magnus Group

JOINT EVENT ON

NEUROLOGY & ADDICTION

EXHIBITOR'S

abbvie

Banyan TREATMENT CENTERS

RWD Life Science

STORZ MEDICAL

ROCKLAND RECOVERY

SUN PHARMA

ACCREDITATION

THE CPD GROUP — APPROVED PROVIDER #780643

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19-21 OCT, 2023

BOSTON
MASSACHUSETTS, USA

IN-PERSON
Hilton Boston/Woburn 2 Forbes Road,
Woburn, Massachusetts, 01801, USA

VIRTUAL
Eastern Time
(US & Canada)

Venue:
Hilton Boston/Woburn 2 Forbes Road,
Woburn, Massachusetts, 01801, USA

BOOK OF ABSTRACTS

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Ulrich Sprick
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W S El Masri
Keele University, United Kingdom

Yong Xiao Wang
Albany Medical College, United States

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Speakers

Aaron Kim
Seoul International School, Korea

Afsaneh Nikjooy
Iran University of Medical Sciences, Iran

Alex Goraltchouk
Remedium Bio, United States

Alexander Guo
Timberline High & Boise State University, United States

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University of Edinburgh, United Kingdom

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Life Centered Therapy Training Institute, United States

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The University of Sydney, Australia

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Revature LLC, United States

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Union College & iPACES, United States

Christina Bitsara
University of Cambridge, United Kingdom

Christine Akumcha Tekum
Maarif international Schools of Equatorial Guinea, Equatorial Guinea

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Â New Hampshire Hospital, United States

Cristian Ravariu
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Daniel Clayman
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Johns Hopkins University, United States

Dominique Hayduk Montecino
Lakeland Regional Health, United States

Drake Shafer
California University of Science and Medicine, United States

Elena DeSanti
Brown University School of Public Health, United States

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Farsana Farooq
Digital University Kerala, India

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Universidade do Oeste Paulista, Brazil

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University of Cologne, Germany

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Alfaisal University, Saudi Arabia

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Ken Ware NeuroPhysics Therapy, Australia

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Kelsey Whitus
Drexel university college of medicine, United States

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Compassionate Beginnings, LLC, United States

Kimberley D. Ryan
Brandon University, Canada

Lama Saad El-Din Mahmoud
October 6 University, Egypt

Leandro Heidy Yoshioka
University of Sao Paulo, Brazil

Makoto Inoue
University of Illinois at Urbana Champaign, United States

Marina Martinez-Vargas
Baylor College of Medicine, United States

Speakers

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University of Sao Paulo, Brazil

Martin Makela
University of Washington, United States

Maryam shahab
Central Park Physicians, United States

Matthew Hanauer
CleanSlate Centers, United States

Matthew J. Beattie
University of Oklahoma, United States

Merve Turkmen
Sanko University Medical Faculty Hospital, Turkey

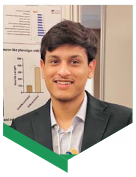
Mia W McNary
Artist and Visual Storyteller â€œPicture Recoveryâ€ , United States

Michele M. Mahr
California State University, United States

Mikaela Atkins
Arizona State University, United States

Mohamed Fathi Al Gharyani
Benghazi Medical Center, Libyan Arab Jamahiriya

Moshe Bensimon
Bar Ilan University, Israel



Muhammad Yahya Saif
Aston University, United Kingdom

Nanxia Zhao
Biogen, United States

Naveen Kunchakuri
EchoStar Corporation, United States

Nico Morales
No Halo LLC, United States

Nikita Dawan
King Georges's Medical University, India

Nikita Mehdiratta
Smell and Taste Treatment & Research Foundation Ltd, United States

Nikita Sharma
Swami Vivekanand Subharti University, India

Nina Sherman
Podcaster, United States

Pallavi Chatterjee
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Priya Joshi
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Sushil Jha
Jawaharlal Nehru University, India

Swetha Ravi
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Wake Forest Institute of Regenerative Medicine, United States

Radika Saigal
The Royal Wolverhampton Trust, United Kingdom

Anita V. Handore
Phytoelixir Pvt.Ltd., India

Welcome Message

Dear Congress Visitors and Speakers,

It is with great honor and distinct pleasure to welcome you to the 4th Edition of the Global Conference on Addiction Medicine, Behavioral Health, and Psychiatry (GAB 2023) in Boston, Massachusetts, USA. This conference will be rich with expertise, knowledge, and collegiality focusing on a much-needed topic, Addiction and Addiction Recovery. The expertise of the speakers will resonate with current practices and treatment modalities that will assist the professional with skill sets that will reinforce exceptional quality of care. With like-minded colleagues, we will be able to collaborate with the use of presentations, poster-sessions, and discussions, using applied research and treatment approaches so useful to patients, clients, and youth who struggle with addiction and/or recovery. Most of all, together we can share resources to enable the humane care of individuals with the Disease of Addiction. I look so forward to meeting everyone at the conference. Cheers!

Ann Marie Leonard Zabel

Curry College & NEALAC Clinic, United States

Welcome Message

I am in deep gratitude at the opportunity to share the stories and research we have discovered over our years of working with adults in addiction during the creation of the documentary ONE.

After 36 years in the field, I have come to understand the most powerful form of learning is experiential. Therefore, rather than develop a piece on addiction that focuses on information, we decided to take the viewer on a journey to learn the stories of several individuals who range from the gang leader to the cheerleader, revealing one simple truth; we all struggle with one form or another of addiction. Through this presentation you will be able to connect your own respective path to what this documentary reveals, particularly as it pertains to life patterns. Combine this with the philosophy of Dr. Alan Watts, and Dr. Vincent Felitti's powerful explanation of ACES and its direction correlation to becoming an IV drug user, I hope to offer an insight into addiction not commonly given in our current culture. Until we fully understand the why, we cannot successfully address the how. ONE provides an opportunity for understanding a critical foundational piece to addiction as well as creating a space for an ongoing dialogue that prompts viewers to look within to their own personal patterns.

I have walked this path personally and professionally. While in the process of producing this film, I discovered my son had become addicted to opioids, entering my own personal nightmare of watching what this disease does to those afflicted and the ones who love them. I speak from both knowledge and experience and am honored to share this journey with all of you.

Looking forward to seeing you all this Fall!

Yours Sincerely,
Dawn Duhaime
Spring Green Foundation, United States

Welcome Message

Dear Conference Attendees,

It is a pleasure for me to welcome you to the GAB Magnus Group 2023 Addiction conference. Your presence is a testimony to your concern over the vast issue of addiction in contemporary American society and how best to resolve it. Clearly, one aspect of this effort will require cutting edge scientific studies, in addition to the social and clinical approaches used to lessen addiction's destructive impact. Fortunately, dramatic advances in the neuroscience of addiction have been made in the last two decades. These findings have revealed not only its pathological effects on brain chemistry but have also begun to identify the pathways and neural circuits that are co-opted by substance abuse. Because brain functioning fundamentally depends on intercellular communication, knowing how these pathways are interrupted by addictive drugs holds promise for appraising how such pathological communication between brain regions can be overcome. It is my hope that these and other discoveries reported on here will assist your efforts in addressing addiction.

Denis Larrivee

Loyola University Chicago, United States

Welcome Message

I am so excited for the opportunities and possibilities which 2023 present. I am thrilled to continue my research on the efficacy of Reward Deficiency Syndrome Solutions. I shall be presenting my most recent research on the Elle Foundation Research Institute 200's series. I am pleased to be able to bring these resources to the public, to the mental health disorder patients who are still suffering, for whom traditional Substance Use Disorder treatment has not worked. Even more importantly, is our work in prevention, for the children of mental health disorder patients, for whom their parents' RDS can cause epigenetic insult for two consecutive generations.

In my personal mental health journey, the most outstanding saving grace was when I was able to step outside of the substance use disorder paradigm and view my individual psychopathology as a manifestation of the underlying neurogenetic causal influence, Reward Deficiency Syndrome. This lessened the shame of mental health stigma and provided solutions which addressed the cause rather than the symptom. I follow my own personal RDS treatment plan, which utilizes pharmacogenomic interventions for my dopamine and serotonin deficiencies. None of this would have been possible if not for the GARS, Genetic Addiction Risk Score (GARS) test.

I am dedicated to my research of RDS because it has been instrumental in my life and that of my family members. We are an RDS family working RDS treatment plans, and enjoying RDS solutions, such as the amino acid BRAIN REWARD, where there used to be none.

See you at the global conference!!

Fondly,

Elizabeth Dale Gilley

The Elle Foundation, United States

Welcome Message

Dear colleagues:

Welcome to the 8th Edition of the International Conference on Neurology and Neurological Disorders.

During the following days, we're going to hear lectures on the Brain and the myriad of Neurological Disorders that affect the brain's performance. The conference will cover a wide variety of pioneering research on neurological conditions such as Alzheimer's disease, Addiction, Stroke, Pain, Traumatic Brain Injury, and others. Our colleagues may enrich and enlighten our understanding of neurological disorders and expand on what may be, the future's therapeutic modalities.

What I hope for, is that professionals attending this conference-whether a researcher, neurologist, or neuroscientist- can not only use the knowledge that they will be gathering in the upcoming days, but also appreciate whatever routine work they might have to complete in the future in the neurological field.

Sincerely,

Juan A. Moreira, MD. FAAN.

CNC / Gnosis Neurointegrative Center, Puerto Rico

Welcome Message

On behalf of the scientific committee and the conference organisers, I warmly welcome all participants in INBC 2023. I have had the honour of participating in INBC for the past 6 meetings and with each meeting I have much enjoyed observing this conference attract the attendance and cutting edge presentations from more and more distinguished scientific researchers, academics, students, therapists and others from around the globe. INBC 2023 is poised to be the most attended and supported meeting of all. So again, on behalf of the scientific committee and the conference organisers I would like to sincerely thank each and every attendee and presenter for your support in ensuring that INBC 2O23 will be a great success.

Ken Ware

Founder of Neurotricional Sciences Pty Ltd and NeuroPhysics Therapy, Australia

Welcome Message

Dear Congress Visitors,

It is my privilege to welcome and thank you for being here with us today. The opioid epidemic was already on the rise when the COVID-19 pandemic hit, and now we are faced with the Fentanyl crisis. It is no wonder that psycho-social health is of utmost concern, not only for those of us here in the US but all over the world. It is with this thought in mind that we come together in the spirit of collaboration to share information and knowledge regarding research, evidence based practice and cutting edge technology. Our collective goal is to bring forth practices, strategies to enhance skill sets, and provide an avenue for the exchange of knowledge so we can help our patients with their struggles and place them in the best position to heal, as well as improve their quality of life.

Dr. Mohammad Zare

UTHealth and Harris Health System, United States

Welcome Message

Welcome to the 4th Edition of Global Conference on Addiction Medicine, Behavioral Health and Psychiatry. This gathering is one of the richest ever.

As neuroscientists and mental health practitioners, we are all faced with the conundrum: is addiction a disease or a dysregulatory behavioral dysfunction? What about the social dimensions of addictive behaviors? Is there such a clinical entity as an “addictive personality”?

The scientific program aims to tackle all these aspects. It comprises presentations about childhood and other traumas (among refugees); neuroscience; spirituality; addictions in various settings (such as the workplace or college); treatments and counseling; prescription drugs and illicit marketplaces; surveys of these afflictions in non-Western societies (such as India and Oman); and personal experiences of family members of addicts.

Tangential topics are also on the agenda: Burenorphine and its effects; COVID-19 quarantine and its effects on addicts; recovery in dysfunctional families; and more.

We wish you a thought-provoking time: addiction to new knowledge is encouraged!

Sam Vaknin

Former Visiting Professor of Personality Psychology

Southern Federal University (SFU), Russia

ABOUT
MAGNUS GROUP

Magnus Group (MG) is initiated to meet a need and to pursue collective goals of the scientific community specifically focusing in the field of Sciences, Engineering and technology to endorse exchanging of the ideas & knowledge which facilitate the collaboration between the scientists, academicians and researchers of same field or interdisciplinary research. Magnus Group is proficient in organizing conferences, meetings, seminars and workshops with the ingenious and peerless speakers throughout the world providing you and your organization with broad range of networking opportunities to globalize your research and create your own identity. Our conferences and workshops can be well titled as 'ocean of knowledge' where you can sail your boat and pick the pearls, leading the way for innovative research and strategies empowering the strength by overwhelming the complications associated with in the respective fields.

Participation from 90 different countries and 1090 different Universities have contributed to the success of our conferences. Our first International Conference was organized on Oncology and Radiology (ICOR) in Dubai, UAE. Our conferences usually run for 2-3 days completely covering Keynote & Oral sessions along with workshops and poster presentations. Our organization runs promptly with dedicated and proficient employees' managing different conferences throughout the world, without compromising service and quality.

EXHIBITOR

Banyan Treatment Centers

The Banyan Treatment Centers Family believes in providing truly customized care for our clients while providing growth through their recovery journey. At Banyan Treatment Centers we offer detoxification programs and individualized treatment programs in our levels of care continuum. We believe that each individual has a unique personality, background, as well as underlying issues that cannot be addressed without having a custom treatment program created specifically for their needs and goals. Our addiction treatment services are completely customized and unique and we pride ourselves in allowing our clients to truly recover and overcome their addiction at any of our nationwide drug and alcohol treatment facilities.

Drug and Alcohol Treatment Programs

As the Banyan Treatment Centers Family, we strive to stand as a leader in the addiction treatment industry by putting our client care at the highest level of importance. We offer free insurance verifications to every individual inquiring about their treatment options. The Banyan Treatment Centers Family knows how devastating the disease of addiction can be, not only to the individual, but also to the family and loved ones of those living in active addiction. We strive to make the process of seeking help for substance abuse and addiction as smooth as possible. We show our clients that life in recovery is possible and Banyan will guide you every step of the way.

The Banyan Treatment Centers Family

The Banyan Treatment Centers Family utilizes a number of different therapeutic methods in order to ensure that each client has a unique therapy program customized to their specific needs. We believe in having a clinical staff with backgrounds in different therapies to offer a broad selection. We have facilities nationwide that offer the best treatment possible for addicted individuals. Before you begin treatment at Banyan, you will receive an initial drug and alcohol assessment that clearly defines where you are at and our team will be able to create a customized treatment plan that addresses your needs. Our number one priority is to ensure a successful and sustained recovery through our treatment and our clients will be able to grow through recovery. Our Alumni Program allows individuals to become active in the recovery community and attend regular meetings to strengthen their recovery efforts. Just because treatment ends does not mean that your recovery efforts do. This is an ongoing process and the Banyan Family is here to support you through each challenging situation.

To learn more about Banyan Treatment Centers' Addiction Treatment Services, please call us anytime. We offer a wide variety of therapy methods that effectively help our clients overcome addiction. The Banyan Treatment Centers Family stands as a leader in providing growth through recovery by offering all levels of care for addiction treatment. It’s never too late to take control over your addiction and get the help you deserve.

EXHIBITOR

Rockland Recovery Treatment Center

Rockland Recovery was founded to help men and women achieve long term sobriety. We incorporated the key factors that we believed helped us to become and remain sober. The 12-steps, structure accountability, and support from others are just a few of the ways in which we help individuals recognize, address, and overcome substance abuse.

At Rockland Recovery, you will be treated with the utmost respect. We understand addiction is a disease and to heal from it you need support. We treat you with the dignity you expect when you have any medical condition cared for. You will not be looked down on or thought less of. It's not about what you have done in the past, but what you're willing to do now to make the necessary changes needed to better your life. We will be there for you every step of the way. So stop delaying, and let us help you get your life back!

Our Mission At Rockland Recovery, our mission is to support and guide men and women through their recovery in a safe, stable, and ethical environment where everyone, from our newest client to our Executive Director, is working towards being a truer version of themselves.

Our Core Values

- Integrity
- Respect
- Philanthropy
- Opportunity
- Community

EXHIBITOR

STORZ Medical AG

STORZ MEDICAL AG, founded in 1987, is an independent partner company of the KARL STORZ Group. We are a medical technology manufacturer located in the heart of Europe, on the Swiss shore of Lake Constance in Tägerwilen, and we develop innovative shock wave systems and shock wave devices of the highest precision.

Our medical products have already proven themselves a million times over in urology. The benefits of non-invasive technology have been extended to other medical disciplines. In this way, STORZ MEDICAL is setting new standards in treatment procedures with technical innovations:

- Extracorporeal shock wave lithotripsy (SWL) in urology
- Extracorporeal shock wave therapy (ESWT) – focused or radial – in orthopaedics, rheumatology, rehabilitation, wound healing, erectile dysfunction and veterinary medicine
- Extracorporeal Magnetotransduction Therapy (EMTT) in orthopaedics
- Transcranial pulse stimulation (TPS) in neurology for the treatment of Alzheimer's dementia
- Acoustic wave treatment (AWT) in aesthetic medicine
- Cardiac shock wave therapy (CSWT) in cardiology
- Physicians and patients on all five continents trust in the experience of STORZ MEDICAL.

EXHIBITOR

RWD Life Science

At RWD we have believe that effective research and development coupled with talent is our company's cornerstone and competitive strength. Our experience of more than 17 years has helped us develop a keen understanding of the unique needs of the market. We invest more than 10% of our gross revenue in technology research and new product development every year to stay ahead of the curve. In 2018, our product research and development personnel accounted for more than 30% of our total human resources.

A competent R&D team has helped RWD obtain nearly 100 invention and utility model patents worldwide, mastering core technologies in many fields such as neuroscience research, molecular and cellular research, respiration and anesthesia, pathological diagnosis products, and more.

Based on the Chinese market and serving customers around the world, RWD has not only achieved a strong reputation and advantage in the fields of respiratory anesthesia, neuroscience research, animal behavior research, surgery and nursing, and pathological analysis, but also gained constant trust and support from our domestic and foreign customers after our efforts during the past 17 years.

We have stable, long-term cooperative relations with many research institutes and animal medical institutions in China and the rest of the world. RWD lays a heavy focus on drawing on the basic research results from these institutes, continuing in innovation, and customer-focused research and development. This helps us promote life science, animal health medical devices, and clinical progress and development.

EXHIBITOR

AbbVie Inc

AbbVie was founded in 2013 when we became a separate company from Abbott. Our name represents a proud connection to that legacy. Since the beginning, our mission hasn't wavered. Our combination of focused innovation and commercial scale brings differentiated products to market that benefit patients, customers and health care providers.

At AbbVie, our R&D teams are chasing bold goals. The therapies and solutions that no one else has achieved or even attempted. And we want to be there first. That's what we go after every day for our patients. Science and innovation are the lifeblood of our company. From drug discovery to clinical trials to regulatory approval, we're pursuing new ways to address patients' most challenging health issues.

Since our launch in 2013, we've invested more than $55 billion in R&D. This enables us to discover and deliver innovative medicines and products that solve serious health issues, enhance people's lives today, and address tomorrow's medical challenges.

We focus on core areas where our proven expertise and bold thinking have the greatest potential to solve unmet needs. These areas are oncology, immunology, neuroscience, eye care, medical aesthetics and other specialty areas.

EXHIBITOR

Sun Pharma

Sun Pharmaceutical Industries Ltd. (Sun Pharma) is the fourth largest specialty generic pharmaceutical company in the world with global revenues of over US$ 5.1 billion. Supported by more than 40 manufacturing facilities, we provide high-quality, affordable medicines, trusted by healthcare professionals and patients, to more than 100 countries across the globe.

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19-21 OCT

DAY 01

KEYNOTE FORUM

JOINT EVENT ON

NEUROLOGY & ADDICTION

Use of MRI-navigated Transcranial Pulse Stimulation (TPS) as an alternative treatment for alzheimer's disease and other psychiatric diseases

Dementia is still one of the most common serious psychiatric disorders in old age. A dementia of the Alzheimer's type is still considered to be a progressive irreversible disease which cannot be treated causally. However, in the meantime it has been shown that novel non-invasive brain stimulation methods offer alternative, effective treatment options to reduce the symptoms. Here, the method of Transcranial Pulse Stimulation (TPS) with mechanotransduction of shock waves offers particularly favourable effects on various symptoms of dementia like memory, executive functions and mood, without showing significant side effects.

The transduction of the shock waves is carried out very precisely with a MRI-navigated system. This allows a precision very close to stereotactically implanted electrodes in Deep Brain Stimulation (DBS). Shockwaves can be administered to superficial brain structures as well as into deep brain areas, up to 8 cm in depth. In contrast to Ultrasound Stimulation (tFUS) TPS does not induce any thermal effects. So there is no risk of thermal lesion after administration of low intensity shock waves. On the contrary locally administered low-energy shock waves have been shown to induce regenerative processes in the central nervous system.

While the TPS procedure is already approved in Germany and several other countries with a CE-certificate, patients with depression and post-COVID-19 illness were treated in the context of healing attempts. In addition to positive effects on the brain and the behaviour of patients with Alzheimer's disease, results of using TPS in patients with severe therapy resistant depression and post- COVID syndrome will also be

presented.

Characteristics and effects of TPS will be compared with alternative standard treatment such as ECT, magnetic stimulation, deep brain stimulation or stimulation with AC or DC currents.

To determine the exact working mechanisms of TPS further investigation is needed. In a rodent model it could be shown that TPS induced an increase of Nitric Oxide (NO)-levels. Both, the release of trophic factors and a temporarily opened Blood-Brain-Barrier (BBB), seem to play a critical role. Thus a transient opening of the BBB might help to potentiate effects of administered pharmaceuticals contributing to an improvement of brain function.

In summary, TPS is a very promising option as an adjunctive therapy to a state-of-the-art treatment which may achieve a reduction of symptoms in alzheimer's disease, depressive symptoms as well as an improvement of symptoms in other psychiatric diseases.

Ulrich Sprick[1,2]*, Martin Kohne[1]

[1]Alexius/Josef Clinic, Neuss, Germany

[2]Faculty of Medicine, Heinrich-Heine-University, Düsseldorf, Germany

Biography

Prof. Dr. med. Dr. rer. nat. Dipl.-Psych. Ulrich Sprick studied Medicine and Psychology at the University of Düsseldorf. He is an associated professor at the Medical Faculty of the University of Düsseldorf. Trained as a specialized psychiatrist and an expert psychologist in neuropsychology he works as deputy medical director and head of the Department of Dayclinics and Out-Patients of the Alexius/ Josef Clinic in Neuss (Germany). He has been working in brain research for more than 20 years with special interests in brain stimulation, neuoplasticity, trophic factors, endogenous opiates and memory. From the clinical perspective his actual research interests include treatment of alzheimer's Disease and depression, nonvisual effects of light and telemedicine.

Audience Take Away Notes

- Presentation of a new effective method of non-invasive brain stimulation with very low side effects compared with other standard therapies
- Treatment data of patients with alzheimer's disease and depression will be included
- Discussion of the working mechanism of TPS

Introducing 4d printing for stem cell delivery to and function in the brain: Improving viability, differentiation, and brain function

Stem cells have not provided the universal, effective solution to neurological diseases that they were once thought to provide. In particular, maintaining stem cell viability during and after implantation into the brain has proved problematic. The use of enzymes (such as trypsin) to lift cells off of typical cell culture dishes so that they can be injected into the brain is particularly problematic as reports indicate up to 60% cell death. Further, once in the brain, stem cells often migrate away from damaged tissue towards cytokines produced from healthy cells in the brain. This presentation will present first-time data where 4D printed materials were designed and developed to reduce stem cell death during implantation and reduce stem cell migration after implantation. 4D printing refers to 3D printed materials which can change shape over time, remotely, wirelessly and on-demand. Promising in vitro and in vivo data will be presented to highlight the promise of this new classification of materials for treating numerous neurological problems.

Audience Take Away Notes

- The concept of 4D printing
- The promise and failures of stem cell use in the brain
- Approaches to treat numerous neurological diseases

Thomas J Webster

School of Health Sciences and Biomedical Engineering, Hebei University of Technology, Tianjin, China; School of Engineering, Saveetha University, Chennai, India; Interdisciplinary Laboratory for Advanced Materials (LIMAV), Materials Science and Engineering Graduate Program (PPGCM), Federal University of Piaui (UFPI), Teresina, Brazil

Biography

Thomas J. Webster's (H index: 113; Google Scholar) degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995; USA) and in biomedical engineering from RPI (Ph.D., 2000; USA). He has served as a professor at Purdue (2000-2005), Brown (2005-2012), and Northeastern (2012-2021; serving as Chemical Engineering Department chair from 2012 - 2019) universities and has formed over a dozen companies who have numerous FDA approved medical products currently improving human health. He is currently helping those companies and serves as a professor at Hebei University of Technology, Saveetha University, Vellore Institute of Technology, UFPI, and others. Dr. Webster has numerous awards including: 2020, World Top 2% Scientist by Citations (PLOS); 2020, SCOPUS Highly Cited Research (Top 1% Materials Science and Mixed Fields); 2021, Clarivate Top 0.1% Most Influential Researchers (Pharmacology and Toxicology); 2022, Best Materials Science Scientist by Citations (Research.com); and is a fellow of over 8 societies.

Office based addiction treatment program update and population health

Harris Health is the largest safety net care system in Texas and the fourth largest safety net in the nation. The patient population is comprised of a high rate of uninsured/underinsured patients and justice-involved individuals, of which many have chronic diseases, including substance use disorders.

Access to treatment for substance use disorders has been limited due to multiple reasons such as resource constraints, increasing demand for mental as well as behavioral health, polypharmacy and polysubstance issues.

Harris Health System's Ambulatory Care Services/University of Texas Health McGovern established the Office Based Addiction Treatment Program (OBAT) for the past 6 years. Harris Health's OBAT Program is based on the Massachusetts model of Office Based Addiction Treatment where patients are in a primary care setting and the care of the substance misuse patient is seen through the lens of a chronic disease model. This program is aimed at integrating treatment for opioid use disorder in primary care. This innovative program utilizes a nurse care manager role working closely with waivered physicians.

The patient's treatment regimens include physical, social, behavioral and mental health. The implementation of Evidence Based Practice models of care ensure that our teams are constantly improving clinical care delivery models through technology, partnerships with community resources, education and research.

The multidisciplinary approach is used in multiple Harris Health clinical sites which entails the collaboration between the Physician (PCP), Nurse Care Manager, Psychiatrist, Behavioral Therapist, Social Worker/Case Managers, Patient Educators, Pharmacists, Information Technology and community resources such as the UT Heroes Program, Harris Center, House of Extra Measures and the Houston Recovery Center.

The Office Based Addiction Treatment (OBAT) Team is also actively working with the Houston Judicial System's Success Through Addiction Recovery (STAR) Drug and the Houston Responsive Interventions for Change (RIC) Courts. Pre-trial, post-trial and residential clients will have opportunities to hear and learn about the OBAT Program in Harris Health.

Our presentation will take you through the leadership journey, the model of care, treatment goals, bridging the treatment gaps, enhancement of access to care and clinical outcomes data.

Mohammad Zare*, Shrabanee Mitra, Jennifer LaHue*, Miguel Aguilar, Kathryn Crary*, Cherise Ramirez, Rachel Ibanez

Integrated Family Planning Opioid Response, Harris Health System-Ambulatory Care Services/University of Texas-Department of Family and Community Medicine, Houston, Texas, United Sataes

Biography

Dr. Mohammad Zare studied Medicine at the University of Texas in Houston, Texas and graduated in the Residency program at UT Health-Department of Community and Family Medicine in 1996. He served as a Medical Director for 13 years in Harris Health System. Dr. Zare also served as the Assistant Chief of Staff and eventually Chief of Staff in 2010-2020. Currently serving in a Faculty physician and Associate Professor of

Audience Take Away Notes

- Updated Evidence Based Practice models of care
- Improve access to substance use disorder treatment
- Bridging the knowledge and treatment gaps for providers and patients
- Practical solution to a complex issue of care delivery via established team approach
- Innovative care delivery models and community linkages

Family Medicine. He is also currently the Vice Chair in the Department of Family and Community Affairs. Dr. Zare is engaged in numerous publications and speeches across the country for the past 20 years.

Jennifer LaHue studied Nursing at the University of Texas in Houston, Texas and graduated with a BS in Nursing. She also received a double Masters in Business Administration with Our Lady of the Lake University in San Antonio, Texas. She served as the Medical Home Director in Harris Health System and is currently the Director of Nursing Strategic Initiatives and Clinical Informatics for Ambulatory Care Services

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SPEAKERS

JOINT EVENT ON

NEUROLOGY & ADDICTION

Bharath Kumar Nagaraj[1], Naveen Kunchakuri[2]

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Finding anatomical relations between brain regions using AI/ML techniques and the ALLEN NLP API

Introduction: The brain is a complex organ with a vast network of interconnected neurons. These connections allow different brain regions to communicate with each other, which is essential for many cognitive functions. However, the anatomical relationships between brain regions are not fully understood.

In recent years, Artificial Intelligence (AI) and Machine Learning (ML) techniques have been used to study the anatomical connectivity of the brain. These techniques have the potential to provide new insights into the functional organization of the brain and to help us understand how brain disorders develop.

In this research, we will discuss how AI/ML techniques can be used to find anatomical relations between brain regions. We will focus on the use of the ALLEN NLP API, which provides a rich set of resources for Natural Language Processing (NLP) tasks.

Anatomical Relations Between Brain Regions: The anatomical relations between brain regions can be described in terms of their spatial proximity, their connectivity, and their functional interactions. Spatial proximity refers to the physical distance between two brain regions. Connectivity refers to the presence of neural fibers that connect two brain regions. Functional interactions refer to the way that two brain regions work together to perform a specific task.

AI/ML techniques can be used to study all three aspects of anatomical relations between brain regions. For example, spatial proximity can be studied using techniques such as Diffusion Tensor Imaging (DTI). Connectivity can be studied using techniques such as tractography. Functional interactions can be studied using techniques such as functional MRI (fMRI).

The ALLEN NLP API: The ALLEN NLP API provides a rich set of resources for NLP tasks. These resources include a large corpus of text data, a set of pre-trained models, and a set of tools for building and training NLP models.

The ALLEN NLP API can be used to study anatomical relations between brain regions in a number of ways. For example, the corpus of text data can be used to identify words and phrases that are associated with specific brain regions (PPC and PFC). The pre-trained models will be used to classify brain regions based on their spatial proximity or their functional interactions. The tools for building and training NLP models can be used to develop new models for studying anatomical relations between brain regions.

Audience Take Away Notes

- Understanding the principles of using AI/ML techniques and the ALLEN NLP API to analyze anatomical relations between brain regions: The presentation will provide a clear explanation of how AI/ML algorithms can be employed to process and interpret neuroanatomical data from various sources, including brain region information from the pre-frontal cortex and posterior parietal cortex
- Practical application and implementation in research and daily work: The audience will learn how to apply AI/ML methods in their own research projects or neuroscientific investigations. They will be equipped with the necessary knowledge to utilize the ALLEN NLP API effectively to extract meaningful anatomical relationships between different brain regions

- Enhancing research and teaching endeavors: Faculty members will gain insights into how this research methodology can enrich their own studies or teaching materials related to neuroanatomy and neuroscience. By incorporating AI/ML techniques, they can augment the understanding of brain region interactions, leading to novel insights and discoveries
- Streamlining the design process and increasing efficiency: For professionals involved in brain-related design projects, this research provides a practical solution to expedite the analysis of brain region connections. By automating the identification of anatomical relationships using AI/ML and the ALLEN NLP API, designers can save time and resources while gaining a deeper understanding of brain organization
- Improving the accuracy and depth of designs: With access to detailed anatomical relations between brain regions, designers can create more precise and data-driven models. This will lead to more accurate representations of brain function and connectivity, resulting in improved designs, interventions, or treatment strategies
- List all other benefits
    - **Advancing neuroscientific knowledge:** The use of AI/ML techniques allows researchers to explore complex brain connectivity patterns at a scale that may not be easily achievable manually, leading to new discoveries and advancements in neuroscience
    - **Facilitating interdisciplinary collaboration:** By combining AI/ML expertise with neuroscience, this research opens up opportunities for interdisciplinary collaborations that can accelerate progress and foster innovation
    - **Potential clinical applications:** The insights gained from analyzing brain region anatomical relations could potentially aid in the diagnosis and treatment of neurological and psychiatric disorders by offering a deeper understanding of brain connectivity alterations in these conditions.
    - **Enabling data-driven decision-making:** Professionals in various fields can make better-informed decisions by leveraging the data-driven insights extracted from the anatomical relationships between brain regions

Overall, the presentation will equip the audience with valuable knowledge and practical skills to leverage AI/ML techniques and the ALLEN NLP API to explore the anatomical relationships within the brain. This has the potential to significantly impact research, teaching, and design applications in neuroscience and related fields.

Biography

Bharath Kumar Nagaraj- Born Brought up in Coimbatore, TamilNadu. Engineer with 12 Years of Solid track record in AI. Bachelors in Engineering, Bharathiar University. CBE Master of Business Administration in Information Technology (MBA IT), London, UK. Specialized research experience in Neuroscience AI at IIT Madras. (Research Internship). Working as an AI Engineer in US with an American multinational financial services corporation.

Naveen Kunchakuri- My name is Naveen Kunchakuri, and I am a highly motivated individual with a passion for Machine Learning. I graduated from NIT Bhopal, India and have accumulated 15 years of professional experience in various roles. Driven by my enthusiasm for AI/ML, I pursued the prestigious post graduate program in Artificial Intelligence and Machine Learning from the University of Texas, Austin, to further hone my expertise in this rapidly advancing field. Currently, I hold the position of a Principal Engineer II - Software at Hughes Network Systems, where I am actively involved in spearheading AI and Machine Learning initiatives. My journey in this domain has allowed me to leverage my expertise and creativity to deliver innovative solutions and drive positive outcomes.

Nina Sherman
Podcaster, United States

"From one mother of an addict to another"

I created a podcast because I wanted to share my experiences of having a son with addiction with other mothers, so they don't feel so alone. my son's an addict and suffers from drug induced Mental Illness. I needed help and felt alone, ashamed and didn't know where to turn. I believe sharing my experiences with other parents will help to alleviate some shame and loneliness. I navigated through the process of seeking help the best way I could and I tried to learn as much as I could about addiction and mental illness.

Below, are some topics I will be discussing.

- I will be addressing topics on self-care, self-esteem and admitting feelings of inadequacy when seeking help. I will share how I addressed them and discuss my thoughts on what I would have done differently 13 years ago.
- I will be discussing how I approached topics like Identify/Communicate/Path.
- I will be addressing the term "Hitting Rock Bottom" and I hope the audience walks away with a better understanding of why these words should not be addressed with a parent who's in denial.
- I will be sharing the importance of a "buddy system". I will discuss how it can add on-going support, structure and break barriers in the stigma of both mental and addiction disorders. Professionals can take this approach back to their communities and share the impact a buddy system can have on supporting patients of all ages.
- I will elaborate on the word DENIAL and my goal is for the audience to pick up some new methods in working with parents/family members that are in denial. Why sharing Podcast suggestions with your clients can offer them emotional support without shame.
- I will be concluding with a brief discussion on how I believe the school system at an early age can play a huge role in changing the stigma of mental illness, depression and addiction.

Biography

Nina Sherman, 56 years old currently living between Englewood NJ and Bal Harbour FL. Nina spent over 12 years working for Comcast in Florida, while raising her two sons. For the past 13 years Nina has been in survival mode as a parent with a child who suffers from addiction as well as drug induced Mental Illness. She recently started a Podcast called "From one Mother of an addict to another "with a goal in mind of sharing her experiences on different topics that could support other parents going through this journey of a lifetime.

Ayla Ahmed[1], Yonis Ahmed[1], Kwaku Duah Asante[1], Abayomi Lawal[1], Zain Mohiaddin[1], Hasan Nawab[1], Alexis Tang[1]*, Brian Wang[2],[3], George Miller[3], Johann Malawana[3]

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[2]Department of Metabolism, Digestion and Reproduction, Imperial College Healthcare Trust, London, United Kingdom
[3]Centre for Digital Health and Education Research, School of Medicine, University of Central Lancashire, Preston, United Kingdom

A cost utility analysis comparing endovascular coiling to neurosurgical clipping in the treatment of aneurysmal subarachnoid haemorrhage

Endovascular Coiling (EC) has been identified in systematic reviews and meta-analyses to produce more favourable clinical outcomes in comparison to Neurosurgical Clipping (NC) when surgically treating a subarachnoid haemorrhage from a ruptured aneurysm. Cost-effectiveness analyses between both interventions have been done, but no cost-utility analysis has yet been published. This systematic review aims to perform an economic analysis of the relative utility outcomes and costs from both treatments in the UK. A cost-utility analysis was performed from the perspective of the National Health Service (NHS), over a 1-year analytic horizon. Outcomes were obtained from the randomised International Subarachnoid Aneurysm Trial (ISAT) and measured in terms of the patient's Modified Rankin Scale (mRS) grade, a 6-point disability scale that aims to quantify a patient's functional outcome following a stroke. The mRS score was weighted against the Euro-QoL 5-Dimension (EQ-5D), with each state assigned a weighted utility value which was then converted into Quality-Adjusted Life Years (QALYs). A sensitivity analysis using different utility dimensions was performed to identify any variation in Incremental Cost-Effectiveness Ratio (ICER) if different input variables were used. Costs were measured in pounds sterling (£) and discounted by 3.5% to 2020/2021 prices. The cost-utility analysis showed an ICER of–£144,004 incurred for every QALY gained when EC was utilised over NC. At NICE's upper Willingness-To-Pay (WTP) threshold of £30,000, EC offered a Monetary Net Benefit (MNB) of £7934.63 and Health Net Benefit (HNB) of 0.264 higher than NC. At NICE's lower WTP threshold of £20,000, EC offered an MNB of £7478.63 and HNB of 0.374 higher than NC. EC was found to be more 'cost-effective' than NC, with an ICER in the bottom right quadrant of the costeffectiveness plane—indicating that it offers greater benefits at lower costs. This is supported by the ICER being below the NICE's threshold of £20,000–£30,000 per QALY, and both MNB and HNB having positive values (>0).

Audience Take Away Notes

- The audience will learn how we conducted a cost-utility analysis on the two main surgical treatments for a subarachnoid haemorrhage – endovascular coiling and neurosurgical clipping. This would be useful for audience members hoping to expand their skills in conducting research studies and teaching others – and thus would be relevant to all faculties of medicine
- The audience will learn which treatment proved to possess more utility for its cost, and how this fits in with NICE's willingness-to-pay thresholds. This can help audience members better understand the utility of these interventions and the future of their usage in the NHS, which can be relevant for doctors that practice them
- The audience will learn about the common clinical outcomes and complications relevant to the two surgical treatments. This would be helpful for all audience members interested in neurology and neurosurgery as these factors greatly contribute to the overall quality of future care provided to their patients

- The audience will learn and be updated on relevant current literature on both interventions, covering previous large-scale studies and a cost effectiveness analysis

Biography

Alexis Tang is a Singaporean 5th year medical student at the University of Edinburgh, planning to graduate in 2024. In her 3rd year, she intercalated in Imperial College London for a degree in Healthcare Management, where she completed a group dissertation on pharmacovigilance in social media and published her first paper covering a cost-utility analysis on endovascular coiling versus neurosurgical clipping. She is currently the sponsorship director for Edinburgh University's Student Surgical society, which is the largest in Scotland, as well as the secretary for Edinburgh University's Plastic, Reconstructive & Aesthetic Surgery Student society.

Jag H Khalsa

DFISAM, Adjunct Professor, George Washington University School of Medicine and Health Sciences, Washington, DC., and Special Volunteer at National Institute on Drug Abuse, National Institutes of Health, Maryland; United States

Clinical evidence supporting cannabis/cannabinoids for treating neurological disorders

Cannabis continues to be the most abused illicit drug in the world with an estimated 2.5% of the world's population (180 million) using it regularly (World Drug Report 2017)1. Medicinal and/or recreational cannabis use is associated with significant health consequences) (WHO, 20162; Volkow et al.3), its use as medicine remains the subject of extensive reviews and debates around the globe. There is paucity of clinical evidence from placebo controlled, double-blind randomized clinical trials that would support the approval of the whole cannabis plant, whether smoked or as an extract as medicine by the FDA or other regulatory body in any country. FDA has approved THC (Marinol, Dronabinol) for treating chemotherapy-associated nausea, vomiting and as an appetite stimulant in AIDS-wasting, but no other cannabinoid or any combination of cannabinoids has been approved as medicine, except Sativex (THC+CBD) approved for treating neuropathic pain in other countries (excepting the US), while the US FDA has approved it for treating two rare conditions of epilepsy in young children. Further, neither THC, CBD, nor any of the other 125 known cannabinoids have been extensively tested nor have they been approved for the treatment of a wide range clinical indications including neurological disorders being promoted (Khalsa et al., 2018,3 Khalsa et al. 20234), and the findings of the National Academy of Sciences (2017)5, the latter recommending that additional research be conducted with cannabinoids, but not with smoked cannabis, for all other potential clinical indications. This presentation will show if current clinical evidence is adequate to support the use of cannabis, or any other cannabinoid to treat a wide range of clinical conditions including various neurological disorders being promoted.

Audience Take Away Notes

- The participants will learn
- The current knowledge on adverse health consequences of cannabis
- The current research available on medicinal cannabis, CBD, or other cannabinoids and
- Clinical evidence supporting cannabis/cannabinoids for treating neurological disorders

Biography

Jag H. Khalsa, MS, PhD, DFISAM, currently is serving as a Special Volunteer/Guest Researcher at National Institute on Drug Abuse, NIH; retired on October 2017 after 40 years of US Federal service (10 at FDA and 30 years at NIH) as the Chief, Medical Consequences of Drug Abuse and Infections Branch, NIDA, NIH), Adjunct Prof, GWU School of Medicine & Health Sciences, and Institute of Human Virology, UM School of Medicine. He is a recipient of numerous Lifetime Achievement awards in Addiction Science and Addiction Medicine, including Distinguished Fellow of the International Society of Addiction Medicine (DFISAM), and serves on several editorial boards including the Journal of Addiction Medicine.

Hiroko Ikeshima Kataoka[1,2]*, Hideaki Kubotera[1], Anna Letizia Allegra Mascaro[3,4], Francesco Saverio Pavone[3], Motoko Furukawa[2], Sayaka Inui[2], Yoko Honjyo[2], Manae Imamura[2], Takafumi Inoue1, Masato Yasui[2]

[1]Faculty of Science and Engineering, Waseda University, Tokyo, Japan
[2]Department of Pharmacology and Neuroscience, Keio University School of Medicine, Tokyo, Japan
[3]European Laboratory for Non-Linear Spectroscopy, University of Florence, Florence, Italy
[4]Neuroscience Institute, National Research Council, Pisa, Italy

Astrocytes have neuroimmunological function in the stab wound mouse brain

Background: Some glial cells such as astrocytes and microglial cells activated when the traumatic injury occurred to the brain. After the stab wound to the mouse brain, those glial cells proliferate and secrete some of the inflammatory cytokines, however the functional role of these activations are still unknown.

Objective: We have been analyzing the functional role of reactive glial cells in the mouse brain with stab wound injury and found that some of the molecules are concerning to the Blood Brain Barrier (BBB) recovery from the break down caused by the brain injury. Since extracellular matrix protein tenascin-C (TN-C), one of the water channels in Astrocytes Aquaporin 4 (AQP4), and the inflammatory cytokine inducer Osteopontin (OPN) expression levels are upregulated according to the astrocyte reactivation, we analyzed functional roles in reactive astrocytes.

Methods: We used gene deficient mice (TN-C/KO, AQP4/KO, OPN/KO) with stab wound injury on the cerebral cortex for the analysis. For the immuno-fluorescent analysis on the brain sections, antibodies against Bromo-Deoxy-Uridine (BrdU) for proliferating cells, GFAP for astrocytes, Iba1 for microglial cells, and IgG for BBB breakdown were used. DNA microarray analysis was performed with RNA extracted from either AQP4/KO or WT mice 3 days after the stab wound site.

Results & Conclusions: We found that reactivation of astrocytes in the injured brain, TN-C is required for BBB recovery from the breakdown caused by stab wound in the brain. Additionally, AQP4 is not only the water channel but also might have a neuroimmunological function in reactive astrocytes around injured site and we hypothesized that integrin a9 and b1 found to be the receptors against OPN in the injured brain.

Audience Take Away Notes

- Brain has not only neurons but also glial cells such as astrocytes and microglial cells
- Glial cells become active when the brain has injury so that those cells could be the target for neuro-regenerations or cure the neurodegenerative diseases
- Neuroinflammation might be an important situation after the brain injury or disease

Biography

Dr. Ikeshima-Kataoka was graduated from Keio Univ. Sch. Med. (Dept. of Microbiology) and received Ph.D. on development of transgenic mice and analyzed in the brain. For the postdoctoral fellow (NIN, Japan), researched on the neuronal development using fly genetics. Then, promoted back to Keio Univ. Sch. Med. (Dept. Neuroanat.) and started to focus on “reactive astrocytes” and performed neuroimmunological analysis in injured mouse brains and found molecules at Keio Univ. Sch. Med. (Dept. Pharmacol. & Neurosci.). Furthermore, performed in vivo imaging analysis on mouse brains with two photon laser microscopy to analyze functional role of “reactive astrocytes” at Waseda Univ.

Mia W. McNary
Artist and Visual Storyteller, “Picture Recovery”, USA

Visual cues trigger emotions picture recovery in actual pictures to stay sober

Picture Recovery is a visual roadmap through the journey of alcohol recovery. It's much easier to remember a picture than words, and with 65 percent of the population identifying as a visual learner, this is the only book of its kind in the alcoholism recovery category. This visual aid (relatable images!) is intended to help people stay on the recovery path. It's a great companion to attending meetings, other literature and connecting with people doing well in the program. I'm confident this is a necessary companion to attending meetings because I used it myself and I'm now more than two decades sober. It was difficult to recall what was said, especially at the beginning of my journey, and this was the recall tool I relied on especially in difficult times.

Created from over 28 years of Mia’s sobriety journey attending meetings, picture recovery is a reminder to slow down, and find more self-compassion. Mia’s goal is to help others like herself who need visuals to retain the suggestions of the program. This book was created to help people recall the incredible suggestions heard in recovery rooms. These images are a reminder to all suffering that each day is an opportunity to discover an amazing potential. Picture Recovery’s goal is to have the reader spot their true super sober self. Our mission is to save one life.

Sample Images

Audience Take Away Notes

- Picture Recovery will help those struggling with addiction to have visual tools to retain these new suggestions heard in meetings, and to be able to recall later when needed. Especially in a crisis moment, it's much easier to remember a picture than words, and the idea is so simple-it's bite-sized graphics depicting recurring themes heard in meetings. Today's reader needs to digest visually, with updated graphics intended to be understood at a glance
- This conference has the literal word, "vision" in it: "Vision" for Controlling Narcotic Dependency and Relapse. It's imperative to think about the journey and the visual aids necessary, in a manner that supports the learning path of 65 percent of the population
- This book contains images, selected from literally thousands of Mia's sketches over her 28 years in Alcoholic Anonymous 12-step recovery program. The audience can begin to think about how to translate the written word and create complementary graphics to ensure broader learning. Our goal is to help one person with this book and to show the world that visual process is key to the majority of the population, especially in the area of mental health
- These visual learners are in crisis so how complex information is delivered to them is key to their life long success. Why is this important? Relapse is common for anyone fighting an addiction so it's

imperative to introduce visuals into the recovery process? If someone has a hearing challenge, we teach sign language or otherwise modify how information is delivered

- Alcoholism is a lifelong disease and the information a person learns in rehab centers should be easy to process and retained long term. The question is how best to deliver critical information to maximize learning has been answered: multiple methods of delivery including visual aids!
- YES! Research has shown that visualization of complex content can bolster communication for changing attitudes and behavior

Biography

Educated at Carnegie Mellon University and at Studio Art Center International in Florence, Italy, Owner of Masters In Art Studio Chicago,IL. McNary worked in the advertising industry for years. Mia is married with three adult kids, is the published author of "Picture Recovery," and an advocate for autism and always sketching her life journey. -Sober date 1/3/1995

Andrew H Hahn
Life Centered Therapy Training Institute, United States of America

The body holds the key: Healing addictions at the source with life centered therapy

To heal addictions, we must be able to do 7 things. 1. Heal the trauma, 2. Heal the way we protect ourselves from ever experiencing the trauma again, 3. Contexts, 4. Triggers, 5. The habit itself, 6. Elators and 7. Anticipatory fears.

We will focus on the first two of these. We will demonstrate how an addiction can be a symptom of a trauma and how it can protect us from experiencing the trauma while inviting us to remember, heal and grow. For example, addictive drinking can be a way to protect ourselves from failure and simultaneously invite us into healing failure.

We will present a way of integrating mindfulness, somatic and transpersonal therapy into an inclusive framework that can be used to understand the broader contexts of the addiction, the addiction itself, and how to heal it. Participants will be able to use these tools immediately in their practice.

Audience Take Away Notes

- They will be able to apply the framework and the tools they learn immediately in their practice
- They will get quantifiably better results while working with people with addictions
- We will be presenting a different paradigm for understanding life and the implications for understanding and healing trauma. Other faculty can use this immediately in their teaching
- We will present an extremely practical resolution for understanding and healing trauma

Biography

Dr. Hahn received his doctorate in clinical psychology from Hahnemann in University in 1985. That same year he became an assistant professor in the graduate counseling department at Leslie University and the training Director at the Charles River Counseling Center. In 1997 he became the founder of an institute that is now called the life centered therapy training and healing Institute. He is the co-author with John Beckett of the book the one our miracle.

BOOK OF ABSTRACTS

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NEUROLOGY & ADDICTION

Ulrich Sprick

Alexius/Josef Clinic, Neuss, Germany, Faculty of Medicine, Heinrich-Heine-University, Dusseldorf, Germany

Transcranial pulse stimulation of the brain – a new strategy of noninvasive treatment

The treatment of various severe neurodegenerative diseases including alzheimer's disease is a real challenge in clinical practice. A new method of brain stimulation using noninvasive Transcranial Pulse Stimulation (TPS) based on ultra-short shockwaves has recently become available. The transduction of the shock waves is carried out very precisely by a MRI-navigated system. This allows a precision very close to stereotactically implanted electrodes in Deep Brain Stimulation (DBS). Stimulated areas can be clearly recognized in real time mode. Shockwaves may be administered to superficial brain structures as well as into deep brain areas, up to 8 cm in depth. In contrast to Ultrasound Stimulation (tFUS) TPS does not induce any thermal effects. So there is no risk of thermal lesions after administration of low intensity shock waves. On the contrary locally administered low-energy shock waves have been shown to induce regenerative processes in various areas of the central nervous system.

The workshop will deal with the latest results in the field. Noninvasive TPS-treatment effects in a randomized, sham-controlled clinical trial in Alzheimer-patients will be demonstrated. Another presentation will deal with beneficial TPS-effects in patients with Long COVID and chronic pain syndromes. Beneficial effects of TPS in patients suffering from stroke, brain trauma and Parkinson's disease will also be regarded.

Audience Take Away Notes

- Presentation of TPS as a new effective method of non-invasive brain stimulation in patients with Alzheimer's disease, Post Covid, Stroke and after brain trauma
- Innovative treatment of patients with (severe) neurological conditions in a complex rehabilitation setting
- Presentation of general effects and working mechanisms of shock waves with low intensities in the brain

Biography

Prof. Dr. med. Dr. rer. nat. Dipl.- Psych. Ulrich Sprick studied Medicine and Psychology at the University of Düsseldorf. He is an associated professor at the Medical Faculty of the University of Düsseldorf. Trained as a specialized psychiatrist and an expert psychologist in neuropsychology he works as deputy medical director and head of the Department of Dayclinics and Out-Patients of the Alexius/ Josef Clinic in Neuss (Germany). He has been working in brain research for more than 20 years with special interests in brain stimulation, neuoplasticity, trophic factors, endogenous opiates and memory. From the clinical perspective his actual research interests include treatment of alzheimer's Disease and depression, nonvisual effects of light and telemedicine.

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Leandro Heidy Yoshioka[1]*, Linamara Rizzo Battistella[2]

[1]IMREA (Institute of PM&R), University of Sao Paulo, chief of inpatient unit, Sao Paulo, Brazil

[2]University of Sao Paulo, Head Professor of PM&R, Sao Paulo, Brazil

Transcranial pulse stimulation in neurological rehabilitation: Exploring potential benefits for stroke, parkinson's disease, and brain trauma patients within a multiprofessional rehabilitation team

The initial phase of the research project exploring Transcranial Pulse Stimulation (TPS) in individuals with stroke, Parkinson's disease, and brain trauma within the complex rehabilitation setting holds significant importance within the context of a multiprofessional rehabilitation team operating in a state network of IMREA hospitals.

Integrating TPS into the repertoire of rehabilitation techniques offered by the multiprofessional team can lead to more comprehensive and personalized care for individuals with stroke, parkinson's disease, and brain trauma. It has the potential to augment the existing rehabilitative strategies, allowing for a more holistic approach to address the specific needs and challenges faced by these patients.

Moreover, the research project conducted within the state network of IMREA hospitals demonstrates the commitment to evidence-based practice and continuous improvement in the field of rehabilitation. The exploration of TPS aligns with the objective of staying at the forefront of advancements in healthcare and leveraging innovative approaches to optimize patient outcomes.

Ultimately, the importance of TPS within the context of a multiprofessional rehabilitation team in the state network of IMREA hospitals lies in its potential to enhance the quality of care provided to individuals with stroke, Parkinson's disease, and brain trauma. It represents a step forward in the pursuit of comprehensive and effective rehabilitation strategies, reinforcing the commitment to improving the lives of patients and advancing the field of rehabilitation within the healthcare system.

In summary, the research on Transcranial Pulse Stimulation (TPS) in individuals with stroke, Parkinson's disease, and brain trauma within the multiprofessional rehabilitation team of the state network of IMREA hospitals provides encouraging evidence of its potential benefits. Integrating TPS into rehabilitation strategies can enhance patient care, improve functional outcomes, and advance the field of rehabilitation. The findings serve as a foundation for future studies and highlight the commitment to evidence-based practice and continuous improvement in healthcare. Overall, TPS shows promise as an innovative therapeutic intervention that can positively impact the lives of individuals with neurological conditions in the complex rehabilitation setting.

Biography

Leandro Heidy Yoshioka was graduated from the Faculty of Medicine of the University of São Paulo (FMUSP) in 2014. Residency in Physical Medicine and Rehabilitation at Hospital das Clínicas da FMUSP concluded in 2019. External internship at the Physical Medicine and Rehabilitation service of the University of Tor Vergata – Rome – Italy specialist by the Brazilian Society of Physical Medicine and Rehabilitation (SBMFR) in 2019. Responsible since 2019 for hospitalization for Intensive Rehabilitation in the Amputee and Brain Injury Infirmary of the Institute of Rehabilitation Medicine (IMREA) of HCFMUSP / Lucy Montoro Network / Vila Mariana Unit.

Marta Imamura[1]*, Gilson Tanaka Shinzato[2]

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New perspectives for TPS treatment – long COVID and chronic pain syndromes / knee osteoarthritis

This abstract presents two study protocols focused on the potential effectiveness of Transcranial Pulse Stimulation (TPS) in individuals with different health conditions: long COVID with cognitive impairment and chronic pain with knee osteoarthritis. The randomized, double-blind, sham-controlled clinical trials will be conducted by the Institute of Physical Medicine and Rehabilitation at the Hospital das Clínicas, University of Sao Paulo, Brazil, aiming to evaluate the impact of TPS on cognitive function and pain management, respectively.

In the long COVID study, participants were selected based on a diagnosis of long COVID and cognitive impairment. The intervention consisted of ten TPS sessions using the Storz Medical NEUROLITH® equipment. Cognitive function, functional abilities, and quality of life were assessed throughout the study, and a sham-controlled group was included for comparison purposes.

In the chronic pain study, participants were selected based on a diagnosis of chronic pain and knee osteoarthritis. The intervention also included ten TPS sessions using the same equipment. Pain levels, functional limitations, and quality of life were assessed, and a sham-controlled group was included for comparison.

