



Georgian Association of Medical Specialties
(GAMS)
VIII International Conference

**“Neurochallenges 2023 in the Era of Evidence-
Based and Personalized Medicine”**



September 16-17, 2023
Chakvi, Adjara, Georgia



Organized by

Georgian Association of Medical Specialties In collaboration with
David Tvildiani Medical University and Batumi Shota Rustaveli State University, with
participation of Ilia State University

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Prof. George Chakhava – Organizing Committee Chair

Prof. Amos Korczyn – Organizing Committee Co-Chair

Prof. Maia Beridze – Organizing Committee Co-Chair

Prof. Irakli Soulakvelidze -Organizing Committee Co-Chair

Organizing Committee: prof. Mikhael Okujava, prof. Nino Tabagari, Miranda Demuria MD, prof. Shorena Vashadze, Mariam Kekenadze MD

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Amos Korczyn Tel Aviv, Israel

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Tamuna Goderidze Tbilisi, Georgia
Nino Tabagari Tbilisi, Georgia
Nino Okribelashvili Tbilisi, Georgia
Marina Gegelashvili Tbilisi, Georgia

“One Brain, One Life, One Mission” Brain Health Mission

A healthy brain and nervous system are essential and integral to your health.

Every person should have the opportunity to keep their brain and body healthy and to get timely and appropriate treatment, rehabilitation and health care support if they have a neurological disorder. Every human being, regardless of age, gender or background, deserves a healthy brain and a healthy nervous system.

“If you think that education is expensive you should consider ignorance” - Socrates

Dreamland Oasis Hotel, Chakvi, Adjara Georgia 16-17.09.2023

[Explore Ajara Batumi](#)

Dreamland Oasis Hotel offering: in the case of preliminary booking significant discount(promo code: GAMS2023Neurochallenges) will be provided for the conference registered participants *The organizing committee of the conference hereby invites you to visit the botanical garden of Batumi, before attending the opening ceremony of the conference.*

Participants of the conference will also have an opportunity to visit Batumi archeological museum, which stores various interesting artifacts that are well-known worldwide.

Furthermore, participants of the conference will have an opportunity to witness the beauties of the pearl of the Black Sea -Batumi, its charming boulevard, and have a taste of well-known Georgian cuisine.

Lastly, we hope that you will enjoy your stay here and get acquainted with the Georgian culture and its rich history.

16.09.2023

09:00-
09:30

Registration

09:30-
10:00

Opening

G.Chakhava President GAMS Amos Korczyn President CONy
L.Tvildiani Rector of D.Tvildiani Medical University
Davit Gabaidze- Chairman of the Supreme Council of Autonomous Republic Adjara, Batumi
N. Nijaradze Minister of Health and Social Affairs of Autonomous Republic Adjara, Batumi
M. Khalvashi Rector Batumi Shota Rustaveli State University, Batumi
Prof. Sh.Vashadze Regional Representative-ambassador of GAMS in Adjara, Batumi

Session 1

10:00 **Neural mechanisms of mindfulness meditation in pain modulation**

10:20 **Irakli Soulakvelidze**, Clinical Prof. University of Washington Anaesthesiology and Pain Medicine, Attending Physician: Centre for Pain Relief, UWMC Seattle Washington USA
Representative of GAMS in Multidisciplinary Joint Committee in Pain Medicine (MJCPM)
UEMS

10:20 **Is Alzheimer's disease a disease?**

11:40 **Amos Korczyn** Prof. Ex-chairman of the Department of Neurology at the Tel-Aviv Medical Center, Sieratzki Chair of Neurology at Tel-Aviv University. President of CONy-the International World Congress on "Controversies in Neurology"
Chairman of the Scientific Medical Board of the Israeli Alzheimer's Disease Association (EMDA), member of the SAB of Alzheimer Disease International (ADI), Tel Aviv, Israel

11:40 **Challenges in Dementia and MS Management in Georgia-actual role of BTK inhibitors in the nearest future.**

George Chakhava, Assoc. Prof. D.Tvildiani Medical University, GAMS Representative in UEMS Board Neurology; Miranda Demuria, MD D.Tatishvili Health Center, Multiprofile Clinic Consilium Medulla, Representative of GAMS in UEMS Board of Neurology, Tbilisi, Georgia

11:20 **"Neuroinflammation –Concept's Evolution"**

11:40 **Marina Janelidze**, Prof. Secretary General, Georgian Union of Neurologists, Chairperson Department of Neurology Tbilisi State Medical University, Head of Department Neurology, S.Khechinashvili University Hospital Tbilisi, Georgia

11:40 **"Neurotuberculosis is still a challenge in the era of modern diagnostics and treatment"**

12:00 **Maia Beridze**, Prof. Head of Neurology Department TSMU, Representative of GAMS in UEMS Board of Neurology, Tbilisi, Georgia

12:00 **Diagnostic tools in Myopathies**

12:20 **Stephan Zierz**, Prof. Martin Luther University Halle-Wittenberg, MLU Clinic for Neurology,
Head of Department Neurology.

Representative of Germany in UEMS Board Neurology, Halle-Wittenberg, Germany.

12:20 **Correlation of Neurological symptoms and Vitamin B12 Levels in COVID-19 Patients**

12:40 **Tamar Goderidze** Prof .University of Georgia, Georgian American Family Medicine Centre
“Medical House”, Representative of GAMS in UEMS Board of Endocrinology and Leader of
GAMS Section Family Medicine, Nino Gulatava MD PhD “Megalab” Representative of
GAMS in UEMS Board of Laboratory Medicine, Irakli Apshinashvili, Resident in Family
Medicine Tbilisi, Georgia

12:40
13:00 Discussion

13:00
14:00 Lunch

14:00 **Stroke with Intracranial Atherosclerosis: Prevention and Treatment**

14:20 **Alexander Tsiskaridze**, Prof., Department of Neurology, Ivane Javakhishvili Tbilisi State University, Pineo Medical Ecosystem, President of Georgian Stroke Society, Tbilisi, Georgia

14:20 **Post-stroke Cognitive Impairment and the Risk of Recurrent Stroke**

14:40 **Zurab Nadareishvili**, Prof., Department of Neurology, The George Washington University, Washington, DC; Director, Comprehensive Stroke Center, VHC Health, Arlington, Virginia, USA

14:40 **Environment and Stroke- a preventable risk factor**

15:00 **Serefnur Ozturk**, Prof., Head of the neurology department and stroke center of the Selcuk University, Faculty of Medicine in Konya, Turkey. Former president of The Turkish Neurological Society. UEMS Representative of Turkey, member of UEMS/Neurology Section, Board Examination Committee Konya, Turkey.

15:00 **From bench to bed - human cortical tissue as an ex vivo translational model for cell therapy in stroke**

Zaal Kokaia, Prof., Experimental Medical Research
Head of the Laboratory of Stem Cells & Restorative Neurology
Lund University Hospital, Lund, Sweden

15:30 **Management of post stroke dysphagia and assessment of pharyngeal electrical stimulation in the PhEAST trial**

Philip Bath, Assoc.Prof. Stroke Medicine, Chair and Head of the Division of Clinical Neuroscience at the University of Nottingham, UK

15:50 **Modern Aspects of Surgery for Stroke**

16:10 **Mirza Khinikadze**, Prof., The Chairman of the Board of Georgian Association of Neurosurgeons. Head of New Vision University Hospital's Neurosurgery and Neurology Direction. Board member of Professional Developmental Direction of Ministry of Health, Labor and Social Affairs of Georgia Tbilisi, Georgia

16:10 Discussion

16:30

16:30 Coffee Break

16:50

Satellite Symposia

16:50 **What we need to know about dementia and how to help patients**

17:50 **Marina Janelidze**, Prof. Secretary General, Georgian Union of Neurologists, Chairperson
Department of Neurology Tbilisi State Medical University, Head of Department Neurology,
S.Khechinashvili University Hospital Tbilisi, Georgia

The quality of life in Antidepressant's Era

Nino Okribelashvili , Prof. Vice-Rector for Research, Tbilisi State University; President,
Society of Georgian Psychiatrists; Deputy Director, Centre for Mental Health and Prevention of
Addiction. Tbilisi, Georgia

20:00 Gala Dinner

17.09.2023

Session 3

10:00 **Study of Glymphatic system using MRI**

10.20 **Mikheil Okujava**, Prof., Head of Neuroradiology and Neuroscience, Todua Clinic, Prof. Ilia State University, School of Natural Sciences and Medicine
Vice-President of Georgian Society of Radiology Representative of GAMS in UEMS Board of Radiology Tbilisi, Georgia

10:20 **Animal Imaging. Technical, Development and Ethical issues. Own Experience.**

10.40 **Nikoloz Sainishvili**, Radiology Group Leader Evex Medical Corporation, CMC - Caucasus Medical Centre, Representative of GAMS in UEMS Board of Radiology Tbilisi, Georgia

10:40 **Inhibition of Epileptogenesis by Myo-inositol; behavioral, electrophysiological,**

11:00 **morphological, and molecular studies**

Revaz Solomon, Prof. Director, G.Gamkrelidze, L.Tsverava, M.Kandashvili, L.Kharkhelauri, E.Lepsveridze, Institute of Chemical Biology, Ilia State University and Iv.Beritashvili Centre of Experimental Biomedicine,
Member of Laboratory Medicine Section of GAMS Tbilisi, Georgia

11:00 **Scull Base Endosurgery**

11:20 **Malkhaz Kintsurashvili**, MD, Representative of GAMS in UEMS Board of Neurosurgery, Buba Shalamberidze, MD, Edisher Magalashvili Prof., Tsotne Ckhikvishvili, MD, Neurosurgery Department American Hospital Tbilisi, Georgia

11:20 **"Modern principles of diagnosis and management of sporadic inclusion body myositis"**

11:40 **Nana Kvirkvelia**, Assoc. Prof. Iv.Javakhishvili Tbilisi State University, Tbilisi State Medical University, Mariam Kekenadze, Tbilisi State Medical University MD PhD student, Elene Nebadze, Iv.Javakhishvili Tbilisi State University PhD student, Tbilisi, Georgia

11:40 **"Rare cases of extraspinal sciatic neuropathy - why do we need MR neurography"**

12:00 **Sophio Mikiashvili** Assoc.Prof. CMC - Caucasus Medical Centre, Radiology Section GAMS, Tbilisi, Georgia

12:00 **"Critical Illness Polyneuromyopathy-the novel diagnostic marker?"**

12:20 **Madona Sekhniashvili**, MD Neurologist, Head of Neurophysiology Centre
CMC - Caucasus Medical Centre
Representative of GAMS in UEMS Board of Neurophysiology Tbilisi, Georgia

12:20 Discussion

12:40

12:40 Lunch

14:00

Session 4

14:00 **European Training Requirement ETR in Neurology approved at last UEMS Council in**

14:20 **Brussels in collaboration with European Academy of Neurology –Georgian Translation-Challenges**

Miranda Demuria, MD, George Chakhava Assoc.Prof., D.Tvildiani Medical University, D.Tatishvili Health Centre, Multiprofile Clinic Consilium Medulla, Maya Beridze Prof. TSMU, Head of Neurology Department, GAMS Representatives in UEMS Board Neurology; Tbilisi, Georgia, Sofo Abashidze Resident Neurology

14:20 **Addressing Challenges and Unlocking Benefits: A Discussion Paper on Hospital**

14:40 **Accreditation in Georgia and its Impact on Neurology Healthcare Professionals, Services, and Patients**

Giorgi Pkhakadze, Prof. Accreditation Canada Representative in Georgia, WHO Consultant, Health and Migration Programme (PHM), Office of the Deputy Director-General, World Health Organization, Geneva, Switzerland

Head, Public Health / Epidemiology D.Tvildiani Medical University

Representative of GAMS in UEMS Board of Public Health Geneva, Switzerland

14:40 **Hyperkinetic movement disorders and their management**

15:10 **Tanya Gurevich**, Assoc. Prof. Director, Movement Disorders Unit, PF Centre of Excellence, Parkinson's & Neuroautonomic Service, Israeli Huntington's Disease Centre, and Huntington Study Group, Neurological Institute, Tel-Aviv Sourasky Medical Center; Sackler School of Medicine & Sagol School of Neuroscience, Tel Aviv University, Israel

15:10 **A strategic training framework for building research capacity in the**

15:20 **Global Parkinson's Genetics Program (GP2)**

Alex Zirra 1, Maria Teresa Periñan1, Sumit Dey 2 et al.

