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VIRTUAL EVENT

4th International Congress on

FUTURE NEUROLOGY & ADVANCES IN RESEARCH & TREATMENT OF BRAIN DISORDERS

June 27, 2023

Peers Alley Media

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FUTURE NEUROLOGY 2023

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YOUR FIRST CHOICE FOR RESEARCH INGENUITY

PROGRAM-AT-A-GLANCE

FUTURE NEUROLOGY
2023

Scientific
P r o g r a m

BST-British Summer Time

08:55-09:00	Opening Ceremony

Distinguished Speaker Talks

Sessions: Neurology | Neurosurgery | Neuropsychiatry | Central Nervous System | Pediatric Neurology | Neuro-Oncology and Brain Tumors | Neurological Disorders | Sleep Disorders | Stroke | Movement Disorders | Parkinsons Disease | Epilepsy | Multiple Sclerosis | Alzheimers Disease and Dementia | Neuromuscular Disease

09:00-09:20	**Title: Neutrophil-to-lymphocyte ratio is associated with venous infarction in acute cerebral venous thrombosis** **Alok Govind,** *National Institute of Mental Health and Neurosciences, India*
09:20-09:40	**Title: Parents' perceptions and expectations of friendship in children with autism** **Wangqian Fu,** *Beijing Normal University, China*
09:40-10:00	**Title: Emotion and judgment: A system-theoretical approach** **Wacław Petryński,** *Katowice Business University, Poland*
10:00-10:20	**Title: How behavioral and psychological factors influence STEM performance in K-12 schools: A mediation model** **Chun Lu,** *Central China Normal University, China*
10:20-10:40	**Title: Prognostic significance of neurofilament light in Fingolimod therapy for Multiple Sclerosis: A systemic review and meta-analysis based on randomized control trials** **Anusha Ashkar,** *Dow University of Health Sciences, Pakistan*
10:40-11:00	**Title: Neurocriminology and A.I. Neuroprediction** **Ghadeer M. M. Abdelaal,** *Zagazig University, Egypt*

Coffee Break 11:00-11:20	
11:20-11:40	**Title: Exploration of molecular mechanisms responsible for anti infammatory and anti angiogenic attributes of methanolic extract of Viola betonicifolia** **Hafiza Sidra Yaseen,** *The University of Lahore, Pakistan*
11:40-12:00	**Title: A meta-analytical review of empathy in autism spectrum disorders** **Mehreen Fatima,** *University of Delhi, India*
12:00-12:20	**Title: Pentoxifylline as add-on treatment to donepezil in copper sulphate-induced Alzheimer's disease-like neurodegeneration in rats** **Mohamed M Elseweidy,** *Zagazig University, Egypt*
12:20-12:40	**Title: Development of methods and mobile application to monitor emotions using ECG signals in young adults: D-OMAEYA** **Monorama Swain,** *Silicon Institute of Technology, India*
12:40-13:00	**Title: Dengue outbreaks prediction in Bangladesh perspective using neural network and machine learning technique** **Md. Ashikur Rahman Khan,** *Noakhali Science and Technology University, Bangladesh*
Lunch Break 13:00-14:00	
14:00-14:20	**Title: Applying the spot model to mental imagery representation and medical imaging** **Nikolai Anatolievich Simonov,** *Valiev Institute of Physics and Technology, Russia*
14:20-14:40	**Title: Telomerase reverse transcriptase and telomerase RNA component gene expression as novel biomarkers for Alzheimer's disease** **Raya Kh. Yashooa,** *Salahaddin University-Erbil- Research Centre -Erbil, Iraq*
14:40-15:00	**Title: Global burden of the COVID-19 associated patient-related delay in emergency healthcare: A panel of systematic review and meta-analyses** **Naser Hatami,** *Jahrom University of Medical Sciences, Iran*
15:00-15:20	**Title: Cryptococcal meningoencephalitis present as a stroke mimic in ICL patient** **Sandeep Ghosh,** *Accord Superspeciality Hospital, India*

15:20-15:40	**Title: Natural substances and neurodegeneration** **Maria Lazarova,** *Bulgarian Academy of Science, Bulgaria*
15:40-16:00	**Title: From post-traumatic stress to post-traumatic growth** **Myriam EL Khoury-Malhame,** *Lebanese American University, Lebanon*

Coffee Break 16:00-16:20

16:20-16:40	**Title: Deep learning on MRI for brain age signature assessment** **Teresa Wu,** *Arizona State University, USA*
16:40-17:00	**Title: Dual-Brain psychology: A science based and tested advanced treatment for multi-diagnostic problems** **Fredric Schiffer,** *Harvard Medical School, USA*
17:00-17:20	**Title: Interventional procedures for post-breast surgery pain syndrome** **Ashish Khanna,** *Winship Cancer Institute of Emory University, USA*
17:20-17:40	**Title: Alzheimer's disease: From basic mechanisms to development of therapeutics** **Cheng-Xin Gong,** *New York State Institute for Basic Research in Developmental Disabilities, USA*
17:40-18:00	**Title: Exogenous ketones as a potential therapeutic intervention for brain injury and neurodegenerative conditions** **Latt Mansor,** *Health Via Modern Nutrition Inc., USA*

Panel Discussions

Closing Remarks

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SCIENTIFIC ABSTRACTS

VIRTUAL EVENT

4th International Congress on

Future Neurology and Advances in Research and Treatment of Brain Disorders

June 27, 2023

FUTURE NEUROLOGY 2023

Neutrophil-to-lymphocyte ratio is associated with venous infarction in acute cerebral venous thrombosis

A. Govind and **R. Kenchaiah**
Department of Neurology,
National Institute of Mental Health and Neurosciences, India

Background and Objective: There is increasing evidence supporting the prognostic value of inflammatory markers in acute Cerebral Venous Thrombosis (CVT), among which Neutrophil-to-Lymphocyte ratio (NLR) has emerged as an inexpensive and readily available predictor of clinical severity and functional outcomes. This study investigated the utility of NLR as a marker of cerebral venous infarction in acute CVT, which is the parenchymal lesion associated with clinical deterioration and poor outcomes.

Methods: Adult patients with acute CVT without a known history of recent or active infections or inflammatory conditions were studied retrospectively. Baseline demographic, clinical, laboratory and radiographic parameters and modified Rankin Scale (mRS) scores at discharge were collected. NLR was calculated from baseline neutrophil and lymphocyte counts obtained at admission. The primary outcome measure was presence of venous infarction on initial neuroimaging. Secondary measures included baseline Glasgow Coma Scale (GCS) score, history of seizures, focal neurological deficits, and mRS score at discharge.

Results: A total of 162 patients (85 male, median age 34) were included in the study. Venous infarction was present in 102 patients. 93 had a history of seizures and 33 had GCS<13 on initial presentation, and 32 had significant disability (mRS>2) at discharge. Presence of venous infarction was associated with higher NLR, anemia, and shorter duration from symptom onset to presentation. In the multivariate model, NLR was an independent predictor of venous infarction – adjusted OR = 1.086, 95%CI: 1.014-1.164 (p = 0.019). NLR levels were also significantly higher in patients with a history of seizure, lower GCS at presentation, and borderline significant in predicting functional disability (mRS>2) at discharge (p = 0.051).

Conclusion: NLR independently predicts the presence of venous infarction and is associated with the downstream effects of brain injury including seizures, coma, and poor short-term functional outcomes in acute CVT.

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Outcome	AUC	95%CI	p-value	Sensitivity	Specificity	NLR Cutoff
Venous Infarct	0.621	0.534-0.708	0.010	63.73	56.67	>4.83
Seizure at presentation	0.663	0.577-0.750	<0.001	68.82	66.67	>5.06
Coma (GCS<13) at presentation	0.692	0.594-0.790	0.001	78.79	55.81	>5.23
mRS >2 at discharge	0. 612	0.496-0.727	0. 051	75.00	48.46	>4.83

Table 1 – AUC and threshold values for NLR as a predictor of clinico-radiologic outcomes in acute CVT
NLR – Neutrophil-to-Lymphocyte Ratio
GCS – Glasgow Coma Scale
mRS – modified Rankin Scale
AUC – Area Under the Curve
CI – Confidence Interval
CVT – Cerebral Venous Thromobosis

Biography

Alok Govind completed his medical training from Bangalore Medical College, India in 2021. His areas of interest include vascular neurology and neuroradiology. Owing to the relatively higher incidence of Cerebral Venous Thrombosis (CVT) in the South Asian population, he undertook this study by curating a large dataset at a busy academic tertiary hospital specializing in neurological care in India to explore the role of innate and adaptive systemic inflammation in brain injury in acute CVT.