Lessons: In conclusion, the presented studies on Transcranial Pulse Stimulation (TPS) offer promising evidence of its effectiveness in improving cognitive function in individuals with long COVID and cognitive impairment, as well as in managing pain in individuals with chronic pain and knee osteoarthritis. The results suggest that incorporating TPS into clinical practice has the potential to enhance cognitive function, pain management, and overall well-being for these patient populations. These findings contribute to advancing therapeutic approaches, simplifying pain management strategies, and have significant implications for clinical practice, research, and teaching.

Biography

Prof Marta Imamura received her medical degree at the University of Sao Paulo School of Medicine in São Paulo, Brazil in 1987. She specialized in Physical and Rehabilitation Medicine in 1990. She received her master and doctorate degree at the same University in 1994 and 1998 respectively. She currently serves as Associate Professor at the Department of Legal Medicine, Medical Ethics, Occupational Medicine and Physical and Rehabilitation Medicine at the University of Sao Paulo School of Medicine. She is member of the world Health Organization Collaborating Center for Rehabilitation. Prof Imamura has authored and co-authored more than 80 peer-reviewed publications.

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Non-invasive brain stimulation by transcranial pulse stimulation as a coadjunctive treatment in alzheimer's disease

The study protocol describes a randomized, double-blind, sham-controlled clinical trial conducted by the Institute of Psychiatry (IPq) and the Institute of Physical Medicine and Rehabilitation (IMREA) at the Hospital das Clinicas, Faculty of Medicine, University of São Paulo. The trial aims to evaluate the effectiveness of transcranial pulse stimulation in individuals with Alzheimer's disease. Participants will be classified based on the disease stage, with a total of 50 volunteers randomly assigned to two study groups. The intervention consists of ten sessions using the Storz Medical NEUROLITH® equipment for transcranial pulse stimulation. The trial includes a sham-controlled group for comparison. The researchers will assess the clinical course, conduct imaging examinations, and use functional and cognitive disability scales to evaluate the intervention's effectiveness. Additionally, preliminary data from an open-label study with ten patients showed statistically significant improvement in behavioral scores after transcranial pulse stimulation.

Audience Take Away Notes

- The audience will learn about the effectiveness of Transcranial Pulse Stimulation (TPS) in individuals with alzheimer's disease
- They will understand how TPS can be applied in clinical practice to improve cognitive function
- Overall, the presentation provides valuable insights, practical applications, and potential benefits for individuals with alzheimer's disease

Biography

Gilson Shinzato graduated from the University of Sao Paulo Medical School in 1988, specializing in Physical Medicine and Rehabilitation in 1992, obtaining a Master's degree from FMUSP in 1998. He has been an assistant at IMREA/HCF-MUSP since 1992, working at the areas of chronic pain treatment, acupuncture, myofascial Fischer block, ENMG, and isokinetic dynamometry, with a focus on improving and promoting Extracorporeal Shock Wave Treatment since 2007, learning directly from the inventor of TPS Henning Lohse-Busch in 2015, and leading the Brazilian research in TPS treatment for Alzheimer`s Disease since 2020, in collaboration with the Institute of Psychiatry of HCFMUSP.

Thi Lan Marina Freedman
Storz Medical AG, Tagerwilen, Switzerland

Transcranial Pulse Stimulation (TPS) – advancements, applications, and current status

Shock waves, single acoustic mechanical pulses utilized in medical treatments since 1980, have demonstrated therapeutic effects in localized tissue regions. Research indicates that shock waves stimulate mechanotransduction, triggering the release of growth factors (VEGF) and Nitric Oxide (NO). These mechanisms enhance cerebral blood flow, promote angiogenesis, and facilitate neural regeneration.

Transcranial Pulse Stimulation (TPS®) utilizes low energy shock waves, that are non-invasively transmitted through the skull into the brain regions affected by alzheimer's disease, up to 8 centimeters deep. The NEUROLITH® device, CE-approved since 2018, offers TPS treatment for alzheimer's dementia symptoms. TPS treatment typically involves a series of six sessions within two weeks, with each session lasting approximately 30 minutes. Follow-up sessions are recommended on individual basis after 4 to 8 weeks. The energy transmission is visually displayed, allowing the operator and patient to track the precise brain area targeted during the treatment.

The utilization of shock waves in TPS represents an innovative approach for addressing alzheimer's disease symptoms. By stimulating growth factors and enhancing blood flow, TPS aims to promote the formation of new blood vessels and facilitate neural regeneration. Recent studies show promising outcomes of TPS in improving cognition among individuals with alzheimer's disease. Conducted TPS surveys provide insights into the current applications and observed results, contributing to further understanding its application range and potential effectiveness. Ongoing research efforts are dedicated to further exploring the effects of TPS and its efficacy in improving cognition and enhancing quality of life in individuals with alzheimer's disease. By studying the application of TPS and evaluating its effects, researchers and medical professionals aim to refine treatment protocols and optimize patient outcomes.

Audience Take Away Notes

- Learn about TPS technology: Gain a comprehensive understanding of TPS principles, mechanisms, and applications
- Get an update on current research: Explore the latest advancements and research findings in the field of TPS
- Practical applications: Discover how TPS can be used in cognitive enhancement and neurorehabilitation
- By attending this presentation, audience members will gain a comprehensive understanding of TPS and actively participate in discussions regarding its potential applications. This serves as an introduction to the following presentations from the TPS researchers

Biography

Thi-Lan Freedman, Business Development Manager in Neurology, has been dedicated to the development, promotion, and scientific progress of NEUROLITH at Storz Medical for the past three years. With a background in Business, she pursued her studies in Bochum and Shanghai. Since 2013, she has been actively involved in the field of Rehabilitation and Medicine, leveraging her expertise to drive advancements in modern treatment approaches. Through collaborations and market analysis, Thi-Lan Freedman ensures continuous improvement and impactful advancements in NEUROLITH with Transcranial Pulse Stimulation (TPS).

BOOK OF ABSTRACTS

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Addressing education and medication adherence for stroke survivors

At one of the largest hospitals in Arizona, who care for individuals suffering from neurological diseases and houses a joint commission comprehensive stroke center, the comprehensive stroke program quality team has been working in conjunction with an Arizona State University, Doctor of Nursing Practice (DNP) student. The comprehensive stroke program quality team used retrospective data from January to May of 2021 and identified that only 34% of Ischemic Stroke and Transient Ischemic Attack (TIA) survivors were filling their prescriptions within one week of being discharged home. An analysis using valid and reliable tools, the Patient Education Materials Assessment Tool (PEMAT) and the flesh- kincaid grade level literacy tool, showed that the stroke education booklet provided to all admitted stroke patients, per The Joint Commission (TJC) and QI, had poor health literacy scores and a high literacy grade level. A new stroke education booklet was developed using current research, scores from tools, and feedback from nurses and providers. Modifications include simplifying content by reducing excess words, removing unnecessary sections, providing bullet points, and adding visuals. Additional interactive sections and tables were provided to personalize patient education and information. Before publishing, the new book was reevaluated with the Patient Education Materials Assessment Tool (PEMAT) and the flesh-kincaid grade level literacy tool. Data will be collected by the project site's standard methods from November 2022 to January 2023. This project includes the of analysis of retrospective and prospective populations. Analytical tests that will be completed include a T-Test and Mann-Whitney U Test. The analysis will be completed to assess if the revised stroke education book, with a reduced literacy level and increased health literacy, helped to increase prescriptions filling for Ischemic Stroke and TIA survivors within one week of being discharged home.

Audience Take Away Notes

- Identify ways to reduce the literacy level of patient education
- Contrast health literacy and literacy level evaluations for stroke education materials
- Differentiate this project, and the results, with current research
- Implement knowledge learned into current practice and patient education
- Formulate areas for further improvement of in-patient stroke education

Biography

Mikaela Atkins received her BSN from Grand Canyon University in 2017. She is currently a Registered Nurse at Barrow Neurological Institute, Neurology-Telemetry Unit, in St. Joseph's Hospital and Medical Center, Phoenix, Arizona. She is a graduate student studying to become an Adult Gerontology Nurse Practitioner within the Doctor of Nursing Practice (DNP) degree program from the Edson College of Nursing and Health Innovation at Arizona State University. Her expected graduation date in May 2023.

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Estrogen Receptor Alpha (ERα) signaling in dendritic cells modulates autoimmune encephalomyelitis disease phenotype in mice

Estrogen is a disease-modifying factor in Multiple Sclerosis (MS), and its animal model, the Experimental Autoimmune Encephalomyelitis (EAE), via Estrogen Receptor Alpha (ERα). However, the mechanisms by which ERα signaling contributes to changes in disease pathogenesis have not been completely elucidated. Here, using the EAE murine model of MS, we demonstrated that the knockout of ERα resulted in altered EAE phenotypes characterized by prolonged motor dysfunctions. For instance, ERα−/− EAE mice presented with motor dysfunction slightly earlier than Wild-Type (WT) mice. On the contrary, while the severity of motor impairment in WT EAE mice remitted at ~30 dpi, EAE disease in ERα−/− EAE mice did not taper and instead was sustained up to 50 dpi. ERα−/− EAE mice showed severe neurodegeneration in the Central Nervous System (CNS) and resistance to Interferon Beta (IFNβ), a first-line MS treatment. Moreover, EAE-induced in WT and aromatase (CYP19)-deficient (Cyp19−/−) mice were treated with IFNβ or vehicle (PBS). DC-specific ERα knockout mice express high levels of Membrane Lymphotoxin (mLT) and Interferon Beta (IFNβ). Furthermore, Dendritic Cells (DC)-specific ERα knockout mice express high levels of Membrane Lymphotoxin (mLT) and IFNβ and show severe and prolonged disease. In vitro, we showed that estrogen signaling via ERα exerts its disease-modifying effect in EAE via direct modulation of TLR-4 immune cell effector function by repressing the TRAF3-IRF3 pathway downstream of TLR4 activation in DCs. Mechanistically, activated ERα directly interacts with TRAF3, a TLR4 downstream signaling molecule, to degrade TRAF3 via ubiquitination, which eventually suppresses IRF3 nuclear translocation and the subsequent transcription of Membrane Lymphotoxin (mLT) and IFNβ components. Diminished ERα signaling generates neurotoxic effector CD4+ T cells via mLT- Lymphotoxin Beta Receptor (LTβR) signaling. Collectively, these findings indicate that DC-specific ERα functions determine the EAE disease phenotype via controlling TRAF3-mediated cytokines production in DCs.

Audience Take Away Notes

- The therapeutic target of endogenous estrogens could be a therapeutics for MS
- This data can help others to investigate the role of endogenous estrogen on the pathogenesis of neurodegenerative and neuroinflammatory CNS diseases other than MS

Biography

Dr. Anwar is a visiting scholar at the Department of Comparative Biosciences, College of Veterinary Medicine, UIUC, USA. He received his PhD in 2016 at Gifu University, Japan. After 2 years of postdoctoral fellowship supervised by Dr Serge Rivest at Neuroscience Laboratory, CHU de Québec Research Center (CHUL), Laval University, Quebec, Canada, he obtained the position as an Assistant Professor Department of Pathology, Faculty of Vet. Med., Beni-Suef University, Egyp. He has published over 15 research articles. His major is experimental neuropathology and neuroimmunology.

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Mechanisms of T cell-mediated brain neuronal damage in murine cryptococcus-associated IRIS

Cryptococcus-associated Immune Reconstitution Inflammatory Syndrome (C-IRIS) is a condition that frequently occurs in immunocompromised patients infected with Cryptococcus Neoformans (Cn), whose immune systems become overreactive upon reconstitution. Patients contracted with C-IRIS exhibit many Central Nervous System (CNS) complications, including headache, fever, cranial neuropathy, and visual disturbance, potentially complicating the progression and recovery from this condition. Pulmonary disease has also been reported in patients with C-IRIS, where symptom presentation can include herniation and pulmonary nodules. However, little is understood about its etiology and pathogenesis, making clinical diagnosis and treatment highly inefficient. Previously, we have developed a mouse model of C-IRIS using immunocompromised mice, with intranasal (i.n.) infection of Cn serotype A H99 (CnH99) and intravenous (i.v.) transfer of CD4+ T cells after CnH99 infection. This mouse model showed manifestations of weight loss, high mortality, systemic upregulation of pro-inflammatory cytokines, elevated levels of CD4+ T cells in the lungs, infiltration of CD4+ T cells into the brain, and cerebral edema. Here, utilizing our previously established mouse model of unmasking C-IRIS, we investigated the involvement of the CNS in directing pulmonary dysfunctions, and demonstrate that pulmonary dysfunctions associated with the C-IRIS condition in mice could be attributed to neuronal damage in the Nucleus Tractus Solitarius (NTS), a region located in the hindbrain and known for processing information related to respiration, and neuronal disconnection via upregulated expression of ephrin B3 and semaphorin 6B, axon guidance molecules during development, on CD4+ T cells. Our findings provide unique insight into the mechanism behind pulmonary dysfunctions in C-IRIS and nominate potential therapeutic targets for treatment.

Audience Take Away Notes

- The research uses a mouse model of C-IRIS, a helpful and relevant research model for investigating pathology and mechanisms of cryptococcus-associated immune response
- Equally of interest to neuroscientists and immunologists, this research provides unique insight into the neurogenic control of pulmonary dysfunctions in patients with C-IRIS
- The identification of specific brain areas and molecules may prompt further investigation into their potential as a therapeutic strategy
- This work could potentially benefit both basic scientists investigating the mechanism of IRIS and clinicians treating IRIS patients

Biography

Jinyan Zhou studied molecular and cellular biology at the University of Illinois at Urbana-Champaign, where she received her bachelor's degree. She then studied and received her master's degree in neurobiology at Boston University. She is currently pursuing her Ph.D. degree in Neuroscience at the University of Illinois at Urbana-Champaign under the supervision of Dr. Makoto Inoue, where she uses neuroimmunology approaches to examine autoimmune conditions.

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CCR5-mediated T cell infiltration into the brain triggers pulmonary dysfunction in murine cryptococcus-associated IRIS

Cryptococcus-associated Immune Reconstitution Inflammatory Syndrome (C-IRIS) is identified upon immune reconstitution in immunocompromised patients who have previously contracted an infection of Cryptococcus neoformans (Cn). C-IRIS can be lethal, but how the immune system triggers life-threatening outcomes in patients is still poorly understood. We recently established a mouse model for C-IRIS with Cn serotype A strain H99 (CnH99), which is highly virulent and the most intensively studied. C-IRIS in mice is induced by the adoptive transfer of CD4+ T cells in Tcra1-/- mice, lack of T cells, which are pre-infected with a low inoculum of CnH99. The C-IRIS mice exhibit symptoms that mimic clinical presentations of C-IRIS, such as brain edema, pulmonary dysfunction, and mortality. Interestingly, the lungs of C-IRIS mice do not indicate significant histopathology change, even though C-IRIS mice show severe pulmonary dysfunction. Instead, we demonstrate that pulmonary dysfunction associated with the C-IRIS condition in mice could be attributed to the infiltrated CD4+ T cell-mediated brainstem neuron damage. We also demonstrated that infiltration of CD4+ T cells is mediated via the CCL8-CCR5 axis in C-IRIS mice. These findings provide unique insight into the mechanism behind pulmonary dysfunction in C-IRIS and nominate potential therapeutic targets for treatment.

Audience Take Away Notes

- The research uses a mouse model of C-IRIS, a helpful and relevant research model for investigating pathology and mechanisms of the cryptococcus-associated immune response
- Equally of interest to neuroscientists and immunologists, this research provides that infiltrated peripheral immune cells in the brain impact peripheral organ function in patients with C-IRIS
- Identifying neuroimmune functions may prompt further investigation into their potential as a therapeutic strategy
- This work could benefit both basic scientists investigating the mechanism of IRIS and clinicians treating IRIS patients

Biography

Dr. Inoue studied Neuroscience at Nagasaki University, Japan, and graduated with a Ph.D. in 2000. After four years of a postdoctoral fellowship at UCLA (Dr. Chris Evans) and Nagasaki University (Dr. Hiroshi Ueda), he obtained the position of Associate Professor at Nagasaki University. Then, he decided to expand his research fields and joined Duke University in 2009. At Duke University, he studied Immunology. In 2016, he obtained an Assistant Professor at the University of Illinois at Urbana-Champaign and started Neuroimmunology studies. In 2022, he received tenure and was promoted to Associate Professor. He has published 78 peer-reviewed research articles.

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Neuro-exergaming for parkinson's: Clinic-observed trend of cognitive improvement after pedal-n-play with the interactive Physical and Cognitive Exercise System (iPACES)

Given that approximately 40% of Parkinson's patients may meet criteria for Mild Cognitive Impairment (MCI) and 80% may progress to dementia (Kenney et al., 2022), researchers have pursued interventions that might stave off or ameliorate neuropsychological decline. Numerous studies support physical exercise for its effectiveness in improving brain health and quelling cognitive decline across a variety of neurological conditions, including Alzheimer's Disease and Related Dementias (ADRDs) and precursor conditions, such as MCI (Kramer & Colcombe, 2018). Neuro-exergaming may not only entice health-focused physical activity through engagement in serious health games, but it has also shown promise for increasing benefits to cognition, perhaps from the two-for-one activity of mental exercise alongside of physical exercise (Anderson-Hanley et al., 2018). Additional research is underway to explore this apparent phenomenon and to try to maximize cognitive benefits by altering the nature of the mental exercise, while also examining generalizability to various neurological populations. The data presented herein is a complement to preliminary experimental data on executive function from a pilot study examining the feasibility for Parkinson's Disease (PD) patients to pedal-n-play a portable tablet-based neuro-exergame, the interactive Physical and Cognitive Exercise System (iPACES). Archival clinic data, collected as the standard of care over time, was analysed de-identified per IRB approval, for those PD patients who participated in recurrent 8-wk pilot pedal-n-play iPACES group classes (2022-2023). Cognitive functioning was assessed by the clinical team serially over 1.5 yrs for five patients, and results suggest an upward trend ($p = .05$). While change over time cannot be fully attributed to neuro-exergaming alone, the finding is encouraging since most studies with MCI necessarily, modestly aim to at least preserve cognitive function or perhaps slow decline. Furthermore, the results are not entirely explained away by mere practice effects from repeated testing since alternate forms are utilized at this clinic. In preparing for a follow-up study, awareness was increased for additional unique considerations in clinical monitoring of status in PD with serial testing, including tracking challenges of on/off medication or other treatment effects. The possibility of clinical improvement over time of neuropsychological function in PD patients engaged in neuro-exergaming, as seen in this preliminary clinic data, which represents a more ecologically valid and potentially generalizable promising trend, warrants follow-up, ideally in a larger scale trial.

Audience Take Away Notes

- The audience will be able to use what they learn from this talk in the possible following ways
- Clinicians and scientists will increase their understanding of the potential use of serious health games to address cognitive challenges in neurological populations; in particular we will present a novel research-based neuro-exergaming intervention being used for MCI as in Alzheimer's disease and related dementias, herein piloted for Parkinson's
- Clinicians might explore the use of neuro-exergames with their patients and/or link up with clinical trials that are currently evaluating these novel behavioral interventions

- Researchers will have a chance to consider collaborating or utilized the iPACES pedal-n-play neuro-exergame in future research

Biography

Dr. Anderson-Hanley studied Biology and Mathematics at Gordon College (MA, USA); completed her PhD in Counseling Psychology at the University at Albany (NY, USA), and was a postdoctoral fellow in geriatric neuropsychology at UCLA (CA, USA). She is currently a Professor of Psychology at Union College (NY, USA) and Director of the Neuroscience Program. Her research is funded by NIH/NIA and she invented the iPACES neuro-exergame in her lab at Union College, which now holds the patent. This pilot study was completed in collaboration with the iPACES LLC start-up (NY, USA) and the CBMW at Gordon College (MA, USA). Dr. Anderson-Hanley has published more than 50 research articles indexed in PsycInfo and MedLine.

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Prunus domestica L. Extract diminishes deteriorations of memory and hippocampal neurogenesis in d-gal-induced aging in a rat model

Memory loss is the most common symptom found in aging. Studies of brain aging have revealed upregulation of the reactive oxygen species levels, which induce oxidative stress, neuronal damage, and neuronal apoptosis linked to memory decline. In animal studies, D-galactose (D-gal) causes down-regulation of hippocampal neurogenesis resulting in memory deficits. Prunus Domestica L. (PD) or look-nai is a fruit that contains phenolic compounds and flavonoids, which have a beneficial effect on memory and neurogenesis. Therefore, this study aimed to investigate the effect of PD extract on memory deficits in aging rats induced by D-gal. Male sprague dawley rats were divided into 8 groups: Vehicle, D-gal, PD 75, PD 100, PD 150, D- gal + PD 75, D-gal + PD 100, and D-gal + PD 150. D-gal (50 mg/kg) was given by intraperitoneal injection and PD (75, 100 and 150 mg/kg) was orally administered once a day for 8 weeks. Memory was determined using the Novel Object Location (NOL) and Novel Object Recognition (NOR) tests. Then, hippocampal neurogenesis was determined using Ki67-RECA1, DCX, and BrdU/NeuN immunofluorescence staining to evaluate vascular associated cell proliferation, immature neurons, and neuronal cell survival, respectively. The results showed a decline in recognition and spatial memories and hippocampal neurogenesis in the D-gal group. However, the co-treatment with PD and D-gal could ameliorate these deteriorations. PD per se could also improve memory. Therefore, PD extract could diminish D-gal-induced deteriorations of memory and hippocampal neurogenesis in aging rats.

Audience Take Away Notes

- Phytochemical agents found in the Prunus domestica L. extract have the potential to encounter memory deficits induced by D-galactose in aging rats
- Prunus domestica L. extract ameliorates memory impairments through upregulating hippocampal neurogenesis in aging rats induced by D-galactose
- The data from this study will be beneficial to use in Thai traditional medicine

Biography

Dr. Jariya Umka Welbat studied Anatomy at Khon Kaen University, Thailand and graduated as MSc in 1995. She then worked as a lecturer the at the Department of Anatomy, Faculty of Medicine, Khon Kaen University, Khon kaen, Thailand. She received her PhD degree in Biomedical Sciences (Neuroscience) in 2010 at the University of Nottingham supervised by Associate Professor Dr. Peter Wigmore. After receiving PhD, she returned to Khon Kaen University and obtained the position of an Associate Professor. Her research of interests focuses on the investigation of neuroprotective effects of bioactive compounds on neurogenesis related to memory in animal models.

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The neuroprotective properties of rosmarinic acid against cognitive impairments and hippocampal neurogenesis caused by L-methionine in adult rats

L-methionine (L-met) is one of the nine essential amino acids. A high dose of supplementary methionine administration over a long period can promote oxidative stress due to increasing base levels of metabolites, such as Homocysteine (Hcy). Homocysteine contributes to neuronal cell damage, which can lead to memory impairment. Rosmarinic Acid (RA) is a polyphenolic hydroxycinnamic acid derivative extensively distributed in rosemary, thyme and holy basil. Rosmarinic acid has numerous biological activities, including antioxidants, anti-inflammation and neuroprotection. Therefore, the aim of this study was to investigate the neuroprotective properties of RA on hippocampal neurogenesis and memory impairments caused by L-met in adult rats. Male Spraque-Dawley rats were divided into 6 groups: Control, L-met 1.7 g/kg, RA 10 mg/kg, RA 30 mg/kg, L-met 1.7 g/kg + RA 10mg/kg and L-met 1.7 g/kg + RA 30 mg/kg groups. Animals were treated 1 time a day for 28 days. After drug administration, spatial and recognition memory were investigated using the Novel Object Location (NOL) and the Novel Object Recognition (NOR) tests, respectively. Moreover, BrdU/NeuN p21 was performed to assess neuronal cell survival and cell cycle arrest by immunofluorescence staining technique. The behavioural analysis revealed that the total exploration time were not significantly different among groups in both tests, suggesting that the animals had no significant difference in locomotor activities. Additionally, the animals significantly spent more time exploring the Novel Location (NOL) and object (NOR) when compare with the old things except for the L-met groups. Animals in L-met groups failed to discriminate location and object using NOL and NOR tests. Furthermore, there were significant increases in the number of cell cycle arrest and decreases neuronal cell survival in L-met group. These results suggest that L-met treatment caused neurogenesis decline and memory impairment. However, co-treatment with RA can attenuate these impairments.

Keywords: Rosmarinic acid, L-methionine, Memory, Neurogenesis.

Audience Take Away Notes

- This presentation gives new knowledge for the development and application of rosmarinic acid to improve neurogenesis impairment induced by L-methionine
- This presentation may be used in basic knowledge for research in neurodegenerative diseases and lead to development and adaptation for further study
- Results from this presentation support the effect of rosmarinic acid on memory and hippocampal neurogenesis

Biography

Dr. Apiwat Sirichoat work at Department of Anatomy, Faculty of Medicine, Khon Kaen University, Thailand. For the research, I focus on neurogenesis in the adult and developing brain especially, new neurons that are continually generated throughout adulthood in the Subgranular Zone (SGZ) of the dentate gyrus in the hippocampus. Moreever, I am interested in the antioxidant effect of Thai plants on neural stem cells in the hippocampal dentate gyrus that is associated with memory, anti-aging, and anti-cancer.

Edlira Shemsi (Harizi)[1]*, Kledisa Shemsi[2], Ferid Domi[3], Nensi Qerimi (Sulstarova)[4], Gjergji Qerimi[5], Erind Shemsi[6]

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Post covid headache, in 510 cases presented in emergency department on regional hospital durres, albania in period november 2020 –november 2022

SARSCoV2 the virus responsible for the COVID-19 pandemic had not only respiratory symptoms, but also neurological symptoms, and headache is a frequent complaint. Pathophysiology of headache in the context of COVID-19 has some mechanisms that can be involved in persistence of headache after acute stage of the disease. These mechanisms include systemic inflammation that can stimulate cytokine storm, can activate trigemino vascular system at the meninges, and in some patients this inflammatory response may be sustained after infection and can play role at post COVID headache.

Methods: We have seen 510 patients that have been presented at emergency department and neurology consult at SRD with headache after COVID19 (2-10months after infections).15% of patients had severe covid infections with respiratory in suficience and have been recovered in hospital (76 patients) and 85% (434 patients) have been treated ambulatory. The most of patients had bilateral frontal headache (52%) and holocranic headache (22%), and hemicranic migraine type (26%).

Conclusions: Most of patients had oppressive pain, 72% (367 patients) had moderate headache and 28% (143patients) had severe continousheadache. Middle age of patients was 52years old and 65% were female (331) and 35% male (179) and mean time of headache was 3.6month from all patients 30% (153 patients) have been known with primary headache, and 76% had migraine (116 patients, 78 female, 38 male), 22% tensive type headache (34 patients, 20 female and 14 male) and 2% had cluster headache (3patients were mens). From all 510 of patients 45% (230) had also other post covid symptoms like dizziness, memory problems, insomnia, brainfog, depression and anxiouse state etc.

Results: The mechanisms of persistent headache for months after COVID-19 infections means to be stimulate by inflammatory mechanisms with stimulation of the trigemino vascular system, and CGRP (calcitonigene-related peptide) released by pulmonary endings nerve during viral infections may stimulate migraine.

Eva Liu (MD), Amy Zhou (BSc)*, Natalie Tilbury (BSc), Amit Persad (MD), Julia Radic (MD, MPH, FRCSC)

Department of Neurosurgery, University of Saskatchewan, Saskatoon, SK, Canada

Chronic subdural hematoma drainage under local vs. General anesthesia: Systematic review and meta-analysis

Introduction: Chronic Subdural Hematoma (cSDH) is one of the most encountered conditions seen in neurosurgery. Although mainstay treatment of cSDH has been burr hole drainage, no consensus yet exists on optimal anesthesia technique for surgical treatment. Currently, the decision to use either Local Anesthesia (LA) or General Anesthesia (GA) depends on the protocol of the hospital or the preference of the individual surgeon. The primary objective of this study is to determine whether GA or LA causes the least complications peri and postoperatively. To do this, we undertook a systematic review and meta-analysis to examine the efficacy of both anesthesia types.

Method: A search was conducted in MEDLINE (1946 to November 11, 2022), Embase (1974 to November 11, 2022), and PubMed (up to November 11, 2022). The inclusion criteria were 1) Studies reporting clinical outcome after chronic subdural hematoma burr-hole drainage under local anesthesia, 2) Studies published in English, 3) Studies in humans. Studies were excluded if they were 1) Non-surgical studies (review articles, technique articles, commentary) and case reports, 2) Studies without separate outcomes for chronic subdural hematoma drainage under local anesthesia. We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to systematically screen studies. Two reviewers independently screened abstracts of the studies identified through the literature search. Relevant articles were retrieved and rescreened for eligibility based on the full-text articles. Any disagreements were resolved through discussion with a third reviewer. Data was extracted in duplicate by two reviewers. Disagreements were resolved through a third reviewer.

Results: Our literature search identified 521 studies, out of which 20 were included. There were a total of 1750 patients who underwent chronic subdural hematoma drainage under LA. The weighted mean age of the patient was 71.0 years, and 449 (27.1%) of the patients were female. The overall complication rate was significantly lower in the LA group (odds ratio 0.44, 95% CI = 0.26 to 0.77, p = 0.004). The revision rate (odds ratio 2.71, 95% CI 0.89 to 8.25, p = 0.08) and mortality rate were not significantly different between groups (odds ratio 1.23, 95% CI 0.63 to 2.43, p = 0.55). The mean operative time was significantly shorter in the LA group (mean difference -29.28 minutes, 95% CI = -41.43 to -17.13 minutes, p <0.0001). The length of admission was also shorter in the LA group (mean difference -1.58 days, 95% CI = -2.40 to -0.76 days, p = 0.0002).

Discussion: In the present meta-analysis, it is clearly shown that LA does show benefits in lower operative time, shorter admission length, and fewer postoperative complications. This makes local anesthesia a less invasive and potentially superior alternative to general anesthesia as cSDH affects mainly the elderly, a more vulnerable population, in whom the risk of general anesthesia is not insignificant.

Audience Take Away Notes

- Guide for anesthesiologists and surgeons on cSDH burr-hole drainage anesthetics
- The evaluation of LA versus GA for neurosurgical procedures
- Aiding the physician in deciding what is best for their patient

Biography

Amy Zhou studied psychology at McGill University, Canada and graduated as Bsc in 2020. During this time, she joined the research group of Prof. Keith Murai at the Department of neurology and neurosurgery. Presently, she is doing research with the Department of Neurosurgery at the University of Saskatchewan while also obtaining her MD degree and is due to graduate in 2024.

Dominique Hayduk Montecino[1]*, Yasser Shahrour[2], Bernardo Costa Guerra[3], Ravi C Shah[4]

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Behind the symptoms: Decoding moyamoya disease in an adult female

Background: We report a case of a middle-aged woman admitted due to near syncope who presented with transient neurological symptoms for months, but had an unremarkable initial neurological examination in the emergency room. Subsequent advanced imaging unveiled a diagnosis of moyamoya disease.

Case description: A 46-year-old female presented with a near-syncope episode accompanied by sudden left leg and arm weakness upon waking. She had experienced intermittent episodes of left-sided weakness, ataxia, and headaches progressing from the back to the right side of her head over several months. These episodes were transient and typically resolved within minutes. Additionally, she reported left hemibody paresthesia but denied memory loss, aphasia, or vision changes. She was not on any medications. Her medical, social, and surgical histories were unremarkable, but family history revealed diabetes, hypertension, and hyperlipidemia.

Hospital course: Upon admission, the patient's neurological exam was within normal limits and reassuring. Initial workup such as routine labs showed thrombocytosis and remaining labs were within normal limits. EKG and echocardiogram are unremarkable. Neurology was consulted and TIA vs. stroke workup was initiated. CT without contrast showed left frontal subacute ischemic stroke and no carotid stenosis on Doppler ultrasound was noted. MRI brain showed restricted diffusion in right Middle Cerebral Artery (MCA) and Posterior Cerebral Artery (PCA) territories, in the watershed region suggesting evolving infarction. Based on the image pattern and intermittent symptoms, the differential for subacute sinus infarct was established. To confirm the later, the patient underwent CT Venogram (CTV). CTV showed non-visualization of right Internal Carotid Artery (ICA) and right MCA, minor right parietal hemorrhage, and ischemic changes in the right MCA area. These findings were suggestive of Moyamoya Disease (MMD). Neurosurgery was consulted and recommended CT Angiography (CTA) and CT Perfusion (CTP) for further elucidation of the new differential. CTP revealed decreased perfusion in right cerebral hemisphere and left Anterior Cerebral Artery (ACA) territory. CTA noted recent ischemic changes and congenital hypoplasia of the right internal carotid artery. The following day, neurointerventional radiology performed a cerebral angiogram which revealed narrowing distal ICA bilaterally with occlusion of right MCA and left A1 segment. Deep and superficial collateral flow from posterior circulation collaterals and anterior circulation collaterals were also noted. Based on the clinical presentation and angiographic findings, a diagnosis of bilateral MMD was made. She was discharged on aspirin 81mg and is following-up outpatient with neurosurgery for direct revascularization surgery.

Discussion: MMD is a chronic vasculopathy marked by narrowing of the internal carotid artery and circle of Willis, leading to the development of fragile collateral vessels in response to chronic brain ischemia. The symptomatic disease primarily manifests in two age peaks: 5-9 and 45-49 years. Moyamoya patients often experience cerebral ischemic events or seizures, with adults specifically facing intracerebral hemorrhage. Symptoms stem from cerebral ischemia or compensatory vessel growth. Treatments aim to enhance cerebral blood flow, via direct or indirect revascularization.

Conclusion: Moyamoya disease lacks a curative treatment, making early diagnosis and surgical intervention vital. Effective MMD management necessitates a collaborative interprofessional approach.

Audience Take Away Notes

- The case report provides an in-depth analysis of a patient presenting with a compilation of neurological symptoms leading to the diagnosis of Moyamoya disease. For medical professionals, especially those in neurology, emergency medicine, or radiology, this case report can help them identify and diagnose similar cases in the future. Recognizing the signs, symptoms, and imaging findings early on can lead to timely interventions and potentially better patient outcomes
- The detailed account of this patients' presentation, paired with the imaging findings and the ultimate diagnosis that is quite rare in the occidental population, makes this a valuable resource. Faculty involved in medical teaching, especially those focused-on neurology or radiology, can incorporate this as a case study in their lessons and include Moyamoya disease as a differential diagnosis for the etiology of ischemic stroke
- Hospitals aiming to improve their diagnostic accuracy for cerebrovascular diseases can use this report as a basis for training sessions or workshops. The insights from this case can assist in designing better diagnostic workflows, ensuring that similar cases are identified promptly and managed appropriately, whether that be conservatively or through surgical revascularization

Biography

Dr. Dominique Montecino is a graduate of medical school from Universidade Presidente Antonio Carlos, School of Medicine of Juiz de Fora, Brazil, class of 2021. During medical school, Dr. Montecino founded the Neurology and Neurosurgery interest group, founded "The Human Body Project" which provides education for underserved high-school students, graduated with honors in her medical school class and has several publications in Neurology journals. She is currently a Transitional Year resident at Lakeland Regional Health, Florida, and is applying Neurology during the upcoming match cycle. She is passionate about improving medical education and her interests include vascular neurology and neuroimmunology.

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Center of pressure oscillations reveal the potential factors of loss of automaticity in older adults

Background & Purpose: Falls are a significant global health issue for older adults. Most falls among older adults occur during dual-task activities. This could be attributed to the reduced automaticity in postural control among older adults. Identifying potential factors contributing to the loss of automaticity is crucial for future rehabilitation interventions aimed at improving postural control in this population. Power spectral analysis of the Center of Pressure (CoP) is believed to reflect the significance and contribution of sensory systems to the execution of postural control. Therefore, this study aimed to examine CoP oscillations and Prefrontal Cortex (PFC) activation under dual-task standing in both young and older adults.

Methods: Fourteen healthy older adults (the experimental group; age: 67.21±3.38 years; height: 162.00±8.79 cm; and mass: 63.67±10.70 kg) and another fourteen gender-matched young adults (the control group; age: 19.80±0.75 years; height: 168.20±8.82 cm; and mass: 57.35±3.52 kg) participated in this study. Participants completed single-task (Standing) and dual-task (Standing and Counting) trials in a fixed order. In the duel-task trials, participants were given a randomly generated 3-digit number, then asked to subtract down by 7's as the secondary task. The displacement of CoP was recorded using a Kistler Force plate in both the Arterial-Posterior (AP) and Medial-Lateral (ML) directions. The PFC activation in both the left and right hemispheres was measured using a functional Near-Infrared Spectroscopy (fNIRS) system. The dependent variables included CoP oscillations at the frequency range of 0-0.1, 0.1-0.5, and 0.5-1.0 Hz in both the AP and ML directions, along with right/left PFC activations. Three two-way mixed model ANOVAs were conducted to examine the effects of group and task on CoP oscillations and PFC activation.

Results: There was a significant group × task interaction ($F_{6, 21} = 3.258$, $p = 0.020$) in CoP oscillations. Also, the main effects of group ($F_{6, 21} = 2.823$, $p = 0.036$ & $F_{2, 25} = 5.893$, $p = 0.008$) and task ($F_{6, 21} = 4.903$, $p = 0.003$ & $F_{2, 25} = 3.414$, $p = 0.049$) were statistically significant for both CoP oscillations and PFC activation. The older adults group showed greater CoP oscillations of 0.5-1.0 Hz (19.58±10.62 vs. 12.03±5.65 cm2, $p = 0.027$) in the AP direction and increased Cop oscillations of 0-0.1 Hz (23.20±12.54 vs. 9.88±6.94 cm2, $p = 0.002$), 0.1-0.5 Hz (30.00±23.12 vs. 11.14±7.05 cm2, $p = 0.007$), and 0.5-1 Hz (14.50 vs. 9.28±3.97 cm2, $p = 0.019$) in the ML direction during dual-task trials when compared to the younger group. In addition, the older adult group presented greater brain activation in the left PFC (0.015±0.028 vs. -0.0089±0.037 mmol/L, $p = 0.015$) than the younger group across both tasks.

Conclusion: Older adults presented increased CoP oscillations and PFC activation when compared to younger adults in response to a secondary task. This suggests a greater reliance on the sensory systems due to the loss of automaticity in postural control.

Audience Take Away Notes

- Older adults are more reliant on sensory information to compensate for their postural control under dual-task standing, which is one of the potential factors for loss of automaticity in postural control with aging

- By targeting the sensory systems through specific exercises and activities, rehabilitation interventions may be able to improve postural control in older adults and reduce the risk of falls
- Utilizing neuroimaging and biomechanical measures in tandem to assess the possible risk of preclinical Alzheimer's disease and early-stage Parkinson's disease in older adults

Biography

Utilizing neuroimaging and biomechanical measures in tandem to assess the possible risk of preclinical alzheimer's disease and early-stage parkinson's disease in older adults

Elena DeSanti[1]*, Lauren Connell Bohlen[2], Alexandra B Collins[3]

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The impact of COVID-19 on substance use treatment utilization among people who use substances in the United States: National survey of drug use and health 2019-2021

In 2015, 99% of those classified as having a substance use disorder had not received substance use treatment. The onset of the COVID-19 pandemic exacerbated existing barriers to accessing substance use treatment and created others. The purpose of this research was to examine the rate of substance use treatment utilization from 2019 to 2021. We hypothesized the rate of substance use treatment utilization to have gone down from 2019 to 2021 due to effects associated with the COVID-19 pandemic. We examined data from the 2019, 2020, and 2021 National Survey of Drug Use and Health (NSDUH) and utilized adjusted wald's test to compare means of unmet treatment need, and chi-squared2 tests to examine variations in substance use treatment utilization by insurance status, household size, and geographic location. After analysis, we found no statistically significant difference in treatment utilization from 2019 to 2021, and no differences in treatment utilization based on insurance status, household size, or community type. In those who did not receive treatment, reasons for not accessing treatment remained similar across years. The most cited reason for not accessing substance use treatment in all years was not believing it to be needed. Due to these findings, we recommend investment in overdose prevention and other harm reduction services (e.g., fentanyl testing strips, drug use education, naloxone distribution) and modification of treatment structure that does not require complete abstinence. Overdose prevention sites have been found to decrease overdose risk, transmission of infectious disease, and crime while increasing engagement in substance use treatment. Further research utilizing qualitative data from those who use substances will be necessary to understand the impacts of public health crises on substance use treatment utilization as effects continue in the United States. Research addressing shifts in barriers, accessibility, and engagement with treatment during crises can guide how practice and policy respond to global health events.

Audience Take Away Notes

- In those who use substances, many do not believe treatment is needed
- Improving access to safe-use facilities will likely decrease risk of overdose, transmission of infectious diseases, and use of emergency services
- Most treatment services were paid for by individuals or their families. Increasing insurance coverage of substance use treatment may increase utilization

Biography

Elena DeSanti studied Sociology at Boston University graduating with her bachelor's degree in 2021. She went on to complete her Master's in Public Health at Brown University, graduating in 2023. During this time, she worked at the Rhode Island Department of Health in the Drug Overdose Surveillance Team and at Brown University's Center for Alcohol and Addictions. She will be beginning her career in Public Health as a Clinical Project Coordinator within the Providence VA in the summer of 2023.

Tom Alexander[1]*, Marissa Perozzi[2], Jessica Guilfoyle[3]

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[2]Department of Mathematics, Slippery Rock University of Pennsylvania, Slippery Rock, PA, United States 3Department of Counselling Psychology, Regent University, Virginia Beach, VA, United States

Increased prevalence of trauma-informed care in substance use treatment centers: Regional and payer-based differences in access

Therapy treatment in substance use disorder (SUD) facilities across the United States has evolved over the past decade—most notably with the advent of trauma-informed care for addiction. However, the exact prevalence and changes of trauma-informed care across SUD facilities in the U.S. has not been well-studied. Therefore, this study analyzed nationally representative data from over 87,000 SUD facilities in the National Survey of Substance Abuse Treatment Services in years 2015 through 2020. Critically, we found a statistically significant increase ($z=23.02$, $p<.001$) in the proportion of SUD facilities offering trauma-informed care from 2015 to 2020 (from 32.36% to 45.37%). In terms of regional differences, trauma-informed care was significantly more prevalent in the West (45.57%) and East (43.33%) regions compared to the South (36.31%) and Midwest (32.48%) regions. Such differences highlight the need for continued study and analysis of state-level data to identify opportunities to expand training, education, and funding for trauma informed care in SUD treatment settings. In terms of differences based on facility payer source, Indian Health Services funded facilities showed the highest prevalence of trauma-informed care (50.72%), with free facilities showing the lowest prevalence (32.75%). Military insurance-funded SUD facilities showed the 3rd lowest prevalence (39.89%) of trauma-informed care programs. This finding was concerning given the well-established connection between military-based PTSD and SUD, and suggest that additional research is needed to better understand the challenges of implementing trauma-informed care in military-funded and other federally-funded facilities. Limitations of this study include not having access to state-level data, information on the specific types of trauma treatment being provided, and inability to assess the impact of COVID-19 upon the SUD service delivery modalities. Overall, this study demonstrated that trauma-informed care appears to be gaining prevalence in SUD treatment within the U.S. Additional research is needed to better understand the challenges of implementing trauma-informed care in SUD facilities across different regions and payer sources.

Audience Take Away Notes

- This will allow audience members to understand the prevalence of trauma-informed care in SUD facilities across the entire United States. Understanding regional and insurance-based differences will provide a basis for conducting future research and introducing public policy changes to improve access to trauma-informed care in SUD facilities
- Faculty studying addiction, SUD, and trauma-informed care can learn from these findings and design their own research projects using the NSSATS data analyzed in the present study
- This information will help researchers, policy makers, clinicians, and therapists to understand the status quo of trauma-informed care in SUD facilities and use their power to increase access to trauma-informed care in populations (e.g. military) who need it the most
- Provides analysis of over 87,000 SUD facilities in the United States. This large, nationally-representative sample provides insight into the status quo of trauma-informed care in SUD facilities, as well as future directions for improving addiction treatment in these facilities

Biography

Tom Alexander, PhD, LPC is a full-time faculty member in the Graduate Psychology – Addictions Department at Purdue University Global. His doctoral degree specializes in addictions and he has over 16 years of experience in the field of co-occurring substance use and mental health treatment and research. Dr. Alexander is a published scholar with publications related to integrated trauma and addiction treatment and co-occurring disorders. As a licensed professional counselor in Texas and Colorado, Dr. Alexander specializes in treating persons in all stages of recovery who are in need of trauma-based treatment interventions.

BOOK OF ABSTRACTS

magnus Group

19-21 OCT

DAY 01-VIRTUAL

KEYNOTE FORUM

JOINT EVENT ON

NEUROLOGY & ADDICTION

Affordances vs task management: Evoking agency in addiction

Neural mechanisms for self regulation feature prominently in studies of addiction, which is characterized by the inability to resist compulsive behavior. Such neural mechanisms involve not just top down processes needed in the execution of decision making events, but also the neural representation of the self/agent, generally regarded as the source of decision making capacity. Impairments of this latter representation can be expected to weaken the ability to enlist capacities for self regulation. How the agent may be represented, nevertheless, has remained an enigma. General models of brain organization increasingly invoke stable networks, termed Resting State Networks (RSNs), which organize brain activity for the support of diverse brain functions. Much evidence now points toward their involvement in a spectrum of neurological dysfunctions and in psychiatric diseases, such as major depressive disorder autism, attention deficit/hyperactivity and schizophrenia. Hence, they are likely to be impaired in addiction abnormalities as well. Current work indicates that bodily representation is a key aspect underpinning the source of top down agent mediated events, particularly those associated with motor actions and RSNs associated with this representation could therefore be impaired in addiction. Significantly, diseases of agency like schizophrenia are known to impair bodily representation and to also affect goal directed neural correlates like those of the mirror system. This talk will explore the relationship between the broader representation needed to underpin the agent and resting network brain operation in such cognitive diseases to gain insight into how agent representation may be impaired in addiction.

Denis Larrivee

Loyola University Chicago, United States

Biography

Dr. Denis Larrivee is a Visiting Scholar at the Mind and Brain Institute, University of Navarra Medical School and Loyola University Chicago and has held professorships at the Weill Cornell University Medical College, NYC, and Purdue University, Indiana. A former fellow at Yale University's Medical School he received the Association for Research in Vision and Ophthalmology's first place award for studies on photoreceptor degenerative and developmental mechanisms. He is the editor of a recently released text on Brain Computer Interfacing with In Tech Publishing and an editorial board member of the journals Annals of Neurology and Neurological Sciences (USA) and EC Neurology (UK). An International Neuroethics Society Expert he is the author of more than 95 papers and book chapters in such varied journals/venues as Neurology and Neurological Sciences (USA), Journal of Neuroscience, Journal of Religion and Mental Health, and IEEE Explore. In 2018 he was a finalist in the international Joseph Ratzinger Expanded Reason award sponsored by the Francis Vittorio University of Madrid.

The future is now for precision genomic addiction medicine as a frontline modality for inducing "dopamine homeostasis" in Reward Deficiency Syndrome (RDS)

Introduction: In this genomic era of addiction medicine, ideal treatment planning begins with genetic screening to determine neurogenetic antecedents of the Reward Deficiency Syndrome (RDS) phenotype. Patients suffering from endotype addictions, both substance and behavioral, and other mental health/comorbid disorders that share the neurobiological commonality of dopamine dysfunction, are ideal candidates for RDS solutions that facilitate dopamine homeostasis, addressing the cause, rather than symptoms.

Objective: Our goal is to promote the interplay of molecular biology and recovery as well as provide evidence linked to RDS and its scientific basis to primary care physicians and others.

Methods: This was an observational case study with a retrospective chart review in which an RDS treatment plan that utilized Genetic Addiction Risk Severity (GARS) analysis to evaluate neurogenetic challenges was used in order to develop appropriate short- and long-term pharmaceutical and nutraceutical interventions.

Results: A Substance Use Disorder (SUD) treatment-resistant patient was successfully treated utilizing the GARS test and RDS science.

Conclusion: The RDS Solution Focused Brief Therapy (RDS-SFBT) and the RDS Severity of Symptoms Scale (SOS) may provide clinicians with a useful tool for establishing neurological balance and helping patients to achieve self-efficacy, self-actualization, and prosperity.

Keywords: Dopamine Homeostasis; Genetic Addiction Risk Severity (GARS); Genomic Addiction Medicine; Neurogenetics; Precision Medicine; Pro-Dopamine regulation.

Elizabeth Dale Gilley

The Elle Foundation,
United States

Biography

Elizabeth Dale Gilley, graduated from Wake Forest University, in 1983 with a Bachelor of Science degree in Business Administration. She founded The Elle Foundation, Dallas, TX, in 1995, initiating the Award of Excellence within the addiction recovery industry in 2000. She went back to school in her 50's, graduated Magna Cum Laude with her Masters in Applied General Psychology (2017) and Post Masters Certificate in Addictions (2019) from NorthCentral University. She is currently a doctoral student at NorthCentral University, with a 4.0 GPA, studying the philosophy of psychology of addictions, gearing up for her own research in electromagnetic healing frequencies to help achieve dopamine homeostasis. She has published consistently in peer-reviewed doctoral journals for the past six years.

BOOK OF ABSTRACTS

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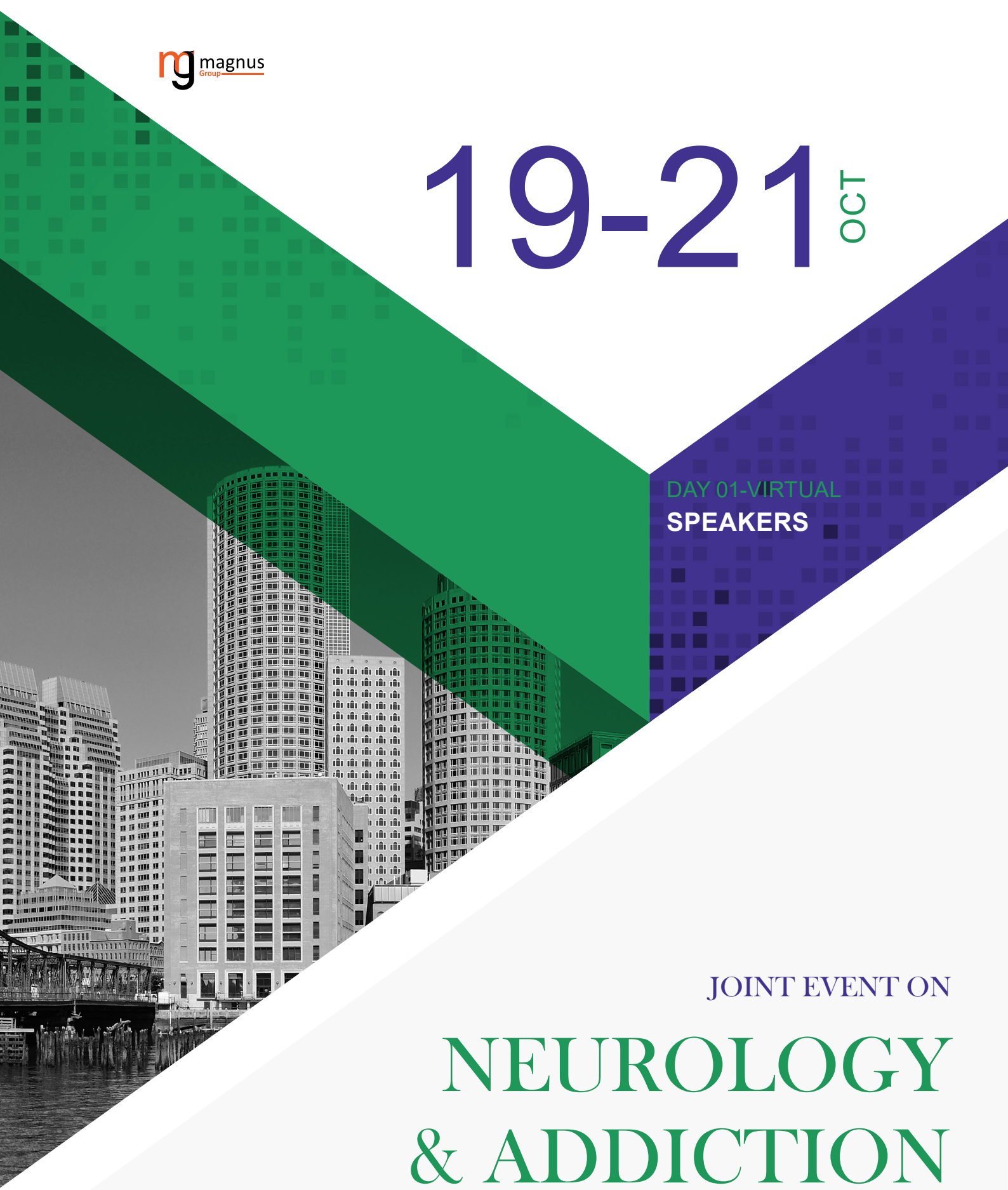

DAY 01-VIRTUAL

SPEAKERS

JOINT EVENT ON

NEUROLOGY & ADDICTION

Ange Weinrabe

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The impact of culture on addiction - can explanatory models go far enough to treat addiction?

Addiction. Labeled a disease by the dominant Medical Explanatory Model, it remains a phenomenon that is widely debated by authors who contest this concept using reductive models that claim it to be a physical-level disorder. Treating the manifestation of behaviour and not addressing social factors that influence human behaviour is problematic. This research suggests that a philosophical approach and critique of the reified addiction-as-concept is needed, before addressing the impact that non-evolutionary and evolutionary factors may have on our human behavioural landscape. If the aim is to relieve the addict, then crucially we need to take into account the influence of culture, and how it can be put to use to help redirect the dominant discourse on addiction. Because culture is conscious and ubiquitous, it is a proactive, transformative process that is busy at work in the lives of each human being. When harnessing culture's influential role, the two Explanatory Models of addiction need not compete, but work together to treat the addict. A combined approach is necessary, one that can be applied in a community health setting working within interdisciplinary frameworks. The need for new ways of thinking is necessary in order to develop innovative approaches to support and provide early intervention.

Biography

Ange Weinrabe holding an Arts (Adv.) Hons Degree in Philosophy, The University of Sydney, and a Master's in philosophy (Medicine) from the Brain and Mind Centre, Sydney Medical School, supervised by Mental Health pioneer Prof. Ian. B. Hickie, Ange published the hypothesis that dysregulated emotion (mainly anxiety) impairs decision-making in youth. Enrolled in a Ph.D. also at the University of Sydney, supervised by philosopher of science, Prof. Dominic Murphy, Ange is investigating the critical role and epidemiological value of culture when investigating explanatory models of addiction (substance and behavioural) in youth at critical stages of development.

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Effectiveness of Mindfulness Integrated Cognitive Behaviour Therapy (MiCBT) on life satisfaction, self-esteem and craving among patients with substance abuse: A randomized control trial

Background: Substance abuse is a significant public health concern in India, like in many other parts of the world. It involves the harmful or hazardous use of psychoactive substances, including alcohol and illicit drugs. India has a limited number of treatment and rehabilitation centers for individuals struggling with substance abuse. Mindfulness Integrated Cognitive Behaviour Therapy (MiCBT) is an intervention that combines mindfulness practices with cognitive-behavioural therapy techniques. This therapy aims to help individuals become more aware of their thoughts, emotions, and physical sensations, and to develop more effective strategies for coping with difficult experiences.

Aim: This study is the first study to examine the effectiveness of MiCBT was improving life satisfaction, self-esteem, and reducing cravings among patients with substance abuse in a mental health care setting in India.

Methods: A randomized controlled trial was used. The study population consists of adult patients (age 18 years and above) diagnosed with substance abuse. Participants were randomly assigned to two groups: the experimental group (MiCBT; n=50) and the control group (Treatment as usual [TAU]; n=50) using a computer-generated randomization sequence. The intervention group received eight weekly MiCBT sessions, each lasting for 90 minutes, while the control group will receive treatment as usual. The Craving, Life Satisfaction and Self-esteem of participants were measured at baseline socio-demographic and clinical data, immediately after the intervention, at three-month follow-up and six-month follow-up using the Rosenberg Self-esteem Scale, Satisfaction with Life Scale, Brief substance craving scale and Mindfulness-Based Self Efficacy Scale-Revised (MSES-R) respectively. Data was analyzed using the SPSS 29.0 version.