1. Unidad de Trastornos del Movimiento, Instituto de Biomedicina de Sevilla, Universidad de Sevilla, Seville, Spain

2. Preventive Neurology Unit, Wolfson Institute of Population Health, Queen Mary University of London, London, UK

15:20 **Social Endophenotype of Schizophrenia**

15:40 **Eka Chkonia**, Prof., Tbilisi State Medical University

Representative of GAMS in UEMS Board of Psychiatry Tbilisi, Georgia

15:40 **“Dark Side of Happiness” Youth Externalizing Disorders and Life Satisfaction**

16:00 **Marina Gegelashvili**, Prof. of Psychiatry Ilia State University, Representative of GAMS in UEMS Board of Psychiatry Tbilisi, Georgia

16:00 **Epileptic Seizure Onset Zone Detection Using the Nonparametric Granger Causality and a**
16:20 **New Matrix Spectral Factorization Algorithm**

Sofia Kasradze, Prof. Caucasus International University

Director, Institute of Neurology and Neuropsychology (INN),

President, Georgian League Against Epilepsy (GLAE)

Representative of GAMS in UEMS Board of Neurophysiology Tbilisi, Georgia

16:20 **Uncertainty and Ambiguity in Diagnostics and Management - When Depression and Dementia Coexist**

Ia Rukhadze Assoc.Prof. Head of Department Neurology, Acad. N.Kipshidze Central University Clinic, Tbilisi, Georgia

16:40 **"Indicators of Cognitive Dissonance and Depression in Adjara region, before and after the spread of Covid-19 Infection"**

Shorena Vashadze Assoc.Prof., Batumi Shota Rustaveli State University, Clinic Medcentre

17:00 **C9orf72 hexanucleotide repeat expansion in Georgian patients with ALS.**

17:20 **Mariam Kekenadze**, PhD fellow at Tbilisi State Medical University, MSc in Clinical Neurology at University College London, Queen Square, London, UK.

Pain management and neuromodulation in headache.

Miguel J A Láinez, Chairman of the Department of Neurology at the Hospital Clínico Universitario and Professor of Neurology at the Catholic University of Valencia in Valencia, Spain. Ordinary Member of the Real Academia de Medicina de la Comunidad Valenciana.

President of the Sociedad Española de Neurología Valencia, Spain. **(Speaker Mariam Kekenadze)**

17:20

17:40 Discussion

17:40

The Farewell -Coffee Break, Vine.

18:40

This course is designed for physicians providing care for patients with different neurochallenges who wish to refine their skills, attitudes and knowledge. Specialists in Neurology (including Stroke Medicine and General Neurology), GP, Family Medicine, Radiology, Psychiatry, Neurosurgeons, Researchers focused on pain, Epilepsy, Stroke, some aspects of cognitive and movement disorders, neuroinflammation are welcome to participate. The GAMS addresses doctors primarily from the Georgia, with special focus on practitioners from Adjara region and other parts of Western Georgia. Applicants from other countries may also participate.

Formats

The didactic format will include the combination of lectures, case oriented discussions, mini-case exercises, data from multicentre international trials and interactive case discussions. Case oriented learning is emphasized. Time will be allocated for questions and answers at the end of each talk and interactive discussions at the end of each session. Didactic cases provided by tutors in case-oriented learning will be useful to applicants for dealing with clinically complicated cases in daily practice.

About GAMS

Georgian Association of Medical Specialties (GAMS) was established in 2006 as a non-governmental and non-profit medical association with aim “to promote the medical and allied sciences, and to maintain the honour and interests of the medical profession “and to popularize the idea of CME, to promote the European System of Medical Education and Continuing Professional Development (CPD).

Activities of GAMS is coordinated with UEMS-leading regulatory European institution in medicine, which participates in development of medical branches and health care as a Whole. It’s important that (GAMS) is the only official representative of this organization in Georgia. GAMS is institutional corporative member of European Medical Association (EMA) and European CME Forum.

GAMS Conception

Leaders of Georgian Association of Medical Specialties work actively together with European and American colleagues in the framework of various meetings and workshops. In spite of difficult economic and social circumstances in our country, (GAMS) has managed to hold a status of observer member in the European Union of Medical Specialists (UEMS). On the basis of agreement with UEMS – our association has also been granted the right to nominate two representatives to take part in the work of different sections Membership of Georgian Association of Medical Specialists should be treated as a privilege, not as a mere obligation. GAMS represents interests of medical profession and the patients. With financial assistance of TAIEX program under auspices of European Commission in Georgia was organized the workshop - Challenges for harmonization of Postgraduate Medical Education and Professional Development System in EU and perspectives of implementation in Georgia. With the initiative of GAMS and Georgian Polish Medical Association was held third International Georgian - Polish Conference, “Medicine in 21-th century achievements, challenges and opportunities “ During the meeting the Polish Chamber of Physicians and Dentists - a professional, self-governing organization of physicians and dental practitioners, which was founded in 1922 and Georgian Association of medical specialties signed Agreement on Collaboration.

GAMS Vision:

- PME and CME/CPD should be coordinated in Georgia in the nearest future-by independent multidisciplinary representative board / professional medical associations (including GAMS) in collaboration with MOLSHA and Ministry of Education;
- A successful strategy includes showing the adult learner the relationship between the knowledge/skill and the expected positive outcomes;
- Medical litigation is no longer fable of the West, it is fast coming up in developing countries like ourselves and we ought to prepare ourselves in time;
- Avoid rigid application of European directives which do not serve the interests of medical society of Georgia. Principles of step by step development of CME/CPD should be preferred;
- Development Registry of physicians and institute of “Sign of excellence”, but not punishment persecutory system;

- More attention on qualification of specialists than accreditation of events;
- Development of the organizational structure and management of institution (PME and CME/CPD) to ensure basic and quality improvement standards;
- Stimulation of incentives to GMP.

Learning objectives

The goal of our activity is to increase healthcare practitioners' knowledge of prevention and management of different neurochallenges, focusing on personalized medicine and latest available research-based evidence. This course, on completion, will enable the participants to receive the up-to-date information and expert opinion on the main topics of cognitive and mental disorder, stroke, pain management, movement disorders, pathophysiology of neuroinflammation (incl. multiple sclerosis, polyneuropathy, neurotuberculosis, myopathy) and other aspects of diseases to improve competence and gain practical skills in the diagnostic work-up and decision-making.

This course enhances knowledge of a comprehensive, interdisciplinary approaches, taking a holistic approach to the patient, and addressing the psychosocial components that underlies various neurologic disorders.

The conference focuses on novel approaches in the management at the time of personalized and evidencebased medicine. The content includes cases for case-based learning, describes pathologic processes, symptoms and signs of various conditions, epidemiology of relevant events, risk factors and conditions, overviews public health and ethics aspects of the problems and forms a base to translate scientific evidence into daily clinical practice. Specific topics include cognitive disorders as complications of strokes, poststroke dementia, the impact of comorbidities on cognitive impairment and falls in frail elderly patient, role of anti-cholinergic treatments in cognitive and physical impairment and the need for qualitative analysis of drug treatments, modern approaches to pain management and more. Activation of neuroinflammation in different types of neurological diseases including neurodegeneration, demyelinating diseases, cerebrovascular or convulsive disorders underlines universality and importance of this process in disease development. Distinguishing of different variations of neuroinflammation in a context-specific manner is important in analysing both positive and negative aspects of these processes. It is now well known that to maximize the treatment and prevention potential, behavioural and clinical interventions should be tailored to each patient, targeting many risk factors at the same time.

Patients benefit from a multidisciplinary approach, which also focuses on improvement in function, not only work with strength training and physical therapy, but also psychology, nutrition, and other modalities to help them get more ownership of their own problems. Comprehensive strategies involving pharmacologic and psychological therapies can improve outcomes. Competence of evaluating and interpreting medical imaging and diagnostic approaches, strengths and pitfalls, as well as potential clinical indications of animal models, different MRI techniques for the evaluation of the glymphatic system will be discussed. The session is dedicated to the topical issues and trends in neurodiagnostic methods, neuroimaging, and neurosurgery. Leading specialists in these fields will share their experience in research and clinical practice. ETR in Neurology recently approved at UEMS Council translated in Georgian as well as presentation of Accreditation Canada Representative will be shared with audience.

Methods and tools:

Encouragement of learners to actively participate and be more proactive than passively receiving information, creating opportunities for learners' proactivity in clinical reasoning and judgment.

Engaging facilitators/moderators who are knowledgeable, engaging, and able to create a positive learning and feedback-giving environment.

Needs assessment, educational needs and educational outcomes

Despite significant progress in medical education and practice in Georgia, there is still an acute need of up to date continuing professional development and medical education interventions for local physicians. This is particularly true in case of physicians and practitioners working in remote mountain areas. Our event takes place in Chakvi, nearby from Batumi-a regional centre of the Western Georgia. Most of the participants highlight the lack of international educational programs and conferences in the region. Georgia is a country with limited resources. Young medical doctors emphasized the need for internationally qualified tutors in their training process.

Field of Neurology in general, is practical medical area where hands-on experience and visually observed information are very important for professional development. The GAMS International Conference Neurochallenges 2023 in the Era of Evidence Based and Personalized Medicine will bring a state of the art lectures and video demonstrations from distinguished speakers to the audience. Participants will gain knowledge and the opportunity personally meet highly qualified experts, discuss problematic complicated medical issues, and enrich their own experiences, real-life cases and examples will make the material more relevant and inclusive.

The main outcomes of the event:

Familiarity with new approaches, techniques, and instruments that really very demanding in modern world.
Ability to diagnose and treat compound neurologic cases.

Understanding of the challenges, ethical and legal aspects of neurosciences.

Understanding the need to collaborate within multidisciplinary teams.

Knowledge of current clinical trends and basic research developments.

Understanding of the role of leadership and mentorship in driving change and innovation in Stroke Medicine, General Neurology, Psychiatry, Radiology

At the end of the online registration, the list of the delegates/participants will be presented and included in the on-site registration form. All the delegates must fill out the requested information (email, etc.) and give their signature during on-site registration for all sessions of the event. Certificates of attendance will be granted only to those delegates who will confirm their participation with their activities and signature.

Means for learners' feedback

Feedback: Provision of detailed feedback from learners to help them reflect on their ideas and identify gaps in medical practice.

Feedback from learners will be collected before, during, and after the event:

-after the event, a special questionnaire with the participants' feedback on different aspects of the course will be analysed and used for the report and future events.

Conference working language is English\Georgian (Simultaneous translation).



Prof. Irakli Soulakvelidze, USA

Current position – Clinical professor, University of Washington Anaesthesiology & Pain Medicine, Seattle Washington

Education: MD degree from Tbilisi State Medical Institute

PhD degree from Moscow 2nd Medical Institute

Residency training from: Tbilisi Medical Institute, Baylor College of Medicine in Houston, TX and University of Washington in Seattle, WA

Pain fellowship training: from Virginia Mason Medical Centre in Seattle, WA

Post-doctoral research training in pulmonary, asthma and inflammation research: at University of California in San Francisco and McMaster University in Hamilton, Ontario, Canada

Current scholarly interests: cultivation of mindfulness, compassion and empathy in pain management, clinical medicine and medical education

Neural mechanisms of mindfulness meditation in pain modulation

Chronic pain continues to be a major public health challenge worldwide. This includes very high prevalence of chronic pain and pain-related disability. Additional problem, however, is the lack of full understanding of mechanisms of chronic pain and subsequently, its effective treatments. Despite incredible upsurge in research, there have not been major breakthroughs in the last 20 years.

Pain is an unpleasant sensory, emotional, and cognitive experience and despite acknowledgement of the biopsychosocial nature of chronic pain, still emphasis has been on pharmacological treatments. Reasons for this are multifold, not least of which is resistance by insurers to pay for non-medication treatments and on the other hand, often longing by patients to attain a quick fix of their pain. It's not surprising, since pain is the most aversive experience that often ruins lives of afflicted individuals.

Because pain is aversive, individuals look for distractions to turn away from pain. This can be helpful in a short term, but often leads to maladaptive behaviours that can become deleterious in the long term. Mindfulness, in fact, implies paying attention in the present moment, on purpose and non-judgmentally. Therefore, it means turning toward pain and investigating the qualities of pain with a wider lens of awareness. The latter enables patients to have more choices in response to pain.

Clinical effectiveness of mindfulness meditation in chronic pain and its neural mechanisms have been broadly investigated. It turns out that mindfulness helps to uncouple sensory experiences of pain from affective and cognitive layers of this experience. This is helpful and seems to be associated with down regulation of the brains' centrally located hub, the so-called default mode network (DMN). These neural mechanisms will be discussed in detail in our presentation.