Parents' perceptions and expectations of friendship in children with autism

Wangqian Fu[1] and **Peidi Gu[2]**
[1]*Faculty of Education, Beijing Normal University, China*
[2]*School of Education, Beijing Normal University (Zhuhai), China*

Aims: The study aims to explore what cultural factors influence Chinese parents' cognition and expectations of friendship for their children with autism,

Method: Interviews were conducted with 11 parents regarding the status, expectations, and barriers to friendship development in their children with autism (n=11, age mean=9.18). Thematic analysis was employed to interpret the data.

Results: The results revealed that Chinese parents generally perceived their children's current level of friendship to be unsatisfactory, and they held low expectations for their children's friendship development due to their understanding of friendship as a more advanced skill and social cognition in the context of Chinese social and cultural norms that still stigmatize people with autism. Cognitive and environmental barriers were identified as the major obstacles to friendship development for children with autism.

Biography

Dr. Wangqian Fu, associate professor in the School of Special Education of Beijing Normal University. His research interests include special education policy, psychology and education of children with developmental disabilities. She hosted several research projects from the Ministry of Education and Social Sciences of Beijing. She published dozens paper on those topic and an English book *Inclusive Education in China: Ideas, practices and Challenges.*

Emotion and judgment: A system-theoretical approach

Wacław Petryński[1], Robert Staszkiewicz[2]
and **Mirosław Szyndera[3]**

[1]Department of Physiotherapy, Katowice Business University, Poland
[2]Department of Physical Education and Sport, University of Physical Education, Poland
[3]Department of Tourism and Recreation, University of Physical Education, Poland

The basic assumption of the system-theoretical approach (STA) in anthropokinetics is that the physiological central nervous system evolves to ensure the most efficient possible psychological control of biophysical movements. Accordingly, the main manifestation of psychological mental activity is a physically observable movement. The interpretation of its empirical research, along with the psychological mechanisms underlying it, is extremely difficult, thus, conceptual models are of crucial importance in this field. A motor operation is the final physical product of a series of physiological and psychological processes, which may be termed 'stream of consciousness'. This comprises a coherent chain of phenomena – reception, information processing, motor response – which result in a final, purposeful motor operation. In the STA, each of such phenomena only make sense when they pose an element of stream of consciousness and may be defined by relations with its other components. The common denominator of attention and foresight is assessment of information processed in the mind. However, they are located in different places of the stream because they differ in their aims and methods of action. The 'working tool' of attention and foresight are, respectively, emotions and judgments. In this paper, a conceptual analysis of these phenomena is presented.

Biography

Wacław Petryński, M.Sc.Eng. (mechanics), PhD (physical education). Retired, but still active academic teacher in Katowice Business University, Katowice, Poland. His main field of scientific activity is the anthropokinetics (motor control, movement science). In 2007-2011, he served as general secretary of International Association of Sport Kinetics.

He claims that in researches into processes underlying human motor behavior mathematics is hardly useful. In this respect promising seems to be a system-theoretical approach. Petryński traced the roots of such an approach in the works of N.A. Bernstein and P.D. MacLean, and the essence of a system as such – in the works of J.M. Morawski. He presented his views in detail in the book „Motor Control in Humans. A System-Theoretical Approach" (Nova Science Publishers, Hauppauge, NY, 2016).

Petryński is married, has three adult children and six grandchildren. His hobby is sailing; he is ocean yacht skipper and former vice-president of the Polish Yachting Association.

How behavioral and psychological factors influence STEM performance in K-12 schools: A mediation model

Chun Lu[1], Wei Yang[2], Longkai Wu[3] and **Xiao Yang[2]**

[1]Educational Informatization Strategy Research Base of Ministry of Education, Central China Normal University, China
[2]National Engineering Research Center for E-Learning, Central China Normal University, China
[3]Faculty of Artificial Intelligence in Education, Central China Normal University, China

Understanding factors that influence k-12 students' Science, Technology, Engineering, and Mathematics (STEM) performance is essential to improving their problem-solving ability. Most studies have focused on the relationship between students' psychological factors and STEM performance and have paid little attention to the relationship between behavioral factors and STEM performance. This study explored the impact of behavioral factors (i.e., information and communications technology (ICT) readiness and online interaction (OI)) and psychological factors (i.e., internet self-efficacy (ISE)) on k-12 students' STEM performance. The sample included 851 fifth graders and 535 eighth graders from cities in central China. The results of structural equation modeling analysis showed that ISE and ICT readiness (IR) significantly impacted the STEM performance of eighth graders. More importantly, ISE, a psychological factor, had the greatest effect on STEM performance and played a mediating role in the relationship between IR, OI, and STEM performance. These findings have important implications for STEM teachers. To improve students' STEM performance, teachers should intervene to improve ISE according to students' grades and cognitive ability, guide students to use ICT correctly, and encourage them to actively engage in OI.

Biography

Associate Professor Chun Lu obtained his Ph.D. from Huazhong University of Science and Technology, China in 2012, and then worked as an associate professor at Central China Normal University, China. In 2014, he also served as the deputy director of the Education Informatization Strategy Research Base (Huazhong) of the Ministry of Education. Associate Professor CL's research interests include, but are not limited to, research on the influence of psychological factors on academic performance of K-12 students, and assessment of the level of school education informatization. Associate Professor CL has published more than 20 journal papers, including 6 SSCI papers. He has been invited to deliver keynote speeches at international academic conferences 13 times. He has also acted as a reviewer of several international journals, including Asia Pacific Education Review, Journal of Computers in Education, and South African Journal of Education. Dr. Xiao Yang obtained her master's degree from Central China Normal University, China in 2019, and then worked as a research assistant at Central China Normal University, China. She is currently

a doctoral candidate in Education at Central China Normal University. Dr. XY's research interests include, but are not limited to, research on the influence of psychological factors on academic performance of elementary and middle school students. Dr. XY has published 4 journal papers, including 3 SSCI papers. She has been invited to deliver 1 international academic conference keynote speech.

Prognostic significance of neurofilament light in Fingolimod therapy for Multiple Sclerosis: A systemic review and meta-analysis based on randomized control trials

Anusha Ashkar[1], Mirza Mehmood Ali Baig[1], Areej Arif[1], Maheen Mazhar Ali[1], Fareeha Yousuf[1] and **Rabeeah Ashkar[2]**

[1]Dow University of Health Sciences, Pakistan
[2]Jinnah Sindh Medical University, Pakistan

Objective: This research was conducted to assess Neurofilament light chain (NfL) as prognostic factor for Multiple Sclerosis and effect of Fingolimod on plasma levels of NfL.

Materials and Methods: A systemic search was conducted from electronic databases (PubMed/Medline, Cochrane Library, and Google Scholar) from inception to 7th September 2022. All statistical analyses were conducted in Review Manager 5.4.1. Studies meeting inclusion criteria were selected. Only those studies that involved Mul- tiple sclerosis patients in which plasma levels of NfL was provided and Fingolimod was used in the treatment group. Fixed-effect model was used to pool the studies to assess NfL as prognostic factor, which was reported in the Hazards ratio (HR) and their corresponding 95% confidence interval (CI). Moreover, effect of Fingolimod on NfL levels was analysed qualitatively.

Results: Five Randomized Controlled Trials were used in the study. Four studies were used in quantitative analysis which showed increased NfL was related to significant increase in cognitive disability worsening (HR= 1.66 [1.35, 2.05]; p< 0.00001; I2= 0%). The qualitative analysis method was employed to evaluate the factors correlating with increased NfL levels in Multiple Sclerosis patients. Five studies evaluated that there was sig- nificant decrease in NfL levels when Fingolimod was used as compared to placebo. 4 studies were included to correlated NfL levels with clinical and MRI parameters and association was found between increasing NfL levels and relapses, active/new T2 lesions and percentage of brain volume change.

Conclusion: The results of our meta-analysis and systematic review demonstrated statistically significant effect of NfL as a prognostic marker with its level being decreased significantly when Fingolimod was used for treating Multiple Sclerosis.

Biography

I am Dr. Anusha Ashkar, a recently graduated doctor from the prestigious 'Dow University of Health Sciences'. I have an immense interest in research and delivering the knowledge within my capacity to the masses, only to educate and play my humble role in enhancing the quality of human life and halting the sufferings of the masses.

My research on neurology is solely aimed to attenuate the disease progression and manage Multiple Sclerosis effectively, only to improve the quality of those who need our help the most.