Results: Findings showed that MiCBT significantly improves life satisfaction, self-esteem, and reduces cravings among patients with substance abuse. The results contributed to the development of evidence-based treatment options for patients with substance abuse.

Conclusion: Overall, the present study suggests that MiCBT was an effective intervention for individuals with substance abuse, particularly when co-occurring mental health issues are present. MiCBT helps individuals develop greater self-awareness and emotional regulation skills, which can support long-term recovery and reduce the risk of relapse.

Keywords: Mindfulness, Cognitive Behaviour Therapy, MiCBT, Life Satisfaction, Self-esteem, Craving and Substance Abuse.

Biography

Mr. Santhosh Kumar J currently serves as Assistant Professor in the Department of Mental Health Nursing, Amrita College of Nursing, Amrita Vishwa Vidyapeetham Health Sciences Campus, Kochi, Kerala, India and he completed his

B.Sc Nursing in 2011 and M.Sc Psychiatric Nursing in the year of 2014, Currently he is pursuing PhD Nursing in Vinayaka Mission's Research Foundation, Tamil Nadu, India. He is also a MiCBT therapist at MiCBT Institute, Australia. He is a Life member of TNNMC, TNAI, ISPN, NSRI, NTA, InSc, RIF and AMCO. Mr. Santhosh Kumar J has been actively involved in national and international Multidisciplinary research projects. He is a Resource person and organizing secretary in various National and International conferences. He has authored and published Research papers in different National and International Journals. He is a psychiatric nurse with experience in patient care, research, teaching and specializes in using BMS and Mindfulness-integrated Cognitive Behaviour Therapy (MiCBT), a grounded, compassionate, and effective skill-based treatment approach.

Sindu Padmanabhan
Bharathiar University, India

Bridging the gap: Addiction and behavioral health integration

Addiction and behavioral health are two intertwined domains with profound implications for public health and individual well-being. This abstract provides an overview of the critical importance of integrating addiction and behavioral health services to address the complex and multifaceted challenges presented by Substance Use Disorders (SUDs) and co-occurring mental health conditions.

Addiction, characterized by the compulsive use of substances despite harmful consequences, is a chronic disease that affects millions of individuals worldwide. The understanding of addiction has evolved, recognizing it as a complex interplay of genetic, environmental, and behavioral factors. In parallel, behavioral health encompasses a wide spectrum of mental health and emotional well-being, underscoring the significance of addressing the behavioral aspects of addiction.

Integration of addiction and behavioral health services implies a holistic approach to healthcare. This approach acknowledges the intrinsic connection between mental health and substance misuse, emphasizing that they often coexist and influence each other. Addressing both issues concurrently is essential to improving treatment outcomes and overall quality of life for individuals struggling with SUDs.

In conclusion, integrating addiction and behavioral health services is paramount to address the intricate challenges posed by SUDs and co-occurring mental health conditions. It acknowledges the inseparable link between these domains and strives for a more holistic and patient-centered approach to treatment. By breaking down silos between addiction and behavioral health care, we can better support individuals on their journey to recovery, fostering healthier communities and improved overall well-being.

Biography

Dr. Sindu is a multifaceted professional with a passion for the intricacies of the human mind and a dedication to enhancing knowledge through research and communication. With a diverse skill set that spans psychology, writing, reviewing, editing, and research, Sindu has made significant contributions to both the academic and literary worlds.

As a psychologist, she brings a deep understanding of human behavior, cognition, and emotions to their work. They have a proven track record of helping individuals navigate life's challenges, offering evidence-based therapeutic interventions, and conducting innovative psychological research. Their empathetic approach and commitment to improving mental well-being have earned them a respected reputation in the field. Their work has been published in leading academic journals and has contributed to the advancement of knowledge in their field. They are known for their innovative research methodologies, critical thinking, and dedication to addressing important questions in psychology

They have served as a peer reviewer for numerous prestigious academic journals, ensuring the quality and rigor of research in psychology and related fields. In addition, they have worked as an editor for both academic and popular publications, helping authors refine their ideas and communicate them effectively to a broader audience. With a flair for the written word, Sindu is a skilled writer who has authored numerous articles, essays, and books on topics ranging from psychology and mental health to personal development and well-being. Their ability to distill complex concepts into accessible and engaging prose has made their work highly sought after by both academic and general audiences. Throughout their career, she has demonstrated a commitment to lifelong learning, staying at the forefront of their field, and promoting the importance of psychological well-being. They continue to inspire and educate others through their writings, research, and therapeutic practice, making a lasting impact on individuals and the broader community.

Jeffrey Lozon and Moshe Bensimon*

Department of Criminology, Bar Ilan University, Ramat Gan, 5290002, Israel

The mutual enhancing effect of music and drugs in the lives of people coping with substance use disorder and its rehabilitative implications

Substance craving may be triggered in people recovering from substance use disorder when listening to the same music genres they had listened to during active addiction. Given the limited research on the topic, the current study examined how the combination of music and drugs facilitate substance use among people with substance use disorder during their active addiction and the role of music during this period. The study was conducted with the phenomenological method using semi-structured interviews with 36 non-active addicts. Content analysis was employed to reveal themes and sub-themes regarding participants' views on the role and meaning of music during their active use. Interview analysis revealed two main themes. The mutual enhancing effect theme relates to participants' utilization of music in service of the drug and vice versa. This mutual enhancing effect had an impact on sharpening sensory capacity and the mood participants wanted to amplify or evoke. The full addiction and music theme relates to a timepoint during active use, when music ceased to be relevant, and drugs dominated the entire experience. Participants reported spiraling downward into their abuse, seeking seclusion and feeling lonelier and more depressed. The ability to develop tolerance to musical triggers seems crucial for rehabilitation, as music is fundamental for human life and cannot be completely avoided outside residential treatment. The current study calls policy makers in the field of substance use disorder treatment to incorporate music therapy in treatment programs, educating clients how to manage their musical triggers.

Audience Take Away Notes

- The presentation will benefit therapists in better understanding how to help people suffering from substance use disorder using music and the role music may play in facilitating their substance use.
- It will provide a deeper meaning to the role music has in the lives of people with substance use disorder.
- The study will enable a fundamental understanding of the combined effects of music and narcotics during active addiction.
- Through this study people will understand the significance music has, not only in contributing towards substance use, but also how it serves as a vital factor in maintaining and helping addicts from further spiraling down into their active addiction.

Biography

Mr. Jeffrey Lozon is a graduate student, nearing the completion of his doctorate in the Department of Criminology at Bar-Ilan University, Israel. His fields of interest include: technology and crime, addiction, criminology theory, gang research, and crime and music.

Moshe Bensimon is an Associate Professor in the Department of Criminology at Bar-Ilan University, Israel. His fields of research include victimology – posttraumatic stress disorder among victims and music therapy with post-traumatized victims; music/music therapy and addiction; and aggression, crime and music. He has published about 60 research articles in refereed journals and chapters in books.

Sushil Jha
School of Life Sciences, Jawaharlal Nehru University, New Delhi, India

Why does memory consolidation require sleep?

Non-rapid Eye Movement (NREM) sleep and Rapid Eye Movement (REM) sleep, in both stages, together or individually, helps in memory consolidation. For example, short sleep deprivation (5-6 hours) soon after fear-conditioned training (cued and contextual fear conditioning) and appetitive-conditioned training (trace and delay appetitive conditioning) induced learning deficit in rodents. In addition, NREM sleep significantly increased at a specific window after fear-conditioning, whereas REM sleep significantly increased after learning appetitive-conditioning tasks. Further, we have observed that the changes in sleep architecture are an explicitly consolidation-dependent phenomenon. In addition, we have found that new learning augments sleep-associated brain oscillatory waves during NREM and REM sleep, which plays an essential role in the neural dialogue between circuitries. These findings suggest that sleep is necessary for neural optimization for memory consolidation.

Sleep may help in memory formation at the cellular and system consolidation levels. Short-term total sleep deprivation soon after fear-conditioning alters the expression of some memory candidate genes such as Gsk-3, NCDN, and Shank-3. In addition, short sleep deprivation alters the learning-induced changes in the expression level of protein kinases, cAMP, Arc protein, in the hippocampus. Short-term sleep deprivation soon after training alters the learning-induced increased adult neurogenesis in the dorsal hippocampus. In addition, sleep plays an essential role in inducing synaptic strength. We have shown that the cellular and molecular events involved in the induction of ocular dominance plasticity (ODP) in the visual cortex are triggered by sleep. Sleep consolidates ODP primarily by strengthening the cortical responses to the non-deprived eye through NMDA receptors and the protein kinase-A pathway. Consolidation is also associated with sleep-dependent increases in the activity of remodeling neurons and the phosphorylation of proteins required to potentiate glutamatergic synapses. Our findings demonstrate that sleep possibly helps in memory formation at cellular and systems consolidation levels.

Audience Take Away Notes

- Sleep is necessary for neural optimization for memory consolidation
- Sleep possibly helps in memory formation at cellular and systems consolidation levels
- New learning always augments sleep-associated brain oscillatory waves during sleep, which plays an essential role in the neural dialogue between circuitries

Acknowledgment: Funding to SKJ from DBT, DST, DST (PURSE), UGC-RNW, UGC-CAS, UPOE-II is highly acknowledged.

Biography

Dr. Sushil Jha currently serves as the Chairman of the Special Center for Systems Medicine at Jawaharlal Nehru University, New Delhi. He also holds the role of Member Secretary on the Institutional Ethics Review Board at the same institution and is an Associate Professor at the School of Life Sciences, where he has been a dedicated faculty member since July 2013. His academic journey includes a prior role as an Assistant Professor at School of Life Sciences, Jawaharlal Nehru University from January 2007 to June 2013. He gained international research experience as a Re-

search Associate at the University of Pennsylvania in Philadelphia, USA, from February 2005 to January 2007, and as a Post-Doctoral Fellow there from July 2001 to January 2005.

Dr. Sushil Jha has been honored with prestigious awards, including the Prof. Baldev Singh Oration Award from the Association of Physiologists and Pharmacologists of India in 2015, the Scopus Young Scientist Award from Elsevier, India, in 2007, and the Young Investigator Award from the Sleep Research Society, USA, in 2006. His research focus revolves around understanding the role of sleep in memory consolidation and its associated cellular and molecular mechanisms.

Paul Raj
Department of Psychology, Jyoti Nivas College Autonomous, Bengaluru, Karnataka, India

Exploring reading and reading disorders in children: Insights from developmental neuroscience

Reading is a fundamental skill crucial for success in various aspects of life, including social interactions, academic achievement, emotional regulation, and professional pursuits. However, reading impairments, a prevalent neurodevelopmental issue impacting approximately 5-10% of school-age children worldwide, significantly impede their reading abilities, hindering their learning progress and potentially persisting into adulthood. Despite advances in neuroimaging studies indicating atypical brain development in individuals with reading disorders, the precise onset and developmental trajectory of these disorders remain poorly understood.

This presentation aims to synthesize empirical research findings from the field of developmental neuroscience to enhance our comprehension of the distinct neural pathways associated with reading and reading disorders. The discussion will commence with an overview of the fundamental brain processes involved in both typical and atypical reading, with a particular focus on neuroimaging studies' outcomes. Furthermore, by emphasizing the importance of considering developmental factors and amalgamating research outcomes from cross-sectional studies involving children with reading disorders at various developmental stages, this presentation seeks to augment our knowledge base regarding reading disorders in children.

To further explore the etiology of reading disorders, a differentiation will be made between primary and secondary impairments that unfold throughout development. Finally, the presentation will present empirical data derived from existing longitudinal studies that investigate developmental reading pathways, commencing during the preliterate stage, at both group and individual levels. This endeavor aims to enhance the accuracy of early identification and enable targeted interventions addressing deficits in foundational pre-literacy skills and reading fluency. Ultimately, this approach holds the potential to yield improved outcomes for individuals at risk of or affected by reading disorders.

Biography

Paul Raj serves as an Assistant Professor of Psychology at Jyoti Nivas College Autonomous, Bengaluru, India. In this role, he instructs a diverse range of courses, encompassing Foundations of Psychology, Lifespan Development, Cognitive Psychology, Research Methods, Health Psychology, and Positive Psychology. Additionally, he offers certificate courses in Basic Counselling Skills and Learning Disabilities. Paul Raj's academic journey includes an MSc in Counselling Psychology and an M.Phil. in Learning Disabilities. His doctoral research focuses on Cognitive Functioning and Mathematical Abilities among Primary School Children in Rural and Urban Areas in Karnataka, India. His research interests extend to child and adolescent development, neuropsychology, specific learning disorders, and positive psychology. Furthermore, Paul Raj has contributed significantly to the field of psychology through his publications. He has authored two books, contributed to two book chapters, and published five articles in esteemed journals, showcasing his dedication to advancing psychological knowledge.

Ramesh Nagarajappa[1]*, Gayathri Ramesh[2]

[1]Department of Public Health Dentistry, The Oxford Dental College, Bommanahalli, Bangalore Karnataka, India

[2]Department of Dentistry, Chamarajanagar Institute of Medical Sciences, Chamarajanagar, Karnataka, India

Vision for controlling narcotic dependency and relapse

The prevalence of opioid use in India is three times the global average. The impact of substance abuse often reaches beyond the abuser to family members, friends, co-workers, and society at large. While biological factors are mainly responsible for progression to dependent use from abuse, the use of illicit drugs is also dependent on sociopolitical factors. Tolerance and withdrawal symptoms are generally found. Effective prevention strategies are critically important in community efforts to combat substance abuse. Many programs and policies are often implemented without a sufficient evidence base or with limited fidelity to the evidence base; this may have unintended consequences when they are broadly implemented. Rigorous evaluation is needed to determine whether programs and policies are having their intended effect and to guide necessary changes when they are not. The primary health care professionals, with a continuous, comprehensive, patient-centered, and longitudinal approach to medical and psychosocial issues, is ideally positioned to support recovery. The entire process may not be easy but the reward of seeing a patient who was impaired by substance abuse return to normal functioning in society is what makes the effort worthwhile.

Audience Take Away Notes

- Certainly, helps to know the prevalence and pattern of use
- Effective prevention strategies to combat substance abuse
- Detoxing from substance abuse assists us in focusing on real-life social interactions without distractions
- Practically supports students to excel academically securing well in examinations

Biography

Prof (Dr). Ramesh Nagarajappa graduated from the prestigious Bapuji Dental College and Hospital, Davangere, India in 1999. I am presently working as a Professor and Head, in the Department of Public Health Dentistry at The Oxford Dental College which is affiliated to Rajiv Gandhi University of Health Sciences, Bangalore in India. I have post-graduation teaching experience of over 23 years and am guiding both PhD and MDS students. I have also authored 145 publications in various international and national reputed journals. Been a regular reviewer in many journals. I do have experience of delivering scientific presentations and chairing scientific sessions at various conferences.

Traci A Owens
Attorney at Law, United States

Generational trauma and the pathology of the addicted survivor in the criminal justice system

Proper representation requires a thorough examination of a client's social history. What appears to be pathological behavior is often, upon closer examination, adaptive behavior. Criminal defendants who manage addictive and neurodiverse features are often a reflection of generational trauma that manifests in the family member who is conveniently scapegoated. This session will define generational trauma and look at the contributing factors that assist in presenting mitigation and defense evidence.

Biography

Traci A. Owens holds a BA from Georgetown University and JD from Emory University School of Law. She has 23 years of experience in Criminal Defense practice. She has been given trainings for CPDA since 2003. Traci A. Owens has been an adjunct faculty member with Santa Clara Univeristy SOL Trial Techniques program since 2002, and the Stanford Trial Advocacy Program since 2009.

She has been a repeat presenter at the International Academy of Law and Mental Health Congresses in Vienna, Prague, and Rome. Traci is also a recurring lecturer for the Magnus Group. She recently lectured for the Sonoma County Bar Association on issues of race in February 2021, and on gender in March 2021 for Elimination of Bias credit. It was open to all (prosecutors included) through the Bar Association. Her most recent project was her role as the moderator and speaker at the 2nd International Webinar on Physical Health, Nursing Care, and COVID-19 Management on March 19, 2021. Her lecture during this event was titled "Is PTSD The New Normal? Life and Practice After A Global Crisis." She is also a published author, with her work appearing in The International Journal of Forensic Science.

Michele M Mahr[1], Robert Paul Maddox II[2], Juan Sanabria[1]

[1]Department of Rehabilitation Counselling, California State University, Los Angeles, CA, United States
[2]School of Counseling, Leadership, Advocacy, and Design, University of Wyoming at Casper Casper, WY, United States

The neurobiology of addiction: The mind and body connection

The purpose of this presentation is to educate participants on the fundamental components of neurobiology of addiction. The presenters will examine neurobiology concepts related to addiction and treatment. Research has been conducted over the past decade revealing the relevance of the mind and body connection in substance abuse and addiction treatment (U.S. Department of Health and Human Services, 2016; Uhl et al., 2019). A primary outcome of previous neurobiologically-related research has been an exploration of how changes at the molecular, cellular, and neurocircuitry levels may help explain the manner in which some individuals transition from occasional, controlled substance use to an increase in drug intake and chronic addictive behaviors (Koob et al., 2008). The ability to conceptualize the impact of these changes may help professionals in identifying potential factors related to the development of addictive behaviors.

Likewise, while preventive and treatment interventions may decrease substance use and substance use disorders, the results of commonly implemented prevention and treatment strategies can be short term (Uhl et al., 2019). Additionally, research has highlighted the role that neurobiological changes, genetic markers, and epigenetic adaptations play in relation to addictive behaviours (Uhl et al., 2019). While addiction may be initiated as a goal-directed behaviour yearning for a specific high or pleasure, stress and trauma can influence an individual's decision-making process impacting their ability to engage in adaptive coping mechanisms (Uhl et al., 2019). Given these potential factors, health care professionals interested in effectively treating individuals with substance abuse and addiction may benefit from a deeper understanding of the neurobiology of addiction.

Through collaboration, multi-disciplinary teams with a foundational understanding of neurobiology and the mind—body connection may build a therapeutic environment which fosters support for a safer and more responsive treatment for clients/patients. It may be viable for health care professionals to recognize and implement a biopsychosocial approach which entails addressing the biology, psychology, and sociology aspects of addiction. Additionally, psychoeducation on the neurobiology for individuals with substance abuse and addiction during the treatment process may positively impact their resilience and motivation to abstain from using substances. In this presentation, multidisciplinary collaborative partnerships, particularly those involving primary health providers and allied health professionals, will be explored. Finally, a biopsychosocial framework for neurobiologically informed treatment along with potential resources for treatment professionals will be provided.

Audience Take Away Notes

- Review the neurobiology of addiction, including the reward pathway, the role of neurotransmitters, and how addiction affects brain function
- Examine the connection between addiction and the mind-body system, including the impact of stress and trauma on addiction and the importance of mindfulness-based interventions
- Explore recent research on addiction and the mind-body connection, including potential factors related to addiction and the use of neuroscience-based treatments

- Identify strategies for interdisciplinary collaboration and integration of evidence-based mind-body approaches into addiction treatment

Biography

Michele M. Mahr Assistant Professor in Rehabilitation Counseling at California State University, Los Angeles. Michele has published two textbooks, the first titled Research Strategies for Counselor Educators; A Modern Approach to Substance Abuse and Addition was published in 2021. Her second textbook titled A Systemic Approach to Substance Abuse and Addiction: The Power of Society was published this past year. Her primary research focus is in substance abuse and addiction; however, she also has several publications with work related to the disability field, multiculturalism, and wellness promotion.

Dr. Robert Paul Maddox II is a counselor educator at the University of Wyoming at Casper. His academic credentials include a Ph.D. in Counselor Education and Supervision, an Ed.S. in Counseling Education, and a M.A. in Community Counseling. Additionally, he is a Licensed Professional Counselor (LPC) and a National Certified Counselor (NCC) with experience in school and clinical mental health counseling. He currently serves as the Play Therapy Online Graduate Certificate Program Coordinator at the University of Wyoming, and he also coordinates the counselor education program's school counseling track at the University of Wyoming's Casper branch campus.

Juan Sanabria is was born in Managua, Nicaragua and immigrated to the United States in the early 1980s amid its civil war. He is a combat veteran that served honorably in the United States Marine Corps. After battling addiction for years for his PTSD and surviving a suicide attempt, Juan has turned his life around, He graduated Magna Cum Laude for his BS degree, and is dedicated to his efforts in becoming a Rehabilitation Counselor for the VA. He is currently pursuing his Master of Science Degree in Counseling, Option in Rehabilitation Counseling.

Hayrunnisa Unlu[1,2]*, Sherif El Gayar[3], Amoghavarsha Havanur[4], Farha G Deceu[3], Samantha Brown[3], Sarah B Umar[4], Paul E Croakin[5], Terry D Schneekloth[1], Osama A Abulseoud[1,6]

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No sex difference in clinical characteristics or treatment outcomes of Alcohol Withdrawal Syndrome (AWS) in 148 hospitalized adolescents

Background: Recent studies suggest that alcohol consumption is increasing in adolescent females but little is known about AWS in this population. Adolescent females may have unique, unknown vulnerabilities as prior studies of AWS focus on males.

Objective: To characterize the demographics of AWS in adolescents and assess potential sex differences in AWS in adolescents.

Methods: Electronic medical records of 130 hospitalized adolescent patients (14-20 years old with 148 hospitalizations) who received care at Mayo Health System and were placed on CIWA-Ar protocol for AWS from 6/2019-6/2022 were included in the study.

Results: Males (53.8%, n=70) and females (46.2%, n=60) were equally represented (p=0.51). Both sexes had high rates of depression (females/males, 51.7%/38.6%, p=0.15), anxiety (30%/18.6%, p=0.15), suicide attempts (25%/22.9%, p=0.83), cannabis (26.7%/18.6%, p=0.23) and tobacco use (23.3%/14.3%, p=0.25). Admission blood alcohol concentration was higher for males (Median (IQR)=151(286,5) vs 107(155) mg/dL) with no significant difference (p=0.15). GI disorders were the most common comorbidity for both sexes (16.7%/14.3%, p=0.80). Females had more asthma (10%/0%, p=0.0094) and sexually transmitted diseases (6.7%/0%, p=0.04). 24% of males and 20% of females were admitted to ICU. No significant difference in hospital or ICU LOS despite that females stayed at the hospital longer (p=0.23), and males had longer ICU stay (p=0.63). There was no sex difference in total lorazepam equivalent dose between sexes (p=0.35). Females (20% vs 17.6% males) needed a higher total haldol equivalent dose (p=0.46). The time from admission to maximum AWS symptomatology, determined by peak CIWA-Ar score, was longer for females (p=0.10). 26.1% of females and 25.3% of males had CIWA-Ar score ≥10 with no sex difference (p>0.9). Patients with CIWA-Ar ≥10 (vs those with CIWA-Ar <10) required more benzodiazepine [median (IQR)=5 (16.63)/2(8.87) mg, p=0.035), stayed shorter at the hospital [median (IQR)=67.6 (92.7)/73.8 (82.24) hr,p=0.8], and the ICU [median (IQR)=26.4 (30)/34 (26.54) hr, p=0.9]. ICU patients needed more benzodiazepine [median (IQR)=20 (29.75) mg/2.25 (5.75) mg, p=0.0003] and longer time from admission to peak CIWA-Ar [median (IQR)=21.19 (38.08)/7.9 hours (17.78), p=0.0166] than non-ICU admitted patients. Patients who received benzodiazepine treatment had higher CIWA-Ar scores [median (IQR)=12 (10)/6 (5), p=0.0001] and shorter hospital LOS [median (IQR)=65 (87.25)/75 (85.25) hr, p=0.57].

Conclusion: Adolescent females and males with AWS have similar clinical characteristics, disease courses, and treatment outcomes. Benzodiazepine-treated patients had shorter hospital stays despite higher peak CIWA-Ar scores in both sexes.

Audience Take Away Notes

- Recognizing the course of AWS, especially in the young female population is becoming more important because of the increasing number of young female alcoholics and closing the sex gap in alcohol abuse.
- Possible sex differences in clinical course and treatment are unknown, as AWS studies mostly included adult males. This study helps understand the possible sex differences in the clinical course and treatment of AWS in adolescents.
- Considering the increasing number of alcoholics among the youth, it can be predicted that the age of AWS will decrease. Therefore, the importance of recognizing and treating AWS in adolescents has increased. There are very few adolescent AWS clinical studies in the literature therefore this study helps to understand demographics, comorbid conditions, course of AWS, and treatment in adolescents.
- As our study revealed, AWS is seen at similar rates and with similar severity in adolescent females and males. Our study will contribute to approach diagnosis and treatment by being aware of this when treating adolescent females.
- This study helps physicians to consider prescribing benzodiazepine to adolescent AWS patients with higher CIWA-Ar scores to decrease hospital length of stay and to be more comfortable with treating female adolescents with AWS.

Biography

Dr. Unlu graduated from Ankara University School of Medicine in 2020, amongst the top 1%. She had attended clinical training at Boston Children's Hospital, Division of Developmental Medicine, and at McLean Hospital, Department of Psychiatry. She served at the COVID-19 patient unit for a year. She is a resident doctor in Child and Adolescent Psychiatry Residency at Baskent University Hospital, Turkey and she is a research fellow at Mayo Clinic, Arizona, Department of Psychiatry and Psychology.

Kelsey Whitus[1]*, Mayar Osman[1], Adam Sigal[2], Traci Deaner[2]

[1]Drexel University College of Medicine, Philadelphia, PA, United States

[2]Department of Emergency Medicine Reading Hospital, West Reading, PA, United States

Ed addiction recovery consults for substance abuse lowers death and incarceration rates

For the past 5 years, the United States has been experiencing an opioid epidemic. Patients with Substance Use Disorder (SUD), especially with opioids, are at an increased risk of death compared to patients without SUD. It is estimated that 11.1% of adult ED patients have a SUD. In 2017, the Commonwealth of Pennsylvania initiated a "Warm Handoff" (WHO) intervention in which patients presenting to the ED with SUD are offered counseling with a Certified Recovery Specialist (CRS) and referred to a treatment program. The purpose of this study was to evaluate the impact of CRS intervention on subsequent ED utilization. We conducted a retrospective review of patients who had a CRS consult for an acute substance or alcohol overdose, SUD contributing to their ED presentation or who presented requesting recovery assistance. Consults were divided into those that accepted and declined the WHO. Once accepted by the patient, they were counseled on Opioid Use Disorder and informed of several resources to help control their opioid dependence and relapse. Reasons for subsequent ED utilization were categorized as a primary acute overdose, substance abuse related, mental health, medical or surgical, or traumatic injury issue. Of the 75% who accepted the WHO there were significant demographic differences between the two groups regarding unemployment (59.3% of accepted vs 42.3% of declined, $p<0.001$) and psychiatric comorbidity (61.8% in accepted vs 39.5% in declined, $p<.001$). The declined group tended to use more heroin than the accepted group (54.9% vs 46.1% $p = 0.06$), while the accepted group was significantly more likely to abuse cocaine, methamphetamines, benzodiazepine, other opioids, cannabis, and alcohol. The index visit of the declined group was significantly more likely to involve an overdose than the accepted group (53% vs 14%, $p<.001$). At one year post index visit, the accepted group had more ED utilization for mental health related disorders (9.9% vs 3.1%, p 0.004) and the declined group had more overdose visits (5.0% vs 1.3%, p 0.01). Contrary to prior studies, we did not find an overall decrease in ED utilization. We did note a trend showing WHO accepted patients had more subsequent ED visits for mental health issues while the declined cohort had more overdose visits. These trends are consistent with the increased use of opioids in the declined cohort and the increased presence of mental health comorbidities in the accepted cohort.

Our study demonstrates that ED identification and intervention for patients with SUD, either from an acute overdose or as a significant comorbidity, resulted in a decrease in mortality and incarceration rates. Patients with SUD are a vulnerable population. SUD still carries negative biases and patients may be unsure how to access services. ED visits provide an opportunity for a meaningful intervention as seen through the WHO process. Our study demonstrates the positive impact a CRS can have in counseling and direct placement in treatment. Future interventions should continue to target this vulnerable population in ways that can help decrease healthcare utilization, mortality, and morbidity.

Audience Take Away Notes

- The audience will gain a greater appreciation for the efficacy of the PA Warm Handoff (WHO) process
- Provide other health care providers with an ability to better serve the underrepresented and underserved

- The audience will have an understanding of the positive impact CRS can have on healthcare utilization in the substance use disorder population
- Healthcare workers need to continue to collaborate to better understand future interventions that can be utilized to continue to help decrease healthcare utilization, mortality, and morbidity

Biography

Kelsey Whitus studied at James Madison University in Harrisonburg, VA and graduated with her BS in 2018. She then began medical school at Drexel University College of Medicine where she found her passion for helping those who are underserved at the student run clinic 'Streetside' in the Kensington neighborhood of Philadelphia, PA. She is now currently working on applying to Emergency Medicine residency with the United States Army and anticipating graduating from medical school in 2024.

Thersilla Oberbarnscheidt

Assistant Professor of Psychiatry, Western Psychiatric Hospital Center for Psychiatric And Chemical Dependency Services, 3501 Forbes Avenue, Suite 900, Pittsburgh, PA 15213, United States

In a world of deltas: Review of clinical implications of delta 8,9 and 10 THC

Along with the legalization of marijuana throughout the U.S., there is an increase in use of delta products as well. While these delta-THCs are widely available and advertised, little information about the effects and possible risks are broadcast to the public. Marijuana is federally classified as a Schedule 1 substance; however, the Delta drugs are not regulated. According to the Farm Bill from 2018, hemp products with less than 0.3% THC can legally be bought, sold, and grown in most states in the U.S., creating a loophole for marketing of these products. For the user this means that there is no assurance of content of the purchased product, and they bear the risk of potentially containing harmful byproducts.

Delta-9-THC is one of the primary psychoactive cannabinoids of marijuana. Delta-9 is hemp derived and binds to the same cannabinoid receptors as marijuana. It can induce the same psychoactive effects which are euphoria, feeling “stoned”, anxiety or paranoia as well as aggression.

Delta-8-THC is commonly called “marijuana lite” or “diet weed”. Marijuana contains Delta-8 THC only in a small percentage. The sold Delta 8 product is typically made by synthetically converting CBD or Delta 9 THC into Delta 8. Delta 8 binds to the same receptors as Delta 9; Little research is available on Delta 8, but available studies are showing side effects that are comparable to marijuana ranging from paranoia, difficulties with concentration, memory, perception of time to sedation and euphoria. Concerning are reports of accidental severe intoxication, resulting in more than 2000 calls to poison control centers between January 2021 and February 2022. Several states have started to ban the recreational sales of delta-8-THC.

Delta-10-THC, however, is often reported to cause more euphoria and energy rather than sedation. Little research is available regarding its benefits and side effects, but the novelty of this substance makes it especially attractive to users. The delta-drugs are available in various forms: edibles, vaped concentrates as well as smoking bud or flower or in topical ointments. About 50% of consumers of delta-drugs also reported in surveys to use marijuana as well. It is important for mental health workers and physicians from other fields of medicine to know and understand these substances in order to be able to assess the clinical presentation correctly and to provide the effective clinical care for acute and ongoing stabilization.

This presentation is a systematic review of literature looking at the available data for Delta 8,9,10 for psychiatric and medical use. Utilized sources were PubMed, Ovid, Medline, Psych Info, EMBASE.”

Audience Take Away Notes

- This presentation will help the audience to better understand Delta-THC drugs as they are increasingly becoming popular and widely used.
- No matter in what field of medicine the audience works in, they will meet patients or clients who are using Deltas and will need to know how those affect their physical and mental health and how they are interacting and interfering with their prescribed medications.

- I am hoping that the audience will become interested in this topic and further investigate. Little research is so far available.
- This presentation will provide important information for the audience for the everyday clinical work but also raise awareness of public health concerns that are related to the increasing availability and use of deltas.
- Delta products are increasingly available throughout the U.S. Unlike other substances, these can be purchased in local convenience stores and shops. Even bill boards along highways or commercials on tv are advertising about these products. The audience will gain competence in addressing the use of Deltas in their clients and patients.

Biography

Thersilla Oberbarnscheidt is an Assistant Professor at the Western Psychiatric Hospital at the University of Pittsburgh where she also completed her fellowship in Addiction Psychiatry. She completed her residency at Central Michigan University in Psychiatry and her graduated Medical School from the Christian-Albrechts University in Germany as well as Yale University School of Medicine. She completed her PhD in neuroscience at the Christian-Albrechts University as well with the thesis of "The effect of phenazone in the acute migraine attack". Thersilla has a long-standing interest in the field of Addiction and has published numerous articles in the field of Addiction. Her particular interest is in Marijuana and Opioids.

Keith Klostermann
State University of New York at Fredonia, United States

Substance use and relationship functioning: The case for couples therapy

The results of numerous studies over the past four decades have consistently revealed the effectiveness of couple and family-based approaches for drug and alcohol abuse. Behavioral Couples Therapy (BCT) is a conjoint approach which has been consistently shown to produce fewer substance-related issues, greater abstinence, and improved dyadic functioning compared to individual- based treatments for married and cohabitating couples. This presentation provides a rationale for why we should use couples therapy with substance-disordered clients and their partners and offers a method for do it.

Biography

Dr. Keith Klostermann is a Clinical Mental Health Counselor, Wheatfield Pediatrics, USA. He received his PhD Counselor Education at University at Buffalo, SUNY, Buffalo, NY, 2003. M.S., Counselor Education, Canisius College, Buffalo, NY, 1999. B.S., Criminal Justice, Buffalo State College, State University of New York, Buffalo, NY, 1992. He worked as a Senior Staff, Counseling Services, University at Buffalo, SUNY, Buffalo, NY. He published more than 69 articles in different journals.

Matthew Hanauer
CleanSlate Centers, Durham, NC, United States

Using AI to identify feature importance for no-show appointments in substance abuse treatment settings

In substance abuse settings no-show rates are correlated with higher mortality rates. The reasons behind no rates are multifactored and complex, limiting insights gained from traditional statistical models. Machine learning models can handle more features but are difficult to explain. Therefore, we propose using explainable artificial intelligence to take advantage of machine learning's ability to integrate more features but also allow for explainability through a 10-step process. We demonstrate this 10-step process with EHR data from outpatient substance abuse clinics evaluating factors influencing no-show rates.

Audience Take Away Notes

- How explainable artificial intelligence (xAI) can be used to identify directional and interpretable impact from features in machine learning models
- How xAI can help them identify the directional impact of features from machine learning models
- How relapsing patients are most at risk for no-show appointments

Biography

Dr. Hanauer studied Research Methods at Indiana University – Bloomington. He worked for Centerstone, one of the nation's largest non-profit mental health providers, for 3 years as a Biostatistician, first authoring several research articles and presenting at dozens of national conferences nationwide. He now works as a Senior Data Scientist at CleanSlate Centers, where he builds prediction models for no-show rates, patient relapse, and NLP models to support call center analytics. Additionally, he provides statistical and machine learning consulting services for universities and other healthcare clients.

Matthew Beattie* and Lex Beattie

Data Science and Analytics Institute, University of Oklahoma, 202 West Boyd St, Norman, Oklahoma, 73019, United States

Revisiting the Gateway Hypothesis by considering the effect of age-of-first use on subsequent illicit drug use

The Gateway Hypothesis, originally formulated in 1975 by Denise Kandel, claims that drug use evolves in stages. It starts with either tobacco or alcohol use, progresses to the use of the other, then to marijuana, and then to other more dangerous illicit substances. Use of a drug in one stage is a required precursor for, but not a determinant of, use in subsequent stages. While debate persists regarding this theory, it has been recognized and demonstrated in many studies since its conception. This study builds upon this work by showing the relationship between the Age of First Use (AFU) of early stage quasi-licit drugs (tobacco, alcohol, and marijuana) and the likelihood of use of illicit drugs such as cocaine or heroin. Machine learning techniques, specifically decision tree and linear regression analyses, are applied to 2016-2019 data from the National Survey of Drug Use and Health to model the relationship between the determinant features (AFU of tobacco, alcohol, and marijuana) and the dependent variable – any lifetime use of other illicit drugs. Both models proved to be very accurate, with test set area under the receiver operating curve values of 0.84. The decision tree model performed best and accurately predicted 83% of illicit drug users and 73% of non-users. The decision tree model found that marijuana AFU was by far the most important predictive feature (importance score of 0.93), and that 32% of illicit drug users first used marijuana at an age of less than 16.4 years. In the linear regression model, the coefficients of AFU were 3.87 for tobacco, 7.60 for alcohol, and 36.65 for marijuana. The coefficient for the combination of marijuana and tobacco AFUs was significantly higher at 114.83. These findings make clear the risks associated with early marijuana use and call for further study of the issue in order to develop policies to reduce illicit drug use among minors in the face of ongoing marijuana legalization.

Keywords: gateway hypothesis, machine learning, age of first use

Audience Take Away Notes

- The study addresses a gap in Gateway Hypothesis literature by adding an analysis of AFU data and its effect on illicit drug use
- Early age marijuana use greatly increases the ability to identify illicit drug use
- Researchers can use these findings for more specific studies of early age marijuana users and their subsequent behavior
- Policymakers can use this study to justify regulations on packaging of legal mari-juana products, restrictions on access to marijuana, and penalties for providers of marijuana to underage users

Biography

Matthew Beattie is currently an Adjunct Professor of Data Science at the University of Oklahoma (OU). His research has focused on the application of machine learning to social challenges, including addiction, disease propagation, and homelessness. He is a member of the Data Science and Analytics Institute and the Data Institute for Societal Challenges, both at OU. His education includes Master's degrees from OU and the North Carolina State University, and a Bachelor of Science from Duke University. Dr. Beattie is a U.S. Army Veteran and has a career in industry including executive positions in multiple companies including AT&T and Crown Castle.

Joey Pagano
Author, SPHS, The Traveling Social Worker, United States

No addict left behind

The session will examine the stigma of addiction from unique real-life perspectives while also focusing on harm reduction treatment related to persons who suffer from substance use disorder and mental health. Social work core values, such as self-determination, will be centralized, while the focus will also be on the theme of "meeting a person where the client is, instead of where the practitioner is." The end result of the lecture will produce an attitude of empathy, compassion, and understanding.

Audience Take Away Notes

- Learn about stigma and how it affects a person seeking recovery
- Understand how the dogma of addiction treatment prevents a person from recovering
- Understand how recovery and treatment are as broad as abstinence to MAT
- Learn how vital it is for a person not to give up on someone trying to access treatment regardless of the level of care they need and choose

Biography

Joey is an author, licensed social worker, therapist, and motivational speaker with over a decade of experience in the field. Joey is the author of No addict left behind: It's a recovery medicine state of mind. His story encompasses the clinical, medical, and personal experiences of the stigma of addiction and recovery medicine in our country.

Cornel Stanciu
Dartmouth-Hitchcock / New Hampshire Hospital, United States

Kratom: The good, the bad, and the unknowns

This workshop will serve to provide an up-to-date all-around coverage of Kratom, a botanical with a rapidly increasing prevalence among our patient population. A tremendous gap of knowledge exists at the intersection of "therapeutic" use and the risks associated with such - including that of overdose and addiction development. It is imperative to understand the current state of the literature concerning the use of Kratom as a harm reduction tool, as well as the toxicities associated with the currently available Kratom products in the United States. This workshop will provide clinicians with the knowledge required to engage in informed discussions with patients who are users, and to be able to implement evidence-based treatment approaches for patients who develop an addiction to Kratom.

Audience Take Away Notes

- Gain a deeper understanding of the differences between traditional use and Western use of Kratom
- Review pharmacology and update on the best practices in managing patients who develop Kratom addiction
- Discuss challenges and approaches to managing such comorbidity

Biography

Dr. Stanciu is an Assistant Professor at Dartmouth's Geisel School of Medicine and the Director of Addiction Services at New Hampshire Hospital. In 2017, he was named the Ruth Fox, ASAM, scholar and Governors Institute on Substance Abuse scholar. In this past year Dr. Stanciu was appointed by New Hampshire's governor to the New Hampshire Board of Medicine, Medical Review Subcommittee as well as by the New Hampshire DHHS's commissioner to the New Hampshire Therapeutic Cannabis Medical Oversight Board. He also earned the prestigious ASAM as well as APA Fellow credentials. Throughout his career, Dr. Stanciu played an active role in academia having published a multitude of papers on themes related to addictive disorders, particularly Kratom. He is on the editorial boards of three journals and has received multiple awards for excellence in research and clinical care. His research was presented at numerous conferences, through live webinars, and cited in literature. Dr. Stanciu is actively involved with several organizations such as APA, ASAM, and AAAP and has contributed to their newsletters, currently serving as the Early Career Editor for the latter. Furthermore, Dr. Stanciu' s devotion to the field and commitment to downstream knowledge dissemination is exemplified through his most recently published book titled "Deciphering the Addicted Brain: A Guide to understanding and Helping a Loved One Towards Recovery".

Brandon Lucke Wold
Department of Neurosurgery, University of Florida, United States

Craniofacial encephalocele: Updates on management

Craniofacial encephaloceles are rare, yet highly debilitating neuroanatomical abnormalities that result from herniation of neural tissue through a bony defect and can lead to death, cognitive delay, seizures, and issues integrating socially. Consensus on the proper approach to treating craniofacial encephaloceles is confounded by the abundance of surgical techniques and parameters to consider when determining the optimal timing and course of intervention. Recent evidence suggests that a single, two-stage operation utilizing neurosurgeons to remove the encephalocele and plastic surgeons to reconstruct the surrounding tissue can be successful in many patients. The HULA procedure and endoscopic endonasal surgery using vascularized nasoseptal flaps have surfaced as less invasive and equally successful approaches to surgical correction, compared to traditional craniotomies. Some of the major concerns postoperatively include infection, CSF leakage, infringement of craniofacial development, elevated intracranial pressure, wound dehiscence, and developmental delay. Depending on the severity of encephalocele prior to surgery, the surgical approach taken, any postoperative complications, and the age of the patient, rehabilitation approaches may vary. Temporal encephaloceles can be a causative factor in drug-resistant temporal seizures and there has been success in curing patients of these seizures by temporal lobectomy and amygdalohippocampectomy. The etiology of encephaloceles is still being investigated, with evidence pointing towards the Sonic Hedgehog pathway, Wnt signaling, GLI transcription factors, and G protein-coupled receptors within primary cilia as some of the major genetic regulators that can contribute to improper mesenchymal migration and neural tube closure.

Biography

Brandon Lucke-Wold was born and raised in Colorado Springs, CO. He graduated magna cum laude with a BS in Neuroscience and distinction in honors from Baylor University. He completed his MD/PhD, Master's in Clinical and Translational Research, and the Global Health Track at West Virginia University School of Medicine. His research focus was on traumatic brain injury, neurosurgical simulation, and stroke. At West Virginia University, he also served as a health coach for the Diabetes Prevention and Management program in Morgantown and Charleston, WV, which significantly improved health outcomes for participants. In addition to his research and public health projects, he is a co-founder of the biotechnology company Wright-Wold Scientific, the pharmaceutical company CTE cure, and was a science advocate on Capitol Hill through the Washington Fellow's program. He has also served as president of the WVU chapters for the American Association of Pharmaceutical Scientists, Neurosurgery Interest group, and Erlenmeyer Initiative Entrepreneur group. In addition, he has served as vice president for the graduate student neuroscience interest group, Nu Rho Psi Honor Society, and medical students for global health. He was an active member of the Gold Humanism Honor Society and Alpha Omega Alpha Honor Society. He is currently a member of the UF House Staff Council, Positive Culture Committee, Quality Improvement Committee, Board of Directors Alachua County Medical Society, and Accreditation Requirements Review Committee. He is married to Noelle Lucke-Wold and has two children. As a family, they enjoy running with their dogs, rock climbing, and traveling. In his spare time, Brandon frequently runs half marathons and 10ks together with is wife. Brandon also enjoys reading, playing piano, discussing philosophy, and playing chess. He is currently a Pgy5 neurosurgery resident at University of Florida with pursuing endovascular enfolded training and was awarded the Dempsey Cerebrovascular Research Fellowship.

Sara Haddadi[1]*, Mukunthan Murthi[2], Ihsan Salloum[3], Mehdi S. Mirsaeidi[4]

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[2]Department of Medicine, Cook County Health, Chicago, Illinois
[3]Department of Psychiatry, University of Miami Miller School of Medicine, Miami, FL, United States
[4]Department of Medicine, Division of Pulmonary & Critical Care, University of Florida, Jacksonville, FL, United States

COVID-19: Risk of alcohol abuse and psychiatric disorders

Alcohol abuse along with difficulties in communication has led to increased morbidity and mortality among patients with psychiatric disorders. This issue has a higher importance during the COVID-19 Pandemic. Standard recommendations to prevent the spread of infection such as self-quarantine, hand washing, covering mouth and nose while coughing may be difficult to enforce in patient with mental illnesses. There is a controversy in discharge and management of patients with history of alcohol abuse and psychiatric disorders when they come to the Emergency Departments (ED) with mild presentation of COVID-19.

We discussed a 39 years old patient known case of paranoid schizophrenia who came to the ED with mild fever, cough and headache. She was soon discharged from the ED after having a normal chest radiograph. She was recommended to be in self-quarantine for at least 14 days. Her COVID- 19 condition deteriorated rapidly in a week, and she was brought back to the ED after she had an altercation with her friends while drinking.

Patients with psychiatric disorders especially schizophrenia or those who have been diagnosed with alcohol abuse may have a higher risk for progression of their mild COVID-19 to a severe form. On the other hand, they have a role in the spread of COVID-19 in the community due to lower compliance with preventive measures. A higher rate of alcohol abuse in psychiatric patients and their lower compliance to self-quarantine calls for a different approach when they come to the ED with COVID-19 presentations. Lessons from the COVID-19 pandemic can also shed light on the health care management of patients with psychiatric disorders in any future potential viral pandemics.

Audience Take Away Notes

- Need for a different approach in preventive health care for patients with alcohol abuse and psychiatric disorder during the COVID-19 pandemic compared to the rest of population
- Global awareness for health care professionals about the progression of mild form of COVID-19 to an advanced disease in patients with underlying alcohol abuse and psychiatric disorder
- Faculties in health care can use this research to teach primary health care providers regarding the importance of close observation or hospitalization of COVID-19 patients with underlying alcohol abuse and psychiatric disorder during the pandemic
- Designing new models for preventive measures in any viral pandemics for patients with alcohol abuse and psychiatric disorder

Biography

Sara Haddadi MD is the author, reviewer and editor of several peer-reviewed journals and have focused her research on the field of COVID-19 and chronic disorders such as sarcoidosis and cancer. Sara graduated in medicine from Shiraz University of Medical Sciences in 2014 and moved to the US to continue her passion in clinical research. She is currently working in this field at the University of Miami.

Baitubaev Dyussengali Gabdullaevich[1]*, Baitubaeva Madina Dyussengaliyevna[2]

[1]Psychiatrist-narcologist of the Department of Psychiatric and drug addiction in the Psychiatric Dispensary, Ridder city, Kazakhstan
[2]Semey State Medical University, Semey city, Kazakhstan

21st century discoveries in the physiology of adaptation and dramatic changes in the validation of substance dependence

The report shows that the current level of physiology does not reveal the biological mechanisms for increasing tolerance in dependence on psychoactive substances. Like, for example, opium (heroin) the addict uses doses repeatedly, almost 10 times, exceeding the lethal for an ordinary person?

The traditional explanation of what grows the body's tolerance in response to an increase in dose is insufficient. The research work shows that in the functioning of the endocrine system, in particular the adrenal cortex, which produces "adaptation hormones" glucocorticoids, that increase the body's resistance to strong stimuli, the mechanism of "anticipatory excitation" has been evolutionarily laid down, contributing to accumulation of reserves - described in the 30s of the last century by the physiologist P.K. Anokhin.

When on any stimulus, the adrenal cortex, as if in anticipation of possible future high costs. responds with somewhat excessive neurotransmitter release. And due to the excess neurotransmitter release, including auxiliary and tissue and adaptation mechanisms, "takes a break" for its own recovery - trophic processes, when the processes of assimilation begin to prevail over the processes of dissimilation and physiological hypertrophy of the cells of the adrenal cortex occurs. Histological evidence comes from Selye's studies of the stress response: "the adrenal glands bloom." And each subsequent increasing dose of the drug is "met" by the hypertrophied endocrine system. And a potentially extreme lethal dose of a psychoactive substance has a non-lethal, sub-extreme effect on the body. It is known that stress - in its development goes through three stages: "anxiety reaction", resistance, exhaustion.

With dependence on psychoactive substances, the hypertrophy of the endocrine system that has occurred in the resistance stage does not allow the development of the final stages - exhaustion and damage to the body is not applied. With an increase in the dose of surfactants, and switching to another range, this process of hypertrophy is repeated. Such a process, with a regular, gradual increase in the acting dose of a psychoactive substance, should be called a state regular, unfinished stress. In the final stage of dependence - the depletion of adaptive possibilities of the body due to regular hypotrophy of the endocrine system, the receptors of the body's protective systems already signal a possible overdose of surfactants, which leads to a parallel decrease in the dose of surfactants that a person is able to use, strength the impact of the psychoactive substance again turns out to be subextreme, the pathology is again not observed Pathology with dependence on PAS-related phenomena.

A new direction in the physiology of adaptation - explains the mechanism of increasing the body's tolerance in dependence on psychoactive substances (PS), it is called progradient (progressive) adaptation. He scientifically proves that the body's dependence on PAS is not a disease, but a state of progressive adaptation.

Audience Take Away Notes

- The report revolutionizes the scientific understanding of substance dependence.
- The audience will learn that the dependence of the body on PAS is not a disease, but a state of the type of progressive (progressive) adaptation. It will improve the understanding of the psychological state of psychoactive substance addicts by doctors.
- Improve understanding by substance addicts of their condition.
- Will improve rehabilitation work with dependent on chemical psychoactive substances.
- Researchers and educators can use this work to improve their research or teaching.

Biography

Baitubaev Dyussengali Gabdullaevich studied medicine at Semey State Medical University, Semey city, Kazakhstan. For more than 35 years he has been working as a psychiatrist-narcologist, and for 20 years he has been studying the physiology of addiction to psychoactive substances. He has published more than 10 scientific articles in international journals.

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Adi Tzameret, Yael Piontkewitz, Anat Nitzan, Nir Rudoler, Marina Bruzel, Yael Zilberstein, Hana Ziv, Sarah Pri Chen, Arieh S Solomon*

The Goldschleger Eye Research Institute, Faculty of Medicine, Tel Aviv University, Israel

Mild carotid stenosis creates gradual, progressive, lifelong brain and eye damage: An experimental laboratory rat model

In humans, carotid stenosis of 70% and above might be the cause of clinical symptoms such as transient ischemic attack and stroke. No clinical or animal studies have evaluated mild carotid occlusion, and few examined unilateral occlusion. Here, Wistar rats underwent bilateral or unilateral carotid occlusion of 28%-45%. Long term effects were evakuated 9-1 months later. We conducted cognitive evaluation using spatial learningin a water maze and exploration behaviour in an open field. Morphology of the brain was examined by MRI using Diffusion–Tensor Imaging (DTI) and immunohistochemistry staining of the brain and eyes. Cognitive deficit was found in spatial memory and exploration behaviour in both occluded groups. Brain and eye histology presented severe damage in the bilateral occluded compared with unilateral. The results support our hypothesis that gradual formation of mild carotid stenosis along life course leads to progressive damage that may create different degenerative diseases at later age.

Audience Take Away Notes

- Those people who are related to medicine or even in para medical work will be aware in the everyday activity and take in consideration the existence of mild carotid occlusion that may have an impact in their research
- They will do their job in a better way
- Other faculty may take as a goal to find methods of preventing the damage of carotid occlusion.
- The presented research is an alarm to try and approach carotid occlusion from a completely other angle of view than of today and create a new protocol of treatment for that pathology

Biography

Arieh S Solomon is an MD graduate of Hadassah Medical School of the Hebrew University Jerusalem and a PhD graduate of the Faculty of Medicine of Tel Aviv University. He was a visiting Assistant Professor at the Medical College of Pennsylvania in 1989, creating a project related to regeneration of the spinal cord. He is active as an eye doctor and a researcher of basic translational research related to eye and brain He created a number of animal models for research that are an important platform for applicative research in human. Member of ARVO and Neuroscience. Reviewer of important journals in the field. Arieh S Solomon had published 115 peer reviewed articles and participated in 11 chapters in books.

Ahmed Noor Eddin, Khaled Hamsho, Ghaith Adi*, Mohammed Al Rimawi, Mohammed Alfuwais, Saleha Abdul Rab, Khaled Alkattan, Ahmed Yaqinuddin

College of Medicine, Alfaisal University, Riyadh, Saudi Arabia

Cerebrospinal fluid micrornas as potential biomarkers in alzheimer's disease

Alzheimer's disease (AD) is the leading form of dementia worldwide, but its early detection and diagnosis remain a challenge. MicroRNAs (miRNAs) are a group of small endogenous RNA molecules that regulate mRNA expression. Recent evidence suggests miRNAs play an important role in the five major hallmarks of AD pathophysiology: amyloidogenesis, tauopathy, neuroinflammation, synaptic dysfunction, and neuronal death. Compared to traditional biomarkers of AD, miRNAs display a greater degree of stability in cerebrospinal fluid. Moreover, aberrant changes in miRNA expression can be measured over time to monitor and guide patient treatment. Specific miRNA profiles and combinations may also be used to distinguish AD subjects from normal controls and other causes of dementia. Because of these properties, miRNAs are now being considered as promising and potential biomarkers of AD. This review comprehensively summarizes the diagnostic potential and regulatory roles miRNAs play in AD.

Audience Take Away Notes

- Researchers, clinicians, healthcare professionals, and students will gain valuable insight into the potential use of Cerebrospinal Fluid (CSF) microRNAs as biomarkers for Alzheimer's Disease (AD). As CSF microRNAs can be used to diagnose and predict Alzheimer's Disease, direct the creation of new therapeutic approaches, and assess the efficacy of treatments and track the progression of the disease, they are of great value
- This publication can broaden researchers' knowledge of the potential biomarkers in AD, enabling them to create experiments and studies focused on CSF microRNAs. Healthcare professionals and clinicians can use this knowledge to help detect, diagnose, and treat AD more accurately and in a timely manner. It offers a data-driven approach to guide decision-making and enhance patient care. Furthermore, it provides students with up-to-date knowledge on the evolving field of biomarkers in AD, helping them understand the molecular basis of the disease and its diagnostic implications
- Absolutely, this research can be a useful resource for other faculty members. This lays the groundwork for further exploration into CSF microRNAs and their potential as biomarkers for AD. Instructors can integrate this research into their instruction, conveying the most recent discoveries to students and motivating further research in the area
- Although the research on CSF microRNAs as biomarkers in AD may not have a direct effect on a designer's work, it provides insights that can be beneficial in an indirect way when designing diagnostic tools, therapeutic interventions, or clinical protocols related to AD. By comprehendingthe possible biomarkers and their implications, designers can create solutions that are in line with the diagnostic and therapeutic requirements of Alzheimer's disease patients
- This publication on CSF microRNAs as potential biomarkers in AD can help to enhance the accuracy of diagnostic and prognostic tools. This research offers fresh insights into the specific microRNAs linked to AD, aiding designers in developing more precise and sensitive diagnostic tests. Furthermore, it

provides insight into the disease mechanisms, allowing designers to create interventions that focus on the pertinent molecular pathways related to AD

- List all other benefits
    - **Early detection:** Utilizing CSF microRNAs as biomarkers can help in the early detection of AD, allowing for timely intervention and potential treatments that can modify the disease
    - **Personalized Medicine:** Comprehending the distinctive microRNA profiles in CSF can enable personalized treatment plans tailored to each patient
    - **Research Development:** This publication adds to the expanding body of knowledge on AD biomarkers, motivating further research and cooperation in the area
    - **Potential Cost Reduction:** If CSF microRNAs are confirmed to be reliable biomarkers, they could be a less intrusive and potentially more economical alternative to current diagnostic techniques such as PET scans or lumbar punctures
    - **Enhanced Patient Results:** The incorporation of CSF microRNA biomarkers into clinical practice could improve patient outcomes by allowing for earlier and more precise diagnosis, tailored treatment, and tracking of disease progression

Biography

Ghaith Adi embarked on their medical journey as a diligent student at Alfaisal University, where they pursued a Bachelor of Medicine and Bachelor of Surgery degree. Their thirst for knowledge led them to excel academically, earning recognition for their outstanding performance in medical sciences. With a burning desire to contribute to the field, Ghaith Adi actively engaged in research projects, collaborating with esteemed professors and mentors. Their dedication and perseverance resulted in several notable publications in renowned medical journals, showcasing their expertise and passion for advancing medical knowledge. Ghaith Adi is poised to continue their remarkable journey as a compassionate and knowledgeable physician, driven to make a positive impact on patient care and medical research.

