle, was reduced in HK-2 cells subjected to 1-deoxySA treatment.

Conclusions: Oxidative stress has been related to CKD and 1-deoxysphingolipid increase.

Former publication: no

Supervisor: Zhibo Gai associate professor experiment center Chinese Medicine Innovation Institute

Development of a universal method for assessing the loss of skills and quality of life of students from 20 to 22 years old with a directed choice of optical correction in a certain age group "Looking into the future"

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Introduction: Myopia is a common eye disorder that usually involves an increase in the axial length of the eye. Nearsightedness greater than -6.00 diopters is associated with a higher risk of eye disease. The prevalence of myopia is rapidly increasing worldwide. According to some data, it is estimated that about half of the population is myopic. The prevalence and progression of myopia in young adults is thought to be related to changes in the daily visual environment. Therefore, efforts to control the progression of myopia and prevent myopia have become an international public health priority.Visual impairment at a young age has lifelong consequences, both for the person himself and for his family. This affects the development of a person, his education and skills, requires the care of a family and specialists. Low vision affects both his abilities and social prospects.

Aim: Identification of patterns of development of pathological changes in the retina and their prediction with the possibility of selective optical correction.

Method: Conducting a survey on the tested IVI-C questionnaire in students with low vision aged 20 to 22 years and selective comparison of the results before and after correction.

Results: Among students with varying degrees of myopia, a survey was conducted according to the tested IVI-C questionnaire containing 30 questions: "Do you confidently get to the university, do you confidently use public transport?" and others with answer options: Always, Almost always, Sometimes, Almost never, Never, No, for other reasons. The data obtained were converted into scores, which made it possible to identify a direct relationship about the negative impact of a high degree of myopia on many areas of students' activities. It follows from this that the tested IVI-C questionnaire is suitable for studying the influence of the degree of myopia on the quality of life of students and their activities.

Conclusions: The modified IVI-C used in this work, a reliable unidirectional, valid method for assessing the quality of life of students with low vision, used as an adjunct to clinical and functional studies of the organ of vision, to assess the ability of people with low vision to communicate and take part in daily activities, confirmed that spectacle correction is an optimal and universal method of optical correction.

Former publication: no

Supervisor: Kovalevskaia Mariia Alexandrovna professor Department of Ophthalmology

The experience of COPD patients and their relatives in advance care planning□Fa meta-synthesis of qualitative research

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Introduction: Chronic obstructive pulmonary disease (COPD) is characterized by unpredictable changes in the condition, and patients often have difficulty expressing their wishes during the acute exacerbation period.Advance Care Planning (ACP) refers to the process by which adults with decision-making ability communicate with medical staff, family members, etc. about values and future medical care intentions with medical staff and family members with clear awareness. ACP aims to respect patients' right to know and autonomy, improve family medical communication, promote shared decision-making among doctors, nursing care, patients and their families, reduce unnecessary treatment or hospitalization, and help improve the quality of life at the end of life.Therefore, this study uses meta-integration to explore the feelings and experiences of COPD patients and their families participating in ACP, and provide a reference for the application of ACP in COPD patients.

Aim: To conduct a meta-synthesis of the experience of chronic obstructive pulmonary disease (COPD) patients and their relatives in advance care planning□iACP□jand provide evidence-based guidance for the development and implementation of ACP in COPD patients.

Method: 5 databases□iPubMed□CThe Cochrane Library□CEBSCO□CWeb of science□CEmbase□j were included to retrieve the literature on the experience of COPD patients and their relatives about ACP intervention from inception until November 2022. Meta-aggregation was used to conduct the synthesis.

Results: 42 findings were extracted from 9 qualified studies and integrated into 8 categories. 3 synthesis results were summarized from the 8 categories. Synthesis result 1□FCOPD patients and their families' awareness of ACP□GSynthesis result 2□FBarriers to participation in ACP for COPD patients and their families□GSynthesis result 3□FRecommendations for the implementation of ACP by patients and families with COPD.

Conclusions: COPD patients face multiple barriers in ACP, and multi-faceted personnel need to work together to obtain high-quality ACP communication, thereby improving the quality of life of COPD patients at the end of life.

Former publication: no

Supervisor: Liming Lv professor head of teaching and research section school of nursing

Fractal phototherapy in correction of color vision deficiency with myopia

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Introduction: myopia is one of the most common pathology of refraction in the world, which is one of the risk factors for the development of glaucoma and affects the quality of life.