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Neurocriminology and A.I. Neuroprediction

Ghadeer M. M. Abdelaal
*Forensic Medicine and Clinical Toxicology Department,
Zagazig University, Egypt*

Introduction: Neurocriminology is a relatively new field of study that combines the principles of neuroscience and criminology to understand the biological basis of criminal behavior. One of the most promising areas of neurocriminology is the development of artificial intelligence (A.I.)-based neuroprediction tools.

Aim: The aim of this review is to provide an overview of the current state of research in neurocriminology as well as the ethical and legal implications of this research, with a particular focus on A.I. neuroprediction.

Results: Neurocriminology is still in its early stages, yet it has the potential to revolutionize our understanding of crime and criminals. Many factors contribute to criminal behavior, such as biological factors (e.g., certain genetic variants, neurological disorders, brain injuries, alteration in brain chemistry, and homones), as well as environmental factors (e.g., exposure to violence, abuse, and neglect during childhood). Recent advances in neuroimaging have made it possible to study the brain in unprecedented detail. The combination of neuroimaging with A.I. has led to the emergence of A.I. neuroprediction tools that could be used to identify individuals who are at high risk of re-offending. These tools use machine learning algorithms to analyze brain data and predict the risk of future criminal behavior. However, some limitations and ethical concerns have been raised about A.I. neuroprediction models, for example, biased results, discrimination, and invasion of privacy. Therefore, ethical guidelines are required for their application.

Conclusion: Advances in neuroimaging have enabled neurocriminologists to better understand the neural correlates of criminal behavior. With this understanding, neurocriminologists are able to develop more effective approaches to rehabilitate criminals and develop new treatments and prevention strategies to prevent future crimes. A.I. neuroprediction tools have the potential to revolutionize the criminal justice system. However, ethical regulations for their application and further research are needed to validate their findings.

Biography

Dr. Ghadeer Abdelaal is a senior lecturer of Forensic Medicine and Toxicology (PhD) at Faculty of Medicine, Zagazig University, a fellow of Egyptian Forensic Medicine Authority in Cairo, and a senior consultant at Forensic Medical Consultation Center of Zagazig University. She is a founding member of Zagazig Forensic and Clinical Toxicology Research Lab, and Safe Woman Unit in Zagazig University Hospitals. She is a member of Arab Union of Forensics and Toxicology, and Egyptian Society of Clinical Toxicology. She is a TEDx Speaker, also speaker and organizer at many national and international conferences. She served as postgraduate, strategic planning, and resources coordinator at faculty Quality Assurance Unit (2018-2021), and as a trainer in Internship Qualification Program. She participated in Zagazig university strategic planning (2011-2016), and in Continuous Improvement and Qualifying for Accreditation Project (2012). She organized a medical convoy in Sharkia governorate, Egypt (2011). She has many international scientific publications.

Exploration of molecular mechanisms responsible for anti infammatory and anti angiogenic attributes of methanolic extract of Viola betonicifolia

Hafza Sidra Yaseen[2], Farzana Andleeb[1] and **Muhammad Asif[1]**

[1]Univeristy of Bahawalpur, Pakistan
[2]The University of Lahore, Pakistan

Uncontrolled infammation plays a central role in the pathogenesis of various diseases. The present study was designed to evaluate anti-inflammatory, anti-arthritic and anti-angiogenic potentials of methanol extract of *Viola betonicifolia* using battery of in vivo models. Methanol extract of *Viola betonicifolia* (Vb.Me) was prepared through maceration. High performance liquid chromatography (HPLC) and gas chromatography mass spectrometry (GC–MS) were performed to identify bioactive compounds present in Vb.Me. In vivo safety profile of *Vb.Me* was evaluated following OECD 425 acute toxicity guidelines. Anti-inflammatory potential of *Vb.Me* at three different dose levels was evaluated by acute (carrageenan and, histamine-induced paw oedema), sub-chronic (cotton pellet-induced granuloma) and chronic (Complete Freund's adjuvant-induced arthritis) models. Blood and paws samples were collected to study effects of *Vb.Me* on expression of various pro- and anti-inflammatory genes (RT-PCR) and to study histopathological changes. Effects of *Vb.Me* on neo-vasculature development were studied in ex-ovo chicken chorioallantoic membrane (CAM) assay. Quercetin and n-hexadecanoic were identified as one of major bioactive molecules in HPLC and GC–MS analysis. Toxicity data revealed that *Vb. Me* was safe up to dose of 2000 mg/kg. Findings of inflammatory models showed that Vb.Me produced time and dose-dependent effects.. 500 mg/kg Vb.Me showed significantly showed better effects as compared to low doses and comparable effects with indomethacin. RT-PCR data exhibited significant downregulation of IL-6, TNF-α, IL-1β, NF-Kβ and COX-2 genes with simultaneously upregulation of IL-6 and IL-10. CAM assay data revealed arrest of micro-vessel outgrowth in *Vb.Me* treated eggs. Synergistic actions of various bioactive molecules in Vb.Me are proposed to be responsible for these attributes. However, further studies to standardize extract and evaluation of its potential in various inflammation-induced diseases are warranted.

Biography

Throughout my educational experiences, I was lucky enough to have educators who poured their knowledge and optimism into me, and now I would like to reciprocate that back to students who are in the position I was once in. Currently I am working as Lecturer in, Faculty of Pharmacy, the University of Lahore, Punjab, Pakistan. I am also paying duty as Product-specialist in Volunteer Pharmaceuticals Lahore. I post-graduated from Government College University Faisalabad with distinction. I did work as Hospital Pharmacist and Healthcare coordinator in Chiniot General Hospital Faisalabad. As far as research experience is concerned, I published 20 full-length research publication in International reputable Journals, with cumulative Impact Factor (65.34). I performed duty in various Journals as Peer Reviewer. I have great passion of cricket and reading books.

A meta-analytical review of empathy in autism spectrum disorders

Mehreen Fatima and **Nandita Babu**

University of Delhi, India

Empathy is one of the core socio-cognitive abilities that is known to be compromised in individuals with autism spectrum disorders. The aim of the present study was to quantitatively synthesize the research conducted in the domain of cognitive and affective empathy in autism spectrum disorders. The moderating effect of variables, such as, age, culture type, and measure-used was also assessed. A total of 35 studies that met the inclusion and exclusion criteria were included in the study and the data was analyzed with the help of meta-essentials software. The results indicated that the individuals with and without autism differed significantly from each other in cognitive as well as affective empathy, with the Hedge's g value of 1.26 (very large effect size) and 0.58 (medium effect size) respectively. Further, although the moderating effect of age and type of culture was not significant, there was a significant effect of the type of measure used on the cognitive empathy, i.e., the individuals with autism exhibited cognitive empathy at par with typically developing individuals when picture/video-based measures were used, as opposed to the traditionally employed questionnaire-based measures. The study, however, has few limitations, for instance, first, it does not shed light on how symptom severity may be affecting empathic abilities; second, all the possible moderating variables could not be studied; and finally, the generalizability of the findings may be limited owing to the limitations of the included studies. The meta-analysis has implications for theorizing cognitive and affective empathy appropriately, and developing sound tools and techniques to assess them.

Biography

Mehreen Fatima is a Senior Research Fellow at the Department of Psychology, University of Delhi. Her research interest lies in the area of Child Psychology, Cognitive Psychology, and Developmental Psychology, pursuing which she completed her master's dissertation entitled "Theory of Mind and Moral Reasoning during Early Childhood". She was awarded Junior Research Fellowship by University Grant Commission, India in 2019. She is presently working extensively in the area of social cognition in children and adolescents with autism spectrum disorders. She has her publications in the areas of adolescent mental health and empathy in autism spectrum disorders. Owing to her keen interest in research, she dedicates most of her time to learning new research tools and techniques. She is also very passionate about teaching and has gained experience as a freelance educator with various online learning platforms.