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Generalized restless body syndrome: A case of opioid withdrawal-induced restlessness extending beyond the legs

Introduction: Restless Leg Syndrome (RLS) has been described in those undergoing opioid withdrawal as a factor exacerbating heroin dependence. RLS, however, has not been described as involving more than the legs. Therefore, a case of generalized Restless Body Syndrome (RBS) induced by opioid withdrawal is reported.

Methods: Case Report: The case involves a 67-year-old male with a history of major depressive disorder, Parkinson's disease, RLS, and chronic pain treated with opioids. Opioid use included hydrocodone/acetaminophen, hydromorphone, fentanyl patch, tramadol, and buprenorphine/naloxone. During opioid detoxification, he experienced new-onset restlessness throughout his body for three days, hindering sleep and prompting constant walking for relief. Restlessness resembled RLS sensations, affecting the thorax, abdomen, back of legs, lower back, arms, and legs, excluding the face. The sensation felt like periodic electric waves, worsened at night or during inactivity, and improved with walking. Similar sensations occurred during opioid or buprenorphine/naloxone withdrawal, particularly when reducing buprenorphine/naloxone to 1mg/day, and resolved upon reintroduction of buprenorphine/naloxone.

Results: Neurological Examination: Recent recall of 2 out of 4 objects in three minutes without improvement with reinforcement. Facial akinesia, decreased blink frequency, 2+ cogwheeling in both upper extremities, Stooped shuffling gait, and resting tremor in both upper extremities were noted. Neuropsychiatric Test: Go-No-Go Test: 4/6 (abnormal). Beck Depression Inventory Type-II score: 9 (Minimal depression). Michigan Alcohol Screening Test: 35 (Problem drinker). Center for Neurologic Study Lability Scale: 8 (average).

Discussion: The semiology of RBS exhibits similarities to RLS but involves additional areas such as the upper extremities, thorax, and back. While this could indicate a variant of RLS, it could also be a distinct condition. It has been observed that opioid withdrawal can trigger RLS and cause jerking movements in both upper extremities. Alternatively, this may not be RLS but rather a form of serotonin syndrome induced by opioid use, including fentanyl, and can result in generalized myoclonus. Although RLS associated with opioid withdrawal is well-documented, the underlying mechanisms responsible for its extension throughout the body, including the neck, remain unclear. One possibility is a generalized polyneuropathy affecting the upper limbs and lower extremities, particularly in iron deficiency. The coexistence of Parkinson's disease in this patient may have increased their susceptibility to RBS. Alternatively, dopamine replacement therapy used to treat Parkinson's disease may have rendered them more prone to abnormal movements, such as choreiform movements or sensations interpreted as a restless body. The absence of facial involvement suggests that the trigeminal spinothalamic tract was unaffected. It is plausible that variants of RBS may occur in individuals undergoing opioid withdrawal, potentially necessitating low-dose opioids for treatment. Therefore, evaluation of RBS as part of the assessment for opioid withdrawal is warranted.

Audience Take Away Notes

- It is plausible that variants of RBS may occur in individuals undergoing opioid withdrawal, potentially necessitating low-dose opioids for treatment
- Evaluation of RBS as part of the assessment for opioid withdrawal is warranted
- The discussion highlights the possibility of RBS being a variant of RLS or a distinct condition potentially associated with serotonin syndrome or generalized polyneuropathy

Biography

Dr. Nikita Mehdiratta pursued MBBS at India's Post Graduate Institute of Medical Sciences. She undertook a psychiatry externship with a special focus on research at the Smell and Taste Treatment & Research Foundation in Chicago, USA, which allowed her to gain insight into the intricacies of psychiatry research in the context of smell and taste. In 2023, she presented case reports at the American Psychiatric Association Annual Meeting and the European Congress of Psychiatry. These presentations demonstrate her passion for psychiatry and commitment to sharing the latest developments with the medical community.

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False-positive phencyclidine (PCP) result on 11-panel Urine Drug Screen (UDS) in a 17-year-old adolescent with long-term venlafaxine use

Venlafaxine is an antidepressant belonging to the class of Serotonin-Norepinephrine Reuptake Inhibitors (SNRIs) that is US Food and Drug Administration (FDA) approved to treat and manage symptoms of depression, anxiety, and other mood disorders in adults. Phencyclidine (PCP) is a dissociative anesthetic that became popular for recreational use in the 1970s. PCP use has rapidly increased in recent years; between 2005 and 2011, ED visits related to PCP have increased five to sixfold.

We describe an adolescent patient who likely had a false-positive phencyclidine (PCP) result detected with an 11-panel Urine Drug Screen (UDS) in an outpatient setting of long-term use of therapeutic venlafaxine extended-release (XR) for the treatment of recurrent MDD and GAD. We believe that this may be the first case report to characterize this phenomenon in a young patient in the absence of an acute overdose.

There is some evidence that venlafaxine's major metabolite, O-desmethylvenlafaxine (ODV), is in part associated with producing false-positive PCP results. One study prepared concentrations of venlafaxine or ODV in the laboratory, which resulted in positive results for PCP, indicating that there is some cross-reactivity between the drug and the metabolites with the PCP assay reagent. The other case report published in the literature among pediatric patients occurred in the setting of acute overdose. Our case presentation is unique in that it occurred in the absence of acute overdose and the medication was taken long-term.

While there is a possibility that there may have been PCP use by the patient, the false-positive PCP result and subsequent discussion can lead to the erosion of trust between the patient and the provider. Repeatedly asking about substance misuse in the absence of misuse can lead to continued mistrust. Patients are often in vulnerable states during their psychiatry visits since they share personal details about their lives that are seldom shared with others. Thus, we believe there is a need to warn patients regarding the association between venlafaxine extended release (XR) use and false-positive PCP results as a part of transparent communication during patient-centered care.

Venlafaxine remains one of the most prescribed medications in the United States for the treatment of depression, anxiety, and other mood disorders. There is a need to further study the association between venlafaxine metabolism and PCP assay reagents commonly used in UDS, particularly in pediatric patients, to improve patient-centered care.

Audience Take Away Notes

- We believe that this may be the first clinical presentation to characterize a phenomenon of false-positive PCP result in a young patient in the absence of an acute overdose
- Young patients are particularly vulnerable populations and moreover, false-positive results can erode the trust between the patient and the provider. There is a need to warn patients and clinicians regarding this possible association between venlafaxine XR use and false-positive PCP results to engage in patient-centered care

- New research efforts can be directed to improve accuracy and detection methods

Biography

Hyun Sue Kim, MSc graduated Summa Cum Laude from Northeastern University in 2019 with a Bachelor of Science in Health Sciences. During her undergraduate degree, she worked at Cardiff University in Wales as a research assistant. She then studied at the London School of Hygiene and Tropical Medicine and graduated with a Master of Science in Epidemiology in 2021. She is currently studying at the Virginia Tech Carilion School of Medicine and is expected to obtain her M.D. degree in 2024. She has published various research articles in intimate partner violence, public health interventions, and infectious diseases.

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From relief to aggravation: The intriguing tinnitus-opioid withdrawal paradox

Introduction: Opioids have been documented to induce tinnitus. However, tinnitus exacerbation with opioid withdrawal and relief upon re-administration of opioids has not been described.

Methods: Case report: A 37-year-old male presented with a persistent ringing sensation in his ears for three years after cessation of chronic heroin abuse. The constant static tinnitus was accompanied by high and low-pitched sounds. Heroin one gram IV or morphine 125 mg IV temporarily alleviated the tinnitus for 6-8 hours, necessitating recurrent injections. Buprenorphine 8 mg, thrice a day, significantly reduced the intensity of tinnitus. The patient experienced auditory hallucinations independent of tinnitus.

Results: Neurological examination: Cranial nerve VIII: Calibrated. Finger Rub Auditory Screening Test: standard. Weber and Rinne's tests: Negative. Decreased tinnitus intensity from 9/10 to 5/10 with mouth wide open. Psychiatric evaluation: Orientation: X 3. Suicidal thoughts with sad and congruent affect. Intact attention. Hypo-verbal speech. Slow thought process. Poor judgment and limited insight.

Discussion: Tinnitus linked to heroin withdrawal and its relief with heroin or opioids implies a temporal relationship. The reduction in tinnitus with the mouth wide open would be consistent with the sound not being derived from the auditory apparatus but rather as a variant of central psychosis auditory hallucinations ascribed to micro-laryngeal movements. Cortically mediated opening of mouth widely inhibits micro-laryngeal movements and thus auditory hallucinations. Opioids may inhibit tinnitus through their cortical effects rather than otological effects. Investigation for tinnitus in those with opioid dependence may reveal a subgroup of patients who may benefit from tinnitus-alleviating medications, thus reducing the risk of relapse.

Audience Take Away Notes

- Assessing tinnitus in opioid-dependent individuals can identify those who may benefit from tinnitus-alleviating medication, thus reducing relapse risk.
- The reduction in tinnitus with the mouth wide open would be consistent with the sound not being derived from the auditory apparatus but rather as a variant of central psychosis auditory hallucinations ascribed to micro-laryngeal movements.
- Tinnitus linked to heroin withdrawal and its relief with heroin or opioids implies a temporal relationship.

Biography

Dr. Nikita Mehdiratta pursued MBBS at India's Post Graduate Institute of Medical Sciences. She undertook a psychiatry externship with a special focus on research at the Smell and Taste Treatment & Research Foundation in Chicago, USA, which allowed her to gain insight into the intricacies of psychiatry research in the context of smell and taste. In 2023, she presented case reports at the American Psychiatric Association Annual Meeting and the European Congress of Psychiatry. These presentations demonstrate her passion for psychiatry and commitment to sharing the latest developments with the medical community.

Jee Young Lee[1], Joaquim J Ferreira[2], Hyeo Il Ma[3], Jose Francisco Rocha[4]*, Beomseok Jeon[5]

[1]Department of Neurology, SMG-SNU Boramae Medical Center, Seoul, South Korea
[2]Laboratory of Clinical Pharmacology and Therapeutics, Faculty of Medicine, University of Lisbon, Lisbon, Portugal
[3]Department of Neurology, Hallym University Sacred Heart Hospital, Anyang, South Korea
[4]BIAL–Portela & Ca S.A, Coronado, Portugal
[5]Department of Neurology, Seoul National University Hospital, Seoul, South Korea

Opicapone as first strategy for the treatment of wearing-off in Korean patients with parkinson's disease

Objective: This study aimed to explore the efficacy of Opicapone (OPC)-50mg or an extra dose of Levodopa (L- DOPA)-100mg to treat wearing-off in patients with Parkinson's Disease (PD).

Background: OPC proved to be effective for end-of-dose motor fluctuations in L-DOPA/dopa Decarboxylase Inhibitor (DDCi) treated patients with PD.

Methods: Prospective, multicenter, randomized, active-controlled (L-DOPA-100mg) and 4-week study. One- hundred and sixty-nine (169) PD patients were randomly assigned (1:1) to OPC-50mg once-daily (n=88) or L-DOPA-100mg (n=81). A 1-week screening-period was followed by a 4-week maintenance-phase. Primary endpoint was change from baseline in absolute OFF-time. Secondary endpoints include tolerability, Movement-Disorder-Society-Unified-PD-Rating-Scale (MDS-UPDRS), 8-item PD Questionnaire (PDQ-8) and clinical-global-impression of improvement/change (CGI-I, PGI-C).

Results: At week 4, mean (SE) change from baseline in absolute OFF-time of -62.1min (9.8) for OPC-50mg and - 16.7min (10.0) for L-DOPA-100mg, resulted in a significant difference of -45.4min (p-value: 0.0015). No significant differences were observed for MDS-UPDRS and PDQ-8 between groups. OPC-50mg treated patients tended to show higher percentage of improvement in both CGI-I/PGI-C. OPC was generally well tolerated, but Adverse-Event (AE) was more frequent for OPC-50mg (37.9% vs 18.5% in L-DOPA-100mg) with dyskinesia (6.9%) as the most common AE.

Conclusions: Opicapone 50mg can be considered a potential first line therapy to treat wearing-off versus the standard L-DOPA approach.

Reshma Paul*, Roshni M Gandhi, Martin O Job

Department of Biomedical Sciences, Cooper Medical School of Rowan University, 401 S Broadway, Camden, New Jersey, United States

A higher selectivity for sigma1 relative to sigma2 receptors is associated with lower efficacy in achieving a dose-dependent attenuation of cocaine consumption

Background: There is an epidemic of Psychostimulant Use Disorders (PUD) in the United States. In addition to the Dopamine Transporter (DAT), cocaine also exerts its effects via the sigma receptors, and sigma receptors may represent a promising pharmacotherapeutic target. However, it is not clear which of the sigma receptors (sigma1 and sigma2) plays the more important role in cocaine's effects.

Objective: In this study, we compared the efficacy of ligands with different selectivity for sigma1 versus sigma2 receptors to suppress cocaine consumption dose-dependently. Methylphenidate (MPH) is a Dopamine Transporter (DAT) inhibitor. BD1063 and BD1008 are sigma receptor antagonists. BD1063 has a higher selectivity for sigma1:sigma2 than BD1008. Based on 1) the assumption that sigma1 is more important in the mechanism of cocaine consumption and 2) the sigma1 versus sigma2 receptor selectivity of these ligands, we hypothesized that a combination of DAT inhibitor (MPH) and BD1063 should have a higher efficacy than a combination of the same DAT inhibitor and BD1008.

Methods: Rats were trained to self-administer cocaine. We assessed the effects of combinations of MPH (1 mg/kg i.p.) and different doses of (a) BD1063 (sigma1/sigma2 selectivity = 70.9, doses = 0, 3.2, 10 mg/kg i.p.), and (b) BD1008 (sigma1/sigma2 selectivity = 7.8, doses = 0, 3.2, 10 mg/kg i.p.). Behavioral economic analysis of cocaine demand curves were employed to quantify the cocaine consumption at zero price (Q0). Linear regression analysis was used to assess the dose-dependency of the effects of these ligands on cocaine Q0.

Results: Combinations of MPH and BD1008, but not combinations of MPH and BD1063, exerted dose-dependent suppression of cocaine Q0. Our results suggest that higher selectivity for sigma1 relative to sigma2 receptor is associated with lower efficacy in exerting a dose-dependent suppression of cocaine Q0.

Conclusions: Higher selectivity for sigma1 relative to sigma2 receptor is associated with lower efficacy in exerting a dose-dependent suppression of cocaine Q0. Sigma 2 may be the more important receptor in the mechanism of cocaine consumption.

Audience Take Away Notes

- The information in this presentation will provide researchers with new information on sigma receptors that may help push more research toward the sigma2 receptor
- This research will help normalize and further research in drug targets for cocaine addiction, as there are currently few options for psychostimulant use disorders
- This research can motivate other medical students to participate in addiction medicine research and broaden their skills when working with substance use patients in practice

Biography

Reshma Paul graduated from New Jersey Institute of Technology in 2021 with a B.S. degree in Biomedical Engineering. While at NJIT, she worked in a biomaterials lab, KumarLab, focusing on identifying potential drug targets for wound healing hydrogels. She then went on to study at Cooper Medical School of Rowan University. She is currently a third year medical student on clerkship rotations. She works with Dr. Martin O. Job in the department of biomedical sciences on Psychostimulant Use research.

BOOK OF ABSTRACTS

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DAY 02

KEYNOTE FORUM

JOINT EVENT ON

NEUROLOGY & ADDICTION

What is wrong with me? The effects of Post-Acute Sequelae of SARS-CoV-2 infection (PASC) long COVID on youth with substance use disorder

This presentation will address the multidisciplinary neuropsychological assessment and intervention services for youth with long COVID (PASC) coupled with sustaining recovery involving substance use disorder. However, since the impetus of COVID-19 as of March 2020, many children and youth worldwide have experienced and suffered the ramifications of fall-out from PASC. An area that has brought complexity to the assessment and intervention process is PASC's couple with youth in recovery involving Substance Use Disorder (SUD). Developmental histories of youth typically review for interview(s) of parents/guardians and school professionals, academic records for grades including teacher comments, classroom observations, and other qualitative and quantitative sources of medical history. However, further impact and benefits of neuropsychological assessment, the use of additional tools helpful to assess the fall-out of PASC, and wrap-around services will be explored. Overall, this presentation will suggest areas to look further beyond a standard developmental history to include various aspects of psycho-educational, neuro- educational, and medical co-morbidities coupled with substance use disorder, that may impact a youngster's return to life demands and learning.

Audience Take Away Notes

- Review of the World Health Organization (WHO) definition of post COVID-19 (PACS)
- Exposure to the long COVID (PASC) National Research Action Plan (2022)
- Research studies that will guide specific neuro-cognitive areas to assess involving PASC
- A proposed extended PASC developmental history involving 6 neurocognitive areas will be reviewed
- Exploration of a three Prong Index to assist with conceptualization of a neuropsychological assessment
- Exposure to neuropsychological tools to assist with wrap around services via the implementation of a brief case analysis

Ann Marie Leonard Zabel

Department of Psychology and Department Coordinator, Curry College, Milton, MA. United States

President of NEALAC Clinic (Private Practice), Cape Cod, MA United States

Biography

Dr. Ann Marie Leonard-Zabel is a Full Professor of Psychology and Department Coordinator at Curry College. She received awards from Curry College involving Person of the Year, Excellence in Teaching, Excellence in Research, Excellence in Partnership Collaboration and Woman of Inspiration. She is a frequent speaker and keynote at national and international conferences involving School Psychology, School Neuropsychology, Disability Analysis, Homeland Security, Violence-Aggression, Forensic Examining, Autism, Trauma, A-D/HD, COVID-19 Effects on Pediatric Learning, Ethics, and Addictions. In addition, she owns a private international practice specializing in evaluations and consultation for neuro-behavioral learning disabilities, neuro-developmental disorders, emotional-behavioral disorders, forensic examiner evaluations and substance use/abuse disorder. Dr. Leonard-Zabel has written training programs in Autism, Mental Health, Learning Disabilities, Telepractice Therapy, Diversity-Equity-Inclusion, as well as chapters in Ethics, TBI, Addictions, and Forensics. Dr. Leonard-Zabel is a Board of Director for the Learning Disabilities Worldwide Congress and a is one of a group of the Global Goodwill Ambassadors-USA for the Global Goodwill Ambassador Foundation focusing on the UN SDG 3 - Good Health and Well-Being (strengthen the prevention, assessment and treatment of substance use disorder) and SDG 4 - Quality Education (disabilities and human rights) and SDG 16 - Promote Peaceful and Inclusive Societies (decrease violence and abuse of children). She received the Lifetime Achievement award in School Neuropsychology and the Distinguished Lifetime Career Achievement award from the American Board of Disability Analysts.

Beyond self-limiting and addictive cultural scripts: Archetypal energies as a framework to "heal" addictions and evolve human consciousness

Dr. Ferguson will discuss how culture influences perceptions and how to recognize and move beyond self-limiting and addictive cultural scripts that are not serving humanity well. He will provide a definition of culture and discuss how we can best manage what he calls the "culture-in-the-Self". Based on his award-winning book, Evolving the human race game: A spiritual and soul-centered perspective, he will also discuss what he calls archetypal energies as a framework to assist humanity in moving beyond self-limiting and addictive cultural scripts, to "heal" addictions, and to evolve human consciousness.

Audience Take Away Notes

- Six ways that culture influences perceptions and how some cultural scripts can lead to transformative effects or to deleterious self-limiting effects
- Twenty-five archetypal energies, what they are and their three basic functions, and how they can assist us in moving beyond self-limiting and addictive cultural scripts
- Implications of archetypal energies as a framework to "heal" addictions and evolve Human Consciousness and to move us toward our optimal selves and optimal realities

Carroy (Cuf) Ferguson

University of Massachusetts-Boston, United States

Biography

Dr. Carroy (Cuf) Ferguson has a Ph.D. in Psychology from Boston College. He has been President or Co-President of the Association for Humanistic Psychology since 2006, the first African American and first person of color to be President of this National Association. A tenured full professor and former dean at the University of Massachusetts-Boston. He currently serves as Human Services Program Director. He cofounded two visionary organizations (Interculture, Inc.; Associates in Human Understanding). He is also a clinical practitioner, a consultant, Associate editor of the Journal of Humanistic Psychology, an award winning author (e.g., Evolving the human race game).

Addiction: A problem of motivation, free will or selfdestructive behavior?

Popular stereotypes of addiction emphasize loss of free will, sometimes based on irresistible urges. The recently popular "brain disease" theory of addiction likewise emphasizes on the inability to stop using despite wanting to quit. This talk reviews a massive literature indicating that free will remains intact among cigarette smokers — instead, changes occur in automatic processes and desires. Moreover, it proposes a new dimension for addiction theory, namely the distinction between process and outcome, which may have separate affects on addictive behavior. Improved understanding of addiction may require replacing the long-running quest for a single formula with a pluralistic framework.

Roy F Baumeister

Harvard University, United States

Biography

Roy F. Baumeister is one of the world's most prolific and influential psychologists. He has published over 700 scientific works, including over 40 books. In 2013, he received the highest award given by the Association for Psychological Science, the William James Fellow award, in recognition of his lifetime achievements. He is currently president-elect of the International Positive Psychology Association and has ties to the University of Queensland (Australia), Florida State University (USA), and the University of Bamberg (Germany).

Although Roy made his name with laboratory research, his recognition extends beyond the narrow confines of academia. His 2011 book Willpower: Rediscovering the greatest human strength (with John Tierney) was a New York Times bestseller. He has appeared on television shows such as Dateline NBC and ABC's 20/20, as well as on PBS, National Public Radio, and countless local news shows. His work has been covered or quoted in the The New York Times, The Washington Post, The Wall Street Journal, Los Angeles Times, The Economist, Newsweek, TIME, Psychology Today, Self, Men's Health, Businessweek, and many other outlets.

Patterns of alcohol use, alcohol research and genomic pathways on alcohol dependence in India

India, which has a vast and long cultural heritage, interestingly, does not fit into the usual conceptualization of cultures as abstinent, ambivalent, permissive or over-permissive cultures. Traits of both abstinence and permissiveness towards drinking have always existed across the Indian population. Historically, in the vedic times alcohol use while was permissible to warrior communities, the upper and elite communities. The post independence India has witnessed changes in pattern of alcohol consumption.

Another interesting aspect of alcohol consumption in India is its pattern. Now, alcohol consumption is not only common but alcohol problems affect individuals from all sections of society regardless of their cultural background, educational background, religion, gender or age. Over the past decades, a number of treatment options have been developed for people with alcohol use disorders and considerable progress has been made both in pharmacological and psychosocial interventions for alcohol dependence.

A comprehensive online and hand-search of the Indian literature on alcoholism was conducted. Among studies on epidemiology, National Household Survey with a nationally representative sample revealed that 25% of the adult males were current alcohol users of which~ 20% were alcohol dependent. Numerous studies have focused on the clinical course, treatment seeking, and outcomes showing that only a minuscule fraction (~2%) of alcoholics seeks treatment. Factors associated with better and poor outcome have also been delineated. Comorbity rates of alcoholism with other psychiatric disorders vary 20% to 50%. Psychosocial issues have also been addressed. Others have highlighted contribution of drinking to family burden, domestic violence and high risk sexual behaviors leading to greater risk of HIV transmission.

The health sector in India is well aware of the harms associated with drinking. Almost all substance abuse treatment facilities provide treatment for alcoholism. At a policy level, though the constitution of India directs the state to take all the necessary measures to promote prohibition. Thus the Indian society remains a culture-in-transition in many respects including its pattern of alcohol consumption.

Many biological studies have been conducted on health consequences of alcoholism, association of alcoholism with various adverse affects such as Cardiac, Neurological, Gastroenterological and Metabolic consequences. This talk would enlighten the audience on Patterns of alcohol use, alcohol research and summarize on Genomic pathways initiated by me for the first time on Indian population.

Meera Vaswani

WHO Collaborative National Drug Dependence Treatment Center All India Institute of Medical Sciences, India

Biography

Dr. Meera Vaswani is a Professor at WHO Collaborative National Drug Dependence Treatment Center, All India Institute of Medical Sciences, New Delhi, India. She has been awarded with “International Visiting Exchange Faculty Award” and “Distinguished International Scientist Collaborative Award” (DISCA) both from NIDA for which she worked in US Universities. She has been recipient of United Nations Fellowship for which she worked in University of Glasgow, Scotland, UK. She has been Chairing Scientific Sessions on “Addiction” in American Psychiatric Association meeting since 2002. She has been Visiting Professor at Rutgers University, University of Iowa and University of Minnesota. She is a “Fellow of Royal Society of Chemists” (FRSC, London). She was invited by Japan to represent India in formulating by-laws of “Asia Pacific Society for Alcohol and Addiction Research”(APSAAR) and was Nominated as the founder Board of Directors from India. She has been Nominated as member of “Board of Directors” by Scientific Council of Skibbereen University, UK.

It could be safely concluded that though country has a huge research experience on most epidemiological and clinical aspects of alcoholism, there is still a lot of potential for improving the quality of biological research on alcoholism.

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DAY 02

SPEAKERS

JOINT EVENT ON

NEUROLOGY & ADDICTION

Kimberley L Berlin
Compassionate Beginnings, LLC, United States

Rise in recovery: The neuroscience of spirituality for healing addiction

Alcohol and substance abuse disorders have baffled the medical community for centuries. Though these conditions can be arrested, there is no known "cure": One drink, or one drug, can undo decades of abstinence and return a person to a state worse than when they left off. More than a neurological or physical disorder, addiction eats at the soul.

Rise in Recovery: The neuroscience of spirituality for healing addiction merges modern day neuroscience with the wisdom of the ancients to help individuals navigate to a higher dimension of recovery than ever thought possible. While many approaches offer "meditation" as a tool for recovery, Rise offers spirituality as an evidence-based path in recovery.

Much has been written about spirituality and healing the brain. Little has been written about how spirituality can heal the brain from addiction. Understanding the connection between science and the human spirit casts new light on what the experience of "recovery" can truly mean.

Examining the foundations of addiction, neuroscience and spirituality, this session presents numerous ways in which individuals in recovery can be guided to healing through research- based approaches. When we can engage clients in connecting to their Self-energy and to develop a relationship with the transcendent, we can help them to experience a profound dimension of human experience.

Audience Take Away Notes

- Understanding what "spirituality" means and how a variety of practices can engage the brain in neuroplasticity, the specific tools and techniques presented will give participants the opportunity to easily share these with clients. This presenter encourages further clinical research to build on the existing body of knowledge published by researchers such as Andrew Newburg, MD, Rick Hanson, PhD, Daniel J. Siegel, MD, Lisa Miller, PhD, Mario Beauregard, PhD, Daniel G. Amen, MD, and Richard J. Davidson, PhD

Biography

Kimberley L. Berlin, LCSW, graduated with her MSW from Florida International University in 1994. She attended University of Southern California doctoral social work program and transitioned to a position in the federal government focused on welfare reform. In 2010 she decided to return to her passion, clinical psychotherapy with individuals struggling with substance abuse disorders. She is the owner and operator of Compassionate Beginnings, LLC. She has written articles for Social Work Today, Advances in Addiction, and in the public domain. Public speaker, presenter, educator. "Rise in Recovery" is a forthcoming book to be released in 2022-2023.

Richard I Suarez*, Jenny Fortun

Office of Medical Education, Florida International University Herbert Wertheim College of Medicine, Miami, FL, United States of America

Combatting “neurophobia”: A proposed educational model to promote “neurophilia”

When we reflect on medical education as a whole, novelty in structure and content promotes growth and enhances student outcomes. The teaching of neurology is no different and presents a more unique hurdle in its instruction considering the well-described phenomenon of “neurophobia”. With the burden of neurological diseases on the rise, there is a heightened demand on medical educators to understand the possible causes of this educational misalignment and implement solutions necessary to ensure adequate education of students. Here, we describe a novel approach to neurology education for 2nd year medical students to stimulate "neurophilia", incorporating evidence-based approaches within the identified areas—Active Learning Pedagogies, Diagnostic and Clinical Reasoning, Use of Technology, Field Exposure and Mentorship, and Innovation. Students demonstrated superior academic performance on the National Board of Medical Examiners (NBME) neurology assessments, and general positive feedback to the use of the innovative approaches to teaching and learning. Overall, we propose this method of teaching neurology as a successful model educational platform that incorporates the areas needed to reduce “neurophobia” and promote “neurophilia”.

Audience Take Away Notes

- By the end of this presentation, you should be able to
- Define the educational phenomenon of “neurophobia”
- Explain the four areas promoting “neurophobia” and the five evidence-based interventions that can be used to generate “neurophilia”
- Understand how the proposed model addresses the problems surrounding “neurophobia” and provides solutions.
- Assess the adaptability of the model and the principles presented within to implement into different medical school curricula

Biography

Richard Suarez received his B.S. in Biological Sciences and his B.A. in Interdisciplinary Studies from Florida International University (FIU). He completed his J.M. in Health Care Regulation from the Florida State University College of Law. He is currently pursuing his M.D. degree from the FIU Herbert Wertheim College of Medicine among the Class of 2024. He conducts research in medical education and health policy. Richard has presented at numerous research conferences, such as the Florida Medical Association Annual Meeting, among others. He has also earned various honors including being inducted into Alpha Omega Alpha and the Gold Humanism Honor Society.

Martin Makela

Department of Emergency medicine, University of Washington School of Medicine Seattle, WA, United States

Binge alcohol use: Why the greek system?

Binge alcohol use is a significant cause of morbidity and mortality in the under 25 age group. Nowhere is this more prevalent than the organizations of the college fraternal system. The author has completed more than ten years of direct interactions withing the local fraternity and sorority system teaching and counselling more than 5000 students. The presentation encompasses the lessons learned from those interactions and explores some of the root causes of alcohol use in this population.

Audience Take Away Notes

- Understand the modern college Greek experience and why alcohol is prevalent
- Understand and learn how to counsel students regarding need for emergent help
- Discuss gender differences regarding effects and morbidity of binge alcohol use

Biography

Dr. Martin Makela is a practicing Emergency Physician at the University of Washington Medical Center. During his ten year tenure as the Medical Director, he was focused on reducing student death, assault, and injury from binge alcohol use. Having been a member of a UW fraternity, and having his children recently within the Greek system, he is uniquely qualified to discuss the causes of binge alcohol uses within that system. He has spent the last ten years lecturing and counseling within the local fraternities and sororities to more than 30 houses and 5000 students. He is a 1995 graduate of the University of Washington School of Medicine and joined the Emergency Medicine faculty following a 22 year career in the US Navy. His career included a tour leading a combat hospital in Fallujah, Iraq for which he received the Bronze Star. He has won many teaching and patient care awards in his 15 years at the University of Washington, including a safety award directly connected to his work within the Greek system.

Sparkles Ransom
Licensed Clinical Social Worker, Douglasville, GA, United States

Barriers hospital social workers experience accessing treatment for substance use disorder patients since the COVID-19 pandemic

The purpose of this study was to explore the barriers hospital social workers experience when accessing treatment for patients with Substance Use Disorders (SUDs) since the start of the COVID-19 pandemic. Barriers to SUD treatment prevent patients with SUDs from receiving the care that they need for recovery. In addition, these barriers prevent hospital social workers from effectively assisting SUD patients. If hospital social workers are able to access treatment for SUD patients, it negates the challenge of promptly discharging patients. More accessible SUD treatment will allow hospital social workers to help decompress emergency rooms, hospital length of stay, and readmissions. Most importantly, it will help social workers get SUD patients the treatment they need in a timely manner so that the patient does not lose interest in services. A total of 90 hospital social workers participated in the study. The participants were recruited from three healthcare systems in the metropolitan Atlanta area: one public hospital and two private hospitals. An exploratory mixed research design was employed, and a survey designed specifically for the study was used to gather the data. The survey measured barriers participants experienced when accessing treatment for SUD patients. Descriptive statistics analysis was used to describe hospital social workers' perceived barriers of availability of services, referral wait time, and patients' ability to pay. Last, content analysis was used to analyze the open-ended questions related to participants' experiences. Hospital social workers experienced moderate barriers related to availability of services and referral wait times when accessing treatment for SUD patients. However, they experienced extreme barriers related to patients' ability to pay. Although the conclusions from this study are preliminary, the study revealed that the COVID-19 pandemic exacerbated the barriers hospital social workers experienced when attempting to provide services to SUD patients.

The following areas will be discussed, review of the literature: substance abuse and COVID-19, social work and substance abuse, Barriers to treatment, and historical overview of substance abuse policies; research findings, implications for pratice and policy.

Audience Take Away Notes

- The audience will learn the historical perspective of hospital social work and substance use disorder patients
- COVID-19 pandemic impact on SUD treatment access and policy implications
- How barriers to SUD treatment impact the healthcare system and patients

Biography

Dr. Sparkles Ransom is a Licensed Clinical Social Worker (LCSW) from San Francisco, CA. She Studied Social Work at Barry University School of Social Work, Miami, Fl and graduated with a MSW in 2013. Dr. Ransom has over 16 years of experience working with children and families, Medicaid, Substance Abuse, and varied populations. She has years of experience working in a safety net hospital. She recently received her Ph.D. in Social Work policy, planning, administration and social science from Clark Atlanta University, Atlanta, GA May 2023. Dr. Ransom is currently a Senior Social Worker at the VA hospital in Atlanta, GA.

Stephanie Cross
WA Department of Children, Youth, and Families, United States

Report on JR substance use disorder & treatment needs

This report is a snapshot of clients who were in either a Juvenile Rehabilitation (JR) institution or community facility in Washington State on Aug. 11, 2021 (N=332).

While this study does indicate that some clients with high treatment need are receiving treatment, the majority of these clients with SUD treatment needs were not receiving treatment (64%) at the studied moment in time. This study also found that clients initially scoring as having little or no treatment needs are often later identified as having a SUD treatment need, showing the possible benefit of administering screening tools that are more exhaustive. JR is encouraged to reexamine the current SUD assessments being used (GAIN-SS and ASUA) to ensure the assessments are accurately identifying clients with SUD treatment need and in a timeframe that provides the client with a greater opportunity to access treatment.

It is clear that JR needs to find ways to expand evidence-based SUD treatment services to a larger proportion of the JR population. This can be accomplished with more SUD treatment dedicated staff and more funding dedicated to evaluating current SUD treatment programs and expansion options. JR is currently onboarding significant resources from targeted funding for SUD treatment in the form of nine full time employees in institutions, re-classifying all SUDPs for retention, and increasing aftercare at community facilities and within the community through community-based contracts.

Biography

Stephanie Cross graduated in 2007 with a MS in Administration of Justice, specializing in statistics/research methods from Portland State University (PSU) in Portland, Oregon and then went on to work as a research associate for the United States Sentencing Commission in Washington, DC. In 2011 Stephanie moved back to Portland to pursue her Ph.D in Public Affairs and Politics specializing in Criminal Justice at PSU. She taught both Crime Analysis and Theories of Crime during her time as a doctorate student at PSU. In 2016 Stephanie moved to Olympia, Washington where she was a juvenile justice analyst for Washington's Statistical Analysis Center, eventually moving on to work for Washington's Dept. of Children, Youth, and Families where she currently does research in conjunction with Seattle Children's hospital, focusing on substance use disorder among juvenile justice youth.

Yihong Yang
Neuroimaging Research Branch, National Institute on Drug Abuse, National Institute of Health, United States

Identifying neuromodulation targets for treatment of substance use disorders

Substance Use Disorder (SUD) is a chronic psychiatric disorder characterized as compulsive drug seeking and taking, as well as repetitive relapse during withdrawal. From a neurocircuitry perspective, SUD is associated with disruptions of multiple brain circuits and networks that underlie these addiction related behaviors. Recently, non-invasive neuromodulation techniques such as Transcranial Magnetic Stimulation (TMS) have shown promise in therapeutic treatment of psychiatric disorders including SUD. However, the target of brain regions/circuits for optimal neuromodulation-based treatment of SUD remains largely unknown. In this presentation, we will discuss three strategies to find optimal neuromodulation targets. First, neuromodulation sites are identified based on neuroimaging and SUD-relevant behaviors (e.g., drug relapse). This will be illustrated by an example of using functional MRI and cocaine relapse follow-up to find potential TMS treatment sites in the dorsolateral prefrontal cortex. Second, neuromodulation sites are identified based on meta-analyses of psychiatric disorders. A newly developed approach that targets the pathological network of the brain will be demonstrated in major depressive disorder and auditory hallucinations of schizophrenia, which can also be used in SUD. Third, neuromodulation sites are identified based on animal models of drug addiction. An example of imbalanced fronto-striatal circuits as potential targets of treatment in a rat model of compulsive drug taking will be shown. These cutting-edge approaches based on imaging markers provide opportunities to identify efficacious targets for treatment of psychiatric disorders including SUD.

Audience Take Away Notes

- The audience will learn non-invasive neuromodulation techniques such as Transcranial Magnetic Stimulation (TMS) in the treatment of psychiatric disorders
- The audience will learn cutting-edge approaches to identify neuromodulation targets for treatment of substance use disorders
- Detailed examples will be given to illustrate these new approaches and the audience will have opportunities to apply these techniques in their research or clinical practice

Biography

Dr. Yihong Yang is a Senior Investigator of the National Institutes of Health (NIH) and Chief of the Neuroimaging Research Branch at the National Institute on Drug Abuse (NIDA). He has been developing neuroimaging and neuromodulation approaches and has been applying these techniques to substance use disorders. He has published over 220 original research papers and served on several research foundations. He was elected as a Fellow of the International Society for Magnetic Resonance Imaging in Medicine (ISMRM) in 2017 and Fellow of the American Institute for Medical and Biological Engineering (AIMBE) in 2018.

Alyssa Nieves
Psychological Science, Cal State San Marcos, San Marcos, CA, United States

Opioid education as a preventative tool: A study on harm prevention

With the opioid epidemic on the rise there has been a significant increase in overdoses and drug related deaths (McMahan et al., 2022). The current study aims to educate participants on the dangers of opioid use and understand the role harm reduction has as a preventative measure in reducing opioid related overdose. Are discussions of opioid education associated with higher levels of confidence in adult's ability to respond in emergency situations? Secondly, does participation in a harm reduction education training influence increased awareness in opioid overdose symptoms/signs? We hypothesize that opioid education will be associated with higher levels of confidence in adult's ability to respond in emergency situations. In addition, we hypothesize participation in a harm reduction education training will be associated with increased awareness in opioid identifying overdose symptoms/signs. Previous research has suggested educating people in harm reduction methods has been useful in preventing overdose on opioids specifically overdose associated with fentanyl poisoning (McMahan et al., 2022). Overdose prevention measures and public health interventions have been shown to be beneficial in combating these negative influences (Bardwell et al., 2021). With the opioid epidemic on the rise, opioid related deaths are increasing at a drastic rate. The current study is a convenience study. Data collection is expected to conclude once the target sample size of 200 participants is reached. Further research on harm reduction education is essential to understanding and raising awareness to combat the rate of opioid related overdose and deaths.

Audience Take Away Notes

- The audience will receive informative information on opioid education, have access to harm prevention training and learn how to identify and respond to an opioid overdose
- Harm prevention training is essential in all situations by being informed and knowing the signs it can save a life.
- This research is helpful to everyone and can be used to both educate and spread awareness as it pertains to opioid education
- Harm prevention training serves as a practical preventative tool to combat the opioid epidemic. It provides individuals with knowledge and the confidence on how to respond in emergency situations
- Further research on harm reduction education is essential to understanding and raising awareness to combat the rate of opioid related overdose and deaths.

Biography

Alyssa Nieves is a Psychological Science major and Art, Media and Design minor at Cal State University, United States. Since transferring to a 4-year University she has been actively involved on campus. She is a TRIO McNair Scholar and is currently involved with research on harm prevention to raise awareness on the dangers of opioid use. She joined the research group of Dr. Huynh at The Culture, Diversity and Reasoning Lab at Cal State San Marcos (CSUSM). Currently she is conducting research with Dr. Grabow of Cal State San Marcos on The Association of Trauma and Fentanyl. Her research interests are trauma, mental health, healthy relationships and drug and alcohol treatment. She aspires to be a psychologist with a specialty in trauma to offer a safe space for her clients to heal.

Izabela Maciel Saraiva*, Bruna de Conti Gramz, Bruna Ronchi, Melina de Castro

Hospital de Clinicas de Porto Alegre, Porto Alegre, Rio Grande do sul, Brazil

Case report of epileptic seizure due to zolpidem withdrawal in a previously healthy young man

In this paper we will present the clinical evolution of zolpidem withdrawal in a previously healthy young man. He is a 28-year-old, healthy young man who lives in the mid-west of Brazil and is an english teacher. After the COVID pandemic in 2019, with a shift to work at home office, increased anxiety and use of screens, the young generalized anxiety, panic attacks and mixed insomnia began. He continued to self-medicate with zolpidem 10mg. After a few weeks, with an increase in the tolerance of the medication, increasing doses were used until using 3 pills at night. After the end of social isolation, it was necessary to reduce the medication dosage to attend appointments and classes in the morning. Then he had a tonic, clonic, generalized convulsive crisis, with mild head trauma while working in the classroom. In all there were 12 crises. He performed some tests that showed:

Neurophysiology electroneuro during wakefulness and sleepiness showing generalized nonspecific intermittent disorder, suggestive of corticosubcortical dysfunction.

MRI within normal limits. Treatment was stated with valproic acid, escitalopram and slow and gradual withdrawal of zolpidem. For 8 months he has been without seizures.

The case report above serves as a warning for the importance of using zolpidem as a potential drug of abuse, especially in patients who self-medicate and have co-morbidities with other mood disorders.

The case report was authorized by the patient and complies with all ethical standards.

Audience Take Away Notes

- Audience will learn from my presentation that besides zolpidem is the first line treatment for insomnia in adults in the United States, we observe in practice numerous hazards and cases of abuse. This should endorse further research about long term use of zolpidem and its consequences, as the need from newest drugs and therapies for insomnia

Biography

Dra Izabela Saraiva studied medicine at Universidade Federal de Goias, Brazil and graduated in 2017. She worked with emergency as a general practitioner for a year. She then joined the medical residency in psychiatry at the Hospital de Clínicas de Porto Alegre, Brazil, one of the best programs of psychiatry of Brazil. She was able to learn from the best professors and researchers. Nowadays she work for SUS, the Brazian Public Health system as well as in her online private office.

Christopher Ashton
Program Director, TeDDs on Chapel, New Brunswick, Canada

Crossed wires: The hall effect in substance use disorder

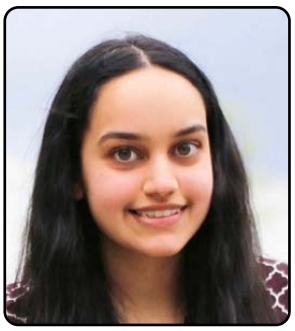
The underlying neuroscience of substance use disorder is becoming well elaborated. Nonetheless, some of the more subtle symptomatology is not well matched with underlying organic processes identified to date. The ability to explain mental phenomena with underlying brain processes is a strong part of the literature and valuable to those caring for persons. This article draws on current knowledge of the fundamentals of substance use disorder and expands on current literature surrounding axonal demyelination to suggest a likely mechanism for thought disorders commonly experienced by persons in recovery. Viewing demyelination and conduction through an analogue lens is more likely to represent the physics involved more accurately than an 'on or off' signaling model as associated with action potentials. Additionally, this approach is thought to better enunciate the underlying physiology behind mental features characteristic to the disorder.

Audience Take Away Notes

- The audience will learn that abnormalities of the white matter (axons) in the brain can be a major cause of subtle mental symptoms for people with SUD
- Gaining a better insight into this aspect of neurobiology of SUD allows professionals the opportunity to better assess, understand and make recommendations to their clients
- A suggested approach to non-invasively measure neural pathway (white matter) conductivity characteristics is given
- Yes, this suggests a far less expensive and technically challenging invasive procedure through the use of magnetic fields
- Yes, this suggests a far less expensive and technically challenging invasive procedure through the use of magnetic fields
- More accurately and inexpensively assess axonal function and gauge progress through recovery

Biography

For over 3 decades, Chris has worked as a healthcare and interdisciplinary professional as a primary care practitioner, innovation research consultant and current program designer and lead at TEDDs On Chapel Recovery Residence. Educated in engineering physics, medicine and business (BEng, MD, MBA (Finance) and CE (Harvard)), Chris brings a unique perspective and personal story to the understanding and treatment of substance use disorder and assessing what is truly evidence-based and best practices.



Roshni Gandhi[1]*, Reshma Paul[1], and Martin O. Job[2]

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Sigma-2 receptors appear to be more relevant than sigma-1 receptors in the mechanism of cocaine consumption

The health problems associated with psychostimulant abuse have become an epidemic with huge socioeconomic impacts. Currently, there are no FDA approved drugs for the management of psychostimulant use disorders, and therefore it is important to identify the mechanisms governing psychostimulant use to advance knowledge related to the development of pharmacotherapies.

There is evidence that drugs with dual affinity at the Dopamine Transporter (DAT) and the Sigma-Receptors (sigma-R) or combinations of DAT Inhibitors (DATi) and sigma-R ligands suppress the consumption and reinforcing effects of psychostimulants such as cocaine. There are two identified subtypes of sigma-R, namely Sigma-1 and Sigma-2 receptors (sigma-1R and sigma-2R) which are thought to play a role in psychostimulant effects, but it is not clear what comparative roles these receptors may play in the consumption and reinforcing mechanisms of psychostimulants. The consensus in the field is that sigma-1R is more important than sigma-2R in cocaine's mechanism.

However, based on prior research, we hypothesized that the sigma-2R may play a greater role in suppressing cocaine reinforcement than the sigma-1R.

First, a comprehensive review of the literature was conducted to understand the comparative roles these two receptors in cocaine consumption and reinforcement. Next, male Sprague Dawley rats were treated with either (a) rimcazole, (b) methylphenidate + BD 1063 (affinity for sigma-1R > sigma-2R), or (c) methylphenidate + BD 1008 (affinity for sigma-2R > sigma-1R), and the effects on consumption of cocaine when cocaine is freely available was measured.

Based on demand curves and models, this research shows that drugs with high affinity for DAT and greater selectivity for sigma-2R relative to sigma-1R were more effective in suppressing cocaine reinforcement. The implication for the field is that sigma-2R may be more relevant than sigma-1R in the mechanism of cocaine reinforcement.

Audience Take Away Notes

- The current consensus in the field is that sigma-1R are more important in the mechanism of cocaine consumption, but hopefully this research can demonstrate the importance of sigma- 2R and help drive research in that direction
- Psychostimulant abuse has become an epidemic, and members of healthcare are constantly faced with the challenge of how to best manage the disease. Learning more about the mechanism in which cocaine exerts its actions on the brain can also help the audience guide management practices
- This research is something that other faculty can use and build upon by allowing them to research a whole new set of substrates that target sigma-2R while developing more effective therapeutics for cocaine addiction

Biography

Roshni Gandhi is a third-year medical student at Cooper Medical School of Rowan University (CMSRU) and graduated with a degree in biomedical engineering from Rowan University in 2021, where she won the DaVinci Medallion for Excellence in Biomedical Engineering. While at CMSRU, she has worked on a number of research projects in clinical medicine encompassing cardiology, internal medicine, surgery, and addiction medicine. She has joined Dr. Martin Job's research lab where she studies the effects of cocaine on the brain.

Katherine Reavis[1]*, Brian Gadbois[2]

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Efficacy of buprenorphine extended-release: A transformative case study

Introduction: The opioid epidemic has underscored the need for sustained and effective medication-assisted treatments. Buprenorphine, traditionally used in its immediate-release formulation, has been a pillar in opioid use disorder treatment. This study delves into the game-changing potential of buprenorphine extended-release, examining its efficacy through a compelling case study.

Objective and Findings: The crux of this research is a detailed exploration of a patient case where buprenorphine extended-release was pivotal in achieving sustained remission and improved quality of life. The insights drawn from this case study can significantly impact multiple stakeholders in healthcare.

Utility for the Audience: By comprehending the clinical applications, dosage, and effects of buprenorphine extended-release, clinicians and healthcare professionals can make informed decisions regarding its integration into treatment regimens.

Job Relevance: For addiction specialists, psychiatrists, and primary care physicians, this research offers a comprehensive understanding of a potent therapeutic tool. They will be better equipped to address opioid use disorder with an enhanced therapeutic option, leading to improved patient outcomes.

Academic Expansion: The profound findings of this research offer fertile ground for academic exploration. Medical faculties can utilize this as a foundation for advanced research or incorporate it into medical education, thereby shaping future clinicians' approach to addiction treatment.

Practical Problem-Solving: The case study demonstrates buprenorphine extended-release as a solution to the challenge of consistent medication adherence and prolonged therapeutic effect. This can simplify treatment plans, making clinicians' roles more efficient, particularly in outpatient settings.

Improving Design and Informative Assistance: While the primary design here refers to the treatment blueprint, buprenorphine extended-release provides a tool that enhances accuracy in treatment duration and dosing intervals. The insights from the case study offer clinicians information that can assist in tailoring individualized treatment plans with greater precision.

Conclusion: Buprenorphine extended-release emerges as a pivotal advancement in opioid use disorder treatment, as underscored by the presented case study. The knowledge imparted through this research promises to catalyze improvements in clinical outcomes, academic research, and treatment design, presenting an invaluable asset for the healthcare community.

Biography

Dr. Katherine Reavis studied at Florida Gulf Coast University and graduated in 2015. She then pursued a Master's of Medical Science at Lake Erie College of medicine and graduated in 2017. She then received her Doctorate of Osteopathic Medicine from Lake Erie College of Osteopathic Medicine in 2021. She is currently a Psychiatry Resident at University of South Florida. Her interests lie in addiction medicine specifically in the Geriatric context.

Jack T. Rogers[1]*, Changning Wang[2], Asif Maroof[3], Jason Evans[4], Robert Hilgraf[5], Alain Ndayisaba[6], Vikram Khurana[6], Carolyn Car[7], Karen Wu[7], Catherine M. Cahill1*[2]

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Alpha Synuclein lowering efficacy of 5'UTR directed small molecules in human dopamine and cortical neurons; Potential therapeutics for parkinson's disease and lewy body dementia

Alpha-synuclein (αsyn) is the ~14 kDa protein implicated in pathogenesis several neurodegenerative diseases, α-synucleinopathies including PD, the most prevalent movement disorder in humans. Limiting expression of Alpha-Synuclein (αsyn) in the brains of Parkinson's Disease (PD) patients is a. Dopaminergic (DA) toxicity is diminished in mice with genetic deletion of brain αsyn levels. Duplication or triplication of the SNCA gene can lead to familial PD where increased dose of this pathogenic protein is correlated to severity of symptoms. Polymorphic variability in the promoter of the SNCA gene was linked to its increased expression as a risk factor for PD. Experimental siRNA infusions demonstrated it is possible to limit αsyn in animal models, although small molecules are more amenable to the therapeutic development of an oral treatment. Our approach to limit αsyn translation via the uniquely folded RNA structure in front of the start codon of αsyn mRNA (SNCA mRNA) first discovered by our group in 2010 is gaining traction. Because of its unique RNA stem loop structure, containing an Iron Response Element (IRE) the SNCA 5'UTR has provided a very useful drug target to screen /identify suppressors of αsyn translation via this stem loop, not found in β– and γ-syn mRNAs. We have screened the full length SNCA 5'UTR for SNCA lowering small molecules at the Broad Institute, Cambridge. These small molecules derive from an in vivo screen in H4 neuroblastoma cells with counter screens and cut offs that have landed several potent and specific small molecules. One of these screened molecules named A3, at an IC50 of 0.1uM lowers αSyn expression detected using western blot and ELISA in lysates from differentiated SH-SY5 DA neurons, while Ferritin, APP, βand γ synucleins were unchanged. It is non toxic to SH-SY5 cells up to 10uM and increases SH-SY5 cell viability at low concentrations (0.001 to 1uM) by MTT assay. A similar IC-50 of 0.1uM was obtained in cultured human ipSC derived DA neurons and in human iPSC derived Triple SNCA cortical neurons. In immunocytochemical assays using iPSC derived differentiated DA neurons it significantly increased the numbers of Tyrosine hydroxylase positive (TH+) while decreasing the SNCA positive (SNCA+) neurons. A3 was administered i.p. at 10mg/kg into control mice and brains harvested at 1h. Measurements taken in whole brain lysates by LC-MS were 75ug/g of whole brain tissue. A3 was labelled with C11 for PET imaging in mice and injected i.v. into the tail vein at (1.0 mg/kg) into control mice. Time–activity curves demonstrate significant uptake into brain areas associated with neurodegeneration, including cortex, cerebellum, brain stem, thalamus, hypothalamus, striatum, hippocampus, and amygdala. A3's potency, BBB permeability and drug like characteristics demonstrates its' potential to be developed into a specific and potent therapeutic for several neurodegenerative diseases where α-Synuclein plays a significant role.

Audience Take Away Notes

- There is compelling support for limiting expression of Alpha-Synuclein (αsyn) protein in the brains of Parkinson's Disease (PD) patients
- αsyn translation can be inhibited via the uniquely folded mRNA structure in front of the start codon of αsyn mRNA (SNCA mRNA)
- Screening the full length SNCA 5'UTR for SNCA lowering small molecules has led to the discovery of novel and now patented 5'UTR mRNA directed small molecule inhibitors for PD therapy
- These small molecules also have potential use in alcohol use disorder and other neurodegenerative diseases with comorbidities including anxiety and depression where α-synuclein plays a significant role

Biography

Dr. Cahill studied at University College Dublin Ireland graduating in 1985 with a Bachelors degree in Zoology. She received her PhD degree in Endocrinology in 1990 from the same institution. In 1992 after a 3 year postdoctoral fellowship in Immunology at the Babraham Research Institute, Cambridge UK, she came to the U.S. where she carried out molecular and cellular biology research at the Dana Farber Cancer Institute and several other Harvard affiliated hospitals including Massachusetts General Hospital. She is now an Assistant Professor of Psychiatry at Massachusetts General Hospital and Co-Directs the Neurochemistry lab with her colleague Dr. Jack Rogers. She has published widely in topics such as cancer and inflammation, diabetes and neurodegeneration bringing her interdisciplinary background and new perspectives to each research area.

Margie R Skeer, Grace Hajinazarian*, Rachael Sabelli, Kenneth Chui, Thomas J Stopka

School of Medicine, Tufts University, Boston, MA, United States

‘And once that’s worn off, we could discuss whether or not you need any more’: Provider perspectives on communicating with patients and other providers about prescription opioids

Background: Prescriber-patient communication plays a crucial role in understanding patients’ clinical needs, while reducing risks for developing an Opioid Use Disorder (OUD), yet research on this is sparse. As such, the need to understand health care providers’ skills, comfort, and confidence when discussing opioids with patients and other providers is an important step in balancing patients’ needs from a pain perspective and risks from an opioid use disorder perspective.

Methods: We interviewed 32 Massachusetts providers (physicians, physician associates, nurse practitioners, and dental practitioners) to assess their communication strategies with patients and other providers. Interviews were conducted online (01/2021-09/2021) and were transcribed verbatim, coded, and analyzed using deductive content analysis.

Results: One major theme was how providers communicated with patients about opioids, including their tone, use of language, and the content they covered ("You know, really just trying to have that sort of heart-to-heart conversation with them."). Providers described frequently encountering patients who expressed fears and concerns about opioid addiction and did not want an opioid prescription ("I say to them: 'I'm talking about a one-time dose right now... and just take the edge off. And once that’s worn off, we could discuss whether or not you need any more.'"). Another major theme, related to the ongoing process of preventing problems with opioids among patients, was a focus on provider engagement in follow-up, including checking if a prescription was filled, having the patient come back to the office, or calling another provider after a certain duration. Recommendations about communication with patients and other providers were also discussed.