Prof. Miguel J A Láinez, Spain
MD, PhD, FAAN, FANA, FAHS

Miguel J A Láinez is Chairman of the Department of Neurology at the Hospital Clínico Universitario and Professor of Neurology at the Catholic University of Valencia in Valencia, Spain.
He is Ordinary Member of the Real Academia de Medicina de la Comunidad Valenciana
He is President of the Sociedad Española de Neurología
He has been Chairman of the Spanish Headache Group of the Spanish Neurological Society and President of the European Headache Federation and member of the Executive Committee of the International Headache Society, where he sits on several committees.
He has authored more than 380 articles in peer-reviewed journals and book chapters, and has edited or authored 17 books.
Secretary of the 3rd Congress of the European Federation of Neurological Societies; Chairman of the 9th Congress of the International Headache Society, the 7th Congress of the European Headache Federation, the 7th Tinnitus Research Initiative International Conference and the 16th Congress of the International Headache Society.
He is a Fellow member of the American Academy of Neurology, the American Headache Society and the American Association of Neurology. Honoured member of the Asociación Latinoamericana de Cefalea, Sociedad Colombiana de Neurología and Sociedad Chilena de Neurología and Societa Italiana per lo Studio delle Cefalee.

Pain management and neuromodulation in headache

While there are numerous pharmacotherapy options available for the treatment of migraine and other headache disorders, some patients are refractory and many of these medications have undesirable adverse effects or are contraindicated. Therefore, in the last decades, multiple neuromodulation devices have been developed to try to improve the treatment of different types of headaches. This technology is emerging as a practical and safe alternative to conventional pharmacological treatment of migraine and other headaches, especially for sensitive patient populations (e.g., pregnant women or adolescents) or those affected by poor tolerability or lack of efficacy of pharmacological approaches

Many interventional techniques can be categorized as neuromodulatory and the classification of the various neuromodulatory approaches frequently varies. One frequently used approach is to identify the nervous structure that is targeted (e.g., peripheral nerves, spinal cord, cortex) and then classify the techniques into invasive and noninvasive.

Several non-invasive and even invasive neurostimulation methods have been proposed for acute or preventive migraine, cluster headaches and other headaches. .

In our presentation we are going to review the scientific evidence that currently exists for the use of the different invasive and non-invasive techniques in the different types of headaches and we will also present our experience with their use.



Prof. Amos Korczyn, Israel

graduated from the Hebrew University-Hadassah Medical School in Jerusalem in 1966 (MD), where he also received an MSc degree in pharmacology (cum laude) in 1966.

He trained in neurology at Belinson Hospital and at the National Hospital for Nervous Diseases Queen Square, London. He was the Chairman of the Department of Neurology at the Tel-Aviv Medical Centre from 1981 until 2002, and the incumbent of the Sieratzki Chair of Neurology at Tel-Aviv University, 1995-2010. Professor A. Korczyn has a particular interest in neurodegenerative diseases. He has authored or coauthored over

700 articles in peer-reviewed journals, as well as many chapters in books. He edited several books and Special Issues in Journals, and is Regional Editor of the Journal of Alzheimer's Disease. He is or has been an Editorial Board member of 20 international journals, and organized several neurological conferences, mainly in the field of dementia, Parkinson's disease and other degenerative brain disorders, as well as CONy-the International Congress on Controversies in Neurology, and has organized the Mental Dysfunction in Parkinson's disease congresses since 1993. Professor A.Korczyn served on advisory boards in several drug discovery programs

Professor A.Korczyn is the Chairman of the Scientific Medical Board of the Israeli Alzheimer's disease association (EMDA), member of the SAB of Alzheimer Disease International (ADI), and has been the chairman of the WFN Research Committee for Clinical Neuropharmacology.

Professor A.Korczyn is a honorary member of the neurological societies of Israel, Serbia, Poland, Russia, Romania and Georgian Association of Medical Specialties

Is Alzheimer's disease a disease?

Alzheimer's disease is a major health concern in older people. Over the past decades much research has been carried out to understand the pathogenesis of the disease and to find a cure. In spite of the investment, we have failed to solve the problem. The causes of the failure will be discussed.



Assoc.Prof. George Chakhava, Georgia

D.Tvildiani Medical University. President of Georgian Association of Medical Specialties (GAMS). Member of European Union of Medical Specialists(UEMS) Board of Neurology. Member of European Academy of Neurology Panel of Cognitive Disorders and Dementia, Infectious Diseases, Board Member of GUN.

PI of Neurology

Multiprofile Clinic Consilium Medulla

D.Tatishvili Health Centre

Main research interests are: Dementia, Stroke prevention.

Headache, Neuroinfections. PME/CPD

Miranda Demuria MD

Secretary of Neurology Section of GAMS, Neurologist, Multiprofile Clinic Consilium Medulla, Jo Ann University Hospital

Challenges in Dementia and MS Management in Georgia-actual role of BTK inhibitors in the nearest future

Challenges of timely diagnosis of dementia in the era of evidence based and personalized medicine is quite important. The cost-effective analysis shows benefits of timely diagnosis-reduced institutionalization costs, prolonged survival and delayed institutionalization.

In spite of national valorisation of some recognized neuropsychological tools, presence of some clinical study data, there is still a stigma, lack of awareness, limited resources (barriers to special care, absence National Strategic Plan, Memory Clinics and special facilities), lack of policies and health care financing for dementia.

Treatment of reversible causes, modification of life risk factors, enrolment in clinical trials, patients and caregivers empowerment, international collaboration, dementia awareness campaigns are main tools of slowing disease progression in Georgia

The audience will have increased knowledge regarding implications of BTK inhibitors for multiple sclerosis (MS), the mechanisms of action associated with Bruton tyrosine kinase (BTK) inhibitors for MS.

All the mechanisms developed over the past decades targeted the immune response prior to its infiltration into the central nervous system, meaning that we are very capable of treating the immune system by different ways, but once the immune system more or less made it into the central nervous system, there's not very much possibilities in terms of therapy. BTK inhibitors could make a difference, because BTK inhibitors, as already mentioned, target both the innate and adaptive immune response. But particularly, they are seen as penetrant to some extent and thereby, they could also target both parts of the immune system behind the blood-brain barrier. BTK is extremely important for the chronic activation of microglia within the central nervous system of patients with multiple sclerosis. So that, basically, not only microglia can be activated, but there's also a microglia phenotype, which is helpful in cleaning up debris, but also, which is of an anti-inflammatory phenotype. So, we have evidence that BTK inhibition inhibits pro-inflammatory activity and drives anti-inflammatory activity of microglia. This new class of emerging treatment is that it is targeting both central innate and adaptive responses, as well as peripheral adaptive responses. So, it is actually an add-on in terms of its dual mode of action from our existing licensed therapies.

The goal of this lecture is a description the role of BTK inhibitors in future MS management, to increase the audience awareness about the prospective and pitfalls of new approaches and trends in this area.



Prof. Marina Janelidze, Georgia

Tbilisi State Medical University, Khechinashvili University Hospital

Janelidze Marina, MD, PhD, DSc

Secretary General, Georgian Union of Neurologists

Professor and Chairperson

Department of Neurology

Tbilisi State Medical University

Tbilisi, Georgia

Neuroinflammation: Concept evolution

Understanding of inflammatory responses within the central nervous system reveals new perspectives in comprehending pathophysiology and treatment options for various diseases of the nervous system. Inflammatory responses that are centralized within the brain and spinal cord are generally referred to as “neuroinflammatory”. Different variations in the process of neuroinflammation are caused by context of disease, injury, infection or other disparate aspects of its pathophysiology and their corresponding physiological, biochemical and behavioural consequences. Microglia, innate immune cells of the central nervous system (CNS), play key roles in mediating these neuroinflammatory responses. The severity, course, and duration of these inflammatory responses are all critical aspects in the understanding of these processes. Because the association of neuroinflammation is inherently negative and maladaptive, the majority of research focus is on the pathological aspects of neuroinflammation. However, in definite situations several degrees of neuroinflammatory responses can be considered as positive. In many circumstances including CNS injury, there is a balance of inflammatory and intrinsic repair processes that can have definite influences on functional recovery.

In addition, there are several examples, where communication between the brain and immune system involves neuroinflammatory processes that are beneficial and adaptive.

Activation of neuroinflammation in different types of neurological diseases including neurodegeneration, demyelinating diseases, cerebrovascular or convulsive disorders underlines universality and importance of this process in disease development.

Distinguishing of different variations of neuroinflammation in a context-specific manner is important in analysing both positive and negative aspects of neuroinflammatory processes.



Prof. Maia Beridze, Georgia

Professor, Head of the Neurological Department of the First University Clinic of (Tbilisi State Medical University) TSMU since 2015 and Program Director of the Residence in Neurology since 2014. She is the author of More than 150 scientific contributions, 53 full papers published in National and International scientific Journals, author of monographs.

Awards: Certificate of the Best Neurologist, the First University Clinic of TSMU-2018

Georgian State Award and silver medal for overcoming the stroke burden in Georgia– 26.05.2010.

Member of Executive Committee of Georgian Association of Neurosciences; Board Member of GUN, Expert of Georgian National Science Fund; GAMS Representative in UEMS Board Neurology.

“Neurotuberculosis is still a challenge in the era of modern diagnostics and treatment”

In 2018 the United Nations General Assembly acknowledged the global epidemic of tuberculosis (TB) in the world. Among different forms of TB, the Neurotuberculosis is considered to be the most dangerous

needing the vast clinical experience for correct diagnosis and treatment. Diagnostics of Neurotuberculosis requires serious clinical experience and involvement of neurologists, infectious disease specialists, neurosurgeons, pulmonologist's, hospitalists to be able to integrate clinical information, radiological findings and laboratory data. The affected sites of the infection can be represented by meningeal, cerebral parenchymal or spinal cord areas. Sometimes the diagnosis is made without of microbiological confirmation.

The two cases of meningoencephalitis are presented confirmed by MR investigation (1.5 Tesla). The precise laboratory data (GeneXpert in sputum sample, QuantiFERON-TB Gold) does not support the existence of mycobacteria and only detailed analysis of anamnesis, and clinical judgment prompted to suspect the presence of Neurotuberculosis. The treatment started with combination of intravenous infusion of antibiotics (amikacin, moxifloxacin, meropenem) until the clinical course of disease has been significantly improved and continued by consecutive treatment with rifampicin and isoniazid with excellent result. Central nervous system TB is still a serious challenge when the prompt diagnosis and clinical management is required.

Key words: Neuroinfection, meningoencephalitis, mycobacteria, GeneXpert, diagnosis.



Prof. Stephan Zierz, Germany

Professor of Neurology and head of the Department of Neurology of the Martin-Luther-University HalleWittenberg, Representative of Germany in UEMS Board Neurology, Germany

Academic and extramural activities and awards

1990 Myopathy award of the German Society for Myopathies (DGM) since 1995 Chairman of board of neurology of the Ärztekammer Sachsen-Anhalt

1996- 2000 Dean of the Medical Faculty of the Martin-Luther-University Halle-Wittenberg and 2006-2010

1998-2003 Member of the Academic Senate of the Martin-Luther-University Halle-Wittenberg

2000-2001 President of the scientific board of the German Society for Muscle Diseases

2000-2004 Elected referee for neurology of the DFG

2000-2007 Member of the board of Medizinischer Fakultätentag der Bundesrepublik Deutschland

2003-2005 Member of the International EU Advisory Board for the Centre of Molecular and Clinical Medicine at the University of Tartu (Estonia)

2002-2008 Member of the board of the Universitätsklinikum Leipzig AöR

2004-2007 Member of the scientific board of the Hermann und Lilly Schilling foundation for medical research 2010 President of the Deutschen Gesellschaft für Klinische Neurophysiologie und funktionelle Bildgebung (DGKN)

2015-2016 Honorary member of the Mongolian Neurological Society. Honorary professor of Neurology at the Medical University of Ulan Bator, Mongolia

2017 Duchenne-Erb award of the German Society for Myopathies (DGM)

2017 Co-president of the annual meeting of the Deutschen Gesellschaft für Klinische Neurophysiologie und funktionelle Bildgebung (DGKN) in Leipzig 2018 Fellow of the European Academy of Neurology (FEAN)

Diagnosis in Myopathies: Are all available tool always necessary?

The diagnosis of myopathies and the differential diagnosis of other neurogenic muscle weakness is based on numerous diagnostic procedures and tools. In this presentation values and limitations of these procedures are discussed. It will also be shown, that these diagnostic tools are not all always necessary and that there are well defined myopathies which only require a clinical examination and the diagnosis might only be confirmed by the specific genetic test.