Pentoxifylline as add-on treatment to donepezil in copper sulphate-induced Alzheimer's disease-like neurodegeneration in rats

Mohamed M Elseweidy[1], Mohamed Mahrous[2], Sousou I Ali[1], Mohamed A. Shaheen[3] and **Nahla N. Younis[1]**

[1]Department of Biochemistry, Faculty of Pharmacy, Zagazig University, Egypt
[2]Department of Biochemistry, Faculty of Pharmacy, Port-Said University, Egypt
[3]Department of Histology and Cell Biology, Faculty of Human Medicine, Zagazig University, Egypt

Alzheimer's disease (AD), the most common neurodegenerative disorder, is characterized by behavioral, cognitive and progressive memory impairments. Extensive neuronal loss, extracellular accumulation of insoluble senile amyloid-β (Aβ) plaques and intracellular neurofibrillary tangles (NFTs) are the major pathological features. The present study aimed to investigate the therapeutic effect of donepezil (DON) and pentoxifylline (PTX) in combination to combat the neurodegenerative disorders (Experimental AD) induced by $CuSO_4$ intake in experimental rats. Thirty adult male Wistar rats (140–160 g) were used in this study. AD was first induced in rats by $CuSO_4$ supplement to drinking water (10mg/L) for 14 weeks. AD group received no further treatment. Oral treatment with DON (10mg/kg/day), PTX (100mg/kg/day) or DON+PTX for the other three groups respectively was started from the 10th week of $CuSO_4$ intake for four weeks. Cortex markers like acetylcholine (Ach), acetylcholinesterase (AChE), total antioxidant capacity (TAC) and malondialdehyde (MDA) and hippocampus markers like β-amyloid precursor protein cleaving enzyme 1 (BACE1), phosphorylated Tau (p-tau), Clusterin (CLU), tumor necrosis factor-α (TNF-α), caspase-9 (CAS-9), Bax and Bcl-2 were measured. The histopathology studies were done by using hematoxylin and eosin and congo red stains as well as immunohistochemistry for neurofilament. $CuSO_4$ induced adverse histological and biochemical changes. The histological injury in hippocampus was inhibited following administration of the DON and PTX. The brain tissue levels of AChE, MDA, BACE1, p-tau, CLU, CAS-9, Bax and TNF-α were significantly increased, while brain tissue levels of Ach, TAC and Bcl-2 were significantly decreased in CuSO4-treated rats as compared with untreated control group. The effects induced by either DON or PTX on most studied parameters were comparable. Combined treatment of DON and PTX induced remarkable results compared with their individual use.

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Development of methods and mobile application to monitor emotions using ECG signals in young adults: D-OMAEYA

Monorama Swain
Silicon Institute of Technology, India

Recognizing and monitoring emotional states play a crucial role in mental health and well-being management. Despite a large number of studies on emotion recognition, most of them have focused on audio, textual, and visual signals (e.g., facial expressions, text, and speech). The effective emotional states of a human being are not always easily detectable in these cases; however the physiological signals generated by the Autonomic Nervous System (ANS) cannot hide it, as it reflects the real emotional state of the person. Recently, researchers have put forth strong evidence that physiological signals like electroencephalogram (ECG) signals are less noisy and contain emotion-related information. An ECG based method is an adequate solution for emotion recognition based on four important reasons. Firstly, the ECG signal is a result of activities in the heart that has nerve endings from the autonomic nervous system that governs the behaviour of each emotion. Secondly, ECG sensors can be used as a wearable device. Thirdly, it is convenient to use because ECG signals can be captured from different parts of the body. Finally, it is a high amplitude signal, more measurable compared to other bio-signals.Therefore, the ECG signal is a kind of physiological signal closely related to emotion, which can be used in emotion recognition systemin real-time applications. Mental health illness is a type of condition that changes a person's mind, emotions, or behaviour (or all three), and has been shown to impact an individual's physical health. A significant aspect of human existence is not the external inputs but internal issues within us i.e. our mental health. The growing number of cases of psychological disorders in young adults (age group of 18 to 30) especially in educational institutions are becoming a major concern. On another side, due to the financial burden of poor young people with a lack of available services and resources, they are also stressed out and show more anxiety disorder. The counselling centers are inadequate to handle such cases properly because of there are no such smart devices are available in the market.

Stress, anxiety, and depression are all negative emotions especially seen in young adults and are a growing concern around the world. During various lifestyle changes in college students such as leaving their homes, learning to live independently, taking difficult courses, peer competition, etc. even small setbacks seem like the end of the world. Depressed students are at a greater risk of falling into the hands of substance abuse, self-harming behaviour, or suicide. Recent evidence from the World

Health Organization (WHO) indicates that mental health affects nearly half the population worldwide.

To treat it, the emotional states of patients can be closely monitored over a specific time-step if it is critical to monitor emotional states as part of treatment. The traditional means used by psychologists is to use questionnaires such as the different positive and negative emotions scale to obtain a subjective response from the individual. Such questions are often answered incorrectly due to personal reasons or hurry. Moreover, these questions are usually asked intermittently hence, cannot be used for continuous evaluation. For seamless monitoring of these conditions without any other clinical treatments, the physiological signal-based method would rather serve as a useful tool. The core aim of this project is to explore an effective solution in order to improve the mental health management through a smart emotion recognition tool. The holistic treatment of these kind of health problems including positive and negative emotions in the literature is very limited. Complete studies of student population data are rarely available. Several studies have been conducted to investigate the use of ECG signals with various machine learning-based techniques. These techniques have been applied on a limited size of datasets. However, the availability of a large dataset has a big impact on the performance of machine learning. Furthermore, applying deep learning methods to recognize human emotions from ECG signals is still in its infancy, although traditional deep learning methods suffer from low prediction accuracy. Moreover, too little attention has been given to achieve higher emotion recognition accuracy. The overall outcome of the work will give a solution in the form of technology in a real time application for overcome the mental health problems.

Biography

Monorama Swain received her bachelor's degree in Electronics and Communication Engg. from Synergy Institute of Engineering and Technology, Dhenkanal (Biju Patanaik University of Technology) and took her Master's degree from University College of Engineering, Burla with research in signal processing (B-spline filter design and Channel equalization). She did her Ph.D from Biju Patanaik University of Technology, Rourkela in the area of Speech emotion recognition and lead as a PI in a DST sponsored project. She is working as a senior asst. professor in the department of Electronics and Communication Engg, Silicon Institute of Technology, Bhubaneswar, India. Her research interests in Audio digital signal processing, speech processing, Image processing, and Emotion recognition. She is a member of IEEE signal processing and Institution of Engineers. She received Institution award from IEI, Odisha and best teacher award from ISTE Odisha section. She served as a reviewer for IET signal processing, IEEE Access, Transactions on Audio, Speech and Language Processing and IEEE women in Engineering.

Dengue Outbreaks Prediction in Bangladesh Perspective Using Neural Network and Machine Learning Technique

Md. Ashikur Rahman Khan[1], Jony Akter[1], Ishtiaq Ahammad[2], Sabbir Ejaz and **Tanvir Jaman Khan[1]**

[1]Department of Information and Communication Engineering, Noakhali Science and Technology University, Bangladesh

[2]Department of Computer Science and Engineering, Prime University, Bangladesh

Dengue fever is a disease that has been spreading throughout the world in recent years. Dengue fever is a fatal disease that can lead to life-threatening complications and possibly death. Dengue fever is one of the most serious diseases, affecting more than 110 countries. In the last year, nearly 45,000 case reports have been discovered across Bangladesh. Dengue fever has emerged as a major public health concern in Bangladesh. As a result, early detection would reduce major Dengue disease casualties. Various studies on Dengue disease have been conducted; however, no effective study, particularly from the perspective of Bangladesh, appears to reveal a method for predicting Dengue outbreaks. In this scenario, the goal of this research is to analyze the Dengue disease and develop an appropriate model to predict Dengue outbreaks. This study also tries to identify the best technique for predicting Dengue disease early on. To achieve the current research's goal, real-time data from patients admitted to various hospitals in Bangladesh is gathered. The data is then processed and normalized before being used in various multilayer perceptron neural network algorithms. Then, different multilayer perceptron neural networks are used to predict Dengue outbreaks. In this work, twenty-five parameters are examined to determine the infection rates of these parameters. To obtain a better Dengue outbreaks prediction model, a comparative study of the developed models' performances is also performed. The results show that the Levenberg Marquardt technique is the best in Dengue disease prediction, with 97.3% accuracy and 2.7% error. By doing this research work, learn the reasons of dengue infections. The significance of this paper is that people can take steps to reduce death rate for dengue infection by observing symptoms and level of different parameters.

Virtual Event

4th International Congress on
**Future Neurology and Advances in
Research and Treatment of Brain Disorders**

June 27, 2023

1. Tawhid Ahmed, Main Uddin, Md. Ashikur Rahman Khan, and A.R. Mahamudul Hasan. Offline Handwritten Character Recognition Including Compound Character from Scanned Document. Asian Journal of Research in Computer Science. 14 (4): 119-129, 2022.