The number of people with myopia is expected to increase worldwide by 2050 to 5 billion people. Violations of the light perception system of the eye accompanies any type of ametropia, because they show the function of the retina and optic nerve.

Aim: to study the effect of low-intensity fractal light stimulation on visual acuity and color perception in group of students with varying degrees of myopia.

Methods: The Sivtsev's table, Farnsworth-Munsell 100 HUE TEST, fractal light stimulation device.

Results: during the analysis of the initial state of the subjects obtained using the Farnsworth-Munsell test before fractal light stimulation therapy, it was found that the total error score (TES) in the group with medium myopia (group 2) was higher than in students with mild myopia (group 1) (OD by 35.6±7.21 TES, OS by 31.45±2.15 TES). After the therapy in clinical group 2 there was a decrease in the number of errors by an average of 25%. Students with low myopia have an improvement in color perception according to the Mansell test by an average of 8%. The number of errors (TES) in the group with medium myopia (group 2) is higher than in students with mild myopia (group 1) (OD by 19.3±10.64 TES, OS by 4.83±3.58 TES). Students with moderate myopia showed colour weakness for blue and cyan. However, low myopia group showed a yellow-green colour weakness.

After the therapy, four subjects have an increase in visual acuity and changes in the type of colour deficiency. Low myopic are characterized by colour weakness mainly on the yellow and yellow-green spectrum with the manifestation of blue. Students with moderate myopia were characterized by colour weakness on the blue, blue-green, cyanide and on the yellow-green spectrum.

Conclusion: it is noted the effectiveness of using the device of low-intensity fractal light stimulation with methodical use during 10 sessions of daily therapy lasting 15 minutes (for both eyes). Subjectively patients observed an improvement in the quality of vision throughout the day, as well as the absence of eye fatigue. Some subjects noted appreciable improvement in visual acuity, despite the identical values of this indicator before and after therapy.

Former publication: no

Supervisors: Kovalevskaya Maria professor Department of Ophtalmology; Antonyan Veronika assistant lecturer Department of Ophtalmology

Investigation of Cyranose device's applicability in intraoral halitosis

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Introduction: The measurement of volatile sulphur compound (VSC) is a widely accepted diagnostic method for halitosis; gas chromatography and electrochemical measurement are the most common. The gold standard organoleptic method has been effaced because of the COVID-19 pandemic, as the examination is not feasible, keeping infection control in mind. Several alternative techniques gained popularity; the most promising ones are the chemical sensors such as electronic noses, shortly eNoses (e.g.: Cyranose® 320, Sensigent, US). The applicability of eNoses has not been proven in halitosis yet.

Aim: Our primary aim is to examine the applicability of the device called Cyranose® 320 in intraoral halitosis.

Methods: Differentiation between solutions (96% ethanol, 5% ammonia) was expected from the device. The device's sensitivity was benchmarked with diluted samples (1:25, 1:125, 1:250). Each measurement was carried out 5 times, and the target component was identified at multiple distances (2 cm, 5 cm).

Results: It was determined that results depend on the distance, concentration, number of measurements and sample volume. The sensitivity of the device was estimated to be 0.5. In the case of diluted ethanol solutions, identification was not feasible, and sensitivity came out as 0. Intraoral halitosis could not be measured with the device as it could not produce reliable data for sample volumes this low (5 cm^3).

Conclusion: The Cyranose device did not live up to the expectations attached to it to measure intraoral halitosis. The experimental data obtained could not be classified by concentration or components. We conclude that our results are in accordance with the previous meta-analytic results of our group. Neither of the trialled devices could provide better results; thus, the replacement of the organoleptic method is not justified (except the pandemic situation).

Former publication: no

Supervisors: dr. Eszter Szalai PhD student Department of Restorative Dentistry and Endodontics, Dr Beáta Kerémi associate professor Department of Restorative Dentistry and Endodontics

Functional penetration depth of sodium hypochlorite and hyper-pure chlorine dioxide. An in vitro study

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Introduction: Endodontic treatment aims to eliminate microbes from the complex root canal system before obturation. Heterogeneous tubular sclerosis and the air bubbles trapped in the dentin tubuli obstruct the penetration depth of endodontic disinfectants. Because of a high percent of unsuccessful endodontic treatments new disinfectants are in demand. The small molecular size and the high volatility of chlorine dioxide (ClO_2) may overcome this problem.