Clinical examination: this includes the analysis distribution of any pareses (proximal, distal, symmetrical, asymmetrical, facial involvement, involvement of extraocular muscles. Atrophies (and hypertrophies), fasciculations, myalgia, and myotonic phenomena might be important clues. It is also important to look for involvement of other organs (e.g. cardiac abnormalities, cataract, retinopathy) respiration and swallowing). Electromyography (EMG) might differentiate between neurogenic atrophy and myopathy. Low and high frequency nervous stimulation of muscle is useful for diagnosis of myasthenia gravis and Lambert Eaton syndrome. It has to be emphasized that normal EMG does not exclude myopathy (e.g. mitochondrial and other metabolic myopathies). In myositis and acid maltase deficiency there might be the misinterpretation of „neurogenic“ changes because in these disorders fibrillation potentials, positive sharp waves, and complex repetitive discharges are frequently found. Electrophysiological findings of myotonia do not necessarily indicate a clinical myotonic disorder because electrophysiological myotonia might also be found in myositis, acid maltase deficiency, myofibrillar myopathies, hyper- and hypothyroidism, and various toxic myopathies.

Clinical chemistry: Elevated serum CK is a valuable indicator for myogenic muscle damage. However, normal CK does not exclude a primary myopathy and even special forms of muscle dystrophy. Analysis of various autoantibodies are important in myasthenic syndromes, inflammatory myopathies, and necrotizing myopathy (HMG-CoA reductase antibodies). Elevated serum lactate at rest and upon mild exercise suggests a mitochondrial disorder while the lack of rise of lactate or ammonia indicates a glycogenosis or a myoadenylate deaminase deficiency (the most frequent metabolic myopathy).

Muscle imaging (MRI): This might be important because (1) it might identify involvement of single muscle groups frequently found in special myopathies (e.g. caput mediale of m. gastrocnemius in anaesthetin 5 myopathy) and (2) it might be useful in quantification of the disease progress (especially under any therapy).

Muscle biopsy: This has to be analyzed in frozen-dried sections (not from formaldehyde fixated paraffin embedded material). The analysis includes the various histological and histochemical stains, immunohistological reactions, western blot analysis of various gene products, and in suspected mitochondrial myopathy also the analysis of mtDNA.

Molecular genetics: In various genetically determined myopathies there are typically only one or a small number of molecular rearrangements causing the disease. These targeted analyses are usually not very expensive. Other cases, however, might require numerous analyses of different genes and different positions within a gene. Here, the panel analysis is often helpful. The diagnostic yield of these studies depends on the number of genes included in the panels. There are panels with about 500 myopathy related genes. However, even using such a panel, the diagnostic yield is still clearly below 100% and abnormalities found might not be of unequivocal pathogenic significance.

The second part of this presentation will focus on frequent genetically determined myopathies with defined clinical symptoms and signs where the diagnosis is already done.



Prof. Alexander Tsiskaridze Georgia

MD, PhD, DSc, FESO, MAE

Chair of Neurology at Ivane Javakhishvili Tbilisi State University, Head of Neurological Service at Pineo Medical Ecosystem.

After obtaining the Honour Diploma of Medical Doctor from Tbilisi State Medical University, Alexander Tsiskaridze started his professional career in late 80ies at Sarajishvili Institute of Neurology in the capacity of Intern, then Junior Scientific Researcher. In the 1999-2000 he has undertaken European Neurological Society Fellowship in Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland. Later he gained Swiss National Science Foundation Research Grant and Fellowship at the Department of Neurology of the same university hospital (2003-2004). In Georgia he continued his career in Sarajishvili Institute of Neurology as Senior Scientific Researcher, Head of Research Department and finally held the position of Scientific Director. He became Professor of Neurology in Ivane Javakhishvili Tbilisi State University in 2006. He also served as the Dean of the Faculty of Medicine (2006-2017) and the Vice Rector for Research (2017-2019) in the same university.

Dr. A. Tsiskaridze is the author of 54 scientific papers. He is also the author and co-author of several book chapters as well as co-editor of the book “Treatment-related stroke: including iatrogenic and in-hospital strokes” (Cambridge University Press). He has received numerous international and local degrees, awards and honours including the degree of Candidate of Medical Sciences (PhD), the degree of Doctor of Medical Sciences, Sarajishvili Medal and Honour Diploma for Achievements in Neurological Research of Georgian Association of Neurologist and Neurosurgeons, Young Investigator’s Award of the European Stroke Council, Bruce Schoenberg International Award in Neuroepidemiology of the American Academy of Neurology, Georgian National Scientific Prize and Silver Medal for the Cycle of Papers on Cerebrovascular Disorders, Ivane Javakhishvili Medal of Tbilisi State University and Order of Merit of President of Georgia. Prof. Tsiskaridze is the Founding Fellow of European Stroke Organization (ESO), the former member of Board of Directors of ESO, the member of Academic Council of Ivane Javakhishvili Tbilisi State University, the member of Board of Directors of Curatio International Foundation and the member of Academia Europaea. At the ESOC 2022 in Lyon he was appointed a Chair of the Council of Fellows of ESO.

He is the member Editorial Board of various journals including European Stroke Journal (Sage) and Neurological Sciences (Springer). He serves as a peer-reviewer of British Medical Journal, Journal of Neurology, Neurosurgery and Psychiatry, Circulation, Stroke, Journal of Neurological Sciences, Internal and Emergency Medicine, Neuroepidemiology, Cerebrovascular Diseases, European Neurology, Frontiers in Neurology, Journal of Neuroinflammation, Journal of Stroke and Cerebrovascular Diseases, and Case Reports in Neurology.

Stroke with Intracranial Atherosclerosis: Prevention and Treatment

Intracranial atherosclerosis (ICAS) is a highly prevalent cause of stroke. It is more often seen in Black, Hispanic, and Asian patients when compared with white patients. Hypertension, diabetes mellitus, smoking, and hyperlipidemia are the major modifiable risk factors associated with ICAS. As to the risk of stroke recurrence among patients with symptomatic ICAS, it is high and variable. Aggressive medical

management, with combined antiplatelet medications and risk factor modification, is a treatment of choice. RCTs comparing intracranial stenting with aggressive medical management to aggressive management alone did not show benefit of stenting. Despite aggressive medical therapy, a certain subgroup of patients has high recurrent stroke risk. These patients may benefit from endovascular therapy



Prof. Zurab Nadareishvili, USA

Professor of Neurology and Rehabilitation Medicine, The George Washington University, and Medical Director of Comprehensive Stroke Centre at VHC Health, Arlington, VA. Zurab Nadareishvili, MD, PhD is a board-certified neurologist with subspecialty certification in vascular neurology by American Board of Psychiatry and Neurology. He completed his neurology residency at Georgetown University Hospital, Washington DC and vascular neurology fellowship at National Institute of Neurological Disorders and Stroke, NIH, Bethesda, MD.

Dr.Z. Nadareishvili has received numerous awards and fellowships related to his research and public service, including the Canadian Stroke Society Prize, the U.S. Department of Health and Human Services Public Health Service Award, and the NIH International Research Fellowship Award. In 2016 he received Best Consulting Physician Award from Johns Hopkins Medicine.

Post-stroke Cognitive Impairment and the Risk of Recurrent Stroke

Despite of more than 25 years of research, the question regarding risks of recurrent stroke and death in patients with post-stroke cognitive impairment (PSCI) remains controversial. To address this controversy, we conducted a meta-analysis of published literature on the risk of recurrent stroke and death in patients with PSCI.

Pooled data from 8 studies (n= 7,664) showed statistically significant 71% increase in the hazard of recurrent stroke in patients with PSCI (HR 1.71; 95% CI: 1.45-2.01), while pooled data from 17 studies (n= 29,919) showed statistically significant 98% increase in the hazard of mortality in patients with PSCI (HR 1.98; 95% CI: 1.64-2.40).

Based on these data, cognitive testing at 3-6 months after stroke might be promising tool in risk stratification for identification of patients at higher risk requiring more aggressive secondary preventive strategies. However, no data is available whether secondary stroke prevention intervention effect modification according to PSCI status exists. To address this question, we conducted subgroup analysis of IRIS trial to study whether pioglitazone secondary stroke prevention effect modification by PSCI status exists.

We studied n=3,338 patients with a baseline cognitive exam at median of 79 days after stroke. Global PSCI was present in 13.6% (n=453) patients. The effect of pioglitazone vs. placebo effect significantly differed by PSCI (interaction p = 0.008) indicating pioglitazone secondary stroke prevention effect was present only in 13.6% (n=453) patients, while no treatment effect was seen in 86.4% patients (n=2,885) without PSCI. These data indicate that there is statistically significant treatment effect modification by PSCI status. PSCI is a promising biomarker of recurrent stroke which can be tested in phase 2 secondary stroke prevention trial as identification of high risk patients may decrease required sample size.



Prof. Serefnur Ozturk Turkey

M.D., FEAN, head of the neurology department and stroke centre of the Selcuk University, Faculty of Medicine in Konya, Turkey. She is former president of The Turkish Neurological Society and member of many national and international committees (WSO Global Policy Committee, chair of WFN Migrant Neurology Specialty Group, EAN core COVID-19 Task Force, European Academy of Neurology (EAN) Rare Diseases, vice president of the WFN Environmental Specialty Group, UEMS Representative of Turkey, member of UEMS /Neurology Section, Board Examination Committee, Co-president of the EAN Critical Care Panel, The Committee of Quality in Stroke Care –Turkish Health Ministry, executive board member of the Cerebrovascular Disease and Neurointensive Working Group of The Turkish Neurological Society.

Her interest areas are stroke, neurointensive care, neuroepidemiology, health care and neurological education.

She has participated to many the national and international phase III and IV projects and registries (as national coordinator and investigator). She is a member of TurkStrokeNet (Collaborate with ESOTA) She has more than 150 national and international publication (including books).

Prof. S.Ozturk serves as Editor-in-Chief for Turkish Journal of Neurology (official scientific journal of TNS) and associated editor for national and international journals.

Environment and Stroke-a Preventable Risk Factor

Stroke is the second leading cause of mortality worldwide. Increasing risk factors increase stroke rates, especially in low and middle-income countries. Newly defined risk factors are also contributing to this health problem. Environmental conditions, especially air pollution, were determined as a significant risk factor for stroke, general brain health, and other cardiovascular disorders. There are various mechanisms for the harmful effects of these factors on the brain and vessels. Besides air pollution, chemical contamination, urbanization, and biological aggression, climate change are important factors. Environmental factors and air pollution will be reviewed as preventable risk factors. There are many potential strategies like green spaces, to increase advocacy to reduce these factors both individually and community-based, and politically.



Prof. Zaal Kokaia Sweden

He obtained a Ph.D. degree in neuroscience from the University Lund, Sweden. He also holds Ph.D. in neurophysiology from I.Beritashvili Institute of Physiology, Tbilisi, Georgia. Currently, Dr. Z.Kokaia is the Professor of Experimental Medical Research at Lund University and heads the Laboratory of Stem Cells and Restorative Neurology at Lund Stem Cell Centre. He is the founding Principal Investigator of this Center and for 10 years served as its director and coordinator of the Strategic Research Area in Stem Cells and Regenerative Medicine (Stem Therapy) at Lund University supported by the Swedish Government. The current research interest in Kokaia's laboratory is to study the possible use of in vitro and in vivo reprogrammed stem and immune cells to restore stroke-damaged neuronal networks and modulate neuroinflammation for improved functional recovery after stroke. In recent years, his ground-breaking studies brought to a new level of use of human induced pluripotent stem cell-derived neurons for the reconstruction of damaged cortical networks and functional recovery.

From bench to bed - human cortical tissue as an ex vivo translational model for cell therapy in stroke

Several neurodegenerative diseases cause loss of cortical neurons, leading to sensory, motor, and cognitive impairments. Studies in different animal models have raised the possibility that the transplantation of human cortical neuronal progenitors, generated from pluripotent stem cells, might be developed into a novel therapeutic strategy for disorders affecting the cerebral cortex. Two main mechanisms have been proposed to give rise to improved functional recovery in animal models of stroke after the transplantation of these cells. First, "bystander" effect, which could modulate the inflammatory environment by releasing different factors from grafted cells resulting in moderate improvements in the outcome of the insult. Second, the neuronal replacement and functional integration of grafted cells into the impaired brain circuitry. This will ultimately result in optimum long-term structural and functional repair. In line with this, we have shown that human long-term neuroepithelial-like stem (lt-NES) cell-derived cortical neurons, produced from induced pluripotent stem cells and transplanted into stroke-injured adult rat cortex, improve neurological deficits and establish both afferent and efferent morphological and functional connections with host cortical neurons. So far, all studies with human pluripotent stem cell-derived neurons have been carried out using xenotransplantation in animal models. Whether these neurons can integrate also into adult human brain circuitry is largely unknown. We showed that cortically fated lt-NES cells, which can form functional synaptic networks in cell culture, differentiate to mature, layer-specific cortical neurons when transplanted ex vivo onto organotypic cultures of the adult human cortex. The grafted neurons are functional and establish both afferent and efferent synapses with adult human cortical neurons in the slices as evidenced by immune-electron microscopy, rabies virus retrograde monosynaptic tracing and whole-cell patch-clamp recordings. Our findings provide the first evidence that pluripotent stem cell-derived neurons can integrate into adult host neural networks also in a human-to-human grafting situation, thereby supporting their potential future clinical use to promote recovery by neuronal replacement in the patient's diseased brain.