Conclusion: Overall, open, supportive, tailored communication with patients and other providers was deemed essential when considering opioid prescriptions. Further research is recommended to learn about the status of opioid prescription knowledge, beliefs, and practices within the fourth wave of the current opioid overdose epidemic.

Audience Take Away Notes

- Skills, comfort, and confidence of providers in MA when discussing opioids with patients and other providers
- Barriers to provider-patient and inter-provider health communication relevant to opioid prescriptions
- Recommendations for improving communication with patients and other providers specifically around opioid prescriptions

Biography

Grace has a background in nursing and graduated from Tufts University's School of Medicine as MPH concentrating in epidemiology and biostatistics in May 2023. She has worked with the research group of Prof. Skeer at the Department of Public Health and Community Medicine as a research assistant since June 2022. She currently co-manages a longitudinal RCT on substance use prevention among adolescents. She is a co-author on this abstract and on a recently published manuscript discussing opioid prescriber screening practices.

Berhanie Getnet Gebresilus
University of Gondar, Ethiopia

Cumulative trauma and refugee alcohol misuse in Eritrean refugees living in Ethiopia: Structural equation modeling

Aim: This study was aimed at testing an established model, indicating co morbidity of alcohol misuse with psychological symptoms (PTSD and depression) and its association with cumulative trauma.

Methods: In a cross-sectional survey, 562 adults were randomly selected from Eritrean refugees living in Mai Aini camp, Ethiopia. The Tigrigna versions of measures, namely: Pre and Post-Migration Living Difficulties checklist, Primary Care PTSD screener (PC-PTSD), Oslo Social Support Scale (OSS-3), Sense of Coherence Scale (SoC-13),Center for Epidemiologic Depression Scale (CES-D), Coping Style scale and Fast Alcohol Screening Test (FAST) were administered. Confirmatory Factor Analysis and structural equation modeling (SEM) were employed to test pre-specified models.

Result: Alcohol misuse has significantly loaded onto the second-order common factor (β =0.21, $p<0.001$) with symptoms of PTSD and depression. Cumulative trauma is associated with this co morbid 'poor mental health' defining depression, PTSD and alcohol misuse both directly (β=0.76, $p<0.001$), and indirectly through psychological and social protective factors (indirect standardized coefficient=0.153, p=0.002) in a model which fitted to the current data [$\chi 2/df$ =2.508, CFI=0.868; TLI=0.855, RMSEA= 0.052 (0.055 0.066)]

Conclusion: Cumulative trauma has directly and indirectly predicted poor mental health. Integrated assessment and intervention of alcohol misuse should be considered in refugee mental health care.

Funding Statement: This study was financially supported by Addis Ababa University and University of Gondar, Ethiopia.

Declaration of Interests: Authors declare that there is no conflict of interest.

Ethics Approval Statement: This study was conducted after obtaining an ethical clearance from Institutional Ethical Review Board (IRB) of College of Health Sciences in Addis Ababa University (AAU) under approval letter (protocol number: 052/14/Psy). Indeed, Ethical issues as outlined by declaration of Helsinki for human participants in medical research were adhered.

Keywords: Alcohol Misuse, Poor Mental Health, Cumulative Trauma, Eritrean Refugees, Structural Equation Modeling

Audience Take Away Notes

- The presentation will act as a learning ground for the audience since it will show how Uganda has put in place different measures to manage addiction in its country which measures can be adopted by the audience and applied in their respective countries
- The presentation will show and explain the different addictions and how Uganda has handled them which will be a share point of knowledge using Uganda as a point of reference
- The presentation will front to the audience different treatment approaches adopted in Uganda and their effectiveness which can be employed by other Psychiatrists to better their patients care

Raj Gopalan
BSRM Consulting, Durham, NC, United States

Artificial intelligence / machine learning (Ai/Ml) has the potential to predict the risk for stroke, days before the symptoms appear

Background: There are 12 million new stroke occurrences every year. 100 million people are living with stroke aftermath worldwide. $900 million are spent on stroke every year. 85% of strokes have no warning signs. 2 million neurons are lost every minute after stroke. If the treatment is initiated quickly, then the neurological impact is reversible. AI/ML algorithms has the potential to predict the risk for stroke, days before the symptoms appear.

Methods: ML models were trained with over 3000 sets of urine test results and 6500 sets of blood test results data from patients with and without stroke from MIMIC-IV, a hospital-wide Electronic Health Record (EHR) dataset from Beth Israel Deaconess Medical Center, Boston, MA. Separate gradient boosted models for blood and urine results produced optimal performance. The input parameters consisted of age, gender, and the results of routine blood and urine markers recorded up to 1 week before the diagnosis of stroke was identified. An evaluation of the performance was conducted using the Area Under the Curve (AUC).

Results: The models were tested in a population with a stroke prevalence of 3%. The blood model predicted the risk for stroke, with an AUC of 0.83 and accuracy of 0.42. This gave the model 0.90 sensitivity, 0.41 specificity, 0.04 positive predictive value, and 0.99 negative predictive value. Glucose, platelet count, bicarbonate, hematocrit and red blood cells seemed predominantly to contribute to the identification of risk for stroke. The urine model predicted the risk for stroke, with an AUC of 0.83 and accuracy of 0.39. This gave the model 0.92 sensitivity, 0.37 specificity, 0.04 positive predictive value, and 0.99 negative predictive value. Blood, urobilinogen, specific gravity and nitrite seemed predominantly to contribute to the identification of risk for stroke.

Conclusion: Studies have shown that hyperglycemia can worsen the consequences of stroke by increasing oxidative stress, systemic inflammation, and barrier permeability. It can also increase the damage caused by reduced blood flow to the brain due to atherosclerotic changes to blood vessels increasing the risk of blood clots, which can cause a stroke. Platelet count is an important factor in stroke risk, as it plays a role in thrombus formation, atherosclerosis, and platelet activity. High-dose administration of undiluted sodium bicarbonate is shown to decrease the Cerebrospinal Fluid (CSF) pressure causing intracranial hemorrhage, particularly in the pediatric population. Hematocrit levels have been found to be associated with stroke risk through increased blood viscosity. Blood in the urine, and its coloration may indicate Urinary Tract Infections (UTI). UTI can increase the risk for stroke by 5 folds. Urine specific gravity can be used as a predictor of early neurological deterioration in acute ischemic stroke and is associated with worse functional outcome. There is some evidence that nitrate intake may play a role in stroke and atherosclerosis prevention. AI/ML model identified the pattern of the combined values of these markers, contributing to the prediction. Thus they may help to identify the risk for stroke days before neurological symptoms appear and facilitate prompt diagnosis and treatment.

Audience Take Away Notes

- The audience will be able to understand the importance of routine urine and blood markers in identifying the risks for stroke
- This will help the audience to access their patients for risk of stroke using similar AI/ML models
- This method will guide the audience to do research in identifying the biochemical mechanism of these markers in impacting the risk for stroke
- Since 85% of strokes have no warning signs, monitoring the patients using simple routine tests driven AI/ML models may help to perform timely imaging studies and appropriate interventions on high risk patients

Biography

Raj Gopalan is a senior physician executive with 35+ years of experience, both in general medicine and healthcare information technology. He is a National Library of Medicine fellow with a master's degree in medical informatics. He has published several articles on distinguished scientific journals. He has worked in senior executive roles with US Oncology, UNC Health, Advent Health, Wolters Kluwer and Siemens Healthineers. He has shown that AI/ML based prediction models would help identify patients at risk for life threatening diseases like cancer, chronic and acute diseases using routine blood test as well as in therapy selection and monitoring.

magnus Group

19-21 OCT

DAY 02-VIRTUAL

KEYNOTE FORUM

JOINT EVENT ON

NEUROLOGY & ADDICTION

The role beliefs, perception, biases, prejudices and patterns of behaviour play in the incubation of and the evolution of psychophysical diseases and disorders

Did the patient genetically inherit their complex psychophysical pathological condition/s or are they simply adopting and/or mirroring other members of their family who have the complex psychophysical condition that the patient is exhibiting?

Over several decades it has been frequently observed in patients who presented with very complex psychophysical diseases and disorders, including many where it is assumed that the origin of their condition/s is genetic and therefor inherited, that during the course of a 4-day intensive NeuroPhysics Therapy (NPT) treatment that unprecedented reversal of their symptoms would emerge. It would be reasonable to postulate in these cases that the assumed genetic/inheritance values are not consistent with these observations, considering that it would be impossible for genes to jump around at this scale to coincide with the normalization emergent phenomena we observe. Therefor we need to consider other factors, such as the individuals' beliefs, perception and patterns of behaviors that may have created the sets of initial conditions that gave rise to and incubated the patients chronic condition over time. The NPT process provides a significant and prescribed perturbation to a patients governing perceptional architecture enabling for new percepts to emergence and give rise to more desirable patterns of behavior.

Key Words: NeuroPhysics Therapy, Emergence, Complex Psychophysical Conditions, Perception, Beliefs, Initial conditions, Perturbation, Inheritance, Genetics.

Ken Ware

Founder of Neurotricional Sciences and NeuroPhysics Therapy, Gold Coast, Queensland, Australia

Biography

Ken Ware was a Founder of Neurotricional Sciences Pty Ltd and NeuroPhysics Therapy and Research; Been in private health, wellness and rehabilitation practice since 1988, while doing independent and collaborative research and consulting for community projects. Presented unique research papers at more than 25 major International Science Conference, including Neuroscience, Physics, Psychology and Life Sciences, covering a very broad scientific audience. Relative publications in 'Frontiers in Clinical Physiology' - 'World Journal of Neuroscience' – 'World Journal of Cardiovascular diseases. Former Mr. Universe 1994, National powerlifting and Bodybuilding champion and record holder. Recipient of Her Majesty, Queen Elizabeth's' 'Australian Sports Medal' - in 2000, in recognition for personal contributions to the development of the Australian Sporting Culture.

One: A documentary

Attendees will have the opportunity to view a clip from the award-winning documentary ONE, which touches on the opioid crisis in our nation, underlying a major fundamental truth about addiction; our culture will do almost anything to avoid pain. This film uses the philosophy of Alan Watts coupled with Dr. Vincent Felitti's explanation of ACES and its direct correlation into the likelihood of becoming an IV drug user. ONE looks at the perspective of addiction from all aspects of life experiences. From the gang leader to the cheerleader, it breaks down the passageway to the dependence and ultimately revealing all paths lead to the same road, pain. Immediately following this film the moderator facilitates a discussion that allows individuals to self-reflect into their own past and how their life experiences led them to unhealthy coping patterns. In reality, we all have some form of addiction whether it be in the manner of a drug or another outlet such as spending, pornography, repeating a cycle of unhealthy relationships, eating, etc. This event opens up the understanding to the significance of these conversations, how they should be facilitated in all treatment centers and more importantly, in our schools and living rooms before it becomes a habit/pattern/addiction.

Audience Take Away Notes

- The group will have multiple abilities for both personal and professional growth through this experience. Since most impactful learning is obtained experientially, we believe it is critical for the viewer to connect their own respective path to what the documentary is revealing. Through their understanding, they have a better ability to lead others into to their own personal insight of how much our life experiences play into our behavioral patterns. This feature has multiple adults with diverse backgrounds. It is likely the viewer will see themselves in one or more pieces of this, giving them the ability to connect their life events with a behavior pattern
- It is our belief this is a foundational piece that must be addressed in all addiction prevention and treatment. If we do not understand the why, we cannot fully address the how. Our hope is that everyone viewing this film and participating in the discussion will be able to lead others through the same discussion, drawing in other mental health professionals in their field to support group participants. This creates an ongoing dialogue that directs each person back to the 'heart of the matter.' When new coping tools are given alongside this form of education, it provides a greater ability to sustain recovery
- While this film has some profane language and does show some drug use, many parents are opting to sit with their teens and watch this together to begin the conversation at home. The discussion guide is a fantastic tool for those who feel ill equipped for this type of dialogue. The film's producer, Dawn Duhaime, shares her own personal

Dawn Duhaime

Executive Director, Spring Green Foundation, Maumee, OH, United States

Biography

Dawn Duhaime received her bachelor's degree majoring in social work, becoming a licensed social worker. From there she went on to complete her masters in the general studies of human behavior. Her desire to understand the 'why' drives her to continually challenge herself personally. She has been in the field of social work for 35 years and has served in numerous roles, including working with inner city gang youth, leading a family ministries counseling program, a school social worker to school dean to eventually training teachers on how to connect with high risk youth in the classroom. She currently is an executive director for a nonprofit that serves to provide healing to individuals who have experienced trauma through their life experiences, addiction, and incarceration. However, her greatest achievement was her son, Justin, whom she always referred to as her 'heart with legs.' Justin lost his battle to addiction in 2019 and Dawn uses her grief as a tool to be his voice to others struggling with personal pain.

experience of discovering her son's addiction while in the middle of production, thus thrusting her into the midst of the very darkness she was learning about. His overdose 911 call has been incorporated into the film for viewers to get a glimpse into the collateral damage that comes with addiction for so many families

- We see this as sort of a "book club" discussion but as a film. The documentary is broken into multiple segments so it can easily be stopped for discussion on topics such as identity, addiction, feelings and how we cope, pursuit of life's meaning, our resistance to change, and personal responsibility

Structural and functional deficits in the olfactory system in parkinson's disease assessed using advanced MRI techniques

Olfactory loss is a key symptom in the prodromal and early stages of Parkinson's disease. Noninvasive imaging biomarkers can provide a powerful tool for diagnosing the diseases, monitoring the progression, and evaluating potential therapeutics. In this talk, I will first describe recent development of MRI techniques for imaging the olfactory system in the brain. I will then discuss the application of these MRI techniques in Parkinson's disease to investigate structural and functional abnormalities in the olfactory system.

Audience Take Away Notes

- Advanced MRI techniques for the olfactory system; Structural and functional abnormalities in Parkinson's disease; Impaired olfaction in Parkinson's disease
- The techniques are available on mainstream clinical MRI systems that can be shared worldwide
- List all other benefits
    - Abnormalities in the olfactory system are commonly seen in Parkinson's disease. Noninvasive imaging techniques can provide sensitive and specific information about such abnormalities which can be used as potential biomarkers for tracking disease progression as well as potential treatment targets for the development of novel therapeutic interventions

Jun Hua

Neurosection, Division of MRI Research, Russell H. Morgan Department of Radiology and Radiological Science, Johns Hopkins University School of Medicine, Baltimore, Maryland, United States. Address: 707 N Broadway, Baltimore, MD, 21205

F.M. Kirby Research Center for Functional Brain Imaging, Kennedy Krieger Institute, Baltimore, Maryland, United States. Address: 707 N Broadway, Baltimore, MD, 21205

Biography

Dr. Hua's research has centered on the development and application of novel MRI technologies for in vivo functional and physiological imaging in the brain. These include the development of human and animal MRI methods to measure functional brain activities, cerebral perfusion and oxygen metabolism at high (3 Tesla) and ultra-high (7 Tesla and above) magnetic fields. He is particularly interested in novel MRI approaches to image small blood and lymphatic vessels in the brain. Collaborating with clinical investigators, these techniques have been applied to detect functional, vascular and metabolic abnormalities in the brain in neurodegenerative diseases.

Addiction: A problem of motivation, free will, or self-destructive behavior?

Recovery from brain trauma is in part dependent upon the brain's ability to adapt to new and challenging experiences. The brain's capacity to structurally and functionally reorganize nerve cells and spontaneously develop new neuronal networks defines neuroplasticity. Neuroplasticity can be enhanced by enriching the therapeutic environment and by providing patients with diverse and multisensory stimulation. Such enriched therapeutic activities have been found to enhance existing cognitive capabilities and to promote recovery from strokes and TBI's across the lifespan.

Experiential Openess (EO) is a personality attribute characterized by the individual's active imagination, intellectual curiosity, and preference for varied and novel stimulation. Individuals who are considered to be high in EO tend to be creative, reflective, inquisitive, and drawn to interests in unconventional and multisensory cognitive challenges.

Openess to experience has been empirically related to improved memory functioning in aging adults. The preservation of autobiographical, immediate, and declarative memory skills in normal and mildly demented adults rated high in EO suggests that this attribute may serve a protective function in normal and degenerative aging. The improved memory functioning consistently displayed by experientially open older adults may reflect more efficient and effective neuroadaptation to aging.

The relationship between EO and memory preservation across normal and degenerative aging populations has implications for the design of neurorehabilitation therapies. Patients rated high in EO may demonstrate greater willingness to engage in novel therapeutic experiences, artistic endeavors, and unconventional therapies involving music, self-reflection, mindfulness, etc. Therapeutic activities which model EO attributes may enhance and support neuroplasticity by incrementally introducing new and unconventional cognitive challenges into the therapeutic environment for both experientially open and closed individuals. Empirical and systematic analysis of the relationships between EO and adaptation to normal and degenerative aging and trauma related cognitive impairments will be discussed.

Audience Take Away Notes

- Participants will increase their understanding of structural and functional neuroplasticity
- Participants will understand the characteristics of open vs. closed to experience personalities
- Participants will gain insight into the relationship between EO and preservation of memory in aging

David J Sperbeck

Private Practice, Anchorage, Alaska, United States

Biography

Dr. Sperbeck graduated from the University of Rochester in 1982. He completed a clinical neuropsychology residency at the Veterans Administration Medical Center in Bath, NY prior to serving as the chief forensic and neuropsychologist at the Alaska Psychiatric Institute from 1982-2005. Dr. Sperbeck was the chief of pediatric neuropsychology at the North Star Hospital in Anchorage Ak from 2005-2019. He held the position of Professor of Psychiatry and Behavioral Sciences at the University of Washington School of Medicine from 1985-2019 and is currently in private practice in Anchorage, Alaska. Dr. Sperbeck has authored more than 150 professional papers in the areas of neurodevelopmental disorders, degenerative aging, personality and cognition, and neuropsychological assessment across the lifespan.

- Participants will understand how diverse and multisensory cognitive challenges enhance neuroplasticity
- Participants will recognize the (dis-)advantages of EO in the brain trauma therapeutic setting
- Participants will be introduced to therapy enhancements designed to promote neuroplasticity
- Participants will be able to identify future areas for the systematic analysis of EO and cognitive rehabilitation

BOOK OF ABSTRACTS

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NEUROLOGY & ADDICTION

Kam Wilkinson

Ken Ware NeuroPhysics Therapy Practitioner, Ballina, New South Wales, Australia

Using a complex adaptive systems approach through neurophysics therapy affords effective treatment in patients with charcot-marie-tooth disorder

Charcot-Marie-Tooth (CMT) disorder is a hereditary neurological condition characterized by progressive muscle weakness, sensory loss, and motor dysfunction. Current treatment options primarily focus on managing symptoms and improving quality of life.

However, unprecedented results have been achieved by NeuroPhysics Therapy (NPT) in treating complex conditions. This presentation will highlight the key upgrades and changes experienced by a recent patient who had been suffering long term with Charcot-Marie-Tooth Disorder by using a complex adaptive system, NeuroPhysics Therapy, approach to optimize psychophysical health.

NeuroPhysics Therapy, which is a multidisciplinary therapeutic approach that integrates principles from all sciences using a complex adaptive system approach. By targeting the nervous system, NPT restores and optimizes neural connections, enhancing muscular strength and coordination, and promoting self-efficacy and psychological well-being. Studies have shown that NPT interventions, which include a combination of a specialized approach to exercise, balance training, proprioceptive activities, and cognitive exercises, result in significant improvements in motor function, gait patterns, and balance control among individuals with all conditions. These improvements contribute to enhancements in all aspects of a patient's life.

This presentation will be supported with pre and post NPT data, highlighting the sensitive protocols and rationale that are required to be applied for any CMT Patient or any system to increase in complexity and rapidly improve in functionality and performance when given the right conditions.

Keywords: Charcot-Marie-Tooth Disorder, Complex Adaptive Systems, Rehabilitative Therapies, NeuroPhysics Therapy.

Biography

Kam Wilkinson is a key member of the NeuroPhysics Therapy organisation and currently practicing as a NeuroPhysics Therapist where he open NeuroPhysics Therapy, Northern Rivers in New South Wales. He is an assistant Ken Ware NeuroPhysics Therapy Institute researcher in Lennox Head, NSW. Practicing as a NeuroPhysics Therapist and researcher Kam has worked with a large number of patients with very complex spinal cord injuries and neurological disorders. He has successfully been able to improve functionality for these patients, despite their often-grim prognosis in very small-time scales in situations where all other medical and non-medical interventions have failed. He is involved in the ongoing research of complex spinal cord injuries and chronic neurological conditions and is the Educational Coordinator for Neurotricional Sciences.

Zhifang Xu[1,2,3]*, Zichen Zhang[1,2,3], Siru Qin[1,2,3], Ganglin Yao[1,2,3], Narendra Lamichhane[1,2,3], Haixia Chen[1,2,3], Yadan Zhao[1,2,3], Wei Li[1,2,3], Huiling Tang[1,2,3]

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Study on the Mechanism of the Wake-promoting and Neuroprotective Efficacy of Acupuncture at Hand twelve Jing-Well Points for Traumatic Brain Injury

Traumatic Brain Injury (TBI) induced coma is a key factor in poor clinical prognosis and poses a significant burden to families and society. However, there is a lack of first-line wake-promoting therapies with proven efficacy and ultra-early intervention. Acupuncture has been certified by the World Health Organization as an effective treatment for a variety of diseases. The Hand Twelve Jing-Well Points (HTJW) acupuncture therapy is a unique Traditional Chinese Medicine (TCM) first-aid treatment that has been proven to be effective for comatose patients and improves the neurological deficits of patients suffering from TBI, stroke, or carbon monoxide poisoning. Our team has conducted a series of studies on the wake-promoting and neuroprotective mechanisms of the HTJW acupuncture therapy. Based on behavioral and EEG platforms, we confirmed the wake-promoting effect of the HTJW acupuncture therapy, focusing on the Ascending Reticular Activating System (ARAS), and found that the P2RX7 pathway of Dopaminergic (DAergic) neurons in the ventral Periaqueductal Gray (vPAG) region may mediate the wake-promoting effect of the therapy and modulate the excitability of Orexinergic (ORXergic) neurons in the lateral hypothalamus. Subsequently, chemogenetic techniques were applied to discover that the vPAG DAergic neurons-lateral hypothalamic ORXergic neurons circuit may be the key link to promote wakeup. Regarding its neuroprotective effect, the therapy improved the symptoms of neurological deficits in TBI rats, and the brainstem JNK/p38 MAPK pathway mediated this effect, and it is speculated that improving inflammation is an important way for the therapy to improve the symptoms of neurological deficits. The HTJW acupuncture therapy provides a new idea for post-TBI treatment, which is especially important to fill the gap of pre-hospital emergency care, and still needs a lot of research and attention in the future to promote its clinical translation.

Audience Take Away Notes

- The HTJW acupuncture therapy is an important complementary and alternative therapy to promote wakeup after central nerve injuries. This study initially reveals the central mechanism of wake-promoting effect of the therapy by modern scientific theory, and provides evidence for expanding its clinical application
- This study provides listeners with new wake-promoting and first-aid therapies, and is of great significance to fill the gap of pre-hospital care. We aim to promote the therapy to receive more academic attention, in order to carry out more high-quality evidence-based research in the future, and to establish better wake-promoting and emergency treatment for TBI
- This study not only reveals the neural circuit of the HTJW acupuncture therapy to promote wakeup, but also confirms the projection of DAergic neurons in the vPAG to ORXergic neurons in the lateral hypothalamus at the functional level, which provides new evidence for the conduction pathway of the ARAS

Biography

Dr. Zhifang Xu, professor of Tianjin University of Traditional Chinese Medicine. She is currently engaged in neuroimmunology research on the mechanism of acupuncture and moxibustion, and has published 86 academic papers. She found that acupuncture initiates effect through the "neural-immune-vascular" cascade in acupoint microenvironment. She elucidated that sympathetic nerve mediates the anti-inflammatory effect of acupuncture by regulating the polarization of immune cells, which is one of the universal principles of acupuncture efficacy. Recently, a breakthrough has been made in the wake-promoting and neuroprotective mechanism of HTJW acupuncture therapy.

Lawrence Best
Oxford University Hospitals Trust, United Kingdom

Incidence of hyponatraemia and impact on morbidity and mortality after subarachnoid haemorrhage: A systematic review and meta-analysis

Introduction: Hyponatraemia after Subarachnoid Haemorrhage (SAH) is common, however the incidence, and association of hyponatraemia with vasospasm, morbidity, and mortality, has yet to be defined. We aimed to identify incidence of hyponatraemia after SAH, and association with measurable outcomes.

Methods: A PRISMA-compliant systematic review and meta-analysis was conducted (PROSPERO ID CRD42022363472). Articles published in MEDLINE, EMBASE, and Cochrane Library between January 2000-September 2022 were included. Hyponatraemia definitions, Incidence at diagnosis, and association between vasospasm, length of hospital stay, and poor outcome (Glasgow Outcome Scale 3 or less) were identified. Pooled incidence rates and binary outcomes were calculated using random effects meta-analysis models.

Results: In total, 51 studies (17,230 patients) were included. Most studies included patients admitted to tertiary neuroscience centres (78.4%, N=40), or critical care units (21.6%, N=11). Less than 135 mmol was the most commonly utilised hyponatraemia definition (82.4%, N=42). The pooled incidence of hyponatraemia was 35.4% (95% CI 31.0-39.4%). Hyponatraemia increased the risk of vasospasm (16 studies, OR 2.41, 95% CI 1.76-3.30), mean length of hospital stay (6 studies, 20.0 days vs 14.0 days, $p<0.001$), and risk of poor outcome (9 studies, OR 3.07, 95% CI 1.83-5.17).

Conclusions: Hyponatraemia is common after people admitted to hospital for SAH, and increases the likelihood of vasospasm, hospital stay, and poor outcome. Managing hyponatraemia effectively should be a priority for treating clinicians.

Nikita Sharma

Maharishi Aurobindo Subharti College & Hospital of Naturopathy & Yogic Sciences, Swami Vivekanand Subharti University, Meerut, Uttar Pradesh, India

Hippocampus the key players in ad and in meditator - a review

Most common yet undefeatable, age-associated neurodegenerative disease AD can be prevented with the help of accessible, fruitful, easily learnable and competent 5,000 years old practice of meditation. There are numerous research cues advocating intervention of this ancient tradition adjunct to avert evolution or dawning of such conditions. The review discusses that meditation can result in positive hippocampus transformations, which plays major role in memory, learning and in timbre of emotional command and is acknowledged for its ability to redefine synapses, neurogenesis and neuroplastic reconditioning with progression of diseases or due to pathology in AD. Review further presents the worthy trappings of meditation in attenuating evolution of AD while impeding cognitive decline and hippocampal neuroplasticity and reducing risk factors accompanying AD.

Keywords: Meditation, Neuroplasticity, Alzheimer's Disease, Cognition, Elderly, Neurodegenerative Diseases.

Audience Take Away Notes

- Self-control and behaviour, which begin at the individual level and spread to the communal, national, and international levels, are the primary factors in maintaining good health. According to the current situation, the prevalence of neurodegenerative illnesses is rising daily, and the majority of risk factors are connected to healthy lifestyle choices. Therefore, with its clinical explanation and correlation, this presentation will aid in fostering personal comprehension of meditation's potential as a technique to avoid neurodegenerative diseases, including Alzheimer's disease
- Since the majority of the speakers and audience members are neuroscientists, doctors, and students, this presentation will aid in the development of fresh perspectives on an age-old, low-cost practise and encourage them rather than just to consider novel pharmacological agents for disease prevention and management
- Yes, definitely along with various molecular markers & pharmacological targets we must need to explore non pharmacological interventions like this which can be directly implemented into human subjects and is easy to explore on various standard parameters
- It is well-established that present methods of health are pathologic rather than salutogenic, and that it is always preferable to prevent rather than treat or manage diseases. As a result, these practises can be established for both treatment and to stop the progression of diseases. Additionally, for the benefit of humanity, this type of health behaviour and practice-related treatments should be promoted

Biography

Dr. Nikita Sharma is now pursuing her Doctor of Medicine in Naturopathy at Swami Vivekanand Subharti University in Meerut, India. She completed her Bachelor of Naturopathy & Yogic Sciences (BNYS) at the Banaras Hindu University in Varanasi. She has a significant interest in the therapeutic effects of yoga, particularly meditation, on Alzheimer's illness since completing her Rotary internship. After a year, she established a non-profit organisation called "Chitto-daya - Sarvam Sambhavayate tvai" with the goal of spreading knowledge about neurodegenerative diseases and the advantages of a yogic lifestyle and practises for preventing them. She is open to connecting with research facilities, institutions, and individuals that share her goals.

Christina Bitsara
University of Cambridge, United Kingdom

Anti-NMDA receptor encephalitis in a patient with ankylosing spondylitis receiving etanercept treatment

A patient diagnosed with Ankylosing Spondylitis on long-term etanercept treatment presented in the Emergency Department with subacute progressive cognitive dysfunction and personality change. He further developed psychiatric symptoms, autonomic dysfunction and orofacial dyskinesias within the first days of admission. His serum was initially negative for autoimmune neuronal antibodies, however CSF analysis was positive for anti-N-Methyl-D-Aspartate Receptor (anti-NMDAR). During his ten-week admission, he was treated with intravenous methylprednisolone, intravenous immunoglobulins, plasma exchange and rituximab before making full recovery with minimal residual neurological deficits. He was discharged on a weaning dose of oral prednisolone, however was re-admitted two months later with pneumocystis jirovecii pneumonia and required three weeks inpatient treatment with intravenous antibiotics. To our knowledge, this is the first report of etanercept-associated anti-NMDAR encephalitis. This case additionally highlights the importance of CSF over serum sampling in suspected anti-NMDAR encephalitis and serves as a reminder for clinicians to consider prophylaxis against Pneumocystis Pneumonia (PCP) when using long-term corticosteroids for neurological conditions.

Biography

Dr. Christina Bitsara (MB BChir, MPhil, BSc) received her medical degree from the University of Cambridge in 2021. She also holds an MPhil in Genomics Medicine from the University of Cambridge where she conducted research at the Wellcome Sanger Institute and discovered new variants for rare neurological disorders and has a BSc in Neuroscience from Kings College London. This is her third year working as a doctor in the National Health Service in the UK. During her Foundation Years of training, she has worked both at a tertiary center at Guy's and St Thomas's hospital in London and at a District General Hospital at Royal Tunbridge Wells in Kent. She currently holds the position of Academic Junior Clinical Fellow in the Emergency Department where she is involved in teaching and training of junior doctors and medical students. Dr Bitsara will continue into Internal Medicine Training next year. She has a keen interest in neuro inflammatory conditions and movement disorders and will specialize in Neurology. She has also been Conference lead and President of university societies for 5 consecutive years where she organized annual Neuroscience and Neurology conferences with both national and international speakers and has also held a fundraiser for Epilepsy UK that raised £3,000.

Buket Ozkara Yilmaz[1]*, Ali Karnaz[2], Umit Gorgulu[3]

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Susac syndrome: Case report

Introduction: Susac syndrome; It is a rare disease that is characterized by the triad of encephalopathy, sensorineural hearing loss and branch retinal artery occlusion, which is thought to develop due to immune-mediated microangiopathy. It is more common in patients aged 16-40 years and in women. Microocclusions that can be seen in the brain, retina and inner ear due to non-inflammatory vasculopathy are responsible for the pathogenesis. The diagnosis is primarily made by clinical findings, visualization of branch retinal artery occlusion by Fluorescent Angiography (FFA), presence of characteristic lesions often observed in the corpus callosum on cranial Magnetic Resonance (MR) imaging, and sensorineural hearing loss on audiometric examination.

Case Presentation: A 39-year-old female patient presented with complaints of dizziness, headache, tinnitus and hearing loss in the left ear. The dizziness was in attacks, sliding from underground, lasting for half an hour to an hour. No nausea or vomiting. She had a throbbing headache, usually in the form of a left-sided headache, occasionally. It was accompanied by photophobia, phonophobia and kinesiophobia. Neurological examination was normal. Cranial Magnetic Resonance (MRI) examination revealed thinning and atrophy in the corpus callosum. Numerous millimeter-sized microinfarcts were observed in the head and body parts of the corpus callosum, and in the pericalllosal-periventricular white matter. Carotid-vertebral doppler ultrasound, brain and cervical MRI angiography were normal. Transthoracic echocardiography was normal. Electroencephalography was normal. Hearing test revealed mild sensorineural hearing loss on the right and moderate-severe on the left. Optical coherence tomography showed thinning and atrophy in the left superior temporal posterior region, and Fluorescein Fundus Angiography (FFA) showed delayed choroidal filling in left eye, arterial venous occlusion was not observed. As a result of the examinations, the patient was evaluated as compatible with Susac syndrome.

Discussion: Susac syndrome is a rare disease characterized by encephalopathy, retinopathy and hearing loss. It should be considered in the diagnosis and should be considered in the differential diagnosis of vasculopathy.

Biography

Dr.Buket Yılmaz graduated from Kocaeli University Faculty of Medicine between 2006-2012. She received neurology specialization at Kocaeli University Neurology Department between 2012-2017. After completing compulsory service in Silvan State Hospital between 2017-2018, she had a private hospital experience for one year. She worked at Antalya Alanya Training and Research Hospital between 2019-2021. Between 2021-2023, she worked at Sanko University. Then she moved to Gaziantep Nizip Public Hospital, where she still work. There are many publications on electromyography, headache, sleep disorders and psychiatric diseases.

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Sporadic creutzfeldt-jacob disease: Case report

Sporadic Creutzfeldt-Jakob Disease (CJD) is one of the diseases that should be considered in dementia-related processes seen between the ages of 50-70. It can be distinguished from other diseases with dementia with its clinical features, typical Electroencephalography (EEG) findings, laboratory and radiological imaging features. In this study, we aimed to present our case of sporadic CJH with clinical, EEG, laboratory and radiological features.

A 65-year-old male patient had complaints of weight loss, loss of way home, not taking a bath, not shaving, irritability, instability, diplopia, and weakness that started 3 months before he applied to our clinic. He was admitted to the clinic with complaints of inability to walk, speak, and myoclonic jerks in the last 1 month. İn his neurological examination, eye contact could not be established and the patient could not cooperate. There was agitation. The patient did not obey single commands and did not speak spontaneously. Myoclonus with tactile stimuli developed. Standard Mini Mental Test (SMMT) could not be performed due to limited cooperation. Thyroid function tests applied as a dementia battery and vitamin B12 blood level were found to be normal, VDRL and Anti-HIV negative. Hepatic and renal function tests and ammonia blood levels were within normal limits. Brain CT imaging was unremarkable. Repeated EEGs showed distinct, periodic sharp slow-wave complexes in the anterior regions of both hemispheres. Except for high CSF protein, protein 14.3.3 was positive and Neurospecific Enolase (NSE) was high. MRI of the brain showed cortical atrophy and T2 hyperintensity in bilateral basal ganglia. The patient, who was discharged with antiepileptic and supportive treatment, died 1 year after the diagnosis.

Biography

Dr. Merve Turkmen graduated from Cukurova University Faculty of Medicine between 2007-2013. She received infection diseases and clinic microbiology specialization at Afyon Kocatepe University Faculty of Medicine between 2014-2020. After completing her compulsory service in Gaziantep Abdulkadir Yüksel Public Hospital she is still working at Sanko University Faculty of Medicine. There are many publications on pneumonia, nosocomial infections in intensive care units, HIV and EBV infections.

Dr.Buket Yılmaz graduated from Kocaeli University Faculty of Medicine between 2006-2012. She received neurology specialization at Kocaeli University Neurology Department between 2012-2017. After completing compulsory service in Silvan State Hospital between 2017-2018, she had a private hospital experience for one year. She worked at Antalya Alanya Training and Research Hospital between 2019-2021. Between 2021-2023, she worked at Sanko University. Then she moved to Gaziantep Nizip Public Hospital, where she still work. There are many publications on electromyography, headache, sleep disorders and psychiatric diseases.

Shamchal Bakavayev[1], Alexandra Stavsky[2], Shirel Argueti Ostrovsky[2], Galit Yehezkel[3], Zeev Barak[3], Daniel Gitler[2,4], Adrian Israelson[2,4], Stanislav Engel[1,4]*

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Blocking an epitope of misfolded SOD1 ameliorates disease phenotype in a model of amyotrophic lateral sclerosis

The current strategies to mitigate the toxicity of misfolded SOD1 in familial ALS via blocking SOD1 expression in the CNS are indiscriminative for misfolded and intact proteins, and as such, entail a risk of depriving CNS cells of their essential antioxidant potential.

As an alternative approach to neutralize misfolded and spare unaffected SOD1 species, we developed scFv-SE21 antibody that blocks the β6/β7 loop epitope exposed exclusively in misfolded SOD1. The β6/β7 loop epitope has previously been proposed to initiate amyloid-like aggregation of misfolded SOD1 and mediate its prion-like activity.

The AAV-mediated expression of scFv-SE21 in the CNS of hSOD1G37R mice rescued spinal motoneurons, reduced the accumulation of misfolded SOD1, decreased gliosis, and thus delayed disease onset and extended survival by 90 days.

The results provide evidence for the role of the exposed β6/β7 loop epitope in the mechanism of neurotoxic gain-of-function of misfolded SOD1 and open avenues for the development of mechanism-based anti-SOD1 therapeutics, whose selective targeting of misfolded SOD1 species may entail a reduced risk of collateral oxidative damage to the CNS.

Audience Take Away Notes

- Our research has shed light on the molecular mechanism of neurotoxicity caused by misfolded SOD1 in ALS, which is key in designing mechanism-based therapeutics for the disease
- Our study presents the potential for the advancement of ALS treatments with a unique mechanism of action, which could manifest in various forms, such as preventative care for individuals carrying the mutated SOD1 gene, active immunization, and potentially the treatment of patients experiencing early-stage symptoms
- Our work serves as a valuable example of how understanding the structural properties of a disease-causing protein can lead to practical therapeutic strategies, and could prove useful for other neurodegenerative conditions

Biography

Ph.D.: The Dept. of Biotechnology Engineering, Ben-Gurion University of the Negev, Israel. Postdoctoral Fellowship: Molecular pharmacology and Molecular modeling, Drug discovery program, Clinical Endocrinology Branch and Laboratory of Biological Modeling, National Institute of Diabetes and Digestive and Kidney Diseases, NIH, USA. Current: Associate Professor, Dept. of Clinical Biochemistry and Pharmacology, Faculty of Health Sciences, Ben-Gurion University of the Negev, Israel. He published near 40 research articles in SCI(E) journals.

Mohamed Fathi Kalifa Al Gharyani[1]*, Hassan Ali Elashhab[2], Taha Abu Bakar Al Bargathy[2], Heba A El Zawawi[3]

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Intracerebral hemorrhage and COVID-19 infection: Clinical characteristics and mortality from intensive care patients: Retrospective cohort review

Background: Since the COVID-19 pandemic, many studies have reported severe neurologic effects of the infection on the brain. Intracerebral hemorrhage (ICH) is a particular pathology that can result in these devastating neurologic effects and affected patients are more likely to require Intensive Care (ICU) and mechanical ventilation.

Objective: The primary aim of our study is to investigate the possible difference in the clinical and laboratory characteristics of ICH between patients with positive COVID-19 tests and those with negative tests. The potential effect of this difference on the prognosis of the patients during their stay in the ICU is a secondary aim of the study.

Methods: In this retrospective cohort review, our data were collected from the electronic medical database of the Benghazi Medical Center (BMC) for the period from January 2021 to June 2022. We depended mainly on the admission paper information documented by emergency doctors, and mortality was measured depending on the clinical status after discharge from the ICU. The main enrollment strategy of the study patients was their diagnosis with ICH either before or during their stay in the ICU.

Results: The difference between groups was significant in ICH score ≥ 3 (higher in positive patients), INR (lower in positive patients), platelets (lower in positive patients), ventilation risk (higher in positive patients), the incidence of new-onset hypertension (higher in positive patients), location of hematoma (infratentorial in positive patients), and IVH extension (more in positive patients). Also, COVID-19 was significantly associated with ICH score ≥ 3 (OR 4.6, 95% CI 1.2-18.6, p = 0.03, R^2 = 0.16), INR (β0.35, 95% CI 0.09-0.62, p < 0.003, R^2 = 0.136), risk of ventilation (OR 14.1, 95% CI 3.5-56.9, p < 0.001, R^2 = 0.26), Hydrocephalus (OR 9.41, 95% CI 2.72-32.5, p = 0.001, R2 = 0.19), Infratentorial location (OR 3.7, 95% CI 1.1-12.5, p = 0.04, R^2 = 0.14), IVH extension (OR 3.5, 95% CI 1.2-10.4, p = 0.03, R^2 = 0.09), new-onset hypertension (OR 4.2, 95% CI 1.5-11.9, p = 0.007, R^2 = 0.10), and mortality (OR 4.9, 95% CI 1.6-15.3, p = 0.04, R^2 = 0.15). The difference in survivability between groups was statistically insignificant (X^2 = 0.41, log-rank, P = 0.53).

Conclusion: The current study demonstrates the significant association between COVID-19 infection and ICH, possibly through changing some of the critical baseline characteristics that influence the formation and prognosis of ICH in intensive care patients.

Audience Take Away Notes

- This study aims for the first time to establish the possible association between COVID-19 and Intracerebral Hemorrhage (ICH); the message this study tries to convey to the interested audience is the observed difference in the clinical characteristics after COVID-19 and the potential effect of this on mortality after the infection
- The audience can use the data in this study as reference data to further investigate this association

and its possible effect on the prognostic score of the ICH and the treatment protocol for the affected intensive care patients

- Additionally, this study will help physicians in neurocritical care to pay much attention to ICH patients with positive COVID-19 infection, as these patients have different laboratory and baseline characteristics that require a different type of management protocol

Biography

Dr. Mohamed Al Gharyani graduated in 2019 from the University of Benghazi Faculty of Medicine in Benghazi, Libya. He then began working in the neurosurgery department at Benghazi Medical Center, where he was supervised by Prof. Siraj Al Zentani. Dr. Mohamed has also started to work as a university assistant teacher at the neurosurgery department at the University of Benghazi since 2021. Dr. Mohamed completed a certificate program in the foundations of clinical research at Harvard Medical School in 2022. He is now a Ph.D. candidate in clinical research and biomechanics at the University of Jamestown. After that program, Dr. Mohamed started working as a clinical researcher and helped with some international studies that have been published or are still ongoing.

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Neuro-psychiatric symptoms in civilian survivors of urban missile attacks

Background: Blast-explosion may cause Traumatic Brain Injury (TBI), that may lead to Post-Concussion Syndrome (PCS) in individuals exposed to the explosion. In military personnel, PCS symptoms are highly similar to those occurring in Post-Traumatic-Stress-Disorder (PTSD), questioning the overlap between these syndromes. In the current study we assessed PCS and PTSD in civilian survivors of urban missile attacks. We hypothesized that PCS symptomatology and brain connectivity will be associated with the objective physical exposure to blast, while PTSD symptomatology will be associated with the subjective mental experience.

Methods: 289 residents of explosion sites were recruited from the city of Beer-Sheva in Israel following operation "Protective-Edge". Participants completed self-reports of PCS and PTSD. Association between objective and subjective factors of blast and clinical outcomes were assessed using multivariate analysis. White matter (WM) alterations and cognitive abilities were assessed in a sub-group of participants and non-exposed matched controls. Non-parametric analysis was used to compare connectivity and cognition between the groups.

Results: Civilian survivors exposed to blast reported higher PTSD and PCS symptomatology. Among exposed individuals, those who were directly exposed to blast, reported higher levels of subjective feeling of danger and presented WM hypoconnectivity. No significant difference in cognitive abilities was observed. Several risk factors for the development of PCS and PTSD were identified; these include female gender, history of head trauma and time passed from the explosion (for both syndromes); as well as marital status and feeling scared (for PCS).

Conclusions: Civilian survivors of urban missile attacks present higher PCS/PTSD symptomatology as well as WM hypoconnectivity. Although symptoms are sub-clinical, they might lead to the future development of a full-blown syndrome and should be considered carefully. The similarities between PCS and PTSD suggest these are not distinct syndromes, but rather represent different ends on a spectrum of a combined disorder.

Audience Take Away Notes

- The coexistence of a highly similar set of objective and subjective risk factors for both disorders (PCS and PTSD), highlights the complexity in differential diagnosis between the two. Our findings suggest that these syndromes are not distinct symptom clusters rather may represent a spectrum of a combined disorder that may develop as a result of a physical injury, or as a result of multiple objective and subjective trauma-related factors. This is valuable information for clinicians dealing with diagnostic questions
- Although symptoms are sub-clinical, they might lead to the future development of a full-blown syndrome and should be considered carefully by clinicians

Biography

Dr. Rotem Saar-Ashkenazy is a senior lecturer in the Faculty of Social-Work in Ashkelon Academic College, Israel. Her research focuses on structural and functional brain alterations in aging and in post-traumatic patients. This research provides new insights into the structural and functional basis of anxiety-related disorders. Dr. Saar-Ashkenazy is aimed to un-cover the brain mechanisms involved in the development of anxiety sensitivity on the normal-to-pathological pathway and to reveal objective and reliable brain-imaging bio-markers for early identification of individuals at risk for stress-related pathologies. Such understanding is crucial for the development of interventions aimed at reducing mental illness.

Anne Dorothee Rosch
School of Philosophy, Psychology and Language Sciences, University of Edinbuigh, United Kingdom

Effects of a mediterranean diet on verbal fluency in patients with parkinson's disease and healthy controls: A fNIRS study

Background: Parkinson´s Disease (PD) is a progressive neurodegenerative disease manifesting itself in motor and non- motor symptoms. With disease progression, cognitive deficits ranging from Mild Cognitive Impairment (MCI) to dementia (Galtier et al., 2016) as well as deficits in word retrieval (Henry & Crawford, 2004) have been described to occur. Recent research showed that a Mediterranean diet increased or maintained cognitive functions in PD patients (Cao et al., 2016; Loughrey et al., 2017). Yet, whether this specific nutrition may have beneficial effects on verbal fluency has not been investigated so far.

Aim: To examine the effect of a Mediterranean diet in patients with PD when retrieving words within a phonemic or semantic category using functional Near-Infrared Spectroscopy (fNIRS) recording.

Methods: Functional NIRS was measured in 20 PD patients being non-demented and having no Deep Brain Stimulation (non-DBS) and in 19 Healthy Controls (HC) during phonemic and semantic Word Retrieval (WR) tasks. Groups were further split into PD-Mediterranean (N= 8; Age Mn 66 yrs. [54-66]; 6.3), PD-traditional (N= 12; Age Mn 66 yrs. [52-78]; 6.4), HC-Mediterranean (N=11; Age Mn 63 yrs. [52-77]; 9.4) and HC-traditional (N=8; Age Mn 66 yrs. [54-77]; 8.6) according to what their regular and daily diet type was. The term "traditional" refers to a traditional Northern European diet. The 8x8 fNIRS system integrated short channels and covered the Broca´s area, the Motor Cortex and the Wernicke´s area, as specified by the fOLD brain atlas (Zimeo Morais et al., 2018). Statistical analysis was conducted with SPSS (V.28) and results were seen as significant if $p < .05$ or less.

Results: PD were outperformed by HCs (regardless of diet type) on all accounts ($p < .01$). For phonemic WR, the PD- Mediterranean group showed higher fNIRS signals bilaterally in the Motor Cortices compared to the PD-traditional group. For semantic WR, the PD-Mediterranean group had higher fNIRS signals in the left hemispheric Broca´s area and the Motor Cortex ($p < .05$) compared to PD following a traditional Northern European diet. For the HCs, there were no statistically significant differences between diet types.

Conclusions: For PD patients, a Mediterranean diet indicated better hemodynamic changes within the (left hemispheric) Broca´s area and the Motor Cortex during semantic WR and bilaterally in the Motor Cortex during phonemic WR. There were no measurable differences between diet types in the healthily aging group. Importantly, weight loss (change in the BMI) has not been considered within these statistics. Yet, weight loss is known to improve the cardiovascular condition and this may in turn, improve overall cognitive functioning.

Audience Take Away Notes

- Results shown in this presentation are based on a pilot study. However, these are in-line with current findings and also pattern-in with findings from recent cognitive research
- Thus, professionals may be briefly introduced to the Mediterranean diet and other different diet types as specified in Medscape, 2023. Further, this presentation may help to raise awareness of possible

beneficial effects of a Mediterranean diet motor-articulatory on parameters (and thus, contribute to current findings deriving from cardiovascular, psychological and cognitive research)

- Professionals working in a clinical field may provide additional information about Mediterranean diet plans directly to patients, and as thus, raise awareness in patients
- In teaching, possible effects of a Mediterranean diet may be introduced and expanded on
- In research, non-invasive approaches such as a Mediterranean diet may receive more attention for future research, in order to explain how a Mediterranean diet affects the human metabolism, for instance

Biography

Anne D. Rosch is a speech-language therapist with expertise in neurocognitive and linguistic research in neurodegenerative disease such as Parkinson's disease. She currently holds a position as visiting academic/ international researcher at the University of Edinburgh (UK). Her latest research project (data collection in 2020) investigated hemodynamic cortical responses using near-infrared spectroscopy in patients with Parkinson's disease (PD) and in healthy elderly before, during and after rhythmic interventions.

Daniel A Clayman[1]*, Joern R Steinert[2]

[1]3rd Year Medical Student, Faculty of Medicine and Health Sciences, Nottingham, United Kingdom

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Exploring the relationship of locomotor function and olfactory memory as a measure of neurodegeneration in TPI deficient (M80T mutation) drosophila melanogaster larvae, with both regular and high fat diets

Background: M80T mutation of Triose Phosphate Isomerase (TPI) presents one potential contributory pathway for developing Alzheimer's Disease (AD). M80T effects the Triose Phosphate Isomerase (TPI) enzyme activity within the glycolysis pathways producing enhanced levels of methylglyoxal, a neurotoxic substance responsible for protein glycation. Dysregulation of the gut brain axis provides a further potential pathway aggravating AD, with High Fat Diet (HFD) causing neuroinflammation, contributing to AD.

Objectives: Drosophila Melanogaster (DM) larvae were used, testing if M80T and HFD influence developing AD. Mutated larvae were tested against w1118 wildtypes as a control, in Normal Diet (ND) and HFD. Objectives included comparing DM wildtype larvae to TPI mutant expressing larvae, for risk of neurodegeneration, and comparing ND to HFD.

Methods: Locomotor assays assessed locomotion, tracking 10-minute periods of DM larvae crawling. Learning and memory assays assessed olfactory memory by training procedures of associating odour, N-amyl acetate (AM) or distilled water, with reward. Memory retrieval procedures followed measuring preference to AM.

Results:

Crawling: 90 values, significance between HFD wildtype vs M80T ($P = 0.0223$), HFD wildtypes and mutations ($P < 0.0001$), HFD mutations ($P = 0.0003$) and ND vs HFD of wildtype and M80T ($P = 0.0239$).

Learning and memory: 76 values, significance between ND wildtype vs M80T AM reward ($P = 0.00018$), HFD wildtype vs M80T AM reward ($P = 0.0425$), wildtype distilled water reward ND vs HFD ($P = 0.0095$), ND M80T vs wildtypes ($P < 0.0001$), ND vs HFD wildtypes ($P = 0.0001$), ND mutations ($P = 0.0016$) and HFD mutations ($P = 0.0090$).

Conclusions: M80T larvae crawled faster than W1118, unexpectedly as neurodegeneration predicts slower locomotion. Learning and memory assays showed impaired memory in M80T larvae relative to W1118, supporting the hypothesis that TPI mutations cause neurodegeneration. Both assays gave positive data on HFD causing neurodegeneration. Therefore, further research is needed of neurodegeneration on locomotor function to assess repeatability.

Audience Take Away Notes

- The effects of both a high fat diet and dysfunction of a glycolytic enzymes (TPI mutation M80T) on developing neurodegeneration
- The use of changing diet in lifestyle as a neuroprotective factor in neurodegenerative diseases in clinical and epidemiological environments
- The use of a locomotor assay as a measure of locomotor function for drosophila melanogaster and how it can be applied to other research conditions

- The potential for more research to be carried out in this area to investigate what it is about a high fat diet that causes the increase in neurodegeneration and begin to work out mechanisms to counteract this

Biography

Daniel Clayman is currently a third year medical student at the university of Nottingham, having finished his dissertation under the supervision of Professor Joern Steinert.

Mihai Popescu[1,2], Cristian Ravariu[1]*

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The almost cybernetic structure and evolution of brain tumors

The human body tumour lesions are almost ordinary events in its life. Almost every people has moles. The moles are in fact small tumours, which normally doesn't grow but in certain condition, triggered say by mechanical or radioactive events may become to have an uncontrollable growing. This is the case with every type of tissue in the body, when some internal or external stress factors interrupt its normal communication with the entire body, being no more under a normal control of the autonomic nervous system. Cancer cells are cells taking their life on their own hands and this could be a normal behaviour of a cell, external signals intended to change the cell state, including apoptosis, being reprogrammed for proliferation and dedifferentiation and conveyed to the genes residing in the nucleus. Tumours growth has some characteristics like spatial and temporal heterogeneity, clone and subclone, genomic instability. There are three stages in the immune escape process: clearance, equilibrium and escape. There are also three models of evolution. The first model has four stages linear, branch, convergent and parallel, function of the state of dissemination. The second model is the neutral evolution or big bang model, where the cell growth rate remains the same and it is characteristic to digestive cancers. The third model, punctuated evolution, is similar to the second model but after a long period of stagnation a new stage of evolution is acquired. The results of cancer cells evolution are drug resistance and immunotherapy resistance. There have been issued some methods for no intruding cancer treatment: radiotherapy, near infrared therapy and low frequency ultrasound to mention some of them. Every of them are not effective in all type of cancers but the results are encouraging. Combined with immunotherapy methods the results were improved. It deserves to mention the term "spontaneous remission" when patients with cancers in terminal stages were sent at home with a life hope of few months but they return back after many years safe and sound for a new control. During recent decades the disciplines of cybernetics, non-linear dynamics, stability theory and synergetic, the last three parts of the system theory have emphasized the importance of small fluctuations, drastically altering a system behaviour. Using a system theory approach Roy has attempted an analysis approach of tumour destabilisation. Cybernetics along with System Theory forms a universal theory of action applicable to the full range of medical sciences.

Audience Take Away Notes

- The audience will have some proposals for improved methods for the discontinuation of tumors evolution
- People working in the field of neurology can use these models to emphasize the importance of small fluctuations, drastically altering the system behaviour
- This research work can be extended to other faculties in the bioengineering field, to expand their research or teaching area
- The audience will assist at simulations of the interactions between no intruding treatment methods, the lesion site and the entire body, all seen from the perspective of the system theory

Biography

M. Popescu graduated as MS in 1989 at Faculty of Computers at the Polytechnic University of Bucharest, Romania. Between 1999-2003 he studied Faculty of Kinetotherapy of National University of Physical Education and Sport Bucharest, Romania. He also graduated Master Program in Medical Electronics at the Faculty of Electronics of Polytechnic University of Bucharest. Till 2017 he worked in the correlated domains of Medicine and Automatics as software Engineer at the National Institute of Sports & Medicine and since April 2017 up to present he is IT engineer at Medicine and Pharmacy University of Bucharest.
C. Ravariu studied Microelectronics and Bioelectronics at the Polytechnic University of Bucharest, Romania. He graduated as MS in 1993. He worked as scientific researcher first 5 years at Institute of Microtechnology, Bucharest, then joined the Polytechnic University of Bucharest. After multiple foreign stages in Bio-Nano-Engineering (Patras, Greece), Nano-devices (EPFL, Switzerland), Organic Electronics (LAAS, France), he received PostDoc degree in 2012 in Romania. Since 2013 he obtained the position of Full Professor at the Polytechnic University of Bucharest, Faculty of Electronics. He has published more than 250 research articles. Since 2014 he is Chairman of Romanian IEEE Electron Devices Chapter.