Aim: The study aimed to measure the penetration depth and to compare the antibacterial effect of a novel hyper-pure ClO2 to gold-standard sodium hypochlorite (NaOCl) along the dentin tubuli in an in vitro model.

Method: In the 1st study 10 single-rooted teeth were dyed by intracanal centrifugation with 1% methylrosaniline. Five were treated with distilled water (control) and 5 with 5% NaOCl. The bleaching effect of NaOCl indicated its penetration depth. In the 2nd study, the distal root of 27 extracted lower molars was infected artificially with Enterococcus faecalis. The control group was rinsed with saline, and the test groups were irrigated with either 2.5% NaOCl or 0.12% hyper-pure ClO_2. The longitudinally split teeth were stained by viability stain. The coronal third of the root was scanned with a confocal laser scanning microscope. The fluorescent intensities of live and dead bacteria were measured, and the % of dead bacteria was calculated at depths up to 950 μm along the dentin tubuli.

Results: Dye penetration showed heterogenous pattern. NaOCl bleached the dye up to 250 μm. The percentage of dead bacteria was higher both in the NaOCl (45.1±2.3%, $p<0.01$) and in the ClO2 (44.6±3.8%, $p<0.01$) groups compared to saline (23±4.5%) used as control; however, there was no difference among them. The percentage of killed bacteria was not correlated with depth until the measured 950 μm in any group ($p=0.633$).

Conclusions: Heterogenous tubular sclerosis may influence the penetration capabilities of root dentin. The functional penetration depth of NaOCl is at least 2-3 times more than published to date. There is no difference in the disinfection effectiveness along the dentin tubuli between NaOCl and hype-pure ClO_2 until at least the measured 950 μm. However, both were able to only partially eradicate intratubular bacteria. We suggest using hyper-pure ClO2 as an alternative or adjuvant final irrigant.

Former publication: no

Supervisors: Zsolt M Lohinai DMD, PhD associate professor Semmelweis Univeristy, Department of Restorative Dentistry and Endodontics Eniko Vaszine Szabo DMD, PhD senior lecturer Semmelweis Univeristy, Department of Restorative Dentistry and Endodontics

Microbiome of dental plaque

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Introduction: A dental plaque is a dynamic structure, based on microcolonies of bacterial cells, associated with the state of the microbiota of the oral cavity and the body as a whole. The taxonomic spectrum of dental plaque representatives is wide and ambiguous. Some micro-organisms are members of the autochthonous microflora, while others are transitory.

Aim: to examine the qualitative and quantitative microbial composition of dental plaque.

Method: microflora of dental plaque is examined in 126 people. Microorganisms were isolated and identified using the bacteriological method. Microbial contamination was determined by counting the colony-forming units in 1 g of material. 635 microbial cultures have been identified and examined.

Results: The predominant in the number and composition of the microbiocenosis of the plaque was the gram-positive flora. The density of microbial populations on average reached $3.2x10^4$ CFU/g. An analysis of the structural and functional organization identified the dominant types of microorganisms: streptococci (100%), lactobacilli (83%), staphylococci (63%), *Actinomycetis viscosus* (62%). *Bacteroids* (23%), *Neisseria* (8%), and *Fusobacteria* (3%) were found less frequently. The largest share in the community belonged to S. mutans (88%), *S. mitis* (77%), *L. acidophilus* (83%). The rate of dominance of staphylococci varied from 45 to 61%. Fungi *Candida* were found in 40% of cases and were represented by *C. albicans, C. tropicalis, C. crusei*. In 35 subjects (28%), a decrease in the number of lactobacilli (up to 14%) and *S. salivarius* (up to 22%) was revealed, along with this, *S. aureus* and *S. pyogenes* were sown, which indicated a dysbiotic state. The presence of acid-forming microorganisms is the main etiological factor of tooth enamel damage, destruction of dentin and the development of dental caries.

Conclusions: the examination of the taxonomic structure of dental plaque microbiome is necessary to assess the state of the microecosystem of the oral cavity.