Assoc.Prof. Philip Bath , UK

Stroke Medicine, and Chair and Head of the Division of Clinical Neuroscience at the University of Nottingham.

Clinically, he contributes to the Nottingham University Hospitals NHS Trust Stroke Service (in-patient stroke care). As an NIHR Senior Investigator, his main research interests cover the treatment of acute stroke (blood pressure lowering), prevention of stroke recurrence and cognitive impairment (antiplatelet agents, blood pressure and lipid lowering) and enhancement of recovery using stem cells. He uses preclinical studies, clinical trials (phase I to IV) and systematic reviews to help address these questions.

Research Summary

Treatment of acute stroke

Anticoagulation in acute stroke

Nitric oxide in acute stroke

Management of blood pressure in acute stroke

Platelet and megakaryocyte function in stroke

Management of post stroke dysphagia and assessment of pharyngeal electrical stimulation in the PhEAST trial

Dysphagia is common affecting more than 50% of stroke patients admitted to hospital. Post-stroke dysphagia (PSD) is a powerful univariate predictor of poor outcome being associated independently with aspiration pneumonia, weight loss, malnutrition, disability and death. Although most patients with PSD requiring a nasogastric tube return to oral feeding, a minority require long-term feeding via a percutaneous endoscopic gastrostomy (PEG) tube. As such, PSD is very expensive through staff support, added bed days and investigations.

A variety of interventions have been assessed to treat PSD and return patients to oral feeding. In our ongoing Cochrane review, the following are associated with swallowing improvement and/or reduction of dysphagia: acupuncture, behavioural interventions (as used by speech & language therapists [SLT]), oral physical stimulation, neuromuscular electrical stimulation, transcranial magnetic stimulation, transcranial direct current stimulation and pharyngeal electrical stimulation (PES). However, there is considerable variability in trial quality, heterogeneity in findings and evidence of publication bias, and the majority of trials were small.

PES involves sensory stimulation of ascending neural pathways to induce plasticity in cortical swallowing centres. The PES catheter includes a feeding tube and stimulation wires and treatment is given over 3-6 days with each lasting 10 minutes. PES has a CE Mark and has been shown to reduce swallowing impairment after stroke in pilot studies. We are now running the large NIHR-funded Pharyngeal Electrical stimulation for Acute Stroke dysphagia Trial (PhEAST) in 800 patients with PSD recruited 4-31 days post stroke and who solely or primarily need NGT/PEG feeding. The primary outcome is swallowing impairment assessed using the dysphagia severity rating scale (DSRS) at 14 days. If PhEAST is positive then PES could become a key adjunctive therapy to SLT management of PSD.



Prof. Mirza Khinikadze Georgia

Caucasus medical centre, New Vision University Hospital, Pineo Medical Ecosystem

He was awarded a Ph.D. He is currently Head of the New Vision University Hospital's Neurology and Neurosurgery direction. He is an author and co-author of about sixty scientific works as well as a co-author of book of endovascular treatment of cerebral aneurysms. He is a member of the European Association of Neurosurgeons, the Ukrainian Association of Endovascular Neurointerventional Radiologists, Ukrainian Association of Neurosurgeons, WFNS and AANS. Dr. Khinikadze is the Chairman of the Board of Georgian Association of Neurosurgeons. Currently he works in Evex Medical Corporation, Pineo Medical Ecosystem, New Vision University Hospital. He is a board member of Professional Developmental Direction of Ministry of Health of Georgia.

The endovascular treatment using stent retrievers, aspiration catheters, thrombolytic, and (in selected patients) carotid stenting.

Novel approaches in prehospital (mobile interventional stroke teams) and early hospital (direct transfer to angiography) management are described, and future perspectives ('all-in-one' laboratories with angiography and computed tomography integrated) are discussed. There is reasonable chance for patients with moderate-to-severe acute ischaemic stroke to survive without permanent sequelae when the large-vessel occlusion is removed by means of modern pharmaco-mechanic approach. Catheter thrombectomy is now the golden standard of acute stroke treatment.

Satellite Symposia

Prof. Marina Janelidze, MD, PhD, DSc

Tbilisi State Medical University, Khechinashvili University Hospital

Secretary General, Georgian Union of Neurologists

Professor and Chairperson

Department of Neurology

Tbilisi State Medical University

Tbilisi, Georgia

What we need to know about dementia and how to help patients

Dementia is a global problem of increasing importance. It is a major cause of disability and dependency. Worldwide, an estimated 35.6 million people have dementia; by 2030, this will almost double, and it is predicted, that patients' number will exceed 115.4 million by 2050.

The total global societal direct and indirect costs of dementia are also huge: in 2010 these costs exceeded US\$604 billion. AD is the most common cause of dementia and may contribute to 60%-70% of cases.

Alzheimer's disease comes with many challenges. First of all, it is the difficulty of diagnosis -the clinical picture of several dementias is similar. Slow, gradually progressive character of AD makes diagnosis even more difficult, especially in the early stages. In case of timely recognition of the pathology, the patient and his family are given the opportunity to plan the future properly and effectively and be well-prepared to face the next stages of the disease.

Although the complete cure of Alzheimer's disease is still not possible, with the right treatment started on time, the dementia stage can be postponed and the patients' ability to live independently can be significantly prolonged.

At the same time, the increasing and changing needs from stage to stage of the disease, faced by the patients and their caregivers and are necessary to overcome for the most effective support and a high quality of life of patients, are often completely unforeseen.

To solve the above-mentioned issues, it is necessary to inform the medical society about the latest recommendations and to implement them in practice; to educate the population about the characteristics,

course, and prognosis of Alzheimer's disease, and, most importantly, to actively involve the patient and his caregiver in all stages of disease management.



Prof. Nino Okribelashvili Georgia

Tbilisi State University, Vice-Rector for research, President of Society of Georgian Psychiatrists, Clinical Director of Centre for Mental Health and Prevention of Addiction Tbilisi Georgia

The quality of life in Antidepressant's Era

Quality of life (QoL) is defined, as a concept that intends to capture the well-being of a population or an individual at a specific time within their existence, concerning positive and negative elements. The World Health Organization clarifies QoL as a subjective evaluation of one's "perception of reality relative to their goals" as observed through their culture and value system.

Depression is one of the most common mental health disorders in the world and along with anxiety it has been associated with adverse societal and individual correlates and an increased risk for physical comorbidities. Moreover, in numerous studies, they have been linked to a reduced quality of life (QoL). Research in recent years has shown that somatic diseases (diabetes, arthritis, hypertension, etc.) have high comorbidity with depression and somehow contribute to its severity, which sometimes leads to excessive algic phenomena or low adherence to treatment.

In this respect, some studies are focused on the efficacy of antidepressants in improving QoL and reduction of existing somatic concerns in chronic illnesses, as shown on Mirtazapine or Escitalopram .

According to recommendations from health professionals, a multidisciplinary approach in treatment with specific attention to the concept of quality of life is highly valued.



Prof. Mikheil Okujava Georgia

MD, PhD, DSc

Head of Neuroradiology and Neuroscience, Todua Clinic

Professor, Ilia State University, School of Natural Sciences and Medicine

Vice-President of Georgian Society of Radiology

Main fields of Interest: Imaging of Epilepsy, Degenerative disorders, Multiple Sclerosis, Radiation-induced changes in CNS

Study of Glymphatic system using MRI

The presence of the glymphatic system in the human brain is a relatively recently defined concept of exchange pathway between the interstitial fluid and perivascular spaces. It is hypothesized that this system plays an important role in the clearance of the brain from different solutes and waste to the meningeal lymphatic vessels. The dysfunction of the glymphatic system may contribute to the pathophysiology of different diseases (Alzheimer's disease, TBI etc.). Original research of the glymphatic pathway was mostly concentrated on experimental studies using fluorescent tracers. Modern neuroimaging techniques, and especially magnetic resonance imaging can be the promising method for the study of the CSF-interstitial pathway. Different techniques are proposed for this purpose - intrathecal gadolinium enhanced imaging, intravenous administration of the gadolinium-based contrast media, flow-sensitive sequences and diffusion based imaging. Strengths and pitfalls, as well as potential clinical indications of different MRI techniques for the evaluation of the glymphatic system will be discussed in the presentation.



Prof. N.Sainishvili Georgia

1993- Graduated from Tbilisi State Medical University / TSMU /diploma-825693/

1994- Graduated from one year residency course in Traumatology /certificate-94258/

1995- Graduated from one year residency course in Neurosurgery/certificate-95862/2000- Graduated from one year residence course in Radiology /certificate-1646/ 2005 – Completed PhD at Institute of Clinical Medicine.

Work experience: 1994-2009 – Neurosurgeon. Central Railway Hospital

Department of Neurosurgery

1997-2007 – Neurosurgeon. Georgian Border Guard Hospital

2001-2009 – Neurosurgeon, Neuroradiologist. Institute of Clinical Medicine.

2007-2008 – MOD Military Hospital, Director.

2009-2016 – Aversi Clinic ltd. Chief of Radiology Department.

By 2013 – Consultant in Radiology. National Forensics Bureau.

By 2014 – Head of Radiology Unit. Tbilisi Central Hospital.

By 2015 – Head of Radiology Unit. Innova Medical Centre.

By 2016 – Chief of Diagnostic Radiology Department. HTMC - University Clinic.

By 2016 – Radiology Group Leader. EVEX Medical Corporation

Animal Imaging. Technical, Development and Ethical issues. Own Experience.

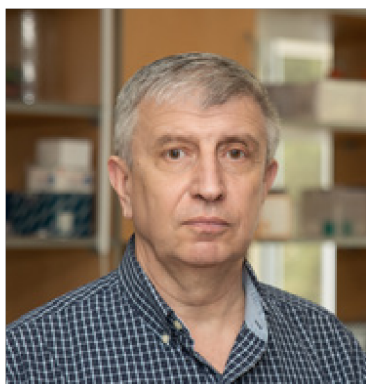
Aim of study:

Develop MRI and CT exam protocols for small and large animals; Solve ethical issues between human & veterinary healthcare; Develop reporting templates for animal imaging.

Material & methods: MRI exams performed on 1,5T Magnetom-Essenza and 3T Magnetom-Skyra. CT exams performed on CT-Somatom-Perspective-128sl.

89 dogs and 27 cats were examined.

Conclusion: Adapted protocols improved image quality and reduced time of exams.
Ethical issues to be solved with cooperation of municipal bodies.



Prof. R. Solomonias Georgia

Director Institute of Chemical Biology, Ilia State University and Iv.Beritashvili Centre of Experimental Biomedicine, Member of Laboratory Medicine Section of GAMS Tbilisi, Georgia

Revaz Solomonias (28.05.1956) graduated from I.Javakhishvili Tbilisi State University, Faculty of Biology in 1978, specialized in Biochemistry. During 1978-1982 years he did post-graduate studies at the Institute of Molecular Biology, Moscow. In 1983 he received his Ph.D. at Moscow State University. From 1982 till present R.Solomonias is a fellow of I. Beritashvili Centre of Experimental Biomedicine (former I. Beritashvili Institute of Physiology) in parallel with other positions.

R.Solomonias took 1 year training course at International Centre of Biological Research in Szeged, Hungary in 1985-1986 years.

In 1992 R. Solomonias received Science Doctor Degree in Biochemistry and Physiology

In 1994-1996 worked at Department of Zoology, University of Cambridge as a fellow of Wellcome Trust.

In 1997 received Wellcome Trust Fellowship for joint project between the Institute of Physiology and University of Cambridge. In 1999 worked at Department of Biochemistry, University of Cambridge as Wellcome Trust Fellow. In the following years he has received two grants from Royal Society for collaboration of Institute of Physiology and University of Cambridge.

In 2002-2005 Revaz Solomonias was Full Professor and head of Laboratory of Biologically Active Compounds at I. Javakhishvili Tbilisi State University.

Since 2006, R. Solomonias has been a full professor at Ilia State University and director of the Institute of Chemical Biology. By combination, he is the head of Biochemical Neuropharmacology at the Ivane Beritashvili Centre of Experimental Biomedicine.

He has received 20 international research grants. He has published 90 articles, more than 45 of which were published in journals with international impact factor. In 2017, he received the National Lecturer Award of the Federation of European Biochemical Societies for a plenary lecture at the Congress of the Turkish Biochemical Society.

More than 20 doctoral theses have been defended under his supervision.