2. Md. Ashikur Rahman Khan, Jony Akter, Ishtiaq Ahammad, Sabbir Ejaz and Tanvir Jaman Khan. Dengue outbreaks prediction in Bangladesh perspective using distinct multilayer perceptron NN and decision tree. Health Information Science and Systems (2022) 10:32 Doi.org/10.1007/s13755-022-00202-x. IF= 5.017. Springer Nature. SCIE Indexing.

3. Md. Ashikur Rahman Khan, Md. Furkan Uzzaman, Ishtiaq Ahammad, Ratul Prosad, Zayed-Us-Salehin, Tanvir Zaman Khan, Md. Sabbir Ejaz and Main Uddin. Stock market prediction in Bangladesh perspective using artificial neural network. International Journal of Advanced Technology and Engineering Exploration. 2022. Vol 9(95). pp:1397-1427. SCOPUS Indexing. IF=0.5. doi.org/10.19101/IJATEE.2021.875852.

Biography

Md. Ashikur Rahman Khan is a Professor at the Department of Information and Communication Engineering, Noakhali Science and Technology University, Bangladesh. He has been working at Noakhali Science and Technology University since 2006. Professor khan received his Bachelor's and Master of Science from Rajshahi University of Engineering and Technology, Rajshahi, Bangladesh, in 1999 and Bangladesh University of Engineering and Technology, Dhaka, Bangladesh, in 2004, respectively. He achieved his PhD degree in 2012 from University Malaysia Pahang, Malaysia. He also served as an Assistant Engineer in IT Directorate, Bangladesh Rural Electrification Board, Dhaka, from 2001 to 2006. His research interests include Advance Machining, Artificial Intelligent, Neural networks, Machine Learning, and Modelling. He has about 60 publications in distinct indexing and impact journals and about 25 articles in distinct international and national conferences. Dr Khan is performing events as a reviewer and editorial board member supportive of distinct scholarly journals.

Applying the spot model to mental imagery representation and medical imaging

N.A. Simonov[2] and **A.A. Gostev[1]**

[1]*FSFES Institute of Psychology, Russian Academy of Science, Russia*
[2]*Valiev Institute of Physics and Technology, Russia*

To solve the problem of the flexibility and reliability of artificial intelligence (AI), it is necessary to use methods for presenting information and the results of mental activity, primarily thinking in human form. Undoubtedly, this corresponds to the task of creating intelligent systems capable not only for representing information in imagery form, but also modeling imaginative thinking.

This report discusses the application of the developed mathematical model and apparatus of spots for use in various fields. In particular, the possibility of using the apparatus of spots to represent mental imagery and imagery sphere in general is considered. On this basis to it is suggested to model the acquisition of new knowledge, process of learning, reasoning, and decision-making. The proposed approach allows modeling mental operations, in particular, qualitative reasoning using nonmonotonic logic, when conclusions are drawn on the basis of existing knowledge, and obtaining new knowledge can change the conclusions. The "spot apparatus" also offers a new approach to the problem of solving inverse problems using the learning method, which is similar to the use of deep learning neural networks.

Another application of the "spot apparatus" is considered – solution of inverse problems by the learning method. In particular, it can be performed for image reconstructions using ultrasound, CT, MRI or radar scan data. The verification of the developed algorithm was made by solve the problem of the image reconstruction of planar figures using only qualitative data on their elementary relationships with other, scanning figures. The feasibility of using the spot model for CT visualization has also been demonstrated on the spot-based inverse Radon algorithm for 2D image reconstruction (Figure 1). In both cases, the spot algorithms demonstrated an effective denoising property.
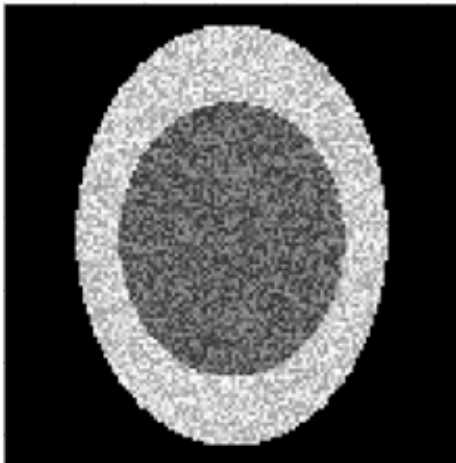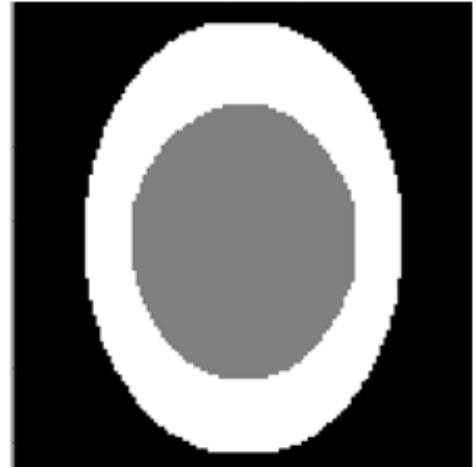
(a)   *(b)*

Figure 1. *Result of spot-based inverse Radon image reconstruction of noisy simple head phantom.*
(a) Original noisy pantom;
(b) Reconstructed image from Radon projections.

Biography

Prof. Andrey Andreevich. Gostev was born in 1950 in Voronezh, Russia. He received M.S. in 1973, Ph.D in 1979, and Sc.D in 2002.

Academician and professor of the Baltic Pedagogical Academy and the Academy of Humanities and Social Sciences.

He is a recognized specialist in the field of psychology of imagery phenomena, mental imagery, including representations, imagination, dreams, imagery of altered states of consciousness.

His scientific interests also include the conceptual and terminological connections of psychological science with philosophy, sociology, cultural studies, history, politics and theology. The contact of diverse psychological knowledge made it possible to "reveal" the traditional general psychological theme of mental images in the field of the spiritual and moral sphere of human existence at the individual and group levels. He study the imago-symbolosphere of society in its influence on the inner world of the individual and the system of social representations of group consciousness.

Dr. Nikolai Anatolievich Simonov was born in 1954 in Moscow, Russia. He received M.S. in 1978 and Ph.D in 1986.

He did research and development in the field of microwaves and millimeter-waves, working in scientific institutes in Russia and Republic of Korea. His area of expertise and experience includes theoretical and applied electromagnetics, microwave and millimeter-wave imaging, microwave and millimeter-wave measurements. Results of his researches were represented in publications in many Russian and international scientific journals, conference proceedings, and in 13 US, South Korean, and Russian patents. He was a recipient of the 2020 Prize Paper Award from the IEEE Antennas and Propagation Society.

His current research interest is in the development of an original mathematical model of spots and apparatus for representing, processing and fusing qualitative or quantitative data that can be applied in Artificial Intelligence and Medical Imaging. He already has 7 publications on this topic.

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Telomerase reverse transcriptase and telomerase RNA component gene expression as novel biomarkers for Alzheimer's disease

Raya Kh. Yashooa[1] and **Ari Q. Nabi[2]**

Salahaddin University-Erbil- Research Centre -Erbil, Iraq

Alzheimer's disease (AD) is a neurological, age-related condition that causes cognitive decline and memory loss; it induces dementia in the elderly. Telomerase is a reverse transcriptase ribonucleoprotein that adds nu¬cleotides to the end of DNA. This study aimed to compare human telomerase reverse transcriptase (hTERT) and telomerase RNA component (TERC) expression in different phases of AD and healthy cohorts. Sixty participants were divided into 30 who had dementia and 30 who did not. After collecting blood samples, total RNAs were extracted from the plasma. Screening for hTERT and TERC gene expression was carried out by quantitative reverse transcriptase real-time polymerase chain reaction (RT-qPCR) using the relative quanti¬fication method to estimate the expression changes in hTERT and TERC. The RT-qPCR results show that hTERT and TERC gene expression was significantly down-regulated in Alzheimer's patients compared to the health subjects (P-value= <0.0001,0.005), respectively. The area under curve AUC was 0.773 for hTERT and 0.703 for TERC. The Mini-Mental State Examination scores revealed a significant difference between dementia and non-dementia subjects (P=<0.0001). We conclude down-regulations in both hTERT and TERC gene expression in AD patients, which supports our hypothesis that the telomerase expression gene in the blood of AD patients can serve as a non-invasive, early, and novel diagnostic marker of AD.

Biography

- MSc. In Biology (Molecular Biology) – College of Science Salahalddin University – Erbil –Kurdistan – Iraq.
- BSc. In Biology - College of Science - Baghdad University.
- Working as a volunteer at salahalddin university – research center and private medical laboratory.
- I participated in many workshop and training course since I finished my study.