Hesham Elnazer
University of Sussex, United Kingdom

Quantification of severity of brain injury and its implications on personality change and long-term outcome

The presentation titled "Quantification of Severity of Brain Injury and Its Implications on Personality Change and Long-Term Outcome" discusses the assessment of brain injury severity, as well as the challenges associated with long-term outcome prediction and management of post-injury personality changes. The Glasgow Coma Scale (GCS) and Mayo classification are commonly used in clinical practice to document brain injury severity, but they have limitations as predictors of long-term outcomes. Acute behavioural disturbances, such as aggression and impulsivity, are often seen in individuals with moderate to severe brain injuries, with frontal and temporal damage being the most significant risk factors. Such disturbances can persist over time, affecting cognitive and emotional functioning, and often cause the most significant issues for family members.

The personality changes following brain injury, known as the frontal lobe syndrome, have been associated with damage to the orbitofrontal cortex and are prevalent in individuals with frontal lobe injuries. However, similar changes can be observed in up to 30% of those with other types of brain injuries. Pharmacological interventions should be used with caution, as they can have unpredictable adverse effects, and monitoring is required to balance the potential benefits against potential adverse effects.

Effective management of post-injury personality changes requires a multidisciplinary approach that includes specialist neurorehabilitation, support from family and friends, and care from other professionals. The challenges faced by clinicians and researchers in managing brain injury and its long-term consequences are significant, and emphasise the importance of a comprehensive approach to rehabilitation and care. Overall, this presentation highlights the need for ongoing research to improve our understanding of the long-term effects of brain injury, as well as the development of effective treatments and rehabilitation strategies to support those affected by this condition.

Biography

Dr. Hesham Y Elnazer is an experienced Neuropsychiatrist who has worked in various regional and national centres of excellence, including the National Centre for Brain Injury Rehabilitation, St. Andrew's Hospital, St. George's Hospital in London, and the University Hospital of Southampton. He is a holistic psychiatrist who utilizes biological, social, behavioural, and psychological models of therapy. Dr. Elnazer holds numerous qualifications, including an MD from the University of Southampton, a Certificate of Clinical Psychopharmacology from the British Association for Psychopharmacology, and a Certificate of Completion of Training (CCT) from the General Medical Council. He is affiliated with the Royal College of Psychiatrists and the European Behavioural Pharmacology Society. Dr. Elnazer has been actively involved in national and international projects and is a senior clinical lecturer at the Brighton and Sussex School of Medicine. He has authored a significant number of publications and reviews and has received several awards and recognitions for his work in developing the Royal College Membership Course, serving as a Royal College examiner and exam writer, and contributing to the development of the national training curriculum and the neuropsychiatry accreditation program.

Radwa Awad[1]*, Visruth Chakka[1], Christopher Beeghly[2], Tatiana Barichello[2], Vijayasree V Giridharan[2], Iraida Sharina[2]

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Oxidation of no-receptor soluble guanylyl cyclase controls cerebral blood flow and cognitive function in mice

Decreased Cerebral Blood Flow (CBF) is one of the major hemodynamic alterations leading to neurodegeneration and age-related cognitive decline. Nitric Oxide (NO)-dependent vasomotor reactivity is central in regulating cerebrovascular hemodynamics and adequate brain blood perfusion. NO receptor Soluble Guanylyl Cyclase (sGC) mediates NO-dependent vasodilation. Oxidative stress, often persisting in diseased vasculature, renders sGC insensitive to NO and impairs the NO signaling. The role of sGC oxidation in regulating CBF was never investigated. The present study investigated how sGC oxidation affects CBF and memory function in mice. To assess causal effect of sGC oxidation on NO signaling function we administered ODQ, a sGC-specific heme oxidizing agent, to simulate long-term effect of sGC oxidation in cerebral vasculature. Two groups of male mice (4 months old C57BL/6) were treated Intraperitoneally (IP) twice a week for one month with ODQ (20 mg/kg, n=7) or a diluent as sham control (n=8). Changes in sGC-dependent cerebrovascular reactivity and memory function were assessed in both groups. We applied a non-invasive pulsed Doppler ultrasound-based system to assess the changes in blood flow velocity (PVF, % of baseline) in the mouse Middle Cerebral Artery (MCA). MCA vasodilation was induced by bolus IP injection of NO donor Sodium Nitroprusside (SNP) or BAY 58-2667, a NO-independent activator of sGC with oxidized heme. Memory function was assessed by the Novel Object Recognition Task (NORT, RI, recognition index) in both experimental groups.

We observed a significantly blunted vasodilative response to SNP (1 mg/kg) in ODQ-treated mice vs controls (PVF, max response, 73.9 ± 10.4% vs 58.5 ± 8.6, p=0.01). The difference in BAY 58-2667 response between the groups was not statistically significant. The reduced memory function in ODQ-treated group was determined by NORT assessment (RI, 0.58 ± 0.13 vs 0.69 ± 0.05; p=0.01). Our results indicate that oxidation of NO receptor sGC in cerebral vasculature impairs CBF regulation and negatively affects memory function in mouse model. Our data suggests that sGC oxidation is an important contributor to cerebrovascular dysfunction and neurodegeneration.

Audience Take Away Notes

- Audience will learn about new mouse model mimicking targeted oxidation of NO-receptor sGC enzyme
- The audience will discover the effect of sGC oxidation on regulation of cerebrovascular blood flow and memory function
- It will introduce the audience to a new potential mechanism of the disruption of CBF regulation by persistent oxidative stress and how it effects memory function
- Our presentation identifies a new molecular target for therapeutic interventions in conditions of neurodegeneration or age-related cognitive decline associated with oxidative stress

Biography

Dr. Awad is a research scholar at the Department of Internal Medicine/Cardiology at McGovern Medical School. She received her MD from Benha University in Egypt in 2012. After obtaining her Master's Degree in Cardiology from the same university, she joined The University of Texas Health Science Center at Houston as a research trainee at Dr. Sharina's Lab. Her main interest is studying sGC activity and function focusing on the role of oxidative stress in the development of sGC-related pathologies.

David Zeng[1]*, Amanda Brown[2]

[1]JHU Department of Neuroimmunology, Post-baccalaureate Research Assistant, United States

[2]Associate Professor of Neurology, Johns Hopkins University, United States

Assessing the role of osteopontin in regulating cytokine expression among macrophages and neuroinflammatory pathways in HIV-Associated Neurocognitive Disorder (HAND)

Previous work in humanized mouse models of human immunodeficiency virus type-1 (HIV-1) has demonstrated that knocking down the matricellular protein Osteopontin (OPN) in vivo leads to a robust increase in the expression of proinflammatory markers TSPO and AIF-1, suggesting that OPN might have a physiological role as a molecular brake in suppressing the inflammatory response to viral infection (Mahmud et al., 2020). To further characterize how OPN specifically regulates the immune response during HIV infection, we knocked down OPN in human macrophages in the presence and absence of HIV infection, examining the corresponding changes in bulk RNA expression across protein-encoding genes. After finding a significant increase in expression of pro-inflammatory cytokines like IL6, TNFα, AIF1, IL1β, and a significant decrease in expression of anti-inflammatory cytokines like TGFβ in response to knocking down OPN, we propose that OPN may specifically regulate the immune response in HIV-infected macrophages by suppressing the expression of certain cytokines. Next, we conducted rt-PCR using macrophage RNA and found robust increases in amplification for IL6 and TNFα specifically in HIV-infected macrophages with OPN knockdown, supporting our hypothesis that OPN may physiologically suppress inflammation. Finally, we evaluated many canonical pathways that were disrupted by knocking down OPN and found increased T-helper cell activation by macrophages, increased macrophage trafficking and diapedesis, but also increased neuroinflammation. Together, this offers strong evidence for the role of OPN in regulating the immune response to HIV infection in macrophages and may more broadly substantiate the role of OPN signaling on modulating host cell factors critical for immune activation and maintaining the inflammatory burden of HIV.

Educational Summary: The goal of this study was to investigate whether OPN functions as a molecular brake regulating the inflammatory response in human macrophages infected with HIV, given previous studies which validated this hypothesis in humanized mouse models for HIV. We produced additional evidence that knocking down OPN results in the overexpression of pro-inflammatory cytokines IL6, TNFα, AIF1, IL1β, and a significant decrease in the expression of anti-inflammatory cytokines like TGFβ. Additionally, we found more activation in inflammatory signaling pathways like activation of T-helper cells, increased immune trafficking and transcellular migration across endothelial layers, and even increased neuroinflammation via astrogliosis (data not shown). Given that IL6 and TNFα are known to cause astrocytosis in the brain and weaken the blood- brain barrier (Nair et al, 2008), increased VCAM-1 signaling may suggest that knocking down OPN may promote the mobilization of peripheral immune elements like macrophages across the blood-brain barrier via the upregulation of certain pro-inflammatory cytokines. This is important because it may suggest a similar pathophysiological basis for HIV-associated neurocognitive disorder and MS. Lastly, we confirmed in our rt-PCR studies that IL6 and TNFα primer sequences amplified significantly more when OPN was knocked down in macrophages infected with HIV, while controlling for basal and nonspecific amplification, further validating the hypothesis that OPN plays a strong role in the homeostatic regulation

of cytokine activity. These results are crucial to understanding the molecular basis for the maintenance of neuroinflammation and neuropathology in the presence of viral infection, and may more broadly suggest that the downregulation of OPN may at least partly explain the overwhelming inflammatory response seen in HAND

Biography

David Zeng studied neuroscience with a concentration in cellular and molecular biology at Johns Hopkins University and graduated with a B.S. in May of 2022. During college, his scientific journey began upon joining an auditory neuroscience lab headed by Dr. Dwight Bergles where he contributed to a project studying the role of gap junctions on congenital hearing loss. In 2020, he collaborated with Dr. Amanda Brown on a basic science project studying the molecular role of OPN on modulating the inflammatory response to HIV in macrophages, culminating in a presentation for the undergraduate DREAMS symposium and honors award for graduation.

Marina Martinez Vargas[1,2,3]*, Justin Curson[2,3], Rolando E Rumbaut[2,3], Miguel A Cruz[1,2,3]

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[3]Center for Translational Research on Inflammatory Diseases (CTRID), Michael E. DeBakey VA Medical Center, Houston, Texas, United States

Studies on traumatic brain injury: Fragments of VWF regulate the expression of adhesion molecules and modulate vascular permeability in stimulated endothelial cells

Von Willebrand Factor (VWF) is a multimeric protein that mediates thromboinflammation and has been linked to Traumatic Brain Injury (TBI), specifically in the pathogenesis of early brain injury. Activated endothelium secretes VWF multimers as long hyperadhesive strings. During TBI, the expression of hyperadhesive strings increase significantly. ADAMTS13, a disintegrin and metalloprotease with thrombospondin type-1 repeats, member 13, is a proteolytic factor that reduces the hyperadhesive VWF strings to less adhesive form by cleaving the VWF strings at the A2 domain. In fact, there are experimental studies demonstrating the beneficial effect of intervening with ADAMTS13 after TBI in mice. However, whether the proteolytic fragments of VWF attenuate the severity of TBI remains unknown. Therefore, our research focuses on elucidating the mechanisms by which VWF fragments may regulate the permeability of stimulated endothelium. Fragments of VWF regulate permeability in endothelial cells and play a role in vascular permeability in a TBI mouse model. We employed recombinant proteins encompassing the amino acid sequence of the A1A2A3 domains of VWF. We used biolayer interferometry, immunofluorescence and immunohistochemistry approaches to analyze vascular permeability during endothelial stimulation. The data shows that Fragments of VWF (A1A2A3 WT and A1A2A3 GOF) modulated permeability, altering the morphology of VE-cadherin, β-actin, and ZO-1. A1A2A3 GOF fragment shown to be effective to rescue permeability at 24 hrs in human microvascular endothelial cells under stimulation with IL-1β. In addition, we noticed a decreased expression of VWF on a mouse brain microvessels after 3 weeks of TBI insult. Based on our experimental data we conclude that VWF is essential to maintain vascular permeability. Our future direction is to evaluate the role of VWF fragments employing a TBI mouse model.

Audience Take Away Notes

- This presentation will help to understand the mechanisms mediated by VWF in the control of vascular permeability. People who work with TBI can expand their work in order to develop better treatments for people who suffer from this condition. Teachers could develop lines of research for other drugs that can be used to improve the quality of life of these people
- Whether this would help focus research on agents that help improve brain damage caused by TBI
- This research is focused on the veteran population, but this information can benefit children and young athletes or people who have suffered a severe brain accident
- Today there are not enough treatments to help restore brain damage and this study aims to find new markers with the potential to reduce damage and prevent brain leaks

Biography

Dr. Marina Martinez Vargas her BS in Microbiology at the University of Puerto Rico (UPR), Humacao Campus. Then, she received her PhD in Biochemistry at UPR, Medical Sciences Campus. She is currently a Postdoctoral Fellow in Neuroscience and Thrombosis at Baylor College of Medicine. She has 6 peer review publications. Her research interests are focused on Traumatic Brain Injury. She is applying for a Career Development Award from the Department of Veteran Affairs. She is proposing to address novel molecular mechanisms associated with the Blood-Brain Barrier (BBB) damage and testing potential reagents capable of improving BBB integrity after TBI.

Isabella Kim
Academy of the Holy Angels Summer Research Project August 31, 2023, United States

Molding the brain: The neural response to intensive motor and cognitive training

Globalization and technological advancements have contributed a shift towards hyperspecialization--the division of work into more specialized pieces done by multiple people--to achieve improvements in quality, efficiency, and cost in the labor market. However, there is a mismatch between the specialized skills employers are looking for and the available skillsets of unemployed workers. Neuroscience research on long-term persistent training in highly specialized trades and neuroplasticity can bring insight into solutions for these labor market challenges, illustrating how our brains can change with a changing job market. This review looks at 10 experimental studies to see how specific job requirements and cognitive demands influence the brain's structure and function. These studies observed structural and functional neuroplasticity due to long-term persistent training in two domains of skills: athletic/motor and cognitive memory skills. Findings show how intensive training in both motor and cognitive skills instigates remarkable changes in the brain's ability to adapt and evolve, even in adulthood, having implications for workforce policy and future work on occupational neuroscience.

Molding the Brain: The Neural Response to Intensive Motor and Cognitive Training: In an ever-evolving job market affected by technological advances and globalization, there is a significant shift towards specialized roles. Increasingly, statistics illustrate a trend where employment opportunities cater to specific skills and knowledge bases (Fuller et al., 2022). Scholars argue that this increase in the division of labor signifies an era of hyperspecialization: work previously done by one person is divided into more specialized pieces done by multiple people, achieving improvements in quality, speed, and cost. (Malone et al., 2011). This specialization has created entirely new environments that individuals must navigate. However, with this change, a question emerges: What does this mean for workers' skills and training? Employment opportunities are more geared towards what researchers call "knowledge workers." Ironically, while unemployment rates may soar, employers often struggle to find candidates with the proper set of specialized skill sets (Fuller et al., 2021). The division between the specialized job openings and the available workforce highlights the challenges and opportunities of the modern employment field.

Research might indicate that our brains can actually change to meet the needs of these jobs. The answer to navigating this complex landscape might lie in long-term persistent training. Long-term persistent training refers to extended periods of deliberate practice and skill refinement within a specific profession, leading to enduring changes in the brain's structure and/or function that enhance cognitive abilities and task performance associated with that occupation. Occupational neuroscience is a field that looks at the relationship between the brain's plasticity and long-term occupational training or experience. Occupational neuroplasticity is the phenomenon of brain changes due to occupational performance. This field of research illustrates how our brains can change with a changing job market.

Neuroscience researchers have looked at specific trades that require unique skill sets to understand training-related neuroplastic changes in the brain better. In this paper, I review the literature on

occupational neuroplasticity across two core skills that are relevant to various hyperspecialized trades: 1) motor/athletic and 2) cognitive/memory across both brain function and structure. The review is guided by the following research question: how do specific job requirements and cognitive demands influence the brain's structural and functional neuroplasticity. What are the potential implications for cognitive performance in the modern job market?

Neuroplasticity and Long-term Persistent Training: Neuroplasticity refers to the brain's unique ability to adapt and reorganize itself in response to experiences, learning, and changes in the environment. Structurally, it involves modifications in the connections between neurons, while functionally, it encompasses the brain's capacity to adjust its activity patterns to accommodate new tasks or demands. More specifically, changes in brain structure refers to the physical organization and arrangement of different brain regions and their components, while brain function refers to the processes carried out by the brain to perform different tasks, such as memory usually measured by gray matter. Gray matter is responsible for processing information in the brain and spinal cord and plays a crucial role in various cognitive functions. Brain function refers to the processes carried out by the brain to perform different tasks, such as memory. This is usually measured by an fMRI or functional magnetic resonance imaging, which is a type of brain scan that measures and maps the brain's activity. Unlike regular MRi scans, an fMRI shows what parts of the brain are active while a person is performing or thinking something specific by measuring the changes in blood flow.

Research on neuroplastic changes as a result of long-term persistent training is often done in two major skill sets: motor/athletic and cognitive/memory. Motor athletic skills are the physical abilities and techniques developed by athletes to perform effectively in their sports. These skills involve using precise coordination of muscles, nerves, and the brain to execute movements necessary for activities like running, jumping, throwing, and balancing. Cognitive skills are the brain's abilities that enable individuals to acquire, process, and apply knowledge.

They include memory, paying attention, solving problems, making decisions, and understanding things. This research typically looks at trades that include long-term persistent training, where individuals are defined as experts, specialists, elite professionals.

Motor Skill Training and Neuroplasticity Motor Skills and Structural Neuroplasticity: Studies have shown how long-term persistent motor skill training can lead to plastic changes in brain structure. For example, one study investigated the structural neuroplasticity of 19 elite ice skating athletes compared to 15 non-athletes (Zhang et. al, 2021). These ice skaters were considered "master athletes", training for over 10 years on average. Voxel-Based Morphometry (VBM), a neuroimaging technique that measures the amount of gray matter in different brain regions, revealed that elite ice skating athletes exhibited higher gray matter volume in the posterior cerebellum, frontal lobe, temporal lobe, posterior cingulate, caudate, and thalamus.

Similarly, professional badminton athletes also experience structural plasticity as a result of their training. A study included 20 professional badminton players and 18 healthy controls and used Magnetic Resonance Imaging (MRI) to measure Gray Matter Concentration (GMC) in the whole brain using VBM (Di et. al, 2012). The results showed that the badminton player had greater GMC in the right and medial cerebellar regions, involved in visuospatial processing and hand-to-eye coordination compared to the control group.

Another study analyzed the structural brain differences between 22 healthy right-handed participants who were either sedentary (referring to a lifestyle with little to no physical activity) or ultra-endurance ironman athletes (individuals who engage in levels of Moderate To Vigorous Physical Activity (MVPA)) (Paruk T et. al, 2020). The participants underwent MRI scans, and grey and white matter were measured using whole brain analysis and VBM as well. The study found that ultra-endurance athletes had larger gray and white matter volume in the brain overall compared to sedentary individuals. Interestingly, however, the ultra-endurance group showed smaller gray matter volumes in specific brain regions important for sensorimotor function and exercise fatigue.

These studies all found increases in GM in the cerebellum in particular, which are known to be involved in learning and retention of motor skills. Interestingly though, studying Korean basketball players, Park et al., (2006;2009), did not find significant differences in the cerebellar volume between the athletes and the height-matched controls, attributing this to potential differences in the motor skills required for basketball compared to other athletic sports. However, looking more granularly at changes in vermian lobules using three-dimensional MRI volumetry, Park et al. (2009) found that basketball players had significantly larger volumes of vermian lobules VI-VII compared to healthy controls.

All of these case studies on various athletes and training suggest that intensive practice of sports-related motor skills can activate structural plasticity in the cerebellum specifically, as well as in other brain regions such as the frontal lobe, temporal lobe, posterior cingulate, caudate, and thalamus. They also demonstrate that unique and specific skill sets within various sports-related motor skill training (e.g. ones that differentiate basketball from badminton), may even result in different, more granular structural changes.

Motor skills and Functional Neuroplasticity: Studies have shown how long-term persistent motor skill training can lead to plastic changes in functional connectivity as well. The ice skater study by Zhang et al. (2021) as well as the research on Badminton athletes also explored functional brain plasticity (Di et al, 2012). Zhang et al. (2021) used resting-state fMRI on the 19 elite ice skating athletes and 15 non athletes to analyze the differences in functional connectivity in the whole brain. The study found that elite ice-skating athletes showed stronger connectivity between the posterior cerebellar lobe and fusiform gyrus. Additionally, the functional plasticity changes were primarily concentrated in the posterior cerebellar lobe. Similarly, Di et al. (2012) utilized resting-state functional MRI to measure functional connectivity between brain regions in badminton players and healthy controls. The results showed that the badminton players had altered functional connectivity between the left superior parietal and frontal regions, which are involved in visuo-spatial processing and cognitive control.

Bezzola et. al (2012) expanded the research on practice-based neuroplasticity by looking at novice / leisure-based motor activity in middle-aged rather than long-term persistent practice in athletes. Golf novices were analyzed at two time points, and compared to a match comparison group who were not practicing motor training in golf as a leisure activity. Researchers measured the mental rehearsal of a golf swing in non-primary motor areas under fMRI. During the imagery condition, motor imagery activity was m ainly observed in secondary motor areas, sub cortical regions, and the superior parietal cortex. In the second measurement, the researches found reduced task-related brain activation during motor imagery of the golf swing, specifically in the right and left dorsal premortor cortex.

In conclusion, when individuals commit to long-term persistent motor skill training, it can potentially induce significant changes in the brain's functional connectivity both across the whole brain as well as within specific brain regions. From these examples, changes in brain structure include brain regions involved in the superior parietal regions, specifically the left superior parietal and cortex, which are important for spatial processing and attention. Interestingly, these studies show how functional change from motor activity can be a result of both professional, long-term training for athletes, as well as This process showcases the brain's remarkable adaptability, reinforcing the relationship between consistent train efforts and the neural adjustments that underlie enhanced motor performance.

Cognitive and Memory Skill Training and Neuroplasticity Cognitive and Memory Skills and Structural Neuroplasticity: Studies have shown how long-term persistent cognitive and memory skill training can lead to plastic changes in different brain regions. A study by Maguire et. al (2000) explored the plastic changes in brain structure in response to environmental demands. The study included 20 licensed London taxi drivers and 30 control subjects who did not drive taxis who were matched for age and gender. Through a cross-sectional design, researchers utilized two different methods to analyze the MRI scans of the participants' brains: VBM to measure gray matter volume in the whole brain and a pixel counting technique to measure the volume of the hippocampus, which are brain regions important for spatial navigation. The

study found that the posterior hippocampi of London taxi drivers were significantly larger than those of control subjects. This suggests that the extensive navigation experience of the taxi drivers may have altered their brains.

After her groundbreaking findings of the London taxi drivers, Maguire shifted her attention towards memory athletes. She wanted to find out if the superior memorizers had structural differences in their brains similar to the London taxi drivers or just optimized their memorization skills that everyone posseses. The researchers placed the memory champions and a comparable control group inside MRI machines. They were then tasked with remembering three-digit numbers, grayscale pictures of individuals' faces, and enlarged snowflake images while their brain activity was being monitored. The study used a whole-brain VBM to compare the difference between Superior Memorizers (SMs) and control subjects in gray matter volume. The VBM analysis was automated, meaning it was not limited to specific brain regions, and considered the whole brain. However, the study found no significant difference in gray matter volume between SMs and control subjects. Structural changes from superior memory cannot be detected using VBM. Rather, functional differences through the fMRI were detected. Maguire et. al (2002).

Structural changes in the brain can happen for individuals who engage in intensive cognitive training/ tasks. However there was no structural differences in gray matter seen in memory athletes compared to control subjects, which brings up some hypotheses. One difference between taxi driving and superior memory athletes is a physical task associated with the cognitive (e.g. driving). This suggests perhaps an importance of physical skills tied to cognitive skills that support structural changes. Alternatively, it is possible that there could be other structural changes outside of grey matter as measured by VBM that Maguire and others could not detect.

Cognitive and Memory Skills and Functional Neuroplasticity: Studies have shown how long-term persistent cognitive and memory skill training can lead to plastic changes in functional connectivity. One study investigated the differences in dynamic Function Network Connectivity (dFNC) between 38 professional chess players with an average training of 4.17 hours per day and 20 beginner chess players whose sex and age-matched the professional group. Researchers used functional Magnetic Resonance Imaging (fMRI) to measure the functional connectivity in the brains of professionals and beginner chess players. Additionally, they analyzed the dFNC between different brain regions in the two groups and found that professional players have greater dFNC in their brain networks, which may be related to their superior cognitive abilities in chess.

Similarly, memory athletes who heavily depend on their cognitive abilities showed differences in which regions of their brain they utilized when memorizing. Although the study failed to find structural differences, they discussed the functional differences between the Superior Memorizers (SMs) and the control subjects using fMRI to investigate differences in brain areas engaged while processing incoming information. The analysis utilized Statistical Parametric Mapping (SPM99) to identify the brain activation during specific tasks. The study found that superior memory was associated with the preferential engagement of three brain regions: the medial parietal cortex, retrosplenial cortex, and the right posterior hippocampus. The same hippocampal region that was found to be enlarged in London cabbies was found in these memory athletes. These regions of the brain are known to be utilized in visual memeory and spatial navigation. These regions were more active in SMs than the control group when performing tasks requiring encoding and retrieving complex visual information.

These two studies demonstrate how functional neuroplasticity resulting from long-term persistent training in cognitive and memory tasks can be measured and shown in various ways. The findings from the professional chess player reveal a heightened dFNC, which suggests a possible link to their advanced cognitive capabilities in chess. Similarly, memory athletes who heavily rely on superior cognitive abilities utilize distinct patterns of brain region engagement during memorization tasks. While structural changes were undetectable, the functional disparities were evident especially in areas such as the medial parietal

cortex, retrosplenial cortex, and the right posterior hippocampus. These regions vital to visual memory and spatial navigation exhibited heightened activity in the SMs compared to the control group. Such findings show the brain's remarkable ability to reorganize its functional pathways in response to rigorous cognitive demands and specialized training.

Conclusions: This review looks at 10 different experimental studies that measured structural and/or functional neuroplasticity as a result of long-term persistent training in either motor skills or cognitive memory skills. I sought to answer the question, how do specific job requirements and cognitive demands influence the brain's structural and functional neuroplasticity. This review demonstrates how intensive training in both motor and cognitive skills instigates remarkable changes in the brain's structure and function. Studies on athletes reveal that rigorous practice activates structural plasticity in specific brain regions, including the cerebellum frontal lobe and more. The training that hones unique skills in specific sports can lead to distinct structural modifications. Similarly, persistent cognitive training displays the brain's ability to adapt to functional connectivity alterations within different regions, such as the superior parietal and cortex areas vital for spatial processing and attention. While memory athletes did not show any difference in gray matter compared to a control group, the functional differences were prominent, especially in regions crucial to visual memory and spatial navigation like the medial parietal cortex and the right posterior hippocampus. These findings suggest a possible link between physical and cognitive skills in developing structural changes. Despite the absence of structural or functional shifts in some studies, the present alterations highlight the brain's impressive ability to restructure its pathways in response to long-term training and high cognitive demands emphasizing the relationship between constant effort and enhanced performance. My review shows how our brains are capable of adapting to different work demands, and this might help us perform better mentally. This research helps provide insight into what tools and interventions can be used to set workers up for success in this changing economy. This research can help support both employees and employers in adapting to a more hyper-specialized workforce. Although the everyday worker may not be a professional ice skater or memory athlete, these findings show how career paths can change the brain and bring promise to how we can change our brains to be more suitable for a changing economy.

Implications: Moreover, this review also illuminated some potential implications for cognitive performance in the modern job market. Structural and functional findings show the ability to adapt throughout one's life. In hyperspecialized roles, one might need to quickly adjust to new tools or techniques within their narrow focus. Similarly, effective brain training pushes the brain to adapt to new challenges, which promotes growth. Our growing grasp of brain plasticity, the remarkable ability of the brain to adapt and evolve, holds transformative potential for both policy and education. For example, this growing body of work can inform shifts in workforce training and education to address the gap between high unemployment rates and employers' struggle to find potential employees with their desired skill sets. Additionally, these findings bring up potential connections to research on cognitive enhancement interventions that could help support individuals looking to expand their skill sets even in adulthood. Future work in hyperspecialization should continue to incorporate research on long-term persistent training and neuroplasticity to better incorporate evidence-based research to address modern labor market problems.

Key words: Neuroplasticity, Motor Skill Training, Cognitive Tasks, Brain Regions, Structural and Functional Brain Changes, Memory Athletes, Long-Term Persistent Training, Spatial Navigation, Superior Parietal Cortex, Sports Related Motor Skills, Cerebellum, Visual Memory.

Kimberley D Ryan

Associate Professor, Brandon University Faculty of Health Studies, Department of Psychiatric Nursing, Brandon, Manitoba, Canada

Equine assisted psychotherapy: An alternative approach to the treatment of youth substance use

The prevalence of youth substance use disorders has increased exponentially and with it so too has mental health services utilization. Since traditional approaches to the treatment of adult substance use disorders are ineffective with youth, alternative treatment approaches must be considered. One such approach is equine assisted psychotherapy (EAP), a person centered, experiential approach using horses during the treatment of psychological disorders and the basis of Equine Assisted Growth and Learning Association (EAGALA) based programming. This presentation will focus on the use of EAGALA model-based EAP in the treatment of youth substance use.

Audience Take Away Notes

- Explain the role of equines during EAP
- Describe the role of mental health and equine specialists within the EAP team
- Explain the process of EAP process while treating Childhood and Adolescent substance use
- Outline treatment outcomes of EAP in Childhood and Adolescent substance use

Biography

Kimberley's expertise in undergraduate psychiatric nursing education spans close to four decades. Areas of research interest include suicide in rural populations, equine assisted psychotherapy/learning, undergraduate and graduate psychiatric nursing education, curriculum development, teaching and learning, mental health psychiatric nursing, mental health of rural and isolated populations, dementia, distance education, and ongoing continuing competency. Kimberley's strength lies in qualitative research. She has disseminated research findings in 30 publications and presented at 44 National and International conferences. In addition to working in academia, Kimberley offers Equine Assisted Psychotherapy services through not-for-profit, private practice.

Brandon Lucke Wold
University of Florida, United States

Exploration of treatments for subarachnoid hemorrhage

Subarachnoid Hemorrhage (SAH) continues to be a leading cause of morbidity and mortality, with cerebral vasospasm as a common etiology of worse clinical progression. The purpose of this study was to evaluate and review the current literature concerning the effective treatment of SAH. The treatment options for SAH are expanding as new therapeutic targets are identified. Nimodipine is the primary medication prescribed due to its neuroprotective properties. In addition, certain drugs can enhance lymphatic flow and influence the recovery process, such as Dexmedetomidine, SSRIs, and DL-3-n-butylphthalide. Vasospastic and ischemic patients commonly undergo transluminal balloon angioplasty. Clinical trials have not yet provided conclusive evidence to support the use of magnesium or statins. Moreover, other agents such as calcium channel blockers, milrinone, hydrogen sulfide, exosomes, erythropoietin, cilostazol, fasudil, albumin, Eicosapentaenoic acid, corticosteroids, minocycline, and stellate ganglion blockade should be investigated further.

Biography

Brandon Lucke Wold was born and raised in Colorado Springs, CO. He graduated magna cum laude with a BS in Neuroscience and distinction in honors from Baylor University. He completed his MD/PhD, Master's in Clinical and Translational Research, and the Global Health Track at West Virginia University School of Medicine. His research focus was on traumatic brain injury, neurosurgical simulation, and stroke. At West Virginia University, he also served as a health coach for the Diabetes Prevention and Management program in Morgantown and Charleston, WV, which significantly improved health outcomes for participants. In addition to his research and public health projects, he is a co-founder of the biotechnology company Wright-Wold Scientific, the pharmaceutical company CTE cure, and was a science advocate on Capitol Hill through the Washington Fellow's program. He has also served as president of the WVU chapters for the American Association of Pharmaceutical Scientists, Neurosurgery Interest group, and Erlenmeyer Initiative Entrepreneur group. In addition, he has served as vice president for the graduate student neuroscience interest group, Nu Rho Psi Honor Society, and medical students for global health. He was an active member of the Gold Humanism Honor Society and Alpha Omega Alpha Honor Society. He is currently a member of the Young Neurosurgeons' Committee. He is married to Noelle Lucke-Wold, and has a toddler daughter named Esme. As a family, they enjoy running with their dogs, rock climbing, and traveling the world. In his spare time, Brandon frequently runs half marathons and 10ks together with is wife. Brandon also enjoys reading and discussing philosophy and playing chess. He is excited to join the neurosurgery residency program at University of Florida.

Aya El Taibany*, Goodwell Nzou1, Daniel Porada, Michael C Seeds, Anthony Atala

Wake Forest Institute of Regenerative Medicine, Wake Forest School of Medicine, Winston Salem, North Carolina, United States

Modeling neuroimmunological interactions in ischemia-reperfusion using human 3D multicellular blood-brain barrier organoids

Introduction: Brain microvascular endothelial cells in the CNS develop special barrier properties that help maintain CNS homeostasis. Ischemia-reperfusion injury is a serious neurological disorder involving Blood-Brain Barrier (BBB) disruption with acute ischemic events and worsening neurological events with reperfusion and immune cell infiltration. Studying the cellular events at the BBB interface is extremely important for the development of immunomodulatory strategies to treat ischemia-reperfusion and stroke injury. In-vitro BBB models containing all elements of the neurovascular unit allow high and efficient throughput screening of potential drugs and facilitate their translation to in-vivo preclinical and clinical investigation. This study evaluated a 3D human BBB model (Goodwell Nzou et al. 2018, Scientific Reports) for its ability to recapitulate the effect of Ischemia-reperfusion injury on the BBB tight junctions, permeability, and immune cell transmigration.

Methods: Organoids were incubated in the hypoxic chamber for 12 hours in low glucose DMEM media and were returned to room oxygen/5% CO2 incubators with normal exchanges of media for another 72 hours. The following experiments were conducted for each exposure (Hypoxia alone and Reperfusion for 24, 48, and 72 hrs.) vs. control: 70 kDa permeability assay, Live, and dead assay, ATP assay, staining for reactive oxygen species and hypoxia, qPCR for quantification of tight junction and cell-adhesion molecules expression, and transmigration of activated CD4+ T-cells under hypoxia and reperfusion. To evaluate the effect of anti-adhesion molecules on the transmigration process, an anti-Human ICAM1 blocking antibody was incubated with the organoids for 1 hr. prior to transmigration.

Results: Hypoxia was induced by incubation under OGD conditions for 12 hrs. Confirmed by qPCR, ROS levels, ATP analysis, Permeability assessment, and live and dead assays. Reperfusion was partly recapitulated by the second phase decrease in viability, increased permeability, increased transmigration, and an increase in TNF-□ and MMP-9 gene expression. Blocking with Anti-ICAM1 decreased transmigration within 48 hours. Reperfusion suggests that blocking cell adhesion might help alleviate the brain insult in reperfusion injury.

Conclusion: Our 3D blood-brain barrier model recapitulated the expected biological changes in ischemia and reperfusion and demonstrated modulation of cell adhesion molecule expression and functional effect on immune cell transmigration across the BBB. The 3D BBB model represents a potential tool to model neurological insult in Ischemic stroke and test/screen for effective immune cell-blocking therapy to ameliorate the serious consequences of reperfusion injury.

Audience Take Away Notes

- Importance of 3D models in modeling serious brain/ neurological disorders
- 3D models could accelerate the translation of many therapeutics into clinical trials
- Potential of immune cell blocking therapy in treating neuroimmunological disorders such as multiple sclerosis or ischemia-reperfusion injury and much more

- The increasing role of the regenerative medicine field to complement the understanding of the molecular basis of neurological disorders and test potential therapeutics

Biography

Aya AR. El-Taibany, currently a fourth-year Molecular Medicine and Translational science Ph.D. candidate, earned an MD degree from Alexandria University School of Medicine in 2008. Worked as a clinical Geneticist, and assistant lecturer from 2009 to 2018. In 2015, earned a master's degree in medical Genetics working on characterizing a screening tool to detect Fragile X syndrome cases among intellectually disabled patients by detecting the number of repeats in the FMR-1 gene. Participated in the national program for treating patients with Inborn Errors of Metabolism (Egypt), especially phenylketonuria, and established a center for treating such disorders at Alexandria School of Medicine. Worked on characterizing genetic mutations in familial retinoblastoma cases through RB gene sequencing. Especially interested in studying neurogenetic and neuroimmunological disorders and cancer genetics. Current work in WFIRM focuses on characterizing brain models for neuroinflammatory disorders to gain better insight into molecular mechanisms and potential therapeutic targets and exploring new approaches for brain cancer immunotherapy.

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DAY 03

KEYNOTE FORUM

JOINT EVENT ON

NEUROLOGY & ADDICTION

Posterior reversible encephalopathy syndrome or disseminated endotheliopathy perfusion syndrome: Time for a new name

In 1996, in this same city, Posterior Reversible Encephalopathy Syndrome (PRES) was presented as a new neurological condition. PRES has long been described as a benign clinico-radiological syndrome. However, in recent years, it has had an associated global mortality rate up to 19% of patients and a specific mortality rate of 5.7% directly correlated to the neurological condition.

Here, the authors suggest a name change from Posterior Reversible Encephalopathy Syndrome to Disseminated Endoteliopathy Perfusion Syndrome (DEPS) based on the radiological and neuropathophysiological findings. The name change presents a more accurate representation of what occurs and can help in explaining prognosis to other physicians and family members of the patient. Furthermore, the name change could contribute to the development of possible treatments to improve cerebral artery endothelium dysfunction observed on DEPS (PRES) patients, as physicians no longer expect the patient to recover to a complete neurological state.

Juan A Moreira[1]*, Gabriel Vidal[2]

[1]Gnosis Neurointegrative Center, San Juan PR, United States

[2]Neurology Department, Ochsner Health, New Orleans LA, United States

Biography

Board-certified neurologist with two fellowships; vascular neurology and neuroimaging. Exceptional background with over 25 years of experience devoted to providing top quality healthcare at the hospital, ER and ambulatory setting. I have successfully run a private practice from 1995-to 2022. In addition, with experience on Botox, Transcranial Magnetic Stimulation and Laser Photobiomodulation. Interested on clinical research. Looking to work on an institution dedicated to excellence.

Board-certified neurologist with two fellowships; vascular neurology and neuroimaging. Exceptional background with over 25 years of experience devoted to providing top quality healthcare at the hospital, ER and ambulatory setting. I have successfully run a private practice from 1995-to 2022. In addition, with experience on Botox, Transcranial Magnetic Stimulation and Laser Photobiomodulation. Interested on clinical research. Looking to work on an institution dedicated to excellence.

Calcium signaling in diabetic vascular dementia

Vascular dementia, also known as Vascular contributions to Cognitive Impairment and Dementia (VCID), is a neurodegenerative disease. VCID has high morbidity and mortality. Diabetes is a leading factor in the development of VCID. However, the cellular and molecular mechanisms underlying the development of diabetes-induced vascular disease are largely unknown. Moreover, the current treatments for VCID are neither specific nor always effective. It has been generally believed that dysfunctions of Cerebral Arteries (CAs) to cause hypoperfusion to the brain plays an important role in the initiation and progress of VCID. Perfusion of CAs is predominantly generated and controlled by contraction and relaxation of Smooth Muscle Cells (SMCs). These two cellular processes are fundamentally produced and regulated by cell calcium signaling. The cell calcium signaling is primarily determined by ion channels on the plasma membrane and Sarcoplasmic Reticulum (SR) membrane. Therefore, we have started to explore whether and which ion channels might be essential for diabetes-evoked VCID. Consistent with previous reports by us and other investigators, we have found that intraperitoneal injection of streptozotocin caused a significant increase in blood glucose, leading to diabetes in mice. A series of our studies have also discovered that the diabetic mice had declined cognition, impaired memory, and increased anxiety, thereby exhibiting significant VCID. This diabetic vascular dementia might occur due to cerebral vasoconstriction and associated blood hypoperfusion, as revealed by Laser Speckle Imaging System. Diabetic cerebral vasoconstriction could result from increased intracellular calcium concentration ([Ca^{2+}] i in CASMCs. Increased [Ca^{2+}] i was attributed to the augmented Ca^{2+} release from the SR, the major intracellular Ca^{2+} store, which followed the hyperfunctional activity of type-2 Ryanodine Receptor (RyR2), the calcium release channel on the SR in CASMCs. Taken together, our findings for the first time demonstrate that RyR2/Ca^{2+} release channel plays an essential role in the development of diabetes-caused VCID; presumably, specific pharmacological and genetic inhibition of RyR2 in vascular SMCs may become specific and effective treatment options for diabetic VCID and vascular complications.

Audience Take Away Notes

- Our current presentation will greatly help the audience to create their future research directions
- The finding presented may significantly assist the audience to develop novel preventive and therapeutic strategies for VCID and other dementias
- Our research could also be used by other faculty to expand their research or teaching

Yong Xiao Wang

Department of Molecular and Cellular Physiology, Albany Medical College, Albany, New York, United States

Biography

Dr. Yong-Xiao Wang has been a Full Professor in Department of Molecular and Cellular Physiology at Albany Medical College since 2006. Dr. Wang obtained his MD at Wannan Medical University, PhD at Fourth Military Medical University, and postdoctoral training at Technology University of Munich and University of Pennsylvania. He has made many important findings using complementary molecular, biochemical, physiological, and genetic approaches at the molecular, organelle, cellular, tissue and organism levels in animals and human samples, had numerous publications in Nature Commun (impact factor: 14.290), Antioxid Redox Signal (8.209), Proc Natl Acad Sci USA (9.432), Nature (34.480), Circ Res (9.214), and other highly peer-reviewed journals and academic books, and served as the editorial board member and/or section editor as well as the executive committee member and/or subcommittee chair for professional societies.

3DYNAFS-MBAFUS: A virtual lab of microbubble-assisted focused ultrasound for noninvasive treatments of neurodisorders

Focused Ultrasound (FUS), especially when combined with Microbubbles (MB), offers non-invasive options for treating deep-seated brain tumors and other neurodisordersm, by enabling targeted surgical ablation and/or local Blood-Brain-Barrier Opening (BBBO) for effective drug delivery. However, clinical translation faces significant challenges due to complex and intertwisted dependencies among various FUS and MB-related parameters, coupled with sensitivity to patient-specific conditions. To expedite the deployment of these non-invasive treatments, Dynaflow has developed MBaFUS, a two-way coupled numerical platform. It models MBs in a lagrangian fashion while solving acoustic and thermal fields in bio-media using an Eulerian approach. This allows for bidirectional interactions, where the acoustic field affects bubble dynamics, and bubble behavior influences pressure and heat distribution in bio-media.

MBaFUS serves as a virtual lab, streamlining therapy development and reducing the time and effort required for extensive testing. Researchers can explore new applications and advance basic science with this platform. Furthermore, it can function as a Treatment Planning System (TPS) in clinics for patient-specific optimizations. We demonstrate its efficacy in non-invasive deep-seated tumor ablation, validated against in vitro and ex vivo experiments. Ongoing efforts to expand its use for sonothrombolysis, including cerebral venous thrombosis treatment, will also be discussed. Lastly, we illustrate the prospects of MBaFUS's as a powerful tool to optimize Blood-Brain Barrier Opening (BBBO) for targeted drug delivery in treating neurodisorders such as Parkinson's and Alzheimer's diseases.

Jingsen Ma

Dynaflow, Inc., Jessup, MD, United States

Biography

Dr. Jingsen Ma is the Vice President at Dynaflow, Inc (DFI), a leading research company specializing in multiphase flow and cavitation. He earned his Ph.D. in Chemical Engineering from the Chinese Academy of Sciences in 2007, conducting postdoctoral research on air-entrained naval flows modeling at RPI until 2010. With extensive experience in computational multiphase fluid dynamics, his expertise spans various industries, including oil & gas, marine, and biomedical sectors. Dr. Ma is a renowned expert in multi-scale modeling of cavitating flows, particularly in Microbubble-assisted Focused Ultrasound (MBaFUS) applications, earning DFI prestigious awards from the American Society of Mechanical Engineers (ASME) such as the CFD Best Paper (2020), Multiphase Flow Best Paper (2021), and the Knapp Award (2022). Apart from his research, Dr. Ma is actively engaged in academic and engineering communities. He founded and leads ASME's Forum on Multiphase Flows with Bio-applications and served as the Outstanding Track Organizer of FEDSM2018. He also held positions as the Chair of the CFD Technical Committee (TC) and Vice-Chair of the Multiphase Flow TC of ASME. Currently, Dr. Ma's primary focus is seeking investment and developing joint proposals to accelerate the clinical translation and commercialization of DFI's MBaFUS—a Virtual Lab and TPS for noninvasive ablation and targeted drug delivery solutions for diseases like brain tumors, Parkinson's, and Alzheimer's.

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DAY 03

SPEAKERS

JOINT EVENT ON

NEUROLOGY & ADDICTION

Maryam Shahab[1]*, Tamanna Nazir[2], Sumaira Nazir[2]

[1]Central Park Physicians, New York, United States

[2]Department or Internal Medicine, Hayatabad Medical Complex, Peshawar, Pakistan

A rare case of arnold-chiari malformation evident after a streptococcal throat infection in a young female: A case report

Arnold-chiari malformation is a rare neurological developmental disorder that presents at birth. No such cases have been reported in support of microbial infections causing chiari malformation; yet there is evidence how microorganisms can lead to brain abscess, brain empyema, and meningoencephalitis. A 23-year-old young woman presented with progressive back and leg pain after a streptococcal throat infection, followed by a single episode of syncope. Radiographs of the spine revealed mild reversal of cervical spine curvature and minimal levocurvature of the lumbar spine. Magnetic resonance imaging of the brain showed herniation of the cerebral tonsils into the foramen magnum, which suggested the diagnosis of arnold chiari malformation I. Neurosurgery was recommended for posterior fossa decompression, but the patient was reluctant to undergo the procedure. This is the first case of arnold-chiari malformation symptomology that became evident only after a streptococcal throat infection in a young female adult.

Audience Take Away Notes

- This is a rare care of ACM post-streptococcal pharyngitis in which symptomatology was evident only after this infection
- Group A streptococcus pyogenes may lead to rare but severe neurological conditions, including bran abscess, encephalitis and empyema
- The pathophysiology is not clear of ACM following a strep throat. However, future research may investigate why Streptococcus caused presentation of ACM and if other microbes can also be linked to this

Biography

Dr. Maryam Shahab is an international medicate graduate who earned her medical degree from Khyber Girls Medical College, Peshawar in 2021. It was there were she developed her passion for research and is now currently working as a research volunteer in New York. She has taken interest in research, having submitted her work to peer-reviewed journals. She is very passionate about surgery and wishes to purse a residency in this field in the near future. Although she loves all aspects of surgery, she has a special interest in cardiothoracic surgery and surgical oncology.

Nanxia Zhao*, Milica Bulajic, Rachel Doyle, Attila Fabian, Chris Ehrenfels, Lasse Dissing Olesen, Miranda Standiford, Naomi Okugawa, Sandi Engle, Akiko Wagatsuma

Biogen, Cambridge, MA, United States

Human ipsc-derived microglia chimeric mouse as a translatable in vivo model

Microglia are resident macrophages of the brain parenchyma that is involved in many critical CNS functions, ranging from supporting neurogenesis and synapse remodeling to direct modulation of myelination and phagocytosis. Due to its reactive response to disease state and neuronal damage, microglia are critically involved in pathogenesis of neurological disorders such as alzheimer's disease, parkinson's disease, and multiple sclerosis. While human iPSC-derived microglia allow the study of microglia disease-associated inflammatory response to stimuli, when cultured in isolation from the brain environment, microglia undergo drastic transcriptomic changes. These changes in gene expression challenge the study of human microglia in their homeostatic state. In addition, microglia from mouse models cannot completely recapitulate human genetic variability.

Here, we transplanted iPSC-derived hematopoietic progenitor cells into a neonatal mouse brain to study human microglia within an intact brain environment. An immunodeficient mouse expressing human cytokines Colony-Stimulating Factor 1 (CSF1) serves as a surrogate host for the human iPSC-derived cells, providing a more mature and structurally developed environment for maturation of human microglia.

Immunofluorescence (IF) staining showed wide and dense coverage of engrafted cells in the cortex, as well as in the hippocampus, striatum, and olfactory bulb. Engrafted human cells strongly expresses microglial marker Iba1, hP2Y12 and the myeloid transcription factor PU.1, suggesting in vivo differentiation of human HPC into microglia. Bioluminescence Imaging (BLI) was also performed on mice engrafted with Td-tomato expressing cells and cell proliferation was observed over 4-month post engraftment. To isolate the human microglia population in the host mouse brain and quantitatively assess the chimerism, we developed a Fluorescence-Activated Cell Sorting (FACS) protocol based on species-specific microglia markers mCD45, hCD45, hCX3CR1 and hP2Y12. With a brief exposure to PLX 5622, a CSF1 receptor (CSF1R) inhibitor, the percentage of engrafted human microglia in 2-month-old mice reaches an equivalent level of the chimerism in 10-month-old mice without PLX treatment, demonstrating the proliferative advantage the transient CSF1R blockade provides to the transplanted human hematopoietic progenitor cells over mouse microglia. In addition, we performed a bulk RNA-sequencing experiment of the in vivo differentiated microglia along with in vitro differentiated microglia. We then found that the xenografted iPSC-derived microglia not only retain key microglia signature, but also expresses homeostatic microglial genes at a higher level than iPSC-derived microglia differentiated in vitro. Taken together, our findings suggest that this humanized microglia chimeric mouse model could serve as a powerful pre-clinical tool to investigate system level impact of risk gene mutations in human microglia, enabling disease modeling in a more translatable manner.

Audience Take Away Notes

- The audience will learn about how a cell transplantation-based approach led to the generation of a humanized microglia chimeric mouse model which hosts human microglia in their homeostatic state and about the use of a pharmacological intervention to accelerate human cell repopulation in the mouse brain

- The audience will be inspired to think more about the advantages and limitations of different in vitro and in vivo models for their research and its translational implications
- The audience will appreciate the value this human microglia chimeric mouse model provides as a more translatable pre-clinical model to test therapeutic candidates for neurological disorders
- The audience will also learn about our approach to translate in vitro cultured-iPSC-derived cells to an in vivo context for human microglia differentiation and the opportunity iPSC-derived cells provided for convenient introduction of risk gene mutations in the mouse model

Biography

Nanxia is a scientist in the translation in vivo sciences group of Biogen. Her work at Biogen has been focused on developing a humanized microglia chimeric mouse model and evaluating its potential translatability advantages. Nanxia holds a BS degree in Chemical Engineering from the University of California, Berkeley, and a PhD degree in Chemical Engineering from Rutgers University. Her PhD research was focused on designing polymeric nanoparticles to modulate microglia-mediated neuroinflammation.

Ilse Ivonne Saldivar Ruiz*, Monika Ummat
Pain and Headache Centers of Texas, Houston, Texas, United States

Unusual case presentation of creutzfeldt-jakob disease case report

Creutzfeldt–Jakob Disease (CJD) is a rare form of rapidly progressive, neurodegenerative disease that results from the misfolding and accumulation of an aberrant, disease-associated Prion Protein (PrPD). CJD affects 1–1.5 cases per million per year with the sporadic-type accounting for an estimated 85% of these cases. Sporadic CJD (sCJD) is further subdivided into five subtypes based on genetic polymorphisms. The current sensitivity of CSF Real-Time Quaking-Induced Conversion (RT-QuIC) undertaken at the UK National CJD Research & Surveillance Unit is 92% and the specificity is 100%. The sensitivity of Cerebral Spinal Fluid (CSF) RT-QuIC is not influenced by PRNP codon 129 alone, but CSF RT-QuIC does appear to have a lower sensitivity in patients with sCJD-MM2 and sCJD-VV1. We do not know the significance of this at present as there are only small numbers of cases involved, but its significance may become clearer with more cases analysed. According to a study Individuals with prion disease and negative RT-QuIC results were younger and had lower tau levels and non elevated 14-3-3 levels compared to RT-QuIC–positive cases.

We present a case where the highly sensitive and specific RT-QuIC assay was negative and prions were not detected, the patient also had an atypical EEG. Contrary to what has been seen in previous studies the patient was of older age (62 years old), and had very elevated levels of T-tau protein and 14-3-3 gamma. Presenting clinical symptoms included rapidly progressive memory loss, stroke-like symptoms, aggressive bouts, prosopagnosia and late development of mutism. The patient received palliative care and lived 18 months since initial symptom onset. Given this patient's presentation this may suggest varied sensitivity to RT-QuIC across sCJD subtypes and although this patient's subtype was not confirmed this case can give insight on certain marker patterns that each subtype can possibly present with. Given that the subtypes MM2 and VV1 are extremely rare but patients seem to have a longer life span they could potentially be targeted for future treatments. Larger cohorts of confirmed VV1 and MM2 cases with appropriate testing markers need to be reported.

Biography

Ilse Saldivar studied medicine in the Universidad Autonoma de Zacatecas in Zacatecas Mexico and graduated in 2019.

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Combination treatment with electroconvulsive therapy and novel neuroactive steroid ganaxolone for cryptogenic new-onset refractory status epilepticus

Rationale: New-Onset Refractory Status Epilepticus (NORSE) is a neurologic emergency and potentially life-threatening syndrome described as continuous seizures in a previously healthy patient. Despite extensive workup, no specific etiology is found in over half of cases of NORSE, a presentation termed Cryptogenic NORSE. Prolonged seizures in NORSE are believed to cause internalization of synaptic GABAA receptors, partly explaining the increased resistance of seizures to treatments targeting neural inhibitory pathways. While intrasynaptic GABAA receptors are internalized in status epilepticus, extrasynaptic GABAA receptors are conserved and can be a target for drug-resistant seizures. Electroconvulsive Therapy (ECT) and Ganaxolone have shown efficacy as novel treatments for drug-resistant and cryptogenic NORSE. ECT delivers an electric current through the cerebral cortex, aiming to induce a generalized seizure. ECT is believed to assist with refractory seizures by producing neurotrophic effects, promoting neuroplasticity, increasing cortical GABA transmission, and elevating the seizure threshold. Ganaxolone is a neuroactive steroid that works as a positive allosteric modulator, enhancing inhibitory signaling by affecting both intrasynaptic and extrasynaptic GABAA receptors.

Both ECT and Ganaxolone target these alternative neural pathways and can be used as adjunctive therapies when conventional epilepsy treatments fail to manage seizures. To our knowledge, no research has evaluated the efficacy of combining ECT with Ganaxolone for treatment of cryptogenic NORSE.

Methods: The patient is a 23-year-old female with no prior history of seizures who presented in status epilepticus following a week of prodromal symptoms of fever, cough, headache, vomiting. Patient developed multiple consecutive seizures that remained refractory to medical management, with an extensive workup that was unrevealing. Seizure activity was effectively suppressed after she was induced into a therapeutic coma using a Pentobarbital infusion. Attempts to wean her off Pentobarbital failed despite multiple anti-epileptic drugs, immunotherapies, and nonpharmacologic treatments. Despite the inadequate response to conventional treatments, a combination therapy involving Ganaxolone and ECT was explored. Starting on day 116 of hospitalization, the patient underwent 12 ECT sessions over 20 days. Each session utilized bitemporal electrode placement with an 800 mAmp stimulus and 120 Hz pulse frequency. A continuous infusion of Ganaxolone was initiated after ECT session 3. After ECT session 8, the patient transitioned from IV to enteric Ganaxolone, which was maintained for the remainder of the ECT course.

Results: Continuous infusion of Pentobarbital was gradually reduced from a rate of 5.75 mg/kg/hr after the first ECT session. Changes in the Electroencephalogram (EEG) were observed after ECT session 3, prior Ganaxolone initiation. After ECT session 9, the patient began experiencing visible tonic-clonic seizures. Following the completion of 12 ECT sessions, significant improvements were detected in the patient's EEG, allowing for complete titration of Pentobarbital.

Conclusions: In patients with cryptogenic NORSE refractory to multi-epileptic drugs and immunotherapies, a combination therapy consisting of ECT and IV Ganaxolone has demonstrated potential in reducing seizure activity. This combined approach has shown promise in safely tapering patients off anti-epileptic medications. This offers a potential alternative for patients without response to traditional therapies, providing a promising avenue for managing cryptogenic NORSE.