Scientific interests / research interests: Molecular Neurobiology, Molecular Microbiology

Inhibition of Epileptogenesis by Myo-inositol; Behavioural, Electrophysiological, Morphological and Molecular Studies

R. Solomonias G.Gamkrelidze, L.Tsverava, M.Kandashvili, L.Kharkhelauri, E.Lepsveridze

Epilepsy is one of the most devastating neurological diseases and despite significant efforts there is no cure available. Occurrence of spontaneous seizures in epilepsy is preceded by numerous functional and structural

pathophysiological reorganizations in the brain—a process called epileptogenesis. Prevention of epileptogenesis is a subject of intensive research. Currently, there are no clinically approved drugs that can act as preventive medication. In our early studies, we have shown that water extract of *Aquilegia vulgaris* (plant widely used in Chinese and Tibetan folk medicine as antiepileptic and soporific medication) contains compounds affecting gamma aminobutyric acid A receptors in vitro. These compounds were identified as myo-inositol (MI) and sleep-inducing lipid oleamide. We have shown that: (i) MI pretreatment significantly decreases severity of acute seizures [status epilepticus: SE] induced by kainic acid (KA) in experimental animals; (ii) daily post-SE administration of MI for 4 weeks prevents certain biochemical changes triggered by SE. However in these series of experiments it was not established whether such MI treatment also exerts long-term effects; are they maintained after MI administration is ceased! In the follow up research we have demonstrated that MI 4 week administration after KA induced SE; (i) decreases the frequency and duration of electrographic spontaneous recurrent seizures (SRS) in the hippocampus; (ii) has an ameliorating effect on spatial learning and memory deficit associated with epileptogenesis; (iii) attenuates cell loss in the hippocampus and (iv) alters the number of molecular changes that all expected to counteract the epileptogenesis. All these effects are still present even 4 weeks after MI treatment ceased. We hypothesize that MI may exert multiple actions on various epileptogenesis-associated changes in the brain and, therefore, could be considered as a candidate target for prevention of epileptogenesis.



Malkhaz Kintsurashvili Georgia

MD Representative of GAMS in UEMS Board of Neurosurgery Buba Shalamberidze MD, Prof. Edisher Magalashvili, Tsotne Ckhikvishvili MD Neurosurgery Department American Hospital Tbilisi, Georgia

Skull Base Endosurgery

In the recent period, the development of neurosurgery is taking place in the direction where, together with the minimization of the operative approach, the maximization of the operative intervention should be achieved. The development of endoscopic techniques, minimally invasive instruments, plays a big role in this case. We want to recall what can already be considered the old trans-nasal trans-sphenoid approach to the structures of the base of the skull, the Turkish hump, the middle fossa, the medial edge of the cavernous sinus, the oral clivus. And so to present a new approach of comparison of trans-orbital endoscopic temporal and frontal pole, the outer edge of the cavernous sinus, and the lateral structures of the middle fossa. Let us present a few cases where we used a trans orbital approach



Assoc. Prof. Nana Kvirkvelia Georgia

Department of Neurology and Neurosurgery, Faculty of Medicine, Ivane Javakhishvili Tbilisi State University. Head of neuromyological department at Petre Sarajishvili Institute of Neurology. Local head of neurology specialty residents at Institute of postgraduate medical education and continuous professional development of Tbilisi State Medical University. President, Neuromuscular Society of Georgia Association for Electro diagnostic Medicine. European Academy of Neurology Muscle and Neuromuscular Member of the Scientific Panel on Union Disorders. Board member, Union of Neurologists of Georgia.



Elene Nabadze

Ivane Javakhishvili Tbilisi State University, Petre Sarajishvili Institute of Neurology ,MD PhD student



Mariam Kekenadze

Tbilisi State Medical University, MD PhD student

“Modern principles of diagnosis and management of sporadic inclusion body myositis”

Sporadic inclusion body myositis (IBM) is the most difficult to diagnose disease, while it is the most common inflammatory myopathy among middle-aged and elderly people. The prevalence of IBM varies greatly depending on geographical, ethnic and age factors. Frequency of the disease in the general

population is from 1: 1,000,000 to 1: 14,000. Over the past 50 years, it has tripled. The aetiology and pathogenetic mechanisms of IBM have not yet been fully studied and, accordingly, the criteria for diagnosis and treatment have not been fully established. A treatment algorithm developed for other inflammatory myopathies is not effective. So, the aim of this work is to review, summarize and analyse the latest medical literature on etiopathogenetic, clinical phenotypes, global prevalence, genetic predisposition, diagnostic criteria and treatment trends for IBM, which will contribute to the improvement and practical application of current diagnostic and therapeutic methods of the disease.



Assoc.Prof. Sophio Mikiashvili, Georgia

Sophio Mikiashvili is a graduate of Tbilisi State Medical University School of Medicine. She trained at the Scientific-Research Institute of Neurology (RAMS) (2003-2005) during her residency. During her practice, she was able to provide superior care and consultation that resulted in an overall improvement of the department's patient satisfaction quotient. Afterwards, she completed a fellowship at N.N.Burdenko Neurosurgery Scientific-Research Centre (RAMS) (2005-2008) in Radiology.

She is practicing her radiology profession at one of the leader hospitals Caucasus Medical Center, Aversi Clinic and American Hospital Tbilisi in Georgia. Her practice focuses on Neuro and MSK radiology since 2009 year till now and works in conjunction with researchers at Aversi Clinic which focuses on Neurooncology, Peripheral neuropathies,

Inflammatory and Demyelinating diseases. She currently is an author of 16 scientific issue/publication in the field of radiology (2009-2021), which are published in different international journals.

Currently Dr.S. Mikiashvili holds medical board licenses in Neurology and Radiology – subspecialty MRI,CT . She is an Associate Professor in SDASU and holds a PhD degree

„Rare cases of extra spinal sciatic neuropathy - why do we need MR neurography “

INTRODUCTION: Peripheral neuropathies - account for the most challenging disorders seen by neurologists, causes are variable. We discuss some unusual cases of sciatic neuropathy. The traditional diagnostic “gold-standard” consists of clinical neurologic examinations supplemented by nerve conduction studies (NCS), electromyography (EMG), Lab Tests. Due to well-known limitations of standard diagnostics and atypical clinical presentations, establishing the correct diagnosis can be challenging, but is critical for appropriate therapies. Magnetic resonance neurography (MRN) is a relatively novel technique that was developed for the high-resolution imaging of the peripheral nervous system. It is a technique that enhances selective multiplanar visualisation of the peripheral nerve and pathology by encompassing a combination of two-dimensional, three-dimensional and diffusion imaging pulse sequences.

OBJECTIVES: The primary objective of the presentation is to summarize progress in visualizing sciatic nerve injury by MRN - discussing different (rare) clinical cases, comparison with US and “gold standard“ – nerve conduction studies. We also made some correlation between pre-surgical MRN and postoperative findings to evaluate diagnostic value of advanced imaging technique, such MR neurography in patients with polymorphic nerve injuries.

METHODS: Clinical applications of MRI and MR neurography: we used combination of two and threedimensional T1-weighted (T1W) and fluid-sensitive sequences such as T2-weighted (T2W) with fat

saturation or short tau inversion recovery (STIR). Three-dimensional sequences such as 3D T2W sampling perfection with application optimized contrasts using varying flip angle evolutions (SPACE) and 3D STIR SPACE are part of the evaluation of the lumbosacral plexuses. In some cases we use MRN with intravenous gadolinium-based contrast (Gadovist) in cases where there is suspicion of a mass lesion or inflammation/infection. We used body and dedicated extremity/joint coils to receive good spatial resolution for evaluating nerve injury types and surrounding soft tissue. We discuss patients with pathologies such as entrapment neuropathy due to nerve compression, or non-entrapment neuropathy due to trauma, infection, inflammation, mass lesions (conventional MRI+MRN). Nerve injuries were classified on MRN using Sunderland's classification.

RESULTS: Discussing our cases, comparison with other diagnostic modalities, such as Nerve conduction studies (NCS), EMG, US, we can say, that while these tools remain essential to diagnostic and postoperative workups, they do not adequately address the full spectrum of nerve injuries seen in a clinical setting. Given the gaps in the current nerve assessment algorithm, MRN has recently been used to supplement traditional techniques for both pre- and postoperative characterization of nerve structures. MRN can provide high-quality images of structures in difficult anatomical areas without a skilled operator, locate the precise location of nerve injury, and visualize signs of secondary muscle denervation, thus addressing many shortcomings of the current diagnostic/monitoring algorithm. We use MRN with contrast in half of cases, and MRN in combining with DTI and diffusion-weighted imaging (DWI) in 2 cases, which enhance the quality of peripheral nerve imaging by showing barriers, such as the myelin sheath, that allow water movement along the longitudinal axis rather than the perpendicular axis. According to some differences between clinical and nerve conduction studies, the sensitivity and the specificity of MRN was approximately 92% and 98%, respectively.

CONCLUSION: MRN is a useful modality for direct demonstration of neuromuscular pathology and characterisation and is playing an increasingly important role in the management of various sciatic nerve pathology. MRI used not only as an additional method, but also as a main independent study in case of contraindications of the nerve conduction studies (in case of lymphadenopathy, skin infection, anticoagulant treatment). MRN is able to delineate the site of disease, assess its severity, identify the cause of neuropathy (neuropathic pain) and also monitor response to therapy, which serves to improve patient's quality of life. MRI with its superior contrast resolution and ability to assess deep seated nerves, gives additional information about the adjacent osseous, vascular, and soft-tissue structures.



Madona Sekhniashvili MD, PHD Student Georgia

Is a Ph.D. student of Tbilisi State Medical University working towards completing her dissertation in neurology as the research fellow of DAAD binational project in University of Leipzig enabled with German License to practice medicine. Her current research interest is Critical illness Polyneuromyopathy, its pathophysiology and new diagnostic aspects.

Currently, Dr. Sekhniashvili is Neurologist, Neurophysiologist. Specialised in Neuromuscular Disorders, she is Co-Founder of "Georgian Association for Neuromuscular diseases and EMG". Dr.Sekhniashvili heads the EMG Laboratory of Caucasus Medical Centre in Tbilisi, Georgia performing clinical examinations with EMG and nerve conduction studies as well as consultation service in several hospital including ICUs. She extended her experience also in the field of intraoperative neuromonitoring, as one of the first in Georgia, trained in the neurosurgery department, Charité Hospital Berlin. Dr.Sekhniashvili is AMEE

certified medical educator having experience in teaching internationally, being also Translator and co-author of the Georgian edition of the English e-book Manual of the Neurological Examination.

“Critical Illness Polyneuromyopathy-the novel diagnostic marker?”

Objective: Critical Illness Neuromyopathy (CIPNM) is a complication in sepsis patients with still enigmatic disease mechanisms. We investigated a novel electrical stimulation method to better define neuromuscular dysfunction in patients with CIPNM.

Patient and Methods: We studied 18 sepsis CIPNM patients on intensive care units, 13 at an early and 5 at a later disease stage, and 7 sepsis control patients. We applied slow conditioning electrical pulses at motor nerves and directly at the muscle to investigate a facilitation phenomenon (FP) of small or absent compound motor responses (CMAPs).

Results: Serial pulses induced a 2 to 490-fold increase in CMAP amplitudes in 17/18 ICU-CIPNM patients ($p < 0.001$). These effects were short lived and reproducible. Direct muscle stimulation in the tibialis anterior muscle resulted in up to 130-fold FP in 7/9 patients tested ($p < 0.01$). In 4/5 post-ICU CIPNM patients FP was up to 10-fold. None of the 7 ICU sepsis control patients without CIPNM and with similar disease severity showed FP ($p < 0.001$). On needle EMG only 5/16 ICU patients tested revealed spontaneous activity.

Conclusions: Conditioning electrical stimulation detected a functional component of the disease process showing temporary improvement in sepsis-associated CIPNM.

Significance: New test differentiates functional from degenerative pathology.

Key Words: Sepsis – Critical Illness neuromyopathy – electrodiagnosis – conditioning stimulation – Facilitation phenomenon – Voltage-gated sodium channels.



Miranda Demuria MD Georgia

Secretary of Neurology Section of GAMS, Neurologist, Multiprofile
Clinic Consilium Medulla, Jo Ann University Hospital

European Training Requirement ETR in Neurology approved at last UEMS Council in Brussels in collaboration with European Academy of Neurology –Georgian Translation-Challenges

George Chakhava Assoc.Prof. , D.Tvildiani Medical University, D.Tatishvili Health Centre, Multiprofile Clinic Consilium Medulla, **Maya Beridze** Prof. TSMU, Head of Neurology Department, GAMS
Representatives in UEMS Board Neurology; Tbilisi, Georgia , **Sofa Abashidze** Resident Neurology

The European Union of Medical Specialists (Union Européenne des Médecins Spécialistes) (UEMS) commits itself to contribute to the improvement of medical training at the European level through the development of European Standards in the different medical disciplines. The European professional advisory organization for neurology is the Section of Neurology of the UEMS (UEMS-SN). It communicates with the executive Bureau of the UEMS and serves in the interest of the various national professional and scientific neurological societies of the European Union and associated countries. The aims of the UEMS-SN and EAN regarding education and training are to ensure that minimal standards for the qualification of European neurologists are achieved. As a general recommendation to all in charge of neurological training at any level, the UEMSSN and EAN encourage the application of modern principles of educational sciences. This presentation contains a core curriculum for European residents in adult

neurology. The endeavour of the document “European Training Requirements for Neurology”, Version 2021, which is updated in cooperation of UEMS European Board and Section of Neurology and European Academy of Neurology (EAN), is to promote high standards of care for patients with neurological conditions throughout the European member states and sets the basic requirements in the domains listed below to enable specialists to move across European country borders for professional purposes. Georgian translation is the first step towards implementation of this document in our country.