Global burden of the COVID-19 associated patient-related delay in emergency healthcare: A panel of systematic review and meta-analyses

Naser Hatami² and **Vahid Mogharab¹**

¹Department of Pediatrics, Jahrom University of Medical Sciences, Iran
²Research Center for Non-Communicable Diseases, Jahrom University of Medical Sciences, Iran

Background: Apart from infecting a large number of people around the world and causing the death of many people, the COVID-19 pandemic seems to have changed the healthcare processes of other diseases by changing the allocation of health resources and changing people's access or intention to healthcare systems.

Objective: To compare the incidence of endpoints marking delayed healthcare seeking in medical emergencies, before and during the pandemic.

Methods: Based on a PICO model, medical emergency conditions that need timely intervention was selected to be evaluated as separate panels. In a systematic literature review, PubMed was quarried for each panel for studies comparing the incidence of various medical emergencies before and during the COVID-19 pandemic. Markers of failure/disruption of treatment due to delayed referral were included in the meta-analysis for each panel.

Result: There was a statistically significant increased pooled median time of symptom onset to admission of the acute coronary syndrome (ACS) patients; an increased rate of vasospasm of aneurismal subarachnoid hemorrhage; and perforation rate in acute appendicitis; diabetic ketoacidosis presentation rate among Type 1 Diabetes Mellitus patients; and rate of orchiectomy among testicular torsion patients in comparison of pre-COVID-19 with COVID-19 cohorts; while there were no significant changes in the event rate of ruptured ectopic pregnancy and median time of symptom onset to admission in the cerebrovascular accident (CVA) patients.

Conclusions: COVID-19 has largely disrupted the referral of patients for emergency medical care and patient-related delayed care should be addressed as a major health threat.

Biography

Naser Hatami is a medical doctor who graduated from Jahrom University of Medical Sciences in Iran in 2022. With a passion for emergency medicine, he has dedicated his career to the field, focusing on providing efficient and effective care to patients in critical situations. Naser's expertise extends to the realm of COVID-19, where he has actively contributed to research and published several articles related to the pandemic's impact on emergency medicine. Naser's dedication to advancing medical knowledge is exemplified by his role as an editorial manager for the Journal of Updates in Emergency Medicine. In this capacity, he plays a vital role in shaping the publication's content, ensuring the dissemination of high-quality research and valuable insights to the medical community. Throughout his academic journey, Naser has consistently demonstrated a commitment to excellence and a drive for continuous learning.

Virtual Event

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Cryptococcal meningoencephalitis present as a stroke mimic in ICL patient

Sandeep Ghosh[1], Rohit Gupta[1], Megha Sharda[1], Sakshi Choudhary[2], Sandip Bhattacharya[3] and **Ashok Sharma[3]**

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[2]Department of Pathology, Accord Superspeciality Hospital, India
[3]Department of Critical Care Medicine, Accord Superspeciality Hospital, India

Cryptococcus neoformans infection predominantly occurs in the immunocompromised patients. However, it may infect apparently immunocompetent hosts and present as stroke mimic.

We are reporting a case of elderly gentleman who presented with acute onset right upper limb weakness, ataxia and impaired awareness. He had no history of fever, headache, vomiting, convulsions, recent travel or vaccination. CT head showed left frontal lobar hypodensity which was not corresponding to a vascular territory. CEMRI brain was done which showed focal left frontal leptomeningeal enhancement with focal cerebral edema. Blood workup including HIV and HTLV was negative. CSF examination showed lymphocytic pleocytosis with raised protein and low glucose. He was started on antitubercular treatment with steroid.

He developed altered sensorium and fever. A repeat CEMRI brain revealed a new diffuse leptomeningeal enhancement with mild improvement in the left frontal focal leptomeningeal enhancement and cerebral edema. Repeat CSF examination showed raised cell count with polymorphic predominance with very high protein and very low glucose concentration. Budding yeast cells with pseudocapsule were seen and cryptococcal antigen was positive. CD 4 count was low on two occasions (106 and 259 cells/cumm). He was started on liposomal amphotericin B and flucytosine following which he had clinical improvement. Follow up CSF examination showed clearance of all fungal elements and MRI brain showed multiple vasculitic infarcts with mild hydrocephalus.

Cryptococcal infections are common in patients with idiopathic CD4+ T lymphocytopenia (ICL). This was present in approximately one fourth of the patients with ICL in one series. Case reports have been documented where it has presented as stroke mimic. It may present atypically without any preceding fever or headache. Also, the initial presentation may be focal leptomeningeal enhancement on neuroimaging prior to its more common manifestation of diffuse leptomeningeal enhancement. A high index of suspicion of cryptococcal meningoencephalitis must be kept in ICL patients with neurological manifestations.

Biography

Dr Sandeep Ghosh is a neurologist who completed his fellowship in neurology (DM neurology) from Christian Medical College, Ludhiana, Punjab, India. He is now working as a Neurology Consultant in Accord Superspeciality Hospital, Faridabad, Haryana, India which is one of the leading healthcare facility in India. He has a keen interest in neuroinfections, neuroimmunology and stroke. He had earlier presented posters in European stroke congress 2020 and World stroke congress 2022.

Natural substances and neurodegeneration

M. Lazarova[1], L. Tancheva[1,2], L. Velkova[3], A. Dolashki[3], D. Uzunova[1], B. Minchev[1], P. Petkova-Kirova[1], Y. Hassanova[1], P. Gavrilova[1], K. Tasheva[4], T. Taseva[4], Y. Hodzhev[5], A. Atanasov[6,7,8], M. Stefanova[1], A. Alexandrova[1], E. Tzvetanova[1], V. Atanasov[3], T.Garev[10], I. Staikov[10], R. Kalfin[1,9] and **P. Dolashka[3]**

[1]Institute of Neurobiology, Bulgarian Academy of Science, Bulgaria
[2]Weston Professor of Weizmann Institute of Science, Israel
[3]Institute of Organic Chemistry with Center for Phytochemistry, Bulgarian Academy of Sciences, Bulgaria
[4]Institute of Plant Physiology and Genetics, Bulgarian Academy of Sciences, Bulgaria
[5]National Center for Infectious and Parasitic Diseases, Bulgaria
[6]Ludwig Boltzmann Institute for Digital Health and Patient Safety, Medical University of Vienna, Austria
[7]Institute of Genetics and Animal Biotechnology of the Polish Academy of Sciences, Poland
[8]Department of Pharmaceutical Sciences, University of Vienna, Austria
[9]Department of Healthcare, South-West University "Neofit Rilski", Bulgaria
[10]UMBALSM "N.I.Pirogov", Bulgaria

Objectives: Alzheimer's (AD) and Parkinson's diseases (PD) are the most common neurodegenerative conditions worldwide. They are complex, progressive and debilitating, with multifactorial etiology, unsatisfactory treatment and a necessity for a broad-spectrum of active substances for treating them.

Scope: We examined the effect of snail extract (SE) from Helix aspersa on learning and memory deficits in scopolamine (Sco) induced experimental model of dementia in male Wistar rats and its neuroprotective capacity in 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) induced model of PD in C57BL/6 mice.

Methods: SE was applied orally for 16 consecutive days in AD models (0.5 mL/100 g b.w.) - 5 days before and 11 days simultaneously with Sco (2 mg/kg, i.p) and for 12 days in PD models (0.1 ml/10g b.w.) - 7 days before and 5 days simultaneously with MPTP (30 mg/kg, i.p). The SE effect was evaluated behaviorally (Barnes and T mazes, Passive avoidance, Hole board and Rotarod tests), biochemically (determination of acetylcholine and biogenic amines levels, acetylcholinesterase activity (AChE) and some main oxidative stress parameters in the brain), immunohistochemistry and genetically (quantitative real-time PCR).

Results: We found that in condition of the experimental dementia, SE treatment significantly improved the cognitive deficit induced by Sco according to all behavioural tests used. The snail extract possessed AChE inhibitory activity, moderate antioxidant properties and ability to modulate monoamine content in cortex and hippocampus. Moreover,

multiple SE applications restored the depressed by Sco expression of cAMP response element-binding protein (CREB) and brain-derived neurotrophic factor (BDNF) in the hippocampus. In condition of MPTP-induced PD model, SE treatment also improved impaired memory and motor disturbance of the experimental animals. Demonstrated dopaminergic neuroprotective effect, most pronounced in striatum and anti-inflammatory effect, most pronounced in the substantia nigra.