Audience Take Away Notes

- This paper provides data on the effectiveness of combining two novel agents (ECT and Ganaxolone) in treating status epilepticus that was otherwise refractory to conventional drug, immunotherapy, and nonpharmacologic treatments
- Our methods present an ECT protocol that future clinicians can use to guide their own ECT settings, technique, and schedules
- We provide new data on the effectiveness of ECT when initiated after 120 days of continuous status epilepticus. It expands the potential application of ECT to a broader range of patients, offering a fresh perspective on its therapeutic efficacy
- This paper serves as a framework for future investigations, laying the groundwork for further studies on ECT, Ganaxolone, or the combination of multiple novel agents in the treatment of refractory seizures

Biography

Ariyaneh Nikbin graduated magna cum laude from Rice University in 2017. She is currently a fourth year medical student at the Albert Einstein College of Medicine. She was awarded the Einstein Medical Student Research Fellowship during the 2022-2023 academic year to conduct research in Psychiatry and Medical education.

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Trend in stroke incidence and admission blood glucose in louisiana

Introduction: Stroke is still a major cause of debilitating disability despite advancements in available clinical therapies. Raised admission blood glucose concentration is associated with poor outcomes of stroke, even in non-diabetics. Hence, reporting stroke burden and outcome is invaluable for evidence-based policy direction and research. We evaluated trends in stroke incidence and outcomes in the last ten years in the state of Louisiana, a region endemic with risk factors for stroke.

Methods: A ten-year retrospective analysis of stroke patients treated at a large integrated healthcare system in Louisiana, from January 01, 2013, through December 31, 2022, was conducted. Data from only inpatients with ischemic and/ or hemorrhagic stroke, aged 18 years and older, were included. Results: A total of 63,763 patients with first-ever stroke were identified. Admission blood glucose was measured in 77.3% (49,307) of identified patients with a median hospital stay of 53 (Q1:26 - Q3:136) hours. Of the 49,307 inpatients, Ischemic stroke was more commonly observed than hemorrhagic stroke (64.9% (41,398) vs 9.9% (6,318)). A significant and progressive increase in annual stroke incidence at an average age of 66.3 ± 15.3 was observed, regardless of stroke type. In-hospital mortality steadily declined over the years with a total of 19.9% (9809). A significant difference in stroke incidence by sex (p=0.0003), marital status (p<0.0001), race (p=<0.0001), and insurance coverage (p<0.0001) was observed. The most prevalent comorbidities were dyslipidemia 55.4% (27,319), chronic renal disease 41.7% (20,558) hypertension 38.8% (19,123), diabetes mellitus 36.7%(18,088). Conclusion: Whilst stroke incidence is steadily increasing in Louisiana, in-hospital mortality is declining and admission blood glucose monitoring significantly increased in the last three years.

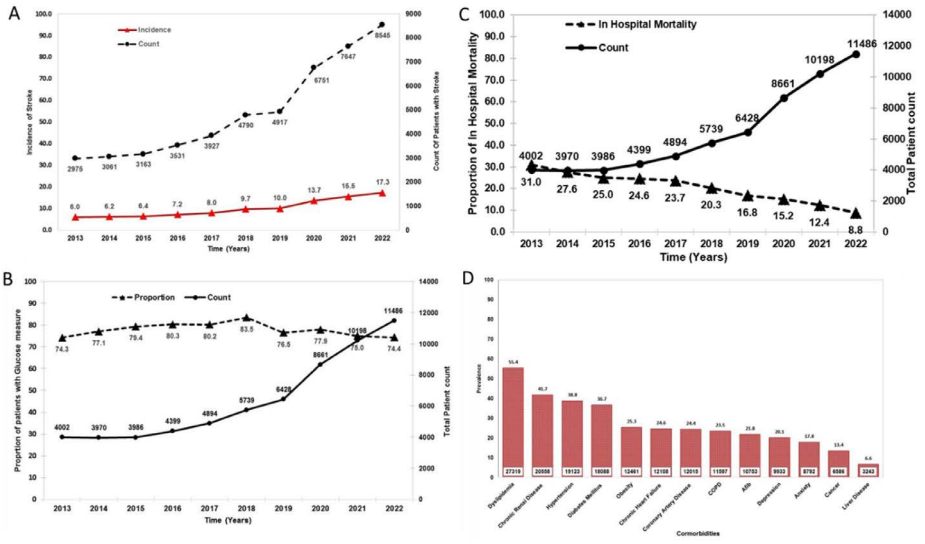

Figure 1. Stroke incidence and outcomes in Louisiana. A. Stroke incidence is rising steadily. B. Admission blood glucose monitoring significantly increased in the last 3-years. C. Inpatient mortality is decreasing. D. Dyslipidemia is the most prevalent comorbidity of stroke in Louisiana.

Audience Take Away Notes

- Explain how the audience will be able to use what they learn: The audience will learn of changes in stroke incidence and mortality in Louisiana as well as the importance of monitoring blood glucose concentration in the context of ischemic stroke. Importantly, our data will show annual changes in the demographics as well as comorbidities which impacts stroke outcomes
- How will this help the audience in their job: This will form the basis of quoted statistics for a stroke belt in relevance to research and teaching
- Our findings will inform institutional and regional research on stroke incidence and changes in demographics for either expansive research in this realm or for teaching purposes
- Our findings will show that whilst in-hospital mortality is significantly decreasing, more work is desired for stroke-related disability
- List all other benefits
- Although blood glucose monitoring in acute stroke is only correlative to the steady decline in stroke mortality during hospital stay, more advocacy is warranted for ameliorating the impact of acute post-stroke hyperglycemia

Biography

Dr. Ifechukwude Biose is an Assistant Professor at the Cardiovascular Center of Excellence, Louisiana State University Health Sciences Center, New Orleans. His research is focused on translational ischemic stroke and heart failure. He received his Doctorate from the University of Glasgow, United Kingdom in 2019 and proceeded to complete his post-doctoral training in experimental ischemic stroke at the University of Kentucky and Tulane University. He has over 165 citations from 20 peer-reviewed publications.

Alex Goraltchouk[1]*, Svetlana Mankovskaya[2], Kuznetsova Tatjana[2], Hladkova Zhanna[2], Francesco Luppino[1], Alexey Seregin[1]

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[2]Institute of Physiology, National Academy of Sciences of Belarus; 28 Academicheskaya St, Minsk,

Treatment with rhFGF18 appears cerebroprotective in model of ischemic stroke

Objective: In this study, we aimed to directly compare the safety and efficacy potential of two novel investigational treatment regimens for cerebral ischemia - rhFGF18 and rhGDF11, using a model of ischemic stroke.

Background: Despite recent advances in prevention and treatment, stroke remains the second-leading cause of death and third-leading cause of disability worldwide. The global economic burden of this disease approaches $1 trillion annually. At the same time, therapeutic treatment options are limited to thrombolytic tissue plasminogen activator, despite its associated risk of haemorrhage and limited effect on survival. Recent studies using growth factor-derived therapeutics, including rhFGF18 and rhGDF11 have demonstrated promise in early preclinical models, however, their mechanisms remain poorly understood and a head-to-head comparison has never been performed.

Methods: We induced cerebral ischemia in 250-300g m/f Wistar rats via a 2-hour Middle Cerebral Artery Occlusion (MCAO) (Day 1). PBS and 100ug/kg/hr rhFGF18 were administered intravenously (0.5mL/hour, for 3 hours); rhGDF11 was administered intraperitoneally (5-daily, 100ug/kg injections in 100uL PBS, starting Day 7 following MCAO). Morris water maze was used to assess motor-cognitive recovery on Days 7, 21, and 42. Tissue sections were collected on Days 21 and 42 to assess markers of neurodegeneration (Nissl stain), Acetylcholinesterase (AChE) fibre density and activity, as well as metabolic parameters including succinate dehydrogenase and lactate dehydrogenase as markers of oxidative phosphorylation and glycolysis.

Results: By Day 7, the water maze times in the PBS control group, rhFGF18, and rhGDF11 increased by 38.3%, 2.1%, and 23.1% relative to pre-MCAO baseline, with rhFGF18 achieving statistical significance over PBS. Cerebral asymmetry present in the placebo-treated animals, was not observed at the Day 21 timepoint in the rhFGF18 and rhGDF11-treated groups. Fraction of neurons with abnormal morphology decreased in all groups toward Day 42 and was lowest for rhFGF18, while gliosis improved in all test groups. AChE-positive fibre density appeared to increase over time in rhFGF18 treated animals, remained unchanged for rhGDF11, and declined in the PBS control-treated animals. Parallel changes were observed in the level of AChE enzymatic activity. Metabolic increases were greatest in rhGDF11 treated animals, as evidenced by an increase in SDH and LDH activity toward Day 42, with both rhFGF18 and rhGDF11 achieving statistically significant improvements over PBS. Finally, rhFGF18 appeared to promote a trend for reduced mortality relative to PBS, with post-MCAO mortality rates of 5.6% (95% CI [27.3%, 0.1%]) and 22.2% (95% CI [47.6%, 6.4%]) respectively.

Conclusions: Our findings suggest that early intervention with rhFGF18 appears cerebroprotective with potential benefits in survival, recovery of motor and memory function, cerebral asymmetry, as well as neuronal viability and metabolic activity.

Audience Take Away Notes

- The audience will learn about a new investigational treatment for ischemic stroke
- They will be able to apply the mechanistic analysis used in our research to their stroke models
- The attendees will expand their knowledge on a new class of growth-factor based treatments

Biography

Alex is the chief operating officer of Remedium Bio, a Boston-area biotechnology company. Prior to Remedium, Alex held roles of increasing responsibilities at companies including Allergan, Biogen, and Regeneron. His efforts were instrumental in bringing to market a number of global blockbuster therapies for the treatment of Spinal Muscular Atrophy, Multiple Sclerosis, Rheumatoid Arthritis, and Atopic Dermatitis. Alex holds a Bachelor in Materials Engineering and a Master in Chemical Engineering from the University of Toronto, MBA and Master of Science in Finance from Indiana University, and a Master in Microbiology and Cell Sciences from the University of Florida.

Fernanda Cristina Poscai Ribeiro
Universidade do Oeste Paulista, Guaruja, Sao Paulo, Brazil

Use of nmda antagonists for the treatment of TBI

Traumatic Brain Injury (TBI) is a leading cause of mortality and morbidity among individuals under 45 years of age worldwide. In the United States alone, approximately 1.7 million traumatic events occur annually, resulting in 50,000 deaths. This high prevalence of TBI poses a significant socioeconomic and healthcare burden due to its association with long-term disability and death in young adults.

The mechanisms underlying secondary brain injury in TBI are complex and involve various processes. These include alterations in cerebral perfusion, activation of inflammatory cytokines, and excitotoxicity. The kinetic energy generated during TBI causes mechanical deformation of the axons, leading to the depolarization of cell membranes and the release of neurotransmitters, such as glutamate. This excessive release of glutamate initiates a process called excitotoxicity, wherein there is a rapid influx of calcium into the cell cytoplasm caused by ionotropic receptors activated. This influx of calcium activates harmful signaling cascades, ultimately leading to cell apoptosis.

Thus, the neurotoxicity generated by glutamate release could be avoided by N-methyl-D-aspartate receptor antagonists. As there is a theoretical potential for administration to this intervention improving outcomes following traumatic brain injury, clinical pre clinical research has focused on the role of NMDA receptors (NMDAR) in TBI.

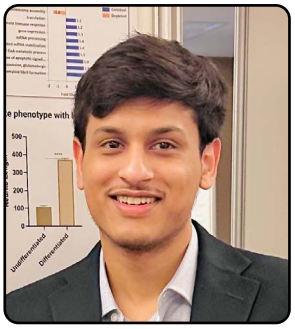
In this presentation the results of clinical and preclinical studies on the use of NMDA antagonists for the treatment of TBI will be discussed. The data and the protocol of a systematic review in progress will be discussed.

Audience Take Away

- Gain a deep understanding of the complex mechanisms underlying secondary brain injury in traumatic brain injury (TBI), including alterations in cerebral perfusion, inflammatory cytokine activation, and excitotoxicity
- Recognize the role of glutamate release and excitotoxicity in TBI, and how they contribute to harmful signaling cascades and cell apoptosis
- Understand the potential benefits of N-methyl-D-aspartate receptor antagonists in preventing neurotoxicity caused by glutamate release and improving outcomes in TB
- Identify new targets and strategies for developing effective interventions and therapeutic approaches for TBI

Biography

Fernanda Cristina Poscai Ribeiro is a medical student at the University of Oeste Paulista. She was president of the Evidence-Based Medicine league and scientific director of the Neurosciences league and anatomy monitor. During high school, she received awards in scientific olympics, in which a gold medal and a bronze medal in the Brazilian Biology Olympiad stand out. She currently has 5 studies published in journals and conference proceedings and she is participating in 2 ongoing systematic reviews, one of them about the use of NMDA antagonists for the treatment of TBI.



Muhammad Yahya Saif[1]*, Clara Musi[2], Tiziana Borsello[2],[3], Ivana Milic[1], Mariaelena Repici[1]

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Investigating the molecular mechanisms involved in early events of cellular dysfunction in alzheimer's disease

Alzheimer's Disease (AD) is a progressive neurological disorder that gradually deteriorates cognitive abilities and leads to the inability to carry out simple tasks. However, the molecular mechanisms and causes of this disease are still unclear. This research aims to use the proteomic signature of the 5xFAD AD mouse model to identify early changes in protein expression in the AD brain compared to the wild type. Lysates from the cerebral cortex of 3 months-old 5xFAD and wild-type mice were analysed by LC-MS/MS and investigated for protein candidates over- or under- expressed in AD mice compared to wild-type: Cryab, MAPK8/9, and VGLUT1/3 were identified as the proteins with the most altered expression in transgenic mice. These candidates were studied in differentiated SH-SY5Y cells upon treatment with amyloid-beta oligomers to mimic AD pathology. This study investigates molecular mechanisms and suggests new insights into the pathogenesis of AD.

Biography

In 2019, I started pursuing a Bachelor of Science (BSc) degree in Biomedical Science at Aston University. During my undergraduate studies, I developed a strong interest in neuroscience, particularly in the fields of neurodegeneration and Alzheimer's Disease. This prompted me to pursue a Master of Research in Neuroscience, focusing specifically on these areas. After completing my master's degree, I have recently embarked on a career as a Researcher at the University of Oxford. My research primarily centers around brain damage, where I aim to contribute to a deeper understanding of the mechanisms underlying such conditions. Simultaneously, I have enrolled in a postgraduate medicine course at the University of Warwick, further expanding my knowledge and skills in the medical field. Throughout my academic and professional journey, I have gained valuable experience in the biomedical industry. Notably, I have worked with renowned organizations such as the NHS, where I served as an Associate Researcher and as a Scientist at the UK Health Security Agency (UKHSA).

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Prospective observational study on hyponatremia in Acute Encephalitis Syndrome (AES) in children: It's occurrence and effect on outcome

Hyponatremia has been reported in various central nervous system infections like tuberculous meningitis and found to be associated with poor outcome. So far, no study has been conducted on hyponatremia in Acute Encephalitis Syndrome (AES) in children. This study was planned to study proportion of hyponatremia in Acute Encephalitis Syndrome (AES) in children, its association with clinical and lab parameters and effect on outcome.

This was a prospective observational study done at tertiary care teaching hospital. Institutional ethical clearance and informed consent from parents was taken. Patients between 6 months and 12yrs of age who presented with acute onset (7 days) of fever and neurological manifestation that included new onset seizures and/ or change in mental status (duration of altered sensorium >12 hrs) were included. A detailed history and examination was conducted, blood and CSF investigations and serum electrolytes were done in all AES cases, neuroimaging was done in a few cases. Hyponatremia was the main outcome variable of interest, defined as serum sodium of less than 135 mmol/L. Clinical, lab parameters and mortality were compared between hyponatremic and non hyponatremic patients. 200 children were enrolled over 18 months duration. Hyponatremia (serum sodium of less than 135 mmol/L) was found in 24.5% cases. Mild hyponatremia (130-134 mmol/l) was seen in 69.5% cases, moderate hyponatremia (120- 129 mmol/l) in 26.5% cases and severe hyponatremia (<120 mmol/l) in 4% cases. Mortality was significantly higher in children with hyponatremia (24.5%) in comparison to non hyponatremic patients (9.3%), p=0.02. No significant association was observed with the occurrence of fever, seizures, focal deficits, altered consciousness. Hepatomegaly was seen more (36.7%) in children with hyponatremia, p value- 0.012. No significant association was seen with GCS at admission, meningeal signs and CNS examination. Hypocalcemia (p value- 0.002) and hypoalbuminemia (p value 0.007) were seen more in children with hyponatremia. Uraemia (p value- 0.03) was seen more in children without hyponatremia. CBC, LFT and CSF examination didn't show any significant association. The most common etiology was scrub typhus, positive in 12.2% children with hyponatremia, 8.6% children without hyponatremia, followed by dengue, JE, chikungunya and malaria, no significant association seen. On multivariate analysis, past admission in hospital (p value- 0.026, OR- 0.423, 95% CI, lower 0.198, upper 0.904) and hepatomegaly (p value- 0.045, OR-2.221, 95% CI, lower 1.019, upper 4.844) were found to be predictors of hyponatremia. Severity of hyponatremia had significant association with duration of seizures (p value- 0.016), hepatomegaly (p value- 0.042), deranged urea levels (p value- 0.043) and deranged transaminases, SGOT (p value- 0.015) and SGPT (p value- 0.002). Etiology was not known in the majority of cases. The most common etiology was scrub typhus, no significant association was seen. In the outcome, 20.59% of children in the mild hyponatremic group and 26.67% of children in the moderate and severe hyponatremic group expired, no significant association was seen.

Hyponatremia was found in one fourth cases and was associated with significantly higher mortality in AES.

Audience Take Away Notes

- This is the first study conducted in the pediatric population in India to determine the percentage of hyponatremia in children with AES and to study its clinical and biochemical implications and its effect on outcome
- The study has shown that if hyponatremia is documented in a child with acute encephalitis syndrome, we predict a higher mortality rate. We must take this as a warning sign and be extra vigilant to deal with the sodium imbalance both to prevent mortality and adverse neurological outcomes
- Pediatricians at all tertiary and peripheral centers and elsewhere should also be in a position to immediately identify the imbalance and take immediate and necessary steps for further management

Biography

Dr. Nikita Diwan has done her MBBS from Bangalore Medical College and Research Institute, Bangalore, Karnataka and is currently a third year post graduate in department of pediatrics in King George's Medical University, Lucknow, Uttar Pradesh. She has an aptitude for research and a strong moral conscience to employ her research for the benefit of the needy. She has worked meticulously under the guidance of her chief supervisor, Dr. Chandrakanta, professor in department of Paediatrics in King George's Medical University, a clinician with unmatchable proficiency in her subject of pediatric neurology and a researcher par excellence.

Pallavi Chatterjee*, Debashis Mukhopadhyay

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Expressions of several sets of micrornas get perturbed when differentiated astrocytoma are exposed to nmosd patient sera with different seropositivity – A functional analysis

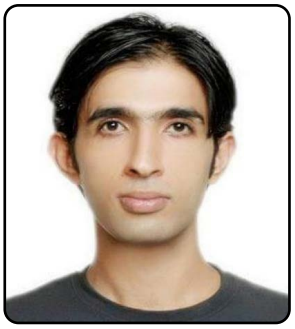
Neuromyelitis Optica Spectrum Disorder (NMOSD), is a rare auto-immune demyelinating disorder of the Central Nervous System. A circulating auto-antibody (AQP4-IgG) against aquaporin-4 (AQP4) is found in more than 80% patients. Other auto-antibodies like the one against Myelin Oligodendrocyte Glycoprotein (MOG) have also been reported. There are very few reports that study the intracellular changes within the astrocytes post exposure to both the auto-antibodies present in patients' serum. Here, we compared the expression profiles of microRNAs within differentiated glioblastoma cell lines and how they regulate the signaling pathways, after their exposure for different time-lengths to AQP4-IgG and MOG-IgG+ve sera respectively using Next Generation Sequencing. Our data revealed that five microRNAs, hsa-miR-3687, hsa-miR-663a, hsa-miR-4466, hsa-miR-222-5p, hsa-miR-100-3p were significantly downregulated in differentiated U87MG cells treated with MOG+ve samples whereas two microRNAs hsa-miR- 6824-3p and hsa-miR-490-3p were significantly up and downregulated respectively in cells treated with AQP+ve sera. Functional enrichment analysis revealed the predominance of MAPK, PI3K-Akt, and calcium signaling pathways. The mechanism and significance of these functions in the context of NMOSD will be discussed. Besides revealing the potential role of microRNAs in the progression of this rare auto-immune disorder, this study will also portray a complete intra-cellular picture of molecular interactions post exposure to auto-antibodies.

Audience Take Away Notes

- NMOSD is a rare disease and a little information is known about the molecular mechanism of AQP+ve Neuromyelitis Optica. There are very few reports that talk about the intracellular changes that take place within the astrocytes after their exposure to AQP4 auto- antibody
- Audience will learn about the microRNAs that play an essential role in the progression of the disease and how they regulate the important intracellular signaling pathways playing key role in astrocytic fate
- What happens to astrocytes when they are exposed to MOG-IgG auto-antibody is a completely new area to explore. This is the first study that will reveal some information in this context
- Our data can be further used by the researchers to dig out deeper information related to the pathophysiology of the disease in cellular level and can be applied to generate novel therapeutics
- The data derived from this research can definitely be used by other faculties to expand their research
- Understanding the molecular mechanism of NMOSD in a deeper level will help to develop new therapeutics with greater precision
- The understanding about the contribution of some micro-RNAs in the pathophysiology of the disease will provide new information in a molecular level and thus, will help in developing some specific microRNA therapeutics relevant to NMOSD

Biography

Ms. Pallavi Chatterjee studied Physiology at the Calcutta University, Kolkata, India. She completed her graduation and post-graduation in the year 2015 and 2017 respectively. She then joined the research group of Prof. Debashis Mukhopadhyay at Saha Institite of Nuclear Physics, Kolkata and currently working there as a Senior Research Fellow.



Arvinder Wander[1]*, Biswaroop Chakrabarty[1], Sheffali Gulati[1], Prashant Jauhari[1], Ashish Upadhyay[2], RM Pandey[2], Sushila Yadav[1], Suresh Kumar[1]

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[2]Department of Biostatistics, AIIMS, New Delhi, India

Optimal duration for recording pediatric EEG: An observational study

Objective: To evaluate optimal duration for recording pediatric EEG in outpatient settings for children and adolescents aged 1month-18years.

Methods: Setting: Outpatient EEG Laboratory at Department of Pediatrics at a tertiary care teaching centre in north India.

Exclusion criteria: Epileptic encephalopathy, non-epileptic indications, seizures within last 24 hours and critical sickness.

Two categories of protocols:

- Category A (awake record with activation procedures followed by sleep, 60 minutes).
- Category B (55 minutes sleep followed by 5 minutes awake, younger children and those with impaired cognition who cannot undergo detailed awake study).

Prospective EEG reporting at 20, 30, 40, 50 and 60minute time-points with no retrospective changes allowed at previous time-points.

Results: Population: 225 cases (category A, n=163, 140.6+/-38.7 months and B, n=62, 90.1+/-48.5 months) with 65% males.

Indications: Tapering antiseizure medications (54.2%), Diagnostic (35.1%) and breakthrough seizures (10.7%).

Diagnosis within 20 minutes:

- Indication-wise (Category A, B): Tapering (85.3%, 77.8%), Diagnostic (68.4%, 95.5%) and Breakthrough seizures (72.7 %, 76.9%).
- Diagnosis-wise (Category A, B): Generalised non-structural (90.9%, 100%), generalised structural (100% in both), focal non-structural (71%, 85.7%), and focal structural (77.5%, 66.7%) epilepsy.
- Awake with and without sleep in category A: With sleep (55%), only awake (81%) (p=0.03).

Conclusions: Considerable number of EEGs can achieve correct diagnosis within 20 minutes. Recording beyond 20 minutes with sleep is particularly beneficial in newly diagnosed epilepsies, more so for focal epilepsies. If awake recording is extended beyond 20 minutes, inclusion of sleep improves yield of the EEG record.

Audience Take Away Notes

- To know the optimum duration of EEG in busy OPD in pediatric age group
- It will save time as if once we know the optimum duration, we can plan EEG according to indication of EEG
- Yes, this research that other faculty could use to expand their research or teaching

- Yes, this provide a practical solution to a problem that could simplify or make a designer's job more efficient
- Yes, as there is no consensus on duration of EEG in pediatric age group and maximum studies opted heterogenous population
- Yes, it improve the accuracy of a design, or provide new information to assist in a design problem

Biography

Dr. Arvinder wander Currently working as Assistant professor in Pediatrics (joined 2023). Research was completed during my pediatric neurology training of 3 years in AIIMS New Delhi.

Ram Prajit*, Rasa Saenno, Soraya Kaewngam, Tanaporn Anosri, Nataya Sritawan, Anusara Aranarochana, Apiwat Sirichoat, Wanassanan Pannangrong, Jariya Umka Welbat

Department of Anatomy, Faculty of Medicine, Khon Kaen University, Khon Kaen, 40002, Thailand

Chrysin attenuates the oxidative stress and neuronal apoptosis related to the reductions of hippocampal neurogenesis in d-galactose-induced brain aging

Brain aging is related to oxidative stress that leads to neuronal apoptosis and cognitive dysfunction. Neurogenesis occurs throughout the lifespan in the subgranular zone of the hippocampal dentate gyrus and it is gradually reduced in brain aging. Long term administration of D-galactose induces oxidative stress, a main factor of neuronal apoptosis resulting in brain aging. Chrysin, a natural flavonoid found in honey, propolis, passion flowers, and mushrooms, has antioxidant properties and protects against neuronal apoptosis in the brain. This study investigated the effects of chrysin on hippocampal neurogenesis through antioxidant and apoptotic pathways in D-galactose-induced brain aging in a rat model. Twelve weeks old male Sprague Dawley rats were divided into 4 groups. The vehicle group received propylene glycol and normal saline. The D-galactose group received intraperitoneal injection of 50 mg/kg of D-galactose. The chrysin group orally received 10 mg/kg of chrysin. The cotreatment group received D-galactose and chrysin at the same doses as the D-galactose and chysin groups. For the first 3 days, all animals received intraperitoneal injection of BrdU 100 mg/kg. After 8 weeks of daily treatment, levels of Superoxide Dismutase (SOD), Catalase (CAT), Glutathione Peroxidase (GPx), Malondialdehyde (MDA), and apoptotic (Bax and caspase-3) protein expressions in hippocampi were determined. Furthermore, the brain sections were performed to detect cell cycle arrest and neuronal survival using p21 and BrdU/NeuN staining, respectively. The results showed that cotreatment with chrysin decreased MDA levels and improved the activities of SOD, CAT, and GPX. Cotreatment with chrysin downregulated Bax and caspase-3 expressions. Additionally, chrysin diminished the increased p21-positive cells and the reduction of BrdU/NeuN-positive cells caused by D-galactose-induced brain aging. These finding demonstrated that supplementary chrysin possibly attenuated D-galactose-induced brain aging via enhancing the scavenging enzyme activities and neuronal survival. Chrysin also supressed oxidative stress, apoptosis, and cell cycle arrest.

Acknowledgement: This research project is supported by National Research Council of Thailand (NRCT): N41A650079.

Audience Take Away Notes

- This study found that intraperitoneal injection of 50 mg/kg of D-galactose induces oxidative stress and neuronal apoptosis which corresponds to the process of brain aging
- We also found that the D-galactose induces the depletions of hippocampal neurogenesis including cell cycle arrest and reduced neuronal survival
- To expand the results of this study, other faculties may create extracted chrysin from natural products including honey, propolis, passion flowers, or mushrooms to produce new products for treating age-related cognitive impairment

Biography

Mr. Ram Prajit has studied in Department of Anatomy, Faculty of Medicine, Khon Kaen University since 2017. He has joined the neurogenesis research group (NRG) of Assoc. Prof. Dr. Jariya Umka Welbat and received his master's degree in 2020. Presently, he is a PhD student at the same institute. His research investigation is about neurogenesis that is a process of new neuron generation in animal models. His work is associated with molecular pathways that promote or suppress neurogenesis in brain aging.

Christine Akumcha Tekum
Guidance and Counselor at Maarif International School of Equatorial Guinea, Equatorial Guinea

Brain and neurological disorder, types, causes, effects and possible solutions

There are many types of brain diseases, from injuries and infections to brain tumors. They can impact your ability to function and carry out daily activities. Outcomes vary widely depending on the type of brain disease, location and severity of the condition.

The brain is the control center of your body. It regulates growth, development and bodily functions. All of your thoughts, feelings and actions begin there.

A wide range of diseases and disorders affect your brain. They can alter a person's behavior, personality and their ability to process information and function. Many brain diseases impact a person's capacity to carry out daily activities.

What are the types of brain diseases?

There are many types of brain diseases. The general categories of brain diseases include:

Autoimmune brain diseases: Autoimmune brain diseases occur when your body's defenses attack a part of your brain, mistaking it for an invader. Multiple Sclerosis (MS) is the most prominent of these. Like electrical wires, nerve cells have insulation covering them. Multiple sclerosis attacks this in your brain, spinal cord and the nerves going to your eyes. There are less common autoimmune brain diseases that mimic MS. There are others, like autoimmune encephalitis, which irritate your brain, causing confusion and involuntary movements.

Epilepsy: Epilepsy is a tendency to have seizures. A seizure is an electrical storm in your brain, typically interfering with consciousness and causing convulsions (uncontrolled movements). Some seizures can be subtle — only causing clouding of consciousness or uncontrolled movements of one part of your body.

Infections: Infections occur when various types of germs invade your brain or its protective coverings. Meningitis happens when your protective coverings are infected. It often causes headaches, confusion and a very stiff neck. Sometimes, it's necessary to do a spinal tap to find out which germ is causing an infection so the right antibiotics can be given.

Mental illness: Mental, behavioral and emotional disorders can diminish a person's quality of life and ability to function. Major types include:

- Anxiety
- Bipolar disorder
- Depression
- Post-Traumatic Stress Disorder (PTSD)
- Schizophrenia

Psychiatrists and psychologists generally treat mental illnesses. If your brain were a computer (and in some ways, it is), your mind would be like a program running in it. In other words, your mind is your brain's "operating system." Psychiatrists and psychologists are like computer programmers who try to figure out why this program is causing distress instead of working as it should.

Often, treatment involves both medications and therapy. People are sometimes hesitant to see a mental health specialist. But they shouldn't be. Mental illness affects 1 in 5 adults.

Neurodegenerative brain diseases: Neurodegenerative disorders are often due to the accumulation of abnormal proteins in your brain. They include alzheimer's disease, parkinson's disease and ALS (Amyotrophic Llateral Sclerosis), among many others. They're most often slowly progressive and interfere with thought, memory, movement or some combination of these things. They're more common in the elderly. Some run in families.

Neurodevelopmental disorders: Neurodevelopmental disorders affect the growth and development of your brain, and are usually cared for by pediatric neurologists. Medical geneticists may determine whether a disorder is likely to be inherited. If it is, they provide family counseling. There are a large number of neurodevelopmental disorders, including:

What are the symptoms of brain disease?

Your brain controls all of your bodily functions. If your brain is injured or diseased, any of those functions can be impacted depending on the type, location and severity of the condition. You may experience general symptoms, such as:

- Fever
- Headaches
- Nausea and vomiting
- Seizures
- Unconsciousness

Brain diseases may also show up as changes in:

- Balance
- Behavior
- Breathing
- Coordination
- Focus
- Memory
- Mood
- Movement
- Personality
- Physical sensations
- Speech
- Strength
- Swallowing
- Vision

Audience Take Away Notes

- They will have a general insight and idea about brain diseases

- The presentation will create awareness about brain diseases and neurology
- In addition, the audience will have ideas on how to handle children with these disorders
- It can help the audience to make the right references in cases of brain diseases and neurology
- School counselors will learn more about brain disorders and its impact on students
- It will help teachers present learn about how to deal and manage in their class rooms students with such disorders
- The presentation can help psychological counselors to assist their clients suffering from post-trauma to avoid brain disorder and neurological disorder

Biography

Mr. Christine Akumcha graduated from the University of BUEA With a bachelor degree in Curriculum Studies and Teaching (CST History). He started teaching and in the line of work, met lots of children with learning difficulties and different behavioral patterns. This triggered his interest into educational psychology after undergoing further studies. He then engaged into research to find out some of the causes of these learning difficulties. He has been serving as a guidance counselor with The Maarif Internal Schools of Equatorial Guinea for over the past 5 years. The Global Psychological department of the Maarif Schools organizes lots of seminars on such related topics. I therefore assist to implement the findings at the national level in Equatorial Guinea basically at Maarif International School.

Andres Villegas-Lanau[1,2]*, Lucia Madrigal[2], Johanna Tejada[2], Alejandro Soto- Ospina[3], Natalia Acosta-Baena[1,2], Mauricio Arcos-Burgos[4]

[1]Grupo de Genetica Molecular (GENMOL), Universidad de Antioquia, Medellin, Colombia
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Tautology of neurological diseases

Introduction: We use "tautology" to denote the effect of mutations capable of producing diverse phenotypes, which shared genes, common pathways, gene interaction, pleiotropy, and epistasis could explain. We evaluated a large family in which six different neurological diseases: intellectual disability, dementia, epilepsy, myelomeningocele, cleft lip, cerebellar atrophy, neurodevelopmental and neurodegenerative, cosegregate and coined the term 'tautological factor" underpinning its etiology.

Methods: Clinical characterization of the phenotypes (medical, neuropsychological, imaging evaluation). Whole exome sequencing to several family members was applied. Forty individuals were analyzed, prioritizing variants according to ACMG guidelines, MAF<0.01, predictors of pathogenicity and phenotype-genotype relationship. Segregation analysis was performed. The identified genes and their functions were analyzed in search of common mechanisms, using databases and the GENEMANIA tool to determine a possible interaction network between them. Structural analysis of variants in the protein was performed.

Results: Ten genes associated with the observed phenotypes were identified, carrying possible pathogenic mutations and forming a genetic interaction network. SPAG9 (p.Tyr914Ter), PCLO (p.Gln375_His5142delinsHisSerTrpSerCys), CNTN5 (p.Phe89AsnfsTer2), CCT7 (p.Arg126Cys), CHMP4C (p.Gly58Arg), VPS13B (p.Ala3716Thr), NOTCH3 (p.Asn1588His), ZIC5 (p.Ala238_Pro251del), MTHFR (p.Arg132His) and CTBP2 (p.Pro569Thr) and (p.Pro391_Leu392insAlaAlaProAla CysGlyPro) of these genes, mutations in the CTBP2 gene were identified in most affected patients. The CTBP2 gene is expressed early in neurodevelopment and is essential in the closure of the neural tube. There are few reports of mutations in this gene, which is a key point where many neuro-ontogeny pathways collide, crucial for regulating pluripotent cells during the development of the three germ layers.

Other of the identified genes are involved in functions such as interactions on the cell surface during neurodevelopment, synaptic vesicle trafficking, neural crest development, retrograde trafficking of lysosomes, autophagosome flow, formation of multivesicular bodies and repression of the transcription in neurodevelopment. Additionally, several of the genes we identified were found to form an interaction gene network closely related to the Wnt pathway that is of great importance in embryogenesis.

Conclusions: A genetic interaction network that explains the possible tautology by combinatorial pleiotropy mechanisms is identified. CTBP2 interacts with various partners, resulting in variability in phenotype. A clinical follow-up and a complete genealogy allowed us to go beyond the mere description of the individual mutations of the family nuclei to understand the entire family as a possible alteration of shared biological pathways grouped by the CTBP2 transcription factor, which may have broader applicability to other complex genetic disorders. We identify common genetic factors in a family group, which are related to pathological

mechanisms leading to different neurological diseases, which is the first report of a tautological genetic effect in neurological diseases.

Audience Take Away Notes

- This work provides tools for other researchers to better study family groups with neurological diseases where several phenotypes can occur in the same family. This study broadens the research possibilities of neurological diseases and helps design new works to consider common genetic factors in different pathologies

Biography

Andres Villegas-Lanau MD, MSc, PhD, is currently a professor at the University of Antioquia and has been the coordinator of the brain bank (Neurobank) of the Grupo de Neurociencias de Antioquia for more than 25 years. Additionally, he is a researcher in the Molecular Genetics (GENMOL) and Neurosurgery (Synapsis) groups.

Faii Ong*, Barun Rai, Chloe Lee, Vicky Shih, Jon Barrenetxea, Benjamin Koh

GyroGear, England, United Kingdom

Efficacy of the GyroGlove in modulating hand tremors in essential tremor - A self-controlled pilot study

Introduction: Essential Tremor (ET) is the most common form of movement disorder, resulting in pathologic tremor of hands and other body parts. The prevalence of Essential Tremor progressively increases with age (from 0.04% among those under 20 years to 2.87% among those over 80). As life expectancy and the proportion of older people expands, a rapidly growing number of ET sufferers will certainly intensify the pressure on healthcare systems worldwide.

Current ET management is symptomatic, and typically involves pharmacotherapy, followed by surgical options where appropriate (Deep Brain Stimulation, MRI Guided Focused Ultrasound etc.). Both pharmacological and surgical options, however, face multiple challenges such as side effects, limited efficacy, poor patient acceptance and high intervention costs. Hence, there is a pressing need from both patients and clinicians for non-invasive tremor modulation options. In this study, we investigated the efficacy of the GyroGlove in modulating hand tremors in participants with ET.

Methods: This single-blind, placebo-controlled, in-house study enrolled 15 participants with a confirmed diagnosis of ET. After signing informed consent and undergoing a screening session to assess if eligibility criteria were met, the participant was invited to attend the on-site assessment. During the on-site assessment session, four interventions were tested on the participants: i) no- device, ii) placebo glove, iii) low-intensity (low-rpm) glove and iv) full intervention (GyroGlove). The clinical effectiveness of each study arm was measured using the Volumetric Measurement Assessment (VMA), Bain & Findley Tremor ADL Scale (i.e., writing a sentence and putting a key into keyhole), and patient/clinician rated global impression of improvement (PGI-I & CGI-I) scores. The effectiveness of the GyroGlove arm was assessed against no device and placebo arms with a non-parametric Wilcoxon Signed-Rank test, followed by a post-hoc Bonferroni correction to account for multiple comparisons.

Results: The GyroGlove showed improvement trends across all the study outcomes. Compared to the no-device arm, the GyroGlove showed fourfold improvement in the VMA test (p-value<0.1), and an ADL burden reduction of 48% (p-value<0.01) and 63% (p-value<0.1) in sentence and keyhole test scores respectively. Compared to the placebo arm, the ADL burden reduction was 40% and 54% for the sentence and keyhole tests (p-values<0.1). Similarly, compared to placebo, the patient rated scores improved by 35% (p-value<0.1) and the clinician rated scores improved by 80% (p- value<0.01). A dose-response relationship was observed between the low-intensity glove and the GyroGlove, with the GyroGlove showing better results than the low-intensity arm in all outcomes measured.

Conclusion: Despite the small sample size, this in-house study of the GyroGlove demonstrated improvement trends across all study outcomes. The GyroGlove has potential as a tremor modulation solution in ET populations. These preliminary results should be complemented with a wider range of clinical outcomes and larger trials in the future.

Audience Take Away Notes

- Essential Tremor epidemiology, current treatment options and challenges for the healthcare system
- Exposure to non-invasive mechanisms of tremor modulation
- Mechanisms of tremor modulation using gyroscopic devices
- Self-controlled pilot trial design and conduction
- Entrepreneurship in the field of medical devices

Biography

Dr. Faii Ong is the founder and CEO of GyroGear, the company behind the GyroGlove. The GyroGlove is a pioneering tremor modulation wearable designed to reduce hand tremors. GyroGear has been awarded $3.3+ million in grant money from the UK government and EU Horizon 2020. Dr Ong read medicine at Imperial College London, and is currently a Masters candidate at the University of Cambridge. He trained under Prof Jeffrey Karp at Harvard-MIT's Health Science and Technology Division, and Prof Elof Eriksson at Harvard Medical School.

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DAY 03-VIRTUAL

KEYNOTE FORUM

JOINT EVENT ON

NEUROLOGY & ADDICTION

What is required for the current management of the injured spine of patients with traumatic cord injury be considered evidence based?

Traumatic Spinal Cord Injuries (TSCI) are life-changing events from medical, physical, psychological, social, financial, vocational, environmental & matrimonial effects. The combination of consequent generalised physiological impairment, multi-system malfunction, multiple disabilities, wide range of potential complications, sensory impairment together with the non-medical effects impose challenges to patients, carers and clinicians. Early prediction of ambulation is important to the patient especially during the transition between spinal and autonomic shock and the return of these reflexes during the first few weeks following injury. Neurological Recovery is not uncommon following spinal cord damage, is predictable and depends on the method and quality of management of the multisystem physiological impairment and malfunction as well as of the spinal injury. In the mid-sixties Frankel and colleagues made an astute observation that with good conservative management of the injured spine and the multisystem malfunctions, patients presenting within 15 days of injury with complete motor paralysis but sensory sparing made spontaneous motor recovery from reactivation of the myotomes adjacent to the functioning dermatomes irrespective of the radiological presentation on admission and on discharge. The same observations were made irrespective of the degree of canal encroachment or cord compression since the development of CT and MRI scans. Currently surgical interventions are carried out on patients with and without traumatic cord damage with claims that surgical intervention is necessary to prevent neurological deterioration and enhance recovery despite the potential hazards from anaesthesia and para surgical mishaps. These claims are unfounded and not supported by the comparative outcomes between Active Physiological Conservative Management of both the injury and the Multisystem physiological impairment and malfunction.

The prognostic indicators of neurological recovery, its extent and the factors that enhance, prevent or cause neurological deterioration and the value of CT and MRI will be discussed.

I will also discuss the necessary requirements for the current surgical management of the injured spine of patients with cord damage to be considered as evidence based

W S El Masri

Clinical Professor of Spinal Injuries, Keele University, Emeritus Consultant Surgeon in Spinal Injuries - RJ & AH Orthopaedic Hospital – Oswestry Shropshire SY107A-GUK, United Kingdom

Biography

Prof W S El Masri FRCS Ed, FRCP currently Hon. Clinical Professor of Spinal Injuries (SI), Keele University has trained between 1971 & 1983 in the Oxford group of hospitals, Guys & Stoke Mandeville hospitals and the USA. Obtained the first accreditation in Spinal Injuries and General Surgery in 1982. Appointed Consultant Surgeon in Spinal Injuries at the Midland Centre for Spinal Injuries in 1983. He personally treated and provided ongoing total care at all stages following injury to about 10,000 patients with SI. He published over 145 manuscripts. He is the author of the Concepts of "Physiological Instability of the Spinal Cord", "Time related Biomechanical Instability", "Hypothesis of Micro-instability of the injured spine" and the largest series of Bladder cancer in SCI patients. He is Past President International Spinal Cord Society and Past Chairman British Association of Spinal Cord Injury Specialists. He won many National and International awards. He is Founder Member and Trustee of SPIRIT a Charity for education and training of Doctors & Health Care Professionals in the Principles and Practice of Management of Spinal Cord Injured Basis, is Founder Member and Trustee of TransHouse now (Ethos) a Charity that offers Transitional Housing from the Hospital to the Community and a Trustee of the Institute of Orthopaedic of the RJAH Hospital.

Intrapsychic Activation Model (IPAM)

Our experience of reality is comprised of data from both the external and the internal environments.

These inputs are mediated, structured, and reframed via constructs which activate introjects to produce automatic thoughts. These thoughts affect behaviors intended to modify the environment to conform to a self-state, buttress, and validate it.

Constructs also select memories in order to prevent dissonance and anxiety between recall and self-state. They dissociate memories, alter their emotional content and correlates via attribution and reframing, and impose selectivity.

The construct organizes the output from the introjects according to an algorithm (“identity”) which provides, for each specific environment, selection criteria of self-states and corresponding introjects.

Sam Vaknin

Former Visiting Professor of Psychology, Southern Federal university, Rostov-on-Don, Russia and Professor of Finance and Psychology in CIAPS (Centre for International Advanced and Professional Studies), Russia

Biography

BSam Vaknin is the author of "Malignant Self-love: Narcissism Revisited" and other books about personality disorders. His work is cited in hundreds of books and dozens of academic papers: He is former Visiting Professor of Psychology, Southern Federal University, Rostov-on-Don, Russia and Professor of Finance and Psychology in CIAPS (Centre for International Advanced and Professional Studies). He spent the past 6 years developing a treatment modality for Narcissistic Personality Disorder (NPD). Over the years, with volunteers, it was found to be effective with clients suffering from a major depressive episode as well.

Posterior reversible encephalopathy syndrome or disseminated endotheliopathy perfusion syndrome: Time for a new name

Neural abnormalities, psychopathologies, and the unity of consciousness. In this talk I first review several different notions of the "unity of consciousness" such as subject unity, object unity, spatial unity, and perhaps most common "phenomenal unity" which is the general notion that, from the first-person point of view, we experience the world and its objects in an integrated way. I then show how various neural abnormalities and psychopathologies cause what we might understand as "disunities" (or breakdowns) in the unity of consciousness. Some of the phenomena to be discussed are hemispatial neglect, agnosia, schizophrenia, amnesia, somatoparaphrenia, akinetopsia, simultanagnosia, and synesthesia. A brief discussion of the related persistent neuroscientific puzzle known as the "binding problem," the problem of just how different regions of the brain integrate the information processed in those different areas, is also included.

Audience Take Away Notes

- List all other benefits
    - The audience will better understand how specific brain damage affects various specific conscious mental abilities in rather strange ways and, in turn, perhaps how to understand and treat various disorders
    - Attendees can be helped in terms of their teaching and research by becoming more aware of how neural abnormalities bear on the nature of consciousness and personal identity
    - It can also help one to think about the philosophical implications of some brain research, e.g. to what extent unified conscious mental activity can be maintained after brain injury or damage

Rocco J Gennaro

Department of Political Science and Philosophy University of Southern Indiana Evansville, Indiana 47712, United States

Biography

Dr. Rocco J. Gennaro is Professor of Philosophy at the University of Southern Indiana, USA. His primary research and teaching interests are in Philosophy of Mind/Cognitive Science (especially consciousness), Metaphysics, NeuroEthics, and Early Modern History of Philosophy. Dr. Gennaro has published twelve books (as either sole author or editor) and over sixty articles and book chapters in these areas. He has most recently published Consciousness (Routledge Press, 2017), Mind and Brain: A Dialogue on the Mind-Body Problem, 2nd edition (Hackett, 2020) as well as edited The Routledge Handbook of Consciousness (2018). He has also published The Consciousness Paradox: Consciousness, Concepts, and Higher-Order Thoughts (MIT Press, 2012), and edited an anthology entitled Disturbed Consciousness: New Essays on Psychopathologies and Theories of Consciousness (MIT Press, 2015).

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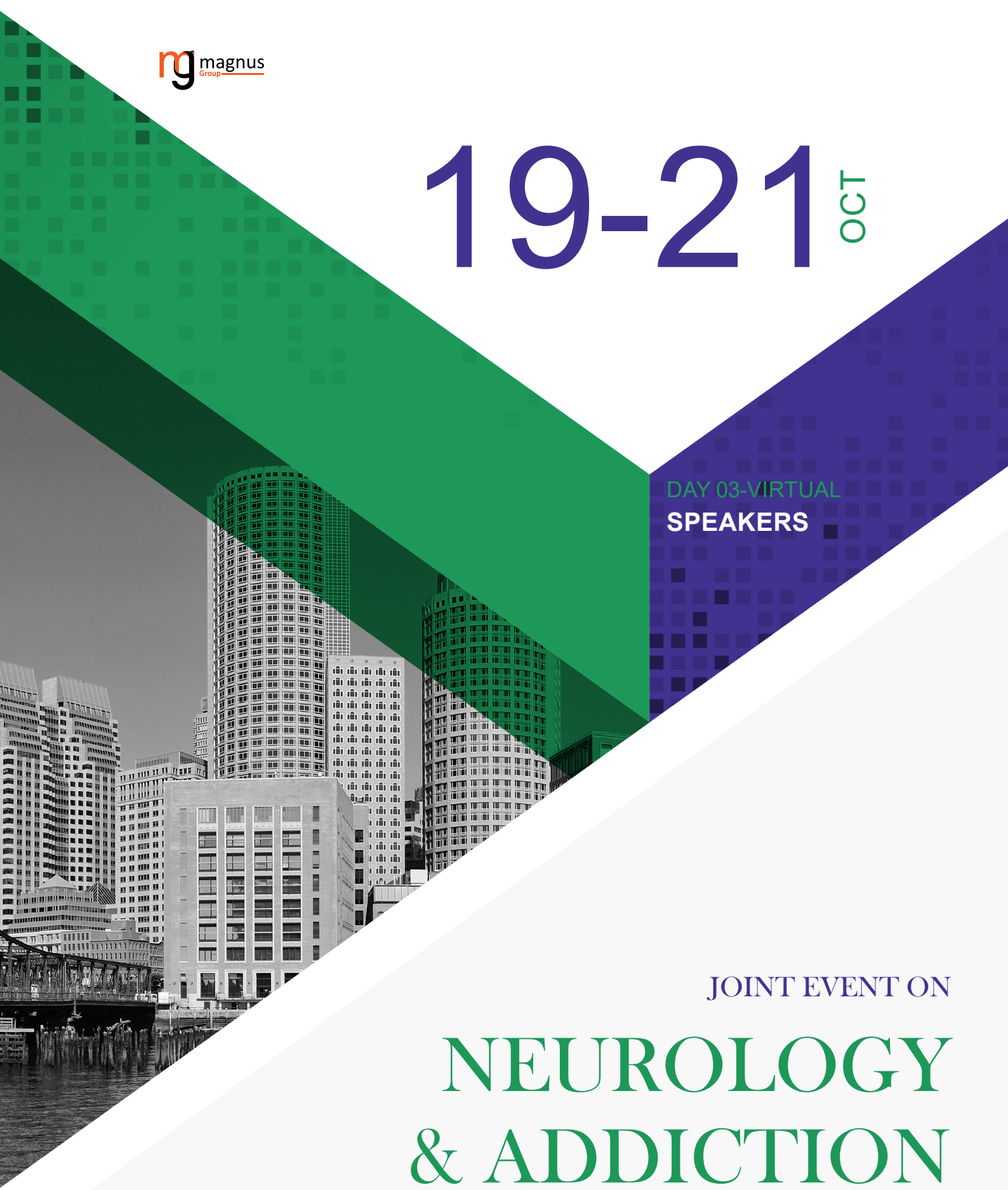


DAY 03-VIRTUAL

SPEAKERS

JOINT EVENT ON

NEUROLOGY & ADDICTION

Yang Du*, Jie Yu, Manhua Liu, Qi Qiu, Yuan Fang, Lu Zhao, Feng Yan, Xia Li

Shanghai Mental Health Center, Shanghai Jiao Tong University School of Medicine, Shanghai, China

The relationship between depressive symptoms and cognitive function in alzheimer's disease: The mediating effect of amygdala functional connectivity and radiomic features

Background: Depressive symptoms are common in Alzheimer's Disease (AD) and are associated with cognitive function. Amygdala Functional Connectivity (FC) and radiomic features related to depression and cognition. However, studies have yet to explore the neural mechanisms underlying these associations.

Methods: We enrolled eighty-two AD patients with depressive symptoms (ADD) and 85 Healthy Controls (HCs) in this study. We compared amygdala FC using the seed-based approach between ADD patients and HCs. The Least Absolute Shrinkage and Selection Operator (LASSO) was used to select amygdala radiomic features. A support vector machine (SVM) model was constructed based on the identified radiomic features to distinguish ADD from HCs. We used mediation analyses to explore the mediating effects of amygdala radiomic features and amygdala FC on cognition.

Results: We found that ADD patients showed decreased amygdala FC with posterior cingulate cortex, Middle Frontal Gyrus (MFG), and parahippocampal gyrus involved in the default mode network compared to HCs. The area under the receiver operating characteristic curve (AUC) of the amygdala radiomic model was 0.95 for ADD patients and HCs. Notably, the mediation model demonstrated that amygdala FC with the MFG and amygdala-based radiomic features mediated the relationship between depressive symptoms and cognitive function in AD.

Conclusion: Our findings may not only expand existing biological knowledge of the relationship between cognition and depressive symptoms in AD from the perspective of brain function and structure but also may ultimately provide potential targets for personalized treatment strategies.

Audience Take Away Notes

- Alzheimer's disease patients with depression show abnormal amygdala dysfunction in the default mode network
- Amygdala radiomic features have excellent diagnostic value for AD with depression
- Amygdala FC and radiomic features related to depressive symptoms and cognition in AD
- Amygdala FC and radiomic features mediate the relation between depression and cognition

Biography

I am Yang Du. I graduated with a Master's degree in Psychiatry and Mental Health from the School of Medicine, West China Hospital, Sichuan University. Currently, I am a Ph.D. student at the Shanghai Mental Health Centre, Shanghai Jiaotong University. I have published 6 SCI papers and 5 CSCD journal papers as the first author. In addition, I have conducted three research projects at the provincial and ministerial levels and received three awards from the China Medical Education Association. I have published one monograph as the second editor-in-chief and was awarded one national invention patent as the second inventor.

Temitope Labinjo
Information School, University of Sheffield, Sheffield, South Yorkshire, United Kingdom

Perceptions, attitudes and cultural understandings of mental health in Nigeria: A scoping review of published literature

Mental disorders are a public health challenge with a lack of understanding, great institutional neglect and widespread stigma in Nigeria. There is also a dearth of secondary review studies exploring knowledge, perceptions, and attitudes towards persons with mental health disorders in Nigeria. This scoping review aimed to explore the knowledge, perceptions, and attitudes of Nigerians towards mental health issues. Sixty-four articles were identified as meeting the eligibility criteria. The most common determinants of mental health disorders as perceived by Nigerians were supernatural causes such as possession of evil spirits, sorcery, witchcraft, and divine punishment. In addition, a significant number of articles attributed the cause to drug or alcohol misuse. Social distancing and avoidance were expressed in all papers that looked at attitudes towards people with mental disorders. The research showed that Nigerians held supernatural beliefs as the cause of mental disorders and religion is a significant cultural aspect for Nigerians. Therefore, collaboration with religious and traditional institutions could help improve knowledge and awareness. Further qualitative studies are needed to explore the experiences of Nigerians particularly, in the northern regions of the country.

Audience Take Away Notes

- The audience will be able to learn about other contexts, and cultures concerning mental health and drug misuse and possibly apply this to their context or background
- This will help mental health professionals be less focused on medical treatment methods but focus on a holistic method recognizing other factors such as culture, background, religion etc., especially among ethnic minority groups
- This research recognizes the need for collaboration with religious and/or traditional institutions or in some specific cases individuals who an individual holds in high regard that can help provide holistic support
- The study will help reduce the stigma associated with mental disorders across Africa and recommend alternative strategies for mental health professionals by recognizing the individuals' backgrounds, cultures, religions etc
- A significant coping method among Nigerians was 'spirituality' along with daily contact with family members. Therefore mental health professionals should identify significant coping aspects of their patients and incorporate them into their care plans

Biography

Dr. Temitope Labinjo's broad research interests include identity, gender, and diversity within different areas of public health, well-being, migration, mental health, and reproductive health. She recently completed her doctoral research at Health, Wellbeing and Life sciences department at Sheffield Hallam University, United Kingdom. Her PhD research explored the experiences of mental health among internal migrants in Nigeria. She currently works as a post-doctoral research associate at the Information School, The University of Sheffield on a project titled' Understanding Fairness in AI for Mental Health. Apart from her PhD research, she has worked on about ten projects and published five papers in reputable peer-reviewed journals as well as co-authored three papers in peer-reviewed journals.