Prof. Giorgi Pkhakadze

Accreditation Canada Representative in Georgia

WHO Consultant, Health and Migration Programme (PHM), Office of the Deputy Director-General, World Health Organization, Geneva, Switzerland

Head, Public Health / Epidemiology D.Tvildiani Medical University

- Established the School of Public Health, coordinating the course, research activities (PhD) in Public Health/Epidemiology
- Established and managed first Georgian Public Health Dictionary
- Published extensively in the field of public health, HIV, Accountability, health systems, PHC, SDG, etc. • Provided technical support (COVID-19) to the Government of Georgia including the Prime Minister’s Office, and Minister of Health. Created social/online movement supporting public health interventions in Georgia related to COVID-19.

Twenty years of professional experience in offering technical support to the design, implementation, management, assessment, monitoring and evaluation of health and social policies and programmes with a special focus on: hospital management; health system strengthening; linking of relief and development activities; strengthening of knowledge management systems. Equipped with a sound academic experience, strong management competencies and process oriented leadership developed through extensive work in the private as well as in the public sector. Experienced in working with international NGOs, local NGOs and several UN agencies. Substantial field experience in Central Asia, Commonwealth of Independent State (CIS), Eastern Europe, Eastern Africa, Middle East and South Eastern Asia.

Addressing Challenges and Unlocking Benefits: A Discussion Paper on Hospital Accreditation in Georgia and its Impact on Neurology Healthcare Professionals, Services, and Patients

Hospital accreditation is a critical process that promotes quality improvement in healthcare services. In Georgia, ensuring high standards of care in the field of neurology is crucial. However, hospitals face various challenges during the accreditation process, affecting their ability to provide optimal neurology services. This discussion paper examines the challenges specific to neurology healthcare professionals, services, and patients in Georgia during the accreditation process. By identifying and addressing these challenges, hospitals can unlock the transformative benefits of accreditation, leading to improved neurology healthcare outcomes and enhanced patient experiences. Through an exploration of limited resources, resistance to change, and compliance with standards, this paper offers insights and recommendations to healthcare leaders and policymakers on effectively navigating the accreditation process. It also highlights potential gains for neurology healthcare professionals, including standardized practices, inter-professional

collaboration, and continuous professional development. Moreover, the benefits for patients, such as improved quality of care, patient-centred approaches, and enhanced safety measures, are examined. By implementing the recommendations presented in this paper, stakeholders can collaboratively overcome challenges, maximize the benefits of accreditation, and elevate the quality of neurology healthcare services and patient outcomes in Georgia.



Assoc. Professor Tanya Gurevich, Israel

MD, FEAN Director of the Interdisciplinary Movement

Disorders Unit and Neuroautonomic Service, the Parkinson's Foundation

Centre of Excellence and Huntington's national Centre of Israel at the

Neurological Institute, Tel Aviv Sourasky Medical Centre and a faculty member of the Sagol Neuroscience School. Tanya (Tatyana) Gurevich is a recognized specialist in the fields of Neurology, movement disorders and neuroautonomic disturbances. The main areas of her clinical and research interests include development and refinement of the interventions for different aspects and stages of Parkinson's disease, and of other hypokinetic and hyperkinetic movement disorders, with emphasis on strategies for diseasemodification and quality of life improvement.

This includes the implementation of the principles of precision medicine in the treatment of Parkinson's disease, and studies on biomarkers, epidemiology and genetics. She is involved in collaborative clinical research on Parkinson's disease, Parkinson plus syndromes, Multiple System Atrophy, Huntington's disease, dystonia, and others. She receives competitive grants for conducting research, she is a principal investigator in several phase 1-3 trials and a member of the Tel-Aviv Medical Centre's institutional review board.

Assoc. Prof. T.Gurevich is the head of the Neurology program at the School of Continuing Medical Education in the Tel Aviv University. She has authored or co-authored over 70 publications in the field of Clinical Neurosciences.

Hyperkinetic movement disorders and their management

Hyperkinetic movement disorders include tremors, dystonia, chorea, ballismus, tics, myoclonus, restless legs syndrome, drug-induced dyskinesias, psychogenic movement disorders and others. Although important progress has been made in research on motor and cognitive control and in the understanding of the role of the basal ganglia in the pathophysiology of involuntary movements, we still lack aetiopathogenetic therapies for them and most of the treatment options are based on symptoms and not aetiologies. Effective management of hyperkinetic disorders is nevertheless possible due to the assortment of symptomatic treatments, including pharmacological formulations as well as a neuromodulation strategy, such as botulinum injections, deep brain stimulation, intrathecal baclofen infusions and focused ultrasound thalamotomy. The possibilities of pharmacological options were significantly extended in 2017 with the approval of 3 new medications for various kinds of involuntary movements. Modern approach to the treatment of hyperkinetic movement disorders, such as tremor, dystonia, chorea, Tourette syndrome, and others will be discussed. Treatment options that are currently under investigation will also be described.



PHD Student Alex Zirra, UK

Trainee doctor in East London, UK, at Queen's Hospital Romford. She has graduated in 2013 from the "Carol Davila" University of Medicine and Pharmacy with an MBBS degree. She then pursued a Clinical Neuroscience MSc at University College London in 2013 to 2014. Her postgraduate work in the Jernej Ule and Rickie Patani groups led to her interest in neurodegeneration and RNA biology. She is currently in clinical training as an Internal Medicine Trainee. Her interest in Parkinson's Disease flourished during a Research Fellowship working on the East London Parkinson Disease Project in 2021-2022 at Queen Mary University London under the supervision of Professor Alastair Noyce. She has secured PhD funding from the Medical College of Saint Bartholomew's Hospital Trust and is due to start a PhD on Parkinson's Disease at Queen Mary University London under the supervision of Prof Alastair Noyce.

Her interest areas are Parkinson's Disease, neurodegeneration, cognitive impairment, epidemiology, and RNA biology.

A strategic training framework for building research capacity in the Global Parkinson's Genetics Program (GP2)

Alex Zirra², Maria Teresa Periñan¹, Sumit Dey², Claire Bale³, Maggie Kuhl⁴, Hampton Leonard^{5,6}, Patrick Lewis^{7,8} Simon Stott⁹, Mary B Makarios^{8,10}, Alejandro Martinez-Carrasco⁸, Alastair J Noyce², Sara Bandres-Ciga⁵ and The Global Parkinson's Genetics Program (GP2)

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2. Preventive Neurology Unit, Wolfson Institute of Population Health, Queen Mary University of London, London, UK
3. Parkinson's UK, London, UK
4. The Michael J. Fox Foundation for Parkinson's Research, New York, NY, USA
5. Center for Alzheimer's and Related Dementias, National Institutes of Health, Bethesda, MD, USA
6. Data Tecnica International, Glen Echo, MD, USA
7. Royal Veterinary College, London, UK
8. Department of Clinical and Movement Neurosciences, UCL Queen Square Institute of Neurology, London, UK
9. Cure Parkinson's, London, UK
10. Laboratory of Neurogenetics, National Institute on Aging, National Institutes of Health, Bethesda, MD, USA, 20814

Background: Parkinson's Disease (PD) is a highly prevalent neurodegenerative disease. Most PD research has been focused disproportionately on White, affluent patients from Western Europe and North America.

Aim: The Global Parkinson's Genetics Programme (GP2) is a collaborative and global effort to improve the genetic understanding of PD on a global scale, with a focus on under-represented populations. Alongside expanding the research population into under-represented communities, GP2 also developed resources and training opportunities in order to expand and train the next generation of PD researchers world-wide.

Methods: GP2 has already developed an online web-based learning platform to promote knowledge and skills around PD genetics and bioinformatics (<https://training.gp2.org>). Other opportunities, such as short courses or graduate programs have also been offered to clinicians from under-represented populations in PD research to build skills and local capacity in this field.

Results: So far, more than 600 students benefitted from the 8 courses launched on the GP2 learning platform with a focus on Bioinformatics, Research Methods, PD Genetics, and others. A network of 168 members world-wide has been established and has fostered many learning opportunities, such as collaborations on book chapters, review articles or new research projects. Graduate courses in bioinformatics and data science through the Foundation for Advanced Education in the Sciences at the NIH were also offered to over 30 trainees from the GP2 networks, alongside 4 PhD and 7 Master fellowships at GP2 centres.

Conclusion: Ensuring local research capacity for PD genetics is a long-term goal of GP2. This is paramount for trainees and researchers world-wide to be able to understand such a complex neurodegenerative disease, like PD, on a global scale.



Prof. Sofia Kasradze, Georgia

Caucasus International University (CIU, Tbilisi, Georgia),

Director of the Institute of Neurology and Neuropsychology (INN, Tbilisi, Georgia),

President of the Georgian Chapter of International League Against Epilepsy (ILAE),

President of the Georgian Sleep research and Sleep Medicine Society (GSSS), Head of the National State Program on epilepsy in Georgia.

Graduated from Tbilisi State Medical University and has begun the work in the Epilepsy Centre at the P. Sarajshvili Institute of Neurology and Neurosurgery (Tbilisi, Georgia).

Her Ph.D. Diploma defended at the Academy of Sciences of Georgia was on women and epilepsy.

In 2005 she founded “Institute of Neurology and Neuropsychology” together with co-founders and created the project on “Prevention and early diagnosis of epilepsy”. On the basis of this project the Georgian Government developed first longstanding State Program on Epilepsy for primary and secondary health care levels. In 2007 founded Georgian Sleep research and Sleep Medicine society.

Under her guidance was created electronic version of “National Epilepsy Registry”, implemented bio-psycho-social approach for the treatment of epilepsy in Georgia (there are included neuropsychologists, clinical psychologists and psychiatrists), developed the National Guidelines and Protocols on Prevention, Diagnosis, Management and Care of Epilepsy; developed Epilepsy Monitoring Unit (EMU) and implemented an epilepsy surgery in Georgia.

NGOs which were founded by her direct participation they are currently the regional chapters of the ILAE (International League Against Epilepsy), EURAP (International Registry of Antiseizure medications and Pregnancy), WSS (World Sleep Society)

Currently she is the head of Task Force of the Georgian Commission on Guidelines and protocols on epilepsy and official expert on adults’ epileptology of MoH of Georgia Special Interests:

Epilepsy and clinical neurophysiology: Drug resistant epilepsy (DRE), Video-telemetry and pre-surgical evaluation of DRE, epilepsy surgery; epilepsy epidemiology; women’s issue, epilepsy co-morbidity

(psychiatric, developmental disorders, sleep disorders)

Other chronic neurological conditions: Sleep disorders, movement disorders and developmental disorders.

Medical Management: preventive, diagnosis, treatment and care services for persons with neurological conditions and sleep disorders.

IT technologies in medicine: Implementation and development of the new IT technologies. Mathematics and Physics in Medicine

Education: in epileptology (for continuing medical education); clinical neurophysiology/electroencephalography.

Epileptic Seizure Onset Zone Detection Using the Nonparametric Granger Causality and a New Matrix Spectral Factorization Algorithm

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1 Caucasus International University, Tbilisi Georgia

2 Institute of Neurology and Neuropsychology, Tbilisi, Georgia

3 New York University in Abu Dhabi (NYUAD)

Purpose: Identification of the epileptic seizure onset zones (SOZ) and their propagations, which usually depends on the EEG recordings is crucial for successful epilepsy surgery. For this purpose, the analysis of high-frequency (>80 Hz) oscillations by non-parametric Granger causality (NPGC) method has been reported to be successful. NPGC method, which uses heavy mathematical computations, relies on matrix spectral factorization (MSF). So far, the Wilson algorithm (WA) for MSF dominated in neuroscience applications. However, an alternative Janashia-Lagvilava Matrix Spectral Factorization Algorithm (JLMSFA) also proved to be effective that is more reliable for unstable matrices than the former one. **Goal:** Testing of the capabilities of JLMSFA in order to identifying of SOZ based on real data obtained from ictal EEG recordings.