Conclusion: As a natural product SE display beneficial effect in condition of experimental neurodegeneration and deserve feature attention.

Biography

Dr. Maria Lazarova is a molecular biologist who received her PhD from the department "Synaptic signalization and communication" in the Institute of Neurobiology, Bulgarian Academy of Science in 2018. She is currently an associate professor in the same department. Dr. Lazarova is an active researcher in field of neurobiology with more than 40 peer-reviewed articles. Her scientific work has been focused on neurodegenerative diseases such as Parkinson's (PD) and Alzheimer's (AD), – animal models, mechanisms and prevention, genetics. The effect of different natural or synthetic biologically active molecules on the changed behaviour, biochemistry and genetics of the animals with experimental dementia or PD have been investigated. Associate Editor of Journal of Alzheimer's diseases. Member of Bulgarian Society of Physiological Sciences.

From post-traumatic stress to post-traumatic growth

M. El Khoury-Malhame
Social and Education Sciences, Psychology Program, Lebanese American University, Lebanon

Stress and trauma are inherent to human condition. They most definitely jeopardize individuals' resources to deal with negative events and might more consequently alter mental and physical health. They reflect in poorer wellbeing and increased risk for psychological distress.

Understanding the bio-psycho-social basis of stress and trauma has been invaluable to better understand how to manage it. By investigating people well-being v/s pathological symptoms in various adverse circumstances, studies show practical evidence-based factors that correlate with resilience in growth.

This talk will first attempt at defining post-traumatic stress and illustrating its occurrences after major trauma. It will also shed light on different studies including various segments of the Lebanese population (e.g. adolescents, students, medical residents, young adults) especially with the recent accumulating challenges (COVID, financial devaluation, Beirut Blast, political instability…) to portray mental distress (anxiety, PTSD, depression) as well as wellbeing, growth looking into vulnerability (gender, proximity to trauma, insecurity) v/s protective factors (such as gratitude and sleep). It will mostly highlight the capacity of many to strive and grow under unprecedented chronic stress.

It will lastly attempt at reframing the classical way of assessing traumatic impact and end with practical ways of healing trauma and promoting growth.

Biography

Dr. Myriam El Khoury-Malhame is an assistant professor of psychology in the Social and Education Sciences department at LAU.

She strongly advocates the bi-directional connections between biology and psychology, as the brain remains the most understudied organ in psychology. It shapes personality and influences health as well as physical and mental illness. She has combined both approaches in her trainings as a licensed clinical psychologist and a cognitive neuroscientist.

Her research interests include bio-psychological basis of stress, trauma and anxiety disorders. She investigates vulnerability and protective factors such as resilience, gratitude, spirituality and sleep to facilitate post-traumatic growth.

She promotes daily use and mastery of novel effective stress management techniques such as mindfulness, EFT and heart coherence for normal and pathological populations, in individual and/or group setting.

She is involved in many community-based interventions for instance working in collaboration with the Ministry of Education and Higher Education to implement emotional intelligence trainings in public schools in Lebanon.

Deep learning on MRI for brain age signature assessment

Teresa Wu[1,2], Jay Shah[1,2] and **Yi Su[1,2,3]**

[1]School of Computing and Augmented Intelligence, Arizona State University, USA
[2]ASU-Mayo Center for Innovative Imaging, USA
[3]Banner Alzheimer Institute, USA

Objective: The objective of this study is to assess a deep learning approach to characterizing brain age signatures using MRI from cognitively normal subjects and explore the potential of the signatures in neurodegenerative disease (e.g., Alzheimer's disease) diagnosis.

Method: A 3D deep ResNet model was implemented to predict the brain age of the participants. The model was trained on 7372 T1 MRI from a combined lifespan cohort of 5848 cognitively normal participants (age: 8-95 yrs) using a 10-fold cross validation. This combined cohort consisted of participants from Open Access Series of Imaging studies, IXI dataset, Autism Brain Imaging Data Exchange, International Consortium for Brain Mapping and National Alzheimer's Coordinating Center. We implemented two architectures from the ResNet family: ResNet-18 and ResNet-50 and used mean squared error as the loss function. Training, validation, and testing set in each fold contained imaging samples from all 5 sources with 80:10:10 ratio. The model was then applied to the independent cohort collected from ADNI (Mild Cognitive Impairment (MCI): N=432, 50-98 yrs; Normal Control (NC): N=678, 55-90 yrs) to interrogate the correlations between the brain age signatures with AD stages.

Results: The ResNet models achieved an MAE=3.76 yrs and R2=0.93 (ResNet-18), an MAE=3.86 yrs and R2=0.91 (ResNet-50) across 10 folds in the lifespan cohort. The brain signatures derived from ADNI cohort showed statistical group difference between MCI and HC (p<0.05).

Conclusion: Using a combined cohort of cognitively normal subjects from 5 diverse sources, our deep neural network (ResNet) was able to achieve state-of-art performance in predicting brain age. The brain age signature has the potential to support neurodegenerative disease diagnosis.
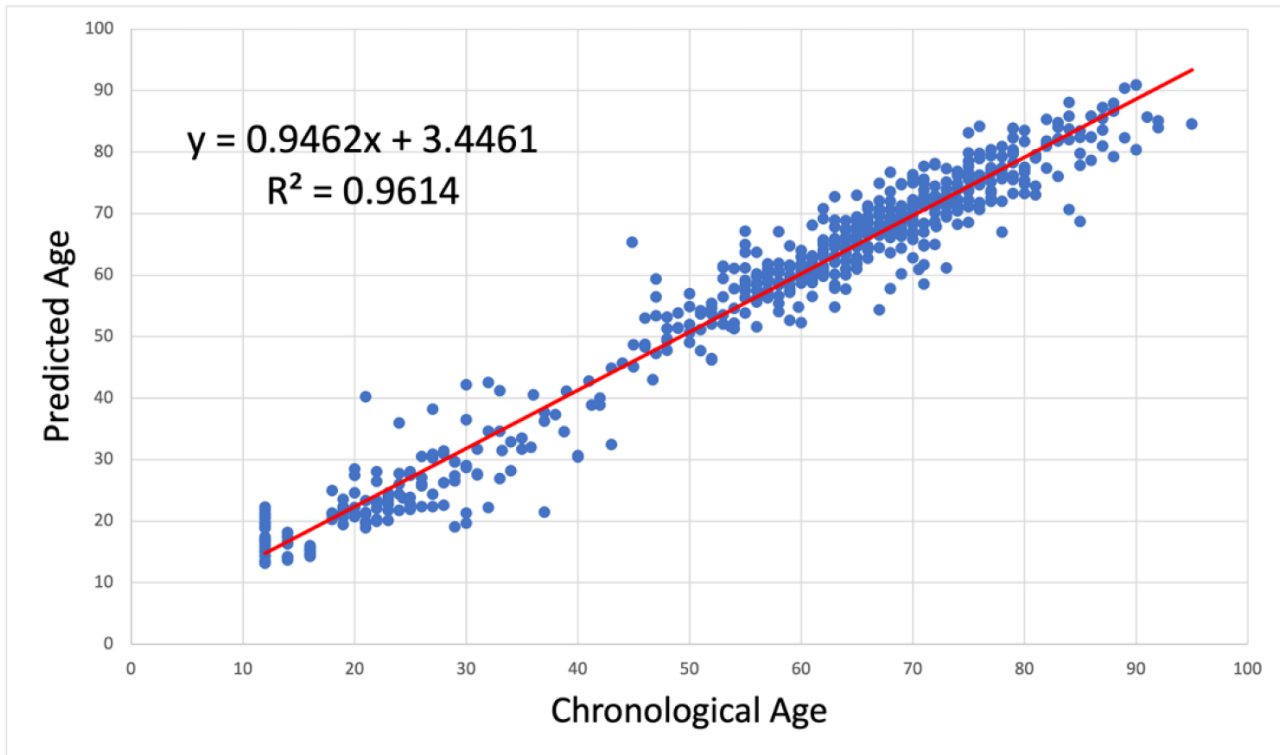
Figure 1 Comparison between chronological and predicted age of participants using our model from one of the 10 test-sets of lifespan cohort

Table 1 *Two clinical groups: age signature is the difference between the predicted age and the chronological age, sex, education*

	HC (678)	MCI (432)
Age (range)	72.6 (55-90)	73.1 (55-98)
Sex (M/F)	290/388	243/189
Education ±SD	16.6 ±2.5	16.1 ±2.8
Brain Age Signature	-1.22 ±0.19	-0.29 ±0.24

Biography

Teresa Wu is a Professor from School of Computer and Augmented Intelligence (SCAI), Arizona State University and an adjunct Professor of Radiology in College of Medicine, Mayo Clinic. Her current research interests include imaging informatics and clinical decision support. Professor Wu has published ~140 journal articles in journals such as NeuroImage, NeuroImaging: Clinical, Brain Communication, IEEE Transactions on Pattern Analysis and Machine Intelligence, Information Science. Professor Wu is the founding Director of the ASU-Mayo Center for Innovative Imaging. She received numerous awards including NSF CAREER award (2003), AFOSR Summer Faculty Fellow (2010, 2011), IBM Faculty Award (2017), IISE Fellow (2020) and ASU PLuS Fellow on Global Health (2016-2020). She was a former Editor-in-Chief for IISE Transactions on Healthcare Systems Engineering (2016-2020).