Vijayan Gurumurthy Iyer
Faculty (Climate Change), Bihar Institute of Public Administration & Rural Development (BIPARD), Kushdihra, Brahmayoni Hill, Gaya-823001, Bihar, India

ISome practical hints on climate change and control towards sustainable medicine, behavioral health and psychiatry

The present study is conducted towards sustainable medicine, behavioral health and psychiatry for sustainable national development. The process of applying Climate Impact Assessment (CIA) and sustainable development in addiction treatment plans, programs, polices, and legislative actions while targeting mitigation of alcohol addiction, drug addiction, gambling addiction and gadget addiction that are integrated with climate change and control. The various addiction among street children and their impact on sustainable development integrated with climate change and control aspects as there are alarming state variables and attributes degrading society and the environment. There are large number of street children found in India in Metro cities like, Mumbai, Delhi, Kolkata and Chennai engage in various addiction products and process. There is lack of effective and efficient method to mitigate this major problem of Addiction Impact Assessment (AIA) process. It is necessary to incorporate sustainability and environment into organizational planning and decision-making process. All developers should take essential steps to deal with this problem towards sustainable national development which is a kind of national development that satisfies current demands without jeopardizing the effectiveness and efficiency of future generations to satiate their own requirements As sustainable development is integrated with CIA, investigations are provided entitled “climate change and control towards sustainable national development”.

“Climate” can be defined as the prevailing or average weather of a place as determined by temperature, precipitation, wind rose, glaciation, frequency of inversion, extreme weather events such as cyclones, tornadoes, cloud burst, typhoons, and hurricanes and environmental quality such as air, water and land quality. Long term variations in average temperature are the most important variables and attributes of climate change.

Change in weather conditions occur in an area over a long period of time such as temperature, humidity, dew point, pressure, volume, wind rose, air movement, photo chemical smog and sunlight energy (photo energy) due to biogenic and anthropogenic activities. Climate change is an evolution in the degree of certainty by biogenic and anthropogenic activities in causing the past half century’s rapid rise of 1.1℃ in global average surface temperature of 14.9 ℃ from 13.8 ℃, and climate sensitivity factor of 0.5 ℃ / W/m2 and net radiating force of 0.9-1.7 W/m2, since mid-twentieth century is due to the observed increase in biogenic and anthropogenic greenhouse gas concentrations, the Antarctic and Greenland ice cores, sea floor sediments, glacial movements, changes in ice volume and sea volume and fossil pollen microorganisms. Global warming is the most important environmental challenge for the twenty first century. The climate change and control can be defined as the power to limit and regulate climate change as per sustainable environmental pollution and control standards. The ‘greenhouse effect’ is one of the environmental problems that have resulted either directly or indirectly from the biogenic and anthropogenic activities. The role of the human population on social and environmental change is given by the equation. I = P X A X T where the impact ‘I’ of the population on the social and environmental results from the size of the Population (P), the per capita affluence or Consumption (A) and the environmental damage by the

Technologies (T) employed to supply each unit of consumption. As 'P' increases so too does 'T' because supplied to additional people that must be mined from deeper ores, pumped from deeper deposits, transportation further. The per Capita consumption of energy in a nation can be used as a surrogate for the A X T part of from clearing forests for agriculture to mining, industrial, manufacturing, sanitation, road building and extraction of fossil fuels. The magnitude of greenhouse effect of earth is Ts minus Te, where Ts is actual surface temperature of earth (288 K) and the Te is the earth's "effective and efficient" blackbody radiation temperature of minus 19 ℃ (254 K). The greenhouse effect is a natural phenomenon due to biogenic and anthropogenic sources of a number of gases and aerosols that is responsible for earth having an average surface temperature 34℃ warmer that is 288 K Versus 254 K that it would have if it did not have radiatively active gases and aerosols in the atmosphere. As every doubling of logarithmic emission function and process of CO2 in to the atmosphere, the global warming surface temperature goes up of 3 ℃, climate sensitivity factor 1 ℃ / W/m2 and net radiating force 2-4 W/m2. It is important to necessary to conduct Climate Impact Assessment (CIA) process to systematically identify and evaluate potential impacts (effects), risks and options for adaptation resilience and mitigation of biogenic and anthropogenic climate change and document as climate research and development (R &D) papers. Three of the most significant terms of CIA process are "climate inventory," "climate impact assessment", and "climate impact statement".

The past three decades have been characterized by passage of the Environmental (Protection) Act (EPA) including Acts on control of water and air pollution, solid- and -hazardous waste management, resource protection and soil and groundwater remediation. In addition to EPA, the community strategies were adopted for sustainable development to address climate change, acidification, and air quality, protection of nature and biodiversity, management of water resources, the urban and rural environment, coastal zones and waste management. It is to be ensured that the balanced planning and decision-making process needed regarding the sustainable environmental and climate development in the public interest.

Project planning and decision-making process should include the integrated consideration of technical, economic, environmental, social and climate and other factors. The most of important of these considerations can be referred to as "three E s" (Engineering or technical, Economics, and Environment" in project planning and decision making process. Prior to Environmental Impact Assessment (EIA) process or "Magna Carta for the Environment", Engineering or technical and economic factors can be referred to as " two E s " dominated the project planning and decision-making process. Traditional organizations typically management according to the functions in vertical organizational charts. However, when interactions and interrelations occur among parts of a systems that is among functions and departments it is required to manage as per process in horizontal organization charts. A system of profound knowledge provides efficient organizational planning and decision-making process for the management of parts in isolation and process of cross functional boundaries including optimization of climate change process that is fulfil our common goal or vision of integration of development and environment. "Climate Impact Assessment" (CIA) process. CIA process can be defined the systematic identification and evaluation of the potential impacts (effects) of proposed projects, plans, programs, or legislation actions relative to the physical-chemical, biological, cultural and socioeconomic components of the total environment and climate. The primary purpose of the CIA process, is to encourage the consideration of the environment and climate factors in planning and decision-making process and to arrive at actions which are environmentally and climate wise compatible. The climate health impacts of projects, programs, plans, polices, or legislative actions should be considered in the decision-making process because of the importance of these concerns, particularly post COVID world, a Climate Health Impact Assessment (CHIA) process is proposed. For certain types of projects such as biogenic plants and nuclear power plants, it may be necessary to address psychological impacts and damages of mental health on human, animals and plants. The emphasis is to given in conduction of primary, secondary and tertiary climate impact studies on the physical-chemical and biological climate (natural or biophysical climate environment) and cultural and socioeconomic environment (man-made climate environment). The global agreements that were adopted on various key issues such as climate

change, biodiversity, tropical forests, and sustainable development, Viz., Law of the Seas (1954), Stockholm Declaration (1972), Montreal Protocol (1987), Kyoto Protocol (1987), Rio declaration (1992) and The Paris Agreement (2015).

Key words: climate, change, control, environment, sustainability.

Audience Take Away Notes

- Climate impact assessment process,
- Environmental Impact Assessment (EIA) Process
- Addiction Impact Assessment (AIA) Process
- Social Impact Assessment (SIA) Process
- Economic Impact Assessment (Economics IA) Process

Biography

Dr.Vijayan Gurumurthy Iyer studied Master of Technology (Environmental Science and Engineering) at the Indian School of Mines (ISM) (Indian Institute of Technology), Dhanbad and obtained as M.Tech and Ph.D. (Engg.). respectively in 1998 and 2003. He has got thirty-five years' experience in research, training, teaching, consultancy and extension activities in national and international levels. Presently he is serving as Faculty in Climate Change in Bihar Institute of Public Administration & Rural Development, Gaya, India. He has received his PDF in 2006 and D.Sc and LL.D. at WSEAS Greece and The Yorker International University (YIU) in 2011. After one-year postdoctoral fellowship supervised by Prof. Dr. Nikos E Mastorakis, he elaborated his post-doctoral research work and joined as Faculty in BIPARD. He has published more than 425 research articles in SCI(E) journals and citations having more than 4500 numbers. His h.index is 55.

Soewadi*, Fairus Syafira
Department of Psychiatry, Faculty of Medicine Gajah Mada University, Yogyakarta, Indonesia

Relationship between religion and adolescent drug abuser

Significant changes occurring in the adolescent brain create an opportune time for poorly thought-out decisions and also involvement in potentially harmful behaviors. A time when the "plasticity" and malleability of the brain allow for interventions to reinforce or alter earlier experiences. Drugs are trending among teenagers these days and become one of the main public health concerns in the world. Adolescents are more likely to take drugs since their socio-emotional conditions are still developing and they are more susceptible to being persuaded to engage in antisocial behavior. Early use of drugs increases an adolescent's chances of developing addiction. We have to remember that drugs change brains, and this can lead to addiction and other serious problems such as intoxication, mental disorders and other physical disorders. Drug abuse also make negative impact on quality of life. Therefore, healing drug abuse, especially adolescents as quickly as possible, can prevent big risks in the future. If we can prevent young people from experimenting with drugs, we also can prevent drug addiction. Religion has the power to regulate behavior, serve as protection and security, and it is especially effective at keeping adolescents away from drug abuse. Holistic is defined as pertaining to all aspects of human nature—physical, mental, emotional, and religious. Approaching health holistically is to consider multiple aspect like mind, emotion, spirit, and whole body, how these things affect human health, it is not just the area that is showing the symptoms. The underlying foundation and prerequisite for true healing is compassion for the patient and consideration of all aspects of the patient's nature, including family, culture, spirituality or religion, and community.

Audience Take Away Notes

- To explain the audience that most of adolescent drug abuser not to do the obedient their religion
- The audience have to be remembered that in order to manage the drug abuser, a holistic approach must be used, which means they have to consider the biopsychosocial and religion approach of the drug abuser
- This research can use in the other faculty to expand their research or teaching
- This research provide a practical solution to a problem that could simplify or make a designer's job more efficient
- This approach will be the new design solving problem for adolescent drug abuser

Biography

Prof. Soewadi, MD, MPH, PhD, studied psychiatry at Gadjah Mada University, Indonesia, and graduated as a psychiatrist in 1984. He then studied at the Prins Leopold Institute in Antwerpen, Belgium, and graduated as a Master of Public Health in 1984. He received his PhD degree in 1992 at Gadjah Mada University, Indonesia. Prof. Soewadi is currently a Professor of Psychiatry at Gajah Mada University. He has published more than 30 research articles in Psychiatry.

Arda Ozkurt*, Ozlem Bozkurt
Hisar School, Istanbul, Turkey

Different approaches in hemispheric specialization in the perception of auditory stimuli

The human brain has developed different neural mechanisms to perceive time in twelve scales. Neural population clocks and ramping activity are the mechanisms responsible for perceiving subsecond timing, which includes speech recognition and internal discrimination. The human brain cannot precisely perceive auditory stimuli, and its perception depends on several factors such as arousal levels, age, emotional state, and external stimuli. In fact, two hemispheres of the brain perceive an auditory stimulus with different accuracies. There is also a more contralateral relationship than an ipsilateral one between the ears and the hemispheres of the brain. This indicates that the precision of the two ears in terms of perceiving auditory information is different.

Furthermore, there are two hypotheses on which types of auditory stimulus are perceived better by which hemisphere of the brain: the domain-related hypothesis and the parameter-specific hypothesis. According to the domain-related hypothesis, the lateralization of the auditory stimuli depends on whether the stimulus is language or nonspeech. Many experiments showed that the language is lateralized in the left hemisphere and the nonspeech is lateralized in the right hemisphere according to this hypothesis. However, according to the parameter-specific hypothesis, the lateralization of the auditory stimuli does not depend on the stimulus type; it depends on whether the stimulus is a temporal or a spectral stimulus. According to this hypothesis, many experiments demonstrate that there is a left hemispheric lateralization for the perception of temporal auditory stimuli and a right hemispheric lateralization for the perception of spectral auditory stimuli independent of whether the stimulus is speech or nonspeech.

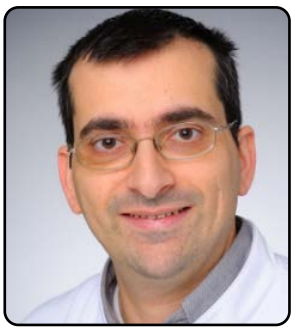
Also, according to some experiments, one of the factors contributing to this effect is the denser myelination in the left hemisphere of the auditory pathways.

Audience Take Away Notes

- The audience will learn two different hypotheses in the lateralization of the auditory stimuli
- The audience will learn how neurological structures contribute to the function of the auditory pathways
- The significance of learning about the lateralization of the brain in perceiving auditory stimuli is to explore more about the factors contributing to the perception of auditory stimuli

Biography

Arda Ozkurt was born in 2006 in Istanbul, Turkey. He will graduate from Hisar High School in 2025.



Georgios Matis

University of Cologne, Faculty of Medicine and University Hospital Cologne, Department of Stereotactic & Functional Neurosurgery 62nd Kerpener Str., 50937, Cologne, Germany

Intrathecal pain treatment & ziconotide

Ziconotide is a synthetic, water-soluble cone snail venom-derived peptide with a molecular weight of 2,639 Daltons. It is a nonopioid analgesic that selectively binds to N-type voltage-sensitive calcium channels on primary nociceptive afferent nerves in the dorsal horn of the spinal cord. This mechanism releases analgesic neurotransmitters into the synaptic gap and subsequently blocks pain signal transmission. Ziconotide does not easily cross the blood-brain barrier, instead revealing its highly potent antinociceptive effect only after intrathecal administration. Because it has a narrow therapeutic window, careful dose titration, and a lag time to allow for onset (and offset) of analgesia and adverse effects are required. The presentation will focus on a recently published consensus proposal and highlight the potential of this drug as well as the areas where additional experience is needed.

Audience Take Away Notes

- Expand the knowledge on possible neuromodulation therapies
- Learn how intrathecal therapy can help patients with chronic pain
- Learn how a non-opioid drug (Ziconotide) could be a viable treatment option
- Learn about the advantages and disadvantages of Ziconotide
- Help physicians provide one more therapy to their chronic pain patients

Biography

Dr. Georgios Matis is a senior consultant for neurosurgery. He leads the chronic pain / spasticity sector of the Department of Stereotactic & Functional Neurosurgery in the University Hospital of Cologne. He has been trained in Greece (General University Hospital of Alexandroupolis, G. Papanikolaou General Hospital of Thessaloniki & 417 Army Equity Fund Hospital of Athens), USA (Department of Neurosurgery, Weill Cornell Medical College, New York, NY), Switzerland (Department of Neuroradiology, University Hospital of Zurich, Zurich) and Germany (Department of Stereotactic & Functional Neurosurgery, University Hospital Cologne, Cologne). Dr. Matis is a member of two medical associations (Thessaloniki, Greece & North Rhine, Germany) and also a member of the German Neuromodulation Society (DGNM) and the International Neuromodulation Society (INS). He serves as reviewer for many international journals and is Editorial Board member for Neuromodulation: Technology at the Neural Interface and Interventional Pain Medicine and Neuromodulation. He holds the position of Editor-in-Chief of the Internet Journal of Neurosurgery. Dr. Matis has published many articles in Greek and international Pubmed-indexed journals and hold many lectures as invited speaker in numerous international congresses and webinars. At the same time, he is Public Education Committee member of the International Neuromodulation Society. Dr. Matis is involved in many international clinical studies and has been active as instructor for many colleagues in Germany and abroad. He is also an active member of the medical advisory board of the German CRPS Support Group and member of several online consultation platforms. He is actively involved in social media trying to raise awareness about spinal cord stimulation and neuromodulation.

Lama Saad El Din Mahmoud

Depatment of Neurology and Neurosurgery, October 6 University, Faculty of Physical Therapy, Lecturer of Neurology and Neurosurgery, Giza, Egypt

Artificial intelligence and virtual reality kinect rehabilitation in stroke patients with unilateral spatial neglect

Background: People with neglect suffer from various spatial deficits in several modalities, which in many cases impair everyday functioning. Virtual Reality (VR) is a form of interaction between humans and computers in which a real or imaginary environment is simulated. Users interact with that world and manipulate it. Artificial Intelligence (AI) can increase the efficacy of promoting and strengthening human activities.

Purpose: to investigate the extent to which the use of VR as an effective AI treatment technique for patients experiencing unilateral spatial neglect after stroke. Subjects: Thirty patients experiencing unilateral spatial neglect after stroke.

Methods: patients were randomly assigned to two groups; a study group and a control group. The study group received VR Kinect rehabilitation and conventional treatment for eight weeks and the control group received conventional treatment using behavioral rehabilitation methods of physical therapy. The disorder was diagnosed with paper and pencil tests of extra-personal neglect, the Catherine Bergego Scale (CBS), and recently, promising new methods based on the number of repetitions of tasks on VR.

Results: There was a highly significant difference between the study and control groups as the p-value was (0.0001) which indicated that the study group shows improvement more than the control group, and there was a correlation between the line cancellation task, the CBS, and the VR repetitions.

Conclusion: This study revealed that eight weeks of VR as an effective AI rehabilitation for every patient was a beneficial therapeutic technique for unilateral spatial neglect in stroke patients.

Keywords: Artificial intelligence, Spatial Neglect, Stroke, Virtual Reality, Rehabilitation.

Audience Take Away Notes

- The audience will be able to practice Artificial intelligence in the treatment of neurological disorders
- The audience will get new advanced knowledge on how to apply Artificial intelligence feedback in a rehabilitation program in stroke patients
- The VR considered an effective AI rehabilitation for every patient was a beneficial therapeutic technique on unilateral spatial neglect in stroke patients

Biography

Lama Saad El-Din Mahmoud has been currently working as a lecturer of Physical Therapy for Neuromuscular Disorders & Its Surgery at, the Faculty of Physical Therapy, October 6 University, Egypt, and working as a Neurology and Neurosurgery Consultant for Neuro-Rehabilitation. Ph.D. degree, Department of Physical Therapy for Neuromuscular Disorders and its Surgery, Faculty of Physical Therapy, Cairo University.

Nico Morales
No Halo LLC, United States

My stuff hurts: Internal pain expressed in external ways

There are many forms of expressing pain and hurt. It may be a learned behavior; replicating the actions and behaviors of a respected individual. It may be unconscious, each time hurt happens it is relieved with a specific food, drink, substance or action. It may be a cultural or traditional method to manage pain. Whether it is physical, mental or emotional pain, it needs to be communicated and expressed in a healthy way. In this engaging presentation audience members will be taken through a story of lived experience expressing pain in unhealthy behaviors, activities and the subsequent results.

Audience members will leave with an applicable method to do a self pulse check. The audience's communication skills will be enhanced throughout this presentation.

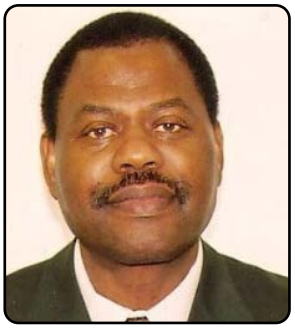
Audience members will be more equipped to communicate with their family, co-workers and other professionals supporting them about the pain or uncomfortable emotions they may be experiencing. While pain is part of life's experience it must be expressed in constructive methods. Each individual will have their own way of expressing their pain, the communication skills taught in this presentation will go over pace and priority when audience members feel their mental health or wellness is being affected. The presentation will encourage the audience to engage with professionals before the pain becomes unmanageable. The objective of this presentation is to equip participants with the knowledge and skills to effectively communicate with self-awareness.

Audience Take Away Notes

- The audience will leave with encouragement and inspiration to engage support before their pain affects their mental health and wellness
- Communicating assertively
- Understanding and recognizing logical v. Emotional thoughts
- A technique to increase self-awareness

Biography

Nico Morales was born and raised in Albuquerque, New Mexico. He was an athlete, opiate user, alcohol drinker and now is an author, graduate, and business owner. Nico grew up with both parents in a middle-class household. Nico had adverse childhood experiences that he repressed, this mental unrest led to an exploration of substances, eventually propelling him into opiate use disorder. By twenty-two, Nico was living out of his truck and spent most of his time finding odd, sometimes illegal ways to make money to support his drug habit. After seeing others close to him pass from overdoses and recounting the times he came near death he recognized there was a reason he was still living. He put down the needle and unfortunately he picked up a bottle. The cycle of addiction repeated itself and because of the to the extent of Nico's over drinking he found himself staying in a building with only electricity. After exploring different counseling techniques that were not successful Nico turned to an alternative method for care. He now uses his lived experience to share topics and tools that he picked up through trial and error. Nico opened No Halo LLC in 2019 a brand for personal and professional development, has published a book, and loves green chile. Thank you for listening as he shares a story of hope.



Alphonsus Obayuwana
Triple-H Project LLC, United States

The edo questionnaire (aka PISA Scale)

The most important information about any client or patient is the PHI, (Personal Happiness Index). Like temperature, pulse, or BP, PHI is a true "vital sign" and the tool needed for determining it is the Edo Questionnaire (aka PISA Scale).

The Edo Questionnaire is a twelve-item self-assessment scale that can identify happy people, unhappy people, very happy, very unhappy, languishing, or flourishing individuals in any given cohort. PHI ranges from 0.125 on the languishing end to 8.000 on the flourishing end of the scale. The questionnaire has good internal consistency with an alpha value of 0.88. Content validity ratio is 0.85—with ten SME used in calculating the CVR. Test-retest reliability is 0.95. Like all other vital signs, PHI should be routinely determined by every clinician—no matter what specialty.

Biography

Alphonsus Obayuwana, M.D., Ph.D., CPC. is both a physician and a happiness guru. He is the Founder and CEO of Triple-H Project LLC, Perrysburg, Ohio, in USA. He is an award-winning author who has published several peer-reviewed articles in the national medical journals on the subject of Human Hope, including the Hope Index Scale that became widely used at Coca-Cola, General Motors, Veterans Administration, and many academic institutions inside and outside USA.

After thirty years of relentless research on Human Hope & Happiness, he successfully derived the Triple-H Equation that is at the core of The Mathematics of Happiness. Throughout his tenure as instructor, assistant professor, associate professor, and professor—respectively at Johns Hopkins, University of Maryland, Eastern Virginia Medical school, Ohio University College of Osteopathic Medicine, and University of Toledo—he taught and mentored medical students, resident physicians, nurses, and fellows in the art of caring and promoting happiness for themselves and their patients. Dr. Obayuwana is also a retired Major in the US Air Force (Reserve)

Vincent Colucciello
Greenville School of Medicine, Greenville, South Carolina, United States

The tragic hero: An unhealthy depression coping mechanism in adolescents

There are currently many internal barriers that adolescents face which hinder the treatment of depression. While stigmatization of depression is still the primary internal barrier, a new and opposite phenomenon has emerged in recent years. Some teenagers have begun to romanticize depression and even develop their sense of identity around it. On the surface, the romanticization of depression can be explained by poor coping skills and a harmful view of mental health. However, these explanations do not address the root issue. Understanding the philosophical reasons behind this romanticization can provide valuable insights.

In the field of psychology, adolescence marks the period when individuals begin to grasp the concept of morality. However, there is a tangential concept that is rarely discussed and may be the cause of the romanticization of depression. This concept is aesthetics, but not in the modern sense, but rather the Ancient Greek form of the word.

The tragic theater transformed the Greeks' perception of beauty. Beauty was no longer viewed through the lens of perfection, but rather through loss. The Greek heroes did everything right, but in the end, they suffered greatly and were subsequently isolated from the world around them. However, this loss was not in vain, as it gave them a profound understanding which can only be achieved through such a loss. This understanding, born from tragedy, was the Greek ideal of beauty, and it still exists in popular culture and movies today.

The romanticization of depression is comparable to the Greek concept of aesthetics, or tragic beauty. Depression gives adolescents a unique, but distorted perspective on the world, which they misconstrue as deep understanding. As depression is the source of this warped view, the teen romanticizes and feels that if they lose their sorrow, they will also lose their insight. This creates a paradoxical state in which individuals feel both exalted and depressed. This powerful, yet harmful coping mechanism forces them to cast themselves as tragic heroes in their own comic to cope with their intense emotions.

Audience Take Away Notes

- How using philosophy can augment the field of psychiatry
- To broaden our view on coping methods in adolescents
- Deepen the connect with adolescent patients by seeing things from their view

Biography

Vince Colucciello is currently a fourth-year medical student at the Greenville School of Medicine in South Carolina. He has a philosophy degree from the University of North Carolina Wilmington and focused his studies on ancient Greek ethics. He is currently hoping to match into a psychiatry residency next year and would like to pursue a fellowship in child and adolescent psychiatry.

Sagarika Gopalkrishan
Einstein Medical Centre, United States

Investigating the molecular mechanisms involved in early events of cellular dysfunction in alzheimer's disease

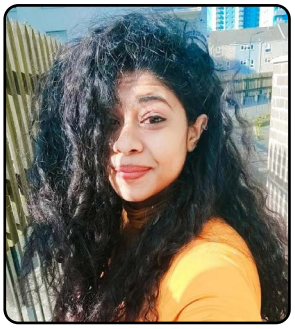
Objective: The aim of the study is to assess the implication of dysfunction in the glymphatic system in patients suffering from sleep-related disorders. The secondary aim is to understand the association between the glymphatic system and cognitive decline in patients with sleep-related disorder.

Method: For the systematic review, our screening was narrowed to seven publications. Databases that used included PubMed & Cochrane Library from January 2013- December 2022 and were searched for studies using the keywords “glymphatic system and narcolepsy”, “glymphatic system & sleep disorder”, “glymphatic system & OSA”, “glymphatic system & REM sleep behaviour disorder” “glymphatic system and neurological disorder”, “glymphatic system and sleep”. Our inclusion criteria included- human subjects, time range of publications within 10 years, adults over 18 years, primarily diagnosed with sleep-related disorders, and no secondary causes of sleep-related disorder.

Results: Based on our study, we found an association between the glymphatic system and sleep-related disorders. In particular, our focus was on REM Sleep Behaviour Disorder (RSBD), narcolepsy, and OSA. It was found that the glymphatic system was impaired in RSBD, narcolepsy, and OSA. In fact, the degree of glymphatic system dysfunction is positively correlated with the severity of the above-mentioned disorder/ disease states. Moreover, normal glymphatic flow is increased during the sleep state, our study further suggests that alteration in sleep patterns in these states leads to a decrease in clearance and building-up of brain metabolic waste and amyloid plaques leading to further poor drainage which in turn leads to cognitive impairment.

Conclusion: This systematic review provides evidence to suggest that dysfunction of the glymphatic system plays a role in the progression of sleep-related disorders of narcolepsy, RSBD, and OSA, which in turn, may lead to cognitive disturbances

Keywords: RSBD- REM Sleep Behaviour Disorder, OSA- Obstructive Sleep Apnea.



Gaurav Jha[1], Radhika Saigal[2]*, Shubhangi Barnwal[3], Rashika Thomas[4]

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Rapidly progressive dementia: A case of sporadic Creutzfeldt-Jakob Disease

Introduction: Creutzfeldt-Jakob Disease (CJD) is a rare and rapidly progressive neurodegenerative disorder with diverse clinical presentations. Timely diagnosis of CJD remains a challenge due to its nonspecific symptoms and lack of widely available definitive tests. This abstract delves into a case study that highlights the diagnostic complexities and the critical role of clinical acumen in the identification of CJD.

Case Study: We present the case of a previously healthy 57-year-old man who initially presented with slurred speech, vertigo, ataxia, and memory loss over two weeks, following a sudden severe headache. Initial assessments, including CT Head and routine blood tests, were unremarkable. An urgent MRI head scan indicated cortical diffusion restriction in the left frontal lobe, raising suspicion of Sporadic Creutzfeldt-Jakob disease (sCJD).

Upon admission, neurological findings included nystagmus, severe gait ataxia, and bilateral dysmetria. Additional tests, including blood and cerebrospinal fluid analysis, and EEG, were normal except for left hemispheric dysfunction on EEG. Over six weeks, as his condition progressed, he experienced reduced visual acuity, leading to an MRI orbit revealing worsening cortical diffusion restriction. Symptoms worsened, including seizures, hallucinations, aggression, and involuntary movements. Diagnostic considerations included paraneoplastic syndrome, subacute cerebellar syndrome, and CJD. His condition rapidly deteriorated, displaying predominantly pyramidal signs, cerebellar syndrome, myoclonus, alien limb syndrome, dysarthria, and relatively preserved cognition. Extensive investigations ruled out alternative causes. A diagnosis of probable sCJD was made based on CDC diagnostic criteria. The patient's condition rapidly deteriorated with worsening CNS dysfunction and he was eventually transferred to hospice care.

Results: Extensive diagnostic workup included neuroimaging with MRI, EEG, CSF analysis, and serological tests, all of which were crucial in narrowing down the diagnosis. The patient exhibited classic CJD features such as periodic sharp wave complexes on EEG, cortical diffusion restriction on MRI, and elevated 14-3-3 protein in CSF. Additionally, this case emphasizes the importance of considering CJD in atypical presentations and highlights the evolving role of diagnostic tools like RT-QuIC.

Conclusion: Creutzfeldt-Jakob Disease remains a rare and enigmatic neurological disorder with a poor prognosis and rapid progression. This case study reinforces the critical role of a multidisciplinary approach in diagnosing CJD, particularly in atypical presentations. It also highlights the evolving diagnostic landscape, emphasizing the importance of early recognition and appropriate management to enhance patient comfort and quality of life throughout the disease course.

Audience Take Away Notes

- The diverse clinical presentations of CJD, emphasizing the need for a high index of suspicion
- The utility of advanced neuroimaging, EEG, and CSF analysis in CJD diagnosis
- The emerging role of RT-QuIC as a less invasive and highly specific diagnostic tool

- The importance of early recognition and appropriate management of CJD, despite its rarity
- The critical role of palliative care in ensuring patient comfort and quality of life as the disease progresses

Biography

Radhika Saigal is a dedicated and diligent Clinical Fellow working with the NHS under The Royal Wolverhampton Trust. She did her medicine graduation from India and worked her way to the United Kingdom where she has been working for over a year now. She is fond of working closely with the elderly and is infectious and plans on applying for IMT. Along with her professional proficiency, she is proficient in classical dancing and goes out with her friends to hike and outings in her free time.

Farsana F J
School of Electronics and Automation, Digital University Kerala, Trivandrum, Kerala, India

Oxygen extraction fraction: Review on different computational methods based on mGRE sequences and clinical manifestations

Oxygen Extraction Fraction (OEF) is a physiological biomarker reflecting the percentage of oxygen extracted from the blood supply, which is directly associated with cerebral oxygen metabolism. It can also provide information about the relative deficiencies in cerebral blood supply with the brain tissue's oxygen demand. Estimation of impaired cerebral metabolic rate using OEF is essential for the evaluation hypoxic conditions in various patient group. As for the current standards, PET with O tracers is the reference standard for quantitative mapping of OEF. In contrast to this, with MRI acquisition, tissue cerebral oxygen consumption is estimated from the susceptibility difference between paramagnetic deoxy heme in the vasculature and the tissue parenchyma. However, the wide variation of oxygenation related to the heterogeneities in the blood vessel network and the presence of non-heme iron deposition alters the pathological and physiological interpretation of OEF computation. This paper reviews the overlap in the clinical manifestation of OEF estimation in patients with cognitive impairment and neurovascular diseases. Several techniques based on Gradient Echo (GRE) MR signal have been proposed to quantitatively estimate the OEF maps. Computational methods of different techniques based on magnitude and phase modelling of mGRE sequences including their optimization mechanisms are also discussed. Finally, we have suggested the inclusion of regional priors in optimization method for OEF computation to overcome the clinical discrepancy in the manifestation of OEF maps.

Audience Take Away Notes

- The audience can understand cerebral oxygen utilization in healthy control and various patients' group. Also, they could correlate Cerebral Blood Flow (CBF) and Cerebral Metabolic Rate of Oxygen (CMRO2) based on the OEF maps. Furthermore, they can understand the recent techniques of OEF computation based on mGRE sequences
- Yes, this paper gives an insight to the designers to develop new algorithms for OEF computation. based on the limitations in the current methods. The designers can include various priors based on disease group in optimization part of the algorithm to overcome the flaws in the existing methods

Biography

Farsana studied B. Tech in Electronics and communication Engineering at University of Kerala in 2010 and M. Tech in VLSI and Embedded system at Cochin University of Science and Technology in 2012. She did her PhD in Non-Linear dynamics at LBS Centre for Science and Technology, University of Kerala in 2020. After PhD she joined the Medical Imaging and Computational Lab, Digital University Kerala as a research engineer. Her area of research includes pre-processing of GRE images in computation of Oxygen Extraction Fraction (OEF), and Quantitative Susceptibility Mapping (QSM).

Anita V. Handore[1]*, Sanjay V. Patil[2], Sharad R. Khandelwal[3], Dilip V.Handore[4]

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Phytotherapy: The promising complementary strategy to cope with addiction and oral cancer

According to the global cancer statistics 2020, Oral Cancer (OC), the subgroup of head and neck cancer, is one of the most common malignancies globally. The Oral submucous fibrosis (OSMF) and progressed Oral squamous cell carcinoma (OSCC) accounts for over 90% of all oral cancers and 38% of head and neck tumors. As per WHO's report, addiction of tobacco and alcohol plays leading role in around 90% of OC cases. The other etiological risk factors of OC are Human Papillomavirus (HPV-16 and HPV-18) classified by International Agency for Research on Cancer (IARC) ,Betel quid chewing, Nutritional deficiencies, Immune conditions , Environmental pollutants, Occupational exposures ,Specific microorganisms , Genetic diseases and disorders etc. In spite of the existing therapies and clinical interventional strategies, mortality rate of OC is still increasing because of numerous shortcomings such as drug resistance, toxic effects, metastasis, recurrence complications etc. In this regard, the high incidence of oral cancer combined with excessive treatment cost underscores the need for natural, novel ,safe and cost effective Anti-addictive and Anticancer agents with therapeutic potential. It is clinically proved that Phytochemicals shows promising Anti-addictive and Anticancer ability .They could play vital role in reducing addiction / substance abuse by reduction of cravings for addictive substances. Due to their stress calming ,anxiolytic, neuro protective, anti inflammatory and antioxidant properties ,they could exhibit capacity to manage the withdrawal symptom like anxiety, stress, depression and mental health problem along with detoxification etc. These bioactive compounds shows promising anticancer ability by regulating epigenetics/epigenomics , targeting cancer stem cells , inhibiting cancer metastasis , improving human immunity,inhibiting cancer cell cycle progression , inhibiting cell signal transduction , promoting cancer cell apoptosis , and eventually achieving the effect of inhibiting cancer cell proliferation and angiogenesis etc.These antioxidant compounds shows reduction of oral lesion size, cell growth, pain score, and development of new lesions etc. In this context such phytochemical based natural, safe and affordable phytotherapy could be efficiently used as a complementary therapy to cope with addiction as well as prevention and management of oral cancer.

Keywords: Bioactive Phytochemicals, Phytotherapy, Addiction, Oral Cancer, Mental health

Audience Take Away Notes

- This presentation will help to create awareness among the audience about the risk of addiction and resulted oral cancer. Besides, they could learn about the Phytochemical based Phytotherapy and its importance in addiction prevention and oral cancer risk reduction .Thereby ,they could include different phytochemical rich well balanced diet and thereby phytochemical based Phytotherapy to reduce the risk of both addiction and resulted oral cancer along with improvement of their overall health
- Significance of Phytotherapy will be recognized by various professionals and stakeholders.Based on patient's overall health and well-being, healthcare professional such as conventional medical

doctor, naturopathic doctor, herbalist, counselors, dietitians and nutritionists etc. could include or recommend the Phytotherapy as complementary therapy for getting better results in the existing treatments and various therapies meant for addiction and oral cancer management

- Physicians can personalize the treatment plans by incorporating specific phytochemical based herbal remedies ,addressing patient's unique risk factors, such as stress, anxiety, or a family history of addiction or cancer. They could recommend phytotherapy to mitigate side effects of conventional treatments or reduce the reliance on pharmaceuticals
- Researchers could develop the targeted therapies by identifying the specific bioactive phytochemicals exhibiting anti-addictive or anti-cancer properties. They could discover and standardize new herbal formulations and could contribute for increasing the precision and consistency of phytotherapy
- Pharmacists can help patients to understand potential interactions between phytochemical based phytotherapy and prescription medications, minimizing the risk of adverse effects Moreover, they can educate patients on the proper use of herbal remedies, dosages, and potential side effects, promoting safe and effective phytotherapy
- Herbal product manufacturers could adhere to Good Manufacturing Practices (GMP) to ensure product quality and they could develop the standardized herbal products with consistent levels of active compounds, making it easier for healthcare professionals to prescribe phytotherapy with confidence
- Manufacturers could follow the Regulatory Compliance and could provide assurance to physicians, pharmacists, and patients that the herbal remedies are safe and effective
- Yes, Educators and Researchers from various faculties can benefit from the study of phytotherapy in several ways. Interdisciplinary collaboration and knowledge sharing among these faculties can help to expand research on the effectiveness of phytotherapy in addiction prevention and oral cancer risk reduction. Furthermore, integrating phytotherapy into educational programs across various disciplines can prepare future healthcare professionals to consider Phytotherapy as part of holistic patient care.
- By incorporating the essentials inspired by phytotherapy in healthcare facility design and society, the aforesaid. health professionals- designers can create environments that could promote health, well-being, and awareness of addiction and oral cancer risks. Phytotherapy could simplify the process of integrating health-focused design elements while making existing therapies more efficient to overcome such critical health issues. Phytotherapy, can offer practical solutions for avoiding addiction and oral cancer in a way that simplifies or makes above mention designer's job more efficient, particularly in the context of healthcare remedies along with designing required healthcare facilities They could practically apply phytotherapy for addressing the health concerns along with efficient solution
- Application of phytotherapy to avoid addiction and oral cancer can improve the accuracy of a design and provide new information to assist in addressing design problems by providing data-driven and evidence-based solutions. It offers new information about the therapeutic properties of unexplored plants, which can be harnessed to create precise and effective design elements. Additionally, phytotherapy can support personalized design solutions and sustainable practices, contributing to better outcomes in addiction prevention and oral cancer risk reduction through thoughtful and accurate design
- The application of phytotherapy, to avoid addiction and reduce the risk of oral cancer offers a range of potential benefits beyond just addressing these specific health concerns. .Phytotherapy takes a holistic approach to health, considering the overall well-being of an individual. It promotes natural remedies and healthy lifestyle choices.Phytotherapy can complement conventional medical treatments, enhancing the effectiveness of existing treatments or reducing their side effects.

1. Cultural and Traditional Practices: Many herbal remedies have roots in cultural and traditional practices, preserving and celebrating cultural diversity and heritage.
2. Personalization: Phytotherapy can be tailored to an individual's specific needs and health profile, providing personalized healthcare solutions.
3. Stress Reduction: Certain phytochemicals can have calming and stress-reducing effects, Anti-Inflammatory, Antioxidant potential ,which can benefit overall mental health and well-being.
4. Improved Nutrition: Incorporating plant-based foods and herbal remedies can improve overall nutrition and contribute to a balanced diet.
5. Sustainable Practices: Many herbs and plants used in phytotherapy are grown sustainably, promoting environmentally friendly and responsible practices.
6. Community and Education: The application of phytotherapy can encourage community involvement through activities like community gardens or educational initiatives about herbal remedies and their uses.
7. Reduced Healthcare Costs: By focusing on preventive measures, phytotherapy may reduce the long-term healthcare costs associated with addiction treatment and cancer care.
8. Empowerment: The knowledge of herbal remedies can empower individuals to take an active role in their own health and well-being.
9. Potential for Research: The study of phytotherapy can lead to new discoveries and scientific advancements in the understanding of the therapeutic properties of plants.
10. Improved Overall Health: Focusing on prevention through herbal remedies and a healthy lifestyle can lead to improved overall health and well-being.

Biography

Dr. Anita V.Handore is Founder and Director of innovation based Biotech Startup, Phytoelixir Pvt.Ltd., and Nashik.MS, INDIA. She is PhD in Microbiology and M.Phil. in Environmental Science. She is a prominent women Bio scientist having credit of two process patents in field of Microbiology and Plant Biotechnology. Her next 2 filed patents are in fields of Agriculture- Biotechnology and Food Technology. Since last 17 Yrs, with her masterliness in innovative Research & Development and with special skills of translating laboratorial research into appropriate technology for sustainable livelihood, she has greatly contributed to diverse sectors. Dr.Anita has commendably & successfully shouldered managerial & administrative responsibilities and effectively working as, programme Advisory Committee member, for Research Foundations, renowned National University.She is Editorial board member and author for various International Journals and books of repute. She has been working as research guide for students of well-known Indian Universities. Over 65 research publications and presentations in reputed International and National research Journals & platforms along with 14 book chapters and books published with world leading publishers are to her credit. Sequences database of more than nine novel and rare endophytes discovered by her submitted to NCBI GenBank is creditable. As a part of her social responsibility, she participates actively in various social activities and serve her knowledge and experience for awareness and upliftment of society.Till date, she has been honored & appreciated with more than 19 awards for her outstanding research contribution towards Biotechnology, Microbiology, Phytochemistry, Food and Nutraceutical, Ayurveda -Healthcare, Agriculture, Environment , Education and social sectors by various State level, National and International forums working in scientific and social sectors. With her profound vision Dr.Anita has started journey as an entrepreneur with the purpose to serve hidden treasure of nature & bring resilience by revitalizing all living beings, using scientific and innovative power to tackle some global challenges & create value for society at large.

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Jinwon Chang, Kyungsil Song

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Eeg power ratio between the frontal and temporal lobes is an accurate marker of frontotemporal dementia

Frontotemporal Dementia (FTD) is the second most common form of presenile dementia; however, its diagnosis has been poorly investigated. Previous attempts to diagnose FTD using quantitative Electroencephalography (qEEG) have yielded inconsistent results in both spectral and functional connectivity analyses. This study aimed to introduce an accurate qEEG marker that could be used to diagnose FTD and other neurological abnormalities. We used open-access EEG data from OpenNeuro to investigate the power ratio between the frontal and temporal lobes in the resting state of 23 patients with FTD and 29 healthy controls. Spectral data were extracted using a Fast Fourier Transform in the delta (1-4 Hz), theta (4–8 Hz), alpha (8–13 Hz), beta (13-32 Hz), and gamma (32-45 Hz) bands. The current study shows that the spectral power ratio between the frontal and temporal lobes is a promising qEEG marker of FTD. Frontal/Temporal (F/T) theta/alpha showed the highest discrimination score for the diagnosis of FTD, while F/T alpha/theta and F/T beta/alpha showed relatively higher diagnostic accuracy in the precision-recall curve and positive predictive value, respectively. In addition, different parameters in the spectral power extraction did not influence these results, indicating the high consistency of such biomarkers. The results of the current study provide baseline evidence for future studies on the diagnosis of FTD and neurological abnormalities.

Biography

Jinwon Chang is currently a student- researcher at the Korean Minjok Leadership Academy. I love studying neuroscience and conducting experiments with open-access data. Despite the lack of specific degree, I investigate how brain waves can be utilized to diagnose dementia or other cognitive disorders. Using open-access data with high quality, I'm good at drawing new conclusion with different perspectives from previous projects of neuroscience. I frequently examine various scientific studies and methods in a school laboratory by cooperating with colleagues.

Aaron Kim
Seoul International School, Seoul, Republic of Korea

Association between digital media use and insufficient sleep among U.S. high school student

Background: Adequate sleep is recognized as a vital contributor to mental and physical well-being. This study investigates the relationship between media usage and sleep among U.S. high school students. With the prevalent use of TV and digital media among U.S. youth, the research explores the correlation between excessive media use and insufficient sleep

Methods: Data from the 2019 Youth Risk Behavior Survey, a nationally representative sample of U.S. high school students (N=13,677, 49.4% Female, 51.2% White, 26.1% Hispanic/Latino, 12.2% Black, 9th-12th graders), was used. A cross-sectional analysis employing binary logistic regression models was conducted to examine associations of excessive TV/digital media use (3 or more hours per day) with insufficient sleep (6 or fewer hours).

Results: Among the analytic sample, 49.5% of youth reported experiencing insufficient sleep. Prevalence rates for excessive TV watching and digital media use were found to be 19.8% and 46.1%, respectively. Notably, students who watched TV for 3 or more hours daily displayed a higher prevalence of insufficient sleep (51.6% vs. 49.4%). Similarly, students who reported engaging in digital media use for ≥3 hours (e.g., playing games, social media on smartphones, texting) showed significantly higher prevalence of insufficient sleep compared to those who used digital media for ≤2 hours (53.8% vs. 45.8%). Moreover, both excessive TV watching (OR[95%CI]=1.11[1.02, 1.22], p=.02) and digital media use (OR[95%CI]=1.36[1.27, 1.48], p<.001) were significantly associated with insufficient sleep, after adjusting for sociodemographic covariates (i.e., gender, age, grade, race/ethnicity). However, when considering both factors simultaneously in a final model, only digital media use of ≥3 hours retained a significant association with insufficient sleep (OR[95%CI]=1.37[1.27, 1.48], p<.001)

Conclusion: The study's findings emphasize the potential risk of insufficient sleep associated with increased media consumption among U.S. youth. Notably, digital media use appears to have a more pronounced relationship with sleep patterns compared to TV watching. These results suggest the importance of multimodal targeting of digital media use as essential in addressing sleep problems among youth, especially considering the variety of digital media sources accessible to them, such as smartphones, social media, and gaming platforms

Table 1. Descriptive results of study variables

Variables	Unweighted N	Weighted %
Gender		
Female	6,885	49.4
Male	6,641	50.6
Age		
14 years or younger	1,786	12.3
15 years	3,473	24.8
16 years	3,628	25.6
17 years	3,102	23.7
18 years or older	1,616	13.7
Grade		
9th grade	3,637	26.6
10th grade	3,717	25.5
11th grade	3,322	24.3
12th grade	2,850	23.6
Race/ethnicity		
White	6,668	51.2
Hispanic/Latino	3,038	26.1
Black/African American	2,040	12.2
Asian	618	5.1
Other[a]	875	5.4
Insufficient sleep (6 or less hours vs. 7 or more hours)	6,552	49.5
TV use (3 or more hours vs. 2 or less hours)[b]	2,596	19.8
Digital media use (3 or more hours vs. 2 or less hours)[b,c]	5,931	46.1

N=13,677. [a]Other category included American Indian/Alaska Native, Native Hawaiian/other Pacific Islander, and multi-ethnic/multi-racial options. [b]Use time on an average school day (Ranged from "No *use*" to "5 or more *hours per day*"). [c]Count time spent playing games, watching videos, texting, or using social media on your smartphone, computer, Xbox, PlayStation, iPad, or other tablet.

Table 2. Associations of TV/digital media use with insufficient sleep

Predictors	**Insufficient sleep outcome[a]**					
	Model 1[b]		**Model 2[c]**		**Model 3[d]**	
	OR (95%CI)	***p***	**OR (95%CI)**	***p***	**OR (95%CI)**	***p***
TV use[e]	1.11 (1.02, 1.22)	.02	1.06 (0.97, 1.16)	.22	1.03 (0.93, 1.13)	.61
Digital media use[e]	1.36 (1.27, 1.46)	<.001	1.35 (1.26, 1.46)	<.001	1.37 (1.27, 1.48)	<.001

N=13,677.

[a]Binary outcome (coded by 7 or less hours vs. 8 or more hours).

[b]Univariable binary logistic regression model for (1) TV use - Insufficient sleep; and (2) Digital media use - Insufficient sleep, respectively.

[c]Unadjusted binary logistic regression model for TV use/digital media use - Insufficient sleep.

[d]Adjusted binary logistic regression model for TV use/digital media use - Insufficient sleep, adjusting for respondents' age, gender, grade, and race/ethnicity.

[e]TV use/digital media use (3 or more hours vs. 2 or less hours).

Biography

Aaron Kim is a passionate presenter with a diverse range of interests in psychology and public health. Currently studying at Seoul International School, Aaron is deeply committed to improving mental health for adolescents. With a strong desire to promote overall well-being, Aaron strives to strike a balance between academic pursuits and physical health. Their dedication to this cause drives them to work tirelessly, making a positive impact on the lives of young individuals. Aaron's biography reflects their determination to contribute to the field of mental health and create a better future for those they serve.

Anacleto Clent L Banaay Jr*, Vita Jane Magdales, Edilberto D Santos

Depart of Health- Treatment and Rehabilitation Center- Cebu City, Cebu, Philippines

The effect of dysfunctional families on the outcomes of drug treatment and rehabilitation among females with substance use disorders confined in a government-run residential facility

High relapse rate was seen among drug dependents after rehabilitation. Poor motivation is one of the reasons why patients do not engage in drug rehabilitation programs. Outcomes in the treatment of Drug addiction can employ the stages of change model to assess patients' motivation to change. There is a high degree of relationship between motivated patients in achieving higher stages of change versus those who were not motivated. Family relationship can affect addictive behaviors and family functioning can be a predictor of motivation and treatment outcome.

Objectives: This study was conducted to determine the association of dysfunctional families among female drug dependents and their outcomes from their treatment and rehabilitation upon 6 months completion in the residential program from a government-run residential facility located in Mandaue City, Philippines. Subjects: Of the 57 admitted patients in the residential facility, 46 completed the study and 11 were excluded.

Setting: The study was conducted at Department of Health- Treatment and Rehabilitation Center-Cebu, a facility for female drug dependents located in Mandaue City. Design: This is a cross-sectional study between functional and dysfunctional family relationships among patients with severe substance abuse disorder. The patients were grouped according to their responses in the validated questionnaire of Family APGAR tool designed to assess the presence of dysfunctional family relationship.

Data Collection: Information checklist and URICA results were collected through chart and records review while the Family APGAR assessment was done through assisted interviews.

Results: 71.4% of the participants have dysfunctional families, while 63% of them of participants were still in the pre-contemplation and contemplation stages of change after upon completion of the 6 months residential rehabilitation program. Female drug dependents with dysfunctional families had the highest prevalence of pre-contemplation and contemplation stages. On the contrary, female drug dependents with functional families were mostly found to be in the preparation stage and action stage. Analysis on family functionality and outcomes of treatment was found to be statistically significant (Likelihood ratio= 30.1, p- value = 0.000), the study showed that female drug dependents with dysfunctional families were more likely to remain unchanged after their treatment and rehabilitation compared to those with functional families which means family functionality of the patient influences the outcome of their treatment and rehabilitation. Drug treatment outcome is influenced by family functioning with unfavorable results in drug treatment and rehabilitation seen among patients with dysfunctional families.

Conclusion: Drug treatment outcome is influenced by family functioning with unfavorable results in drug treatment and rehabilitation seen among patients with dysfunctional families.

Audience Take Away Notes

- This paper tackles about the perceived family functionality (patient's satisfaction on family support) among admitted female drug dependent in a rehabilitation facility, and how it affects the outcome or success in their rehabilitation after 6 months
- This study looks into the influences of family dynamics of families with substance addiction problem in the treatment outcome. Addressing family problem or resolving family issues may improve the treatment process but it is important to assess the patient's level of accepting and acknowledging family love and support from her family or love ones
- This will bring about the understanding of family dynamics in the evolution of drug addiction; and how the family resolves issues related to emotional support and in overcoming hindrances to the overall sobriety of the individual with addiction. It will help interventionists and counsellor in redirecting the pathways in treatment process of drug addiction and it will guide case managers in their treatment planning

Biography

Dr. Anacleto Clent L. Banaay Jr., studied Doctor of Medicine at Southwestern University PHINMA, Cebu City, Philippines and obtained his graduate study on Master in Public Management at the Development Academy of the Philippines in 2015. He finished his residency training in Family and Community Medicine and worked then after as a Primary Care Physician at the Department of Health- Treatment and Rehabilitation Center- Cebu City, Philippines. He joined the School of Medicine faculty at SWU PHINMA where he teaches Preventive and Community Medicine. He was trained at the University of the Philippines College of Public Health on the Diagnosis and Management of Drug Addiction and on Universal Treatment Curriculum on Substance Use Disorder from Eco link Institute of Well- being, Mangalore, India.

Huicong Wang
Xuanwu Hospital of Capital Medical University, China

Transcranial near-infrared stimulation of the left DLPFC relieved anxiety: A randomized, double-blind, sham-controlled study

Objective: Generalized Anxiety Disorder (GAD) is a typical multisystem disease characterized by decreased activity in the left Dorsolateral Prefrontal Cortex (DLPFC). Transcranial Near-Infrared Stimulation (tNIRS) was used to stimulate the left DLPFC to relieve anxiety, and Transcranial Magnetic Stimulation with Electroencephalography (TMS-EEG) was used to assess changes in brain connectivity associated with the anti-anxiolytic effect.

Methods: A double-blind, randomized controlled trial was conducted to assess the efficacy of tNIRS on the left DLPFC in patients with GAD. 36 patients with GAD were randomized to receive active tNIRS or sham stimulation for two weeks. Clinical effectiveness was assessed before, after, and at the 2-, 4-, and 8-week follow-ups. TMS-EEG was performed for twenty minutes before and immediately after the tNIRS treatment, and healthy controls were collected only once.

Results: The active stimulation group's posttreatment Hamilton Anxiety Scale (HAMA) scores decreased more than the sham stimulation group's, a statistically significant difference (p=0.021). The HAMA scores of both the active and the sham stimulation groups at posttreatment and at the 2-, 4-, and 8-week follow-up visits were lower than the scores before the treatment. However, the active stimulation group improved significantly greater than the sham group. TMS-EEG targeting the left DLPFC of patients after active treatment induced information outflow from the left DLPFC and left posterior temporal region.

Conclusion: Stimulation of the left DLPFC by tNIRS in patients with GAD relieved anxiety, which promoted the recovery of brain network connectivity.

Keywords: Transcranial Near-Infrared Stimulation, Generalized Anxiety Disorder, Dorsolateral Prefrontal Cortex, Hamilton Anxiety Scale, TMS-EEG.

Biography

Experience: 10 years in Neurophysiolog Examination Room, Department of Neurology, Xuanwu Hospital of Capital Medical University, Beijing. Independently undertake the daily work of the Biofeedback Room, EEG MonitoringRoom, Sleep Research Room, Neuromodulation Room Neuropsychology Room, etc. Supervisory Technician (Neurophysiological Techniques-Intermediate), National psychological counselor II. **Education:** 2018.09-2023 Master of Neurology, Capital Medical University, **Tutor:** Wang Yuping 2009.09-2013.06 Bachelor of Biomedical Engineering, Capital Medical University.

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Ischemic stroke in the context of the covid-19 pandemic: Comorbidities and in-hospital complications affecting the outcomes of ischaemic stroke patients

Introduction: Stroke is ranked as the second major cause of death and a major cause of disability in the world with increasing annual numbers. Ischemic stroke (IS) being the most prevalent form of stroke, the role of COVID-19 in the risk of complications and outcomes for patients with IS is still important to explore. The aim of this retrospective record-based observational descriptive study was to evaluate the risk of in-hospital lethality for IS patients according to comorbidities, and in-hospital complications in the context of the COVID-19 pandemic.

Methods: We identified 1898 acute IS patients (749 men and 1149 women), admitted to the Kaunas Hospital of the Lithuanian University of Health Sciences (Kaunas Hospital of LUHS), Lithuania, from December 2020 to February 2022. The sociodemographic, clinical, and outcome features of the patients were evaluated. T-test and ANOVA analysis with Bonferroni multiple comparison tests for interval data were used, a chi-squared test and z-test with Bonferroni corrections for categorical variables were deployed. Hazard Ratios (HR) and 95% Confidence Intervals (CI) were estimated by the Cox proportional hazards regression for hospital lethality.

Results: In-hospital lethality rates for IS patients were determined to be 15.0% in men and 19.7% in women ($p<0.05$). In men, suffering from IS and comorbid with chronic Ischaemic Heart Disease (IHD), the risk of in-hospital lethality was 2.22 times higher compared to those, comorbid with isolated Arterial Hypertension (AH) ($p<0.05$). COVID-19 infection 3.16 times elevated the risk of in-hospital lethality in men ($p<0.05$). In women, comorbid with type 2 diabetes mellitus (DM) or chronic IHD, the risk of in-hospital lethality was 2 times higher compared to those, comorbid with AH ($p<0.05$). The risk of in-hospital lethality significantly increased in both men, and women, with an increase in the total number of in-hospital complications per 1 unit (HR=3.54 (95% CI 2.7-4.58) and HR=1.96 (95% CI 1.71-2.25), respectively).

Conclusions: Of the comorbidities studied, DM and chronic IHD together with SARS-CoV-2 infection, elevated the risk of in-hospital lethality significantly. Within the acute in-hospital complications, pneumonia, respiratory failure, and acute renal failure showed