Methods: Two regions (X and Y) of interest and a time epoch were isolated by visual inspection of two ictal EEG data of the patient. In order to apply NPGC estimation for these regions, after the data cleaning, bad segments removal, and line noise suppression by the standard functions of EEG Lab Toolbox, cross power spectral density (cpsd) matrix $S(f)$ was constructed in frequency domain by the multitapers method. The spectral factorization of this matrix, $S(f)=H(f)\Sigma H^*(f)$, where $H(f)$ is a transfer function and Σ is a noise covariance's matrix, was performed by JLMSFA. The Granger-Geweke frequency dependent causality estimations $I_{Y \rightarrow X}(f)$ and $I_{X \rightarrow Y}(f)$ were computed for high frequency values ($f > 80$ Hz) by the standard formula using $H(f)$ and Σ . These estimations were used to confirm the visually suspected SOZ and its propagation.

Results: The JLMSFA was used the first time on specific real EEG data for epileptic SOZ and its propagation by NPGC method. The algorithm was compared to the corresponding algorithm of Wilson. A thorough comparative analysis of these two methods should be the subject of the future work. **Conclusion:** The recently developed JLMSFA has the potential to substitute the Wilson corresponding algorithm which is widely used in computational neuroscience at present.

Acknowledgment: The study was performed in a frame of the Internal Scientific Grant for Fundamental Research of the Caucasus International University



Assoc. Prof. Eka Chkonia, Georgia

Tbilisi State Medical University (TSMU), an Honorary Member of the World Psychiatric Association, Clinical Director at the Central Psychiatric Hospital (Tbilisi Mental Health Centre), the international advisory board member of the Journal Psychiatry and Clinical Neurosciences (PCN), Editorial Board member of the medical journal “The Georgian Psychiatric News”.

Eka Chkonia is the Secretary of the Steering Committee of the EPA (European Psychiatric Association) Council of NPAs, a Member of the EPA Ethic’s committee, and Head of the WPA Expert Committee on the Ukrainian mental health crisis. She is a Director of the Clerkship in Psychiatry (TSMU USMD program). Associate Professor at Tbilisi State Medical University, GAMS delegate to the UEMS Board of Psychiatry

Social Endophenotype of Schizophrenia

Chkonia Eka 1, Khatia Sulaberidze 2

1. Tbilisi State Medical University
2. Tbilisi Mental Health Centre

Mental disorders represent a significant challenge for global healthcare systems and society. One of the most debilitating mental disorders, such as Schizophrenia, affects twenty million people worldwide and presents substantial health, social, and economic burdens due to comorbidities, relapses, chronicity, suicidality, and early mortality.

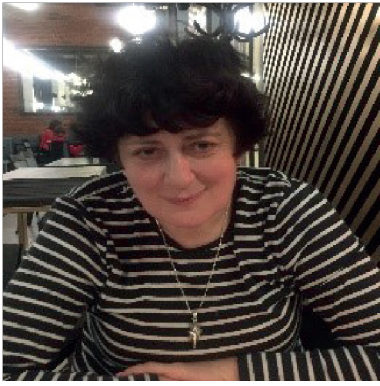
In psychiatry, there is a lack of objective markers and sensitive indicators for diagnoses and treatment decisions compared to the other branches of medicine. There is an urgent need for sufficient longitudinal studies and observational research.

The National Institute of Mental Health (NIMH) proposes a multidimensional diagnostic approach that combines behavioural, social, and biological factors, highlighting the importance of diverse data for the comprehensive approach and management of mental disorders.

Behaviour recognition methods based on artificial intelligence have become increasingly influential in various tasks. Mental disorders are predominantly manifested in the disturbances of social interaction, which emphasizes the importance of studying behavioural dynamics in real-life social interaction rather than solely individual performance. Interaction-based phenotyping to quantify the level of social conduct exchange or interpersonal synchrony of interaction could deliver additional data to generate an observer-independent picture of a patient’s mental state, leading to earlier and more sensitive identification of abnormalities. An Interaction-based sociometric approach combined with new automated monitoring technologies delivers novel state-associated biomarkers for diagnostic and therapeutic guidance. Research suggests that passive data may be a potential proxy for social performance and personal interaction in mental disorders.

There is clinical evidence that machine-learning models can make personalized predictions of relapse in psychiatric patients based on linguistic and behavioural markers.

The initial results are promising; the studies could be enhanced by further development of digital phenotyping technology and by fostering multidisciplinary collaborations between clinical stakeholders, computer scientists, and researchers.



Assoc. Prof. Marina Gegelashvili, Georgia

MD PhD, Ilia State University, a Head of the of Child and Adolescents Crisis Intervention Program, Psychiatrist in mental health Centre “NDOBA,” Consultant of mental health centre ”Psychea”, Mental health expert of the Council of Europe, expert of Ministry of Health, Labour and Social Affairs of Georgia. She is Fulbright Program’s alumna.(Program of the United States Department of State Bureau of Educational and Cultural Affairs, University of Miami, Miller School of Medicine, USA).Served as Trainer, Manager and/or consultant for the various international and national projects. Author and co-author of numerous scientific articles, manuals, books. Topic of interests: youth self-concept, child adolescents and adults emotional and behavioural disorders, autism and comorbidities. GAMS Representative in UEMS Board Psychiatry, Tbilisi, Georgia

“Dark Side of Happiness” Youth Externalizing Disorders and Life Satisfaction

Life Satisfaction is acknowledged as one of the core indicator of positive development and good mental health.

Numerous studies suggest that LS is negatively linked with maladaptation during adolescence and emerging adulthood and positively associated with favourable outcomes.

On the other hand despite the many findings about the positive and protective effects of high LS. There are other opinions and concerns about “dark side of happiness” particularly hypothesis that high level of LS does not always predict favourable outcomes for externalizing disorders. Many of them who show high levels of LS are prone to risk behaviour and overestimate their ability to deal with the negative consequences associated with risk behaviours. Thus, it is important to study and evaluate this externalizing disorders in the Georgian population, both in the aspect of public health and from the point of view of clinical approach.



Assoc. Prof. Ia Rukhadze, Georgia

Head of Department of Neurology of Central University

Clinic after Academic N.Kipshidze. Head of Sleep Disorders Association in Georgia, Member of

Georgian Chapter of International League Against Epilepsy (ILAE). She is the author of many scientific

publications in Journals with high impact factor. Main research interests are: Epilepsy, Neurophysiology, Stroke.

Uncertainty and Ambiguity in diagnostics and Management, When Depression and Dementia Coexist

Ia Rukhadze, MD, PhD, Central University Clinic, after Acad.N.Kipshidze, Department of Neurology. Tbilisi, Georgia

Otar Koniashvili, Central University Clinic, after Acad.N.Kipshidze, Department of Neurology. Tbilisi, Georgia

Gvantsa Khachiashvili, Tbilisi State Medical University, Faculty of Medicine, Tbilisi, Georgia

Depression is a common cause of reversible cognitive impairment in the elderly and is sometimes referred to as pseudodementia. However, occurrence of major neurocognitive disorder - dementia in the same population is common.

Among the possible aetiologies Alzheimer's disease and vascular dementia are two leading causes. In a relatively rare setting the coexistence of depression-induced cognitive impairment and dementia can occur. In such cases symptoms associated with underlying depression and structural neurodegenerative processes can overlap, making both differential diagnosis and planning subsequent treatment strategy challenging. Patients who have depressive episodes exhibit abnormalities in information processing on both a qualitative and quantitative level. It appears that depressed individuals arrange and modify events to be recalled using ineffective encoding mechanisms.

A major depressive episode typically lasts from a few weeks to several months and causes the person a considerable new disability. On the other hand, dementia itself may slowly proceed over months or years. Before a sufficient trial of depression treatment has completed, it may be difficult to attribute cognitive decline to dementia or depressive disorder. Currently published researches stress the importance of MRbased hippocampal volumetry in clinical practice while assessing the cognitive impairment. Based on studies, in comparison to other implemented neurocognitive tests, the Benton Facial Recognition Test might be a relatively sensitive tool in order to evaluate hippocampal function.

Neuropsychological tests should be used to distinguish between the "true" cases of dementia, depression, and the ill-defined intermediate stage of pseudo-dementia. To generalize these findings, further research in this field with appropriately selected and properly designed studies are required.



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“Indicators of Cognitive Dissonance and Depression in Adjara region, before and after the spread of Covid-19 Infection”

The present topic is not only important, but pressing, as number of cases of dementia in 2010 has consisted of 35.6 million people around the whole world. About two-thirds of people with dementia live in low- and middle-income countries where a sharp increase in numbers is seen. In 2013 the Dementia caused the death of 1.7 million, compared with 0.8 million in 1990. Dementia and depression are common

diseases, and because they may have similar symptoms, they are difficult to distinguish from each other. There are certain features that make it possible to differentiate one disease from another, but for the above, it is necessary to carry out a special survey. The organization of treatment of patients with Dementia and their care requires enormous financial resources. Dementia is a source of stress for relatives of patients and caregivers.

The goal of the paper is to study patients cognitive impairment and indicators of depression and their variation before and after spread of Covid-19 infection. Before the spread of Covid-19, the study was conducted during 2016-2017 years, and the subsequent study, covering the post-Covid-19 period, was conducted during 2021-2022 years in Batumi, at clinic Metacentre.

The purpose of the study is diagnosis of depression and dementia based on clinical observation, given the medical history and the objective information, analysis of the clinical features of depressive disorders in patients. Furthermore, the paper aims to study depression and dementia on the localization of the lesion, before Covid-19, where have been studied 250 patients from the age of 50 to 70 years. There were examined 120 men and 130 women to identify depression by the Beck depression scale. To identify the focus of the lesion, there were used methods of neuroimaging - computer or magnetic resonance imaging (CT or MRI). Diagnosis was established according to NINCDS-ADRDA criteria .For the diagnosis of dementia: “A brief scale of assessment of mental status” (Mini-Mental State Examination) was used[5]. The final score is displayed by summing the results for each of the items.

The number of patients who have been subject of the study and at least one month has passed after they had Covid-19 numbered 65 (30% of the patients), while patients who had Covid-19 three to six months before, numbered 115 (57,5% of patients), lastly, the number of patients who had the same infection six to one year before, numbered 20 (14.81% of patients).

Out of patients who have been subject of our study, 170 (85%) of them had dementia, out of them, 65% had their memory deteriorated, 76% had trouble with finding relevant words while speaking, 55% could not remember previously processed data, 75% had deteriorated the ability of the logical thinking and 35% the ability to process the information; 34% had deteriorated vision and orientation, 35% had lost interest in performing activities; 76% had depression; 65% had disturbance of the day-night cycle; 15% had disrupted social behaviour; 35% of studied patients had impaired emotional control and decreased motivation, 67% of them were easily triggered and angered, 25% had apathy. In addition to the above, out of studied patients, 85% had decreased level of intellectual abilities, 5% of studied patients, became unrestrained and tactless and engaged in socially unacceptable behaviours, develops convulsive discharges (5%), 15% were attracted to alcohol, 10% had Speech problems and 25% had urinary incontinence.

According to our research, the rate of depression and dementia is much higher after the Covid-19 pandemic than before, which requires a state approach to this issue, the development of a special plan and the implementation of preventive measures.



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Neurological symptoms and Vitamin B12 Levels Correlate in COVID-19 Patients

Tamar Goderidze; Irakli Apshinashvili; Nino Gulatava;

At the beginning of the COVID-19 pandemic, olfactory and gustatory changes were common which were connected to vitamin B12 deficiency. From early 2022 we observed post-covid neurological symptoms which significantly worsened the patient's quality of life because of this the patients were referred to primary care. The objective of our research was to evaluate the vitamin B-12 deficiency correlation to postcovid neurological symptoms. We selected 201 patients with laboratory-confirmed COVID-19 who were included in our research. All these patients had self-rated symptoms such as memory problems, impaired concentration, mood changes, tingling sensation, and/or weakness of muscles. All patients mentioned that before the COVID-19 infection they did not have these symptoms, or they had them but did not affect their quality of life. Utilizing standard enzyme-linked immunosorbent assay (ELISA) serum vitamin B12 levels were measured with CBC and TSH. A study showed that 85% of patients had low levels of vitamin B12. Based on the laboratory results, patients have been prescribed a daily dose of per oral vitamin B12 therapy for 2 months. Patients with a severe deficiency were initially given the injectable form for the first ten days, followed by a switch to the tablet form. Upon completing the treatment, all patients reported a significant reduction or complete disappearance of their symptoms. According to the study, we hypothesize that the overconsumption of vitamin B12 may be a result of physiological alterations caused by the illness, or due to its interaction with one or more viral proteins.

In conclusion, we recommend monitoring vitamin B12 levels in patients presenting with neurological symptoms developed after COVID-19 infection.



PLATINUM



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