Dual-Brain psychology: A science based and tested advanced treatment for multi-diagnostic problems

F. Schiffer
Harvard Medical School, USA
McLean Hospital, USA
MindLight,LLCl, USA

Dual-Brain Psychology is a novel theory and application that comes out of the split-brain studies of the 1960s. Based on the work of Werner Witling, Schiffer discovered that in most psychiatric patients, it is easy to simulate one brain hemisphere or the other with lateral visual field stimulation. This is confirmed by fMRI. With this stimulation, a majority of patients experience different personalities, depending on which hemisphere is stimulated. One personality is adversely affected still by early traumas and is symptomatic while the other hemisphere (left or right) is relatively healthy. The treatment focuses on the troubled hemisphere using the healthier hemisphere as a co-therapist to help the affected side better grieve and bear its traumas and work cooperatively with the healthier hemisphere. In two randomized controlled trials we used unilateral transcranial photobiomodulation to stimulate the positive hemisphere as a safe, effective treatment for opioid use disorder. Our Phase I clinical trial found a 71% decrease in opioid craving after 4 weeks of active treatment with and effect size of 1.5 over sham. This treatment is undergoing a larger NIH/NIDA sponsored clinical trial to try to achieve FDA clearance.

Biography

Fredric Schiffer, MD is a researcher at McLean/Harvard, a clinician in private practice, and CEO and Founder of MindLight, LLC which hopes to commercialize unilateral transcranial photobiomodulation as a both a stand-alone and an adjunctive treatment for opioid use disorder, depression, and PTSD. Dr. Schiffer is the author of 2 books on Dual-Brain Psychology, Of Two Minds, second edition 2021 and a forthcoming book, Goodbye to Anxiety, Depression, and Addiction. He had 23 peer-reviewed publication on the topic describing experiments and case reports.

Interventional procedures for post-breast surgery pain syndrome

Ashish Khanna[1] and **Anam Purewal[2]**

[1]Winship Cancer Institute of Emory University, USA
[2]SUNY Downstate Health Sciences University, USA

Breast cancer is the second most common type of cancer afflicting women worldwide. Improvements in diagnostics and treatment has resulted in an improved survival rate, creating new challenges for supportive after-care and optimal rehabilitation. Post-breast surgery pain syndrome, also known as post-mastectomy pain syndrome, is a broad category of conditions that often develop after radiation and breast surgery. Common reported consequences of surgery and radiation include poor self-image, psychological distress, fatigue, pain, and difficulty with activities of daily living, all of which have implications on quality of life. Management of post-mastectomy pain is multifactorial, often including physical therapy, pharmacological therapies, modalities, and interventional injections. New interventional procedures to treat neuropathic and musculoskeletal chest wall and axillary pain are emerging. The most performed procedures include botulinum toxin injections, and nerve blocks involving the serratus anterior, pectoralis, erector spinae, and intercostobrachial nerve and thoracic paravertebral nerves. By using a comprehensive and interventional approach to cancer-related pain, an oncology team can relieve significant burden and suffering that is endured by millions of patients in the growing cancer survivorship community.

Biography

Ashish Khanna, MD is Assistant Professor in the Department of Rehabilitation Medicine at Emory University School of Medicine. Dr. Khanna serves as Director of Cancer Rehabilitation at Winship Cancer Institute of Emory University.

Board certified in physical medicine and rehabilitation, Dr. Khanna focuses on the identification and treatment of neuromuscular, musculoskeletal, and other issues resulting from cancer and related treatments, including aromatase inhibitor joint pains, lymphedema, pain, neuropathy, radiation fibrosis syndrome and trismus. He is a strong advocate for cancer survivors and access to rehabilitation care and services.

He has written numerous book chapters and peer-reviewed scientific articles on cancer rehabilitation and is the co-author of a pocket guide for clinicians, Cancer Rehabilitation: A Concise and Portable Pocket Guide. This concise and essential guide to cancer rehabilitation will help the clinician navigate the care of this often complex population.

Alzheimer's disease: From basic mechanisms to development of therapeutics

Cheng-Xin Gong

Professor and Head, Laboratory of Brain Metabolism
Head, Alzheimer's Disease Research Groups
New York State Institute for Basic Research in Developmental Disabilities, USA

Alzheimer's disease (AD) is a devastating neurodegenerative disease that affects more than five million people in the US alone. Despite enormous effort on research and drug development in the last three decades, no effective disease-modifying therapeutics for AD have been developed. Out-of-the-box thinking and novel strategies are needed for the success of AD drug development. We recently proposed a multifactual mechanism of AD, which warrants a new strategy toward multi-targets for developing AD therapeutics. We tested several approaches in preclinical studies on the basis of this strategy. This new AD hypothesis and some of the preclinical studies will be presented in this talk.

Biography

Cheng-Xin Gong, M.D., received his medical education at Hubei Medical College at Xianning and postgraduate studies in biochemistry at Tongji Medical University, China. He is currently a tenured Professor and Head of the Laboratory of Brain Metabolism, as well as Head of the Alzheimer's Disease Research Groups at the New York State Institute for Basic Research in Developmental Disabilities, New York. He also serves as an Adjunct Professor in Neuroscience at the Graduate Center of the City University of New York. Dr. Gong is a neuroscientist working on the basic and translational research on Alzheimer's disease and related neurodegeneration. He has published more than 200 research articles in the field of neurodegeneration and related neuroscience areas and achieved an h-index of 79. He serves in the editorial boards of over 20 biomedical journals.

Exogenous ketones as a potential therapeutic intervention for brain injury and neurodegenerative conditions

Mansor LS, Omori NE and **Woo GH**

Health Via Modern Nutrition Inc., USA

Metabolic dysfunction is a ubiquitous underlying feature of many neurological conditions including acute traumatic brain injuries and chronic neurodegenerative conditions. A central problem in neurological patients, in particular those with traumatic brain injuries, is an impairment in the utilization of glucose, which is the predominant metabolic substrate in a normally functioning brain. In such patients, alternative substrates including ketone bodies and lactate become important metabolic candidates for maintaining brain function. While the potential neuroprotective benefits of ketosis have been recognized for up to almost a century, the majority of work has focused on the use of ketogenic diets to induce such a state, which is inappropriate in cases of acute disease due to the prolonged periods of time (i.e., weeks to months) required for the effects of a ketogenic diet to be seen.

The following review seeks to explore the neuroprotective effects of exogenous ketone and lactate preparations, which have more recently become commercially available and are able to induce a deep ketogenic response in a fraction of the time. The rapid response of exogenous preparations makes their use as a therapeutic adjunct more feasible from a clinical perspective in both acute and chronic neurological conditions. Potentially, their ability to globally moderate long-term, occult brain dysfunction may also be relevant in reducing lifetime risks of certain neurodegenerative conditions. In particular, this review explores the association between traumatic brain injury and contusion-related dementia, assessing metabolic parallels and highlighting the potential role of exogenous ketone and lactate therapies.

Biography

Dr. Latt Mansor holds a PhD in Physiology, Anatomy and Genetics from the University of Oxford, where his research focused on the metabolism of the type 2 diabetic heart in hypoxia. He also holds an M.A. (Columbia University) and B.Sc. (Hons) (University of Nottingham) in Biotechnology. He is a world expert in physiology and metabolism, and consults with elite sport, military, clinical and research organizations. Dr. Mansor is the Research Lead at H.V.M.N., overseeing all of the company's research efforts and collaborations with universities and research institutions. Currently, he is the principal investigator of the $6 million U.S. Special Operations Command (USSOCOM) contract awarded to H.V.M.N by the Department of Defense.

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