Former publication: no

Supervisor: Kravtsova Elena Olegovna associate professor Department of Microbiology, Virology and Immunology

Pharmacoeconomic evaluation of the effectiveness of rheumatoid arthritis therapy with rituximab analogues

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Introduction: The high significance and severity of rheumatoid arthritis (RA) require the use of highly effective therapy. Therapy with biological agents, including rituximab, is the most effective therapy for RA. But these types of drugs are very expensive. Therefore, comparative clinical and economic studies are needed for high-cost therapies.

Aim: To evaluate the pharmacoeconomic effectiveness of rheumatoid arthritis (RA) therapy with rituximab analogues (Swiss and Russian-made).

Method: The study included 170 RA patients with moderate and high disease activity. Patients were divided into 2 groups (85 patients in each): group 1 received Mabtera® (F. Hoffmann-La Roche Ltd, Switzerland) and group 2 received Acellbia® (BIOCAD, Russia). Patients in the groups were comparable by sex, age, RA activity, presence of rheumatoid factor, and anti-cyclic citrullinated peptide antibodies. Pharmacoeconomic evaluation of RA therapy effectiveness was performed using the cost-per-responder model (CPR). "Good" and "moderate" DAS28 responses (EULAR criteria) after 12 months of therapy were accepted as a positive response to therapy.

Results: After 12 months of therapy DAS28 decreased by -1.3 [-2; -0.8], $p<0.001$ in group 1, and by -1.8 [-1.6; -1.7], $p<0.001$ in group 2. Group 1 had a positive response to therapy in 56.4% of patients (21.8% of patients had a good response and 34.6% of patients had a moderate response). Group 2 had a positive response to therapy in 77.6% of patients (15.8% of patients had a good response and 61.8% of patients had a moderate response). CPR-DAS28 in the first group amounted to 6 894,96 EUR over 12 months of treatment, and in the second group – 3 328,64 EUR.

Conclusions: Both rituximab analogues significantly reduce RA activity. CPR-DAS28 was 2-fold lower for patients treated with Acellbia® compared to Mabtera®. The results obtained can be used to optimize the cost of hospital therapy for RA patients.

Former publication: no

Supervisors: Olga Zaharova professor I.M. Sechenov First Moscow State Medical University (Sechenov University), Elena Gerasimova research professor Nasonova Research Institute of Rheumatology

Variation of melatonin production in children receiving intensive care

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Introduction: Several factors disrupt sleep in the pediatric intensive care unit (PICU). The integrity of the sleep-wake cycle is crucial in critically ill patients, its disruption may compromise physical and psychological recovery. Diurnal variation of 6-sulfatoxymelatonin (aMT6s) excretion, which correlates to serum melatonin concentrations, is a feasible tool in the assessment of circadian rhythmicity. Current evidence of the development and progression of sleep-wake cycle disturbances and its impact on critically ill pediatric patients is incomplete.

Aim: Identify factors associated with sleep and circadian disruption in critically ill children, particularly concentrating on the types, duration, and doses of sedatives.

Method: We have been conducting a prospective observational single center study in our PICU. To date, our study population consists of 10 patients between the ages of 7 months to 15 years who were admitted to our surgical-medical PICU (from 2021 October to 2022 April) and received invasive mechanical ventilation for at least 24 hours. Urine samples were collected after extubation for 3 days at 6-hour intervals for aMT6s measurement. Patient age, ventilation duration, cumulative, peak doses and the duration of analgo-sedation were collected from patient documentation. Mixed effect cosinor modeling was used to analyze the effects of different variables to the mesor, amplitude and acrophase of melatonin production.

Results: Interim analysis shows a significantly smaller mesor (day 1 vs 3 and day 2 vs 3, $p < .001$) and amplitude (day 1 vs 3, $p = .008$, day 2 vs 3 $p = .07$) of melatonin concentration on day 1 and 2, indicating a suppressed melatonin production. The time of the peak concentration in infants and toddlers tended to occur earlier in the morning ($p = .1$) compared to older children. Larger cumulative dose of midazolam ($p = .036$) resulted in significantly smaller amplitude and a tendency for a later peak ($p = 0.084$). Longer midazolam use tended to result in smaller amplitude ($p = .054$).

Conclusions: A final conclusion cannot be drawn until data collection is complete; however, based on the interim analysis, 6-sulfatoxymelatonin excretion, therefore, serum melatonin concentrations, show significant disruption, specifically in children receiving more midazolam during critical care, leading to notable circadian rhythm disruption.

Former publication: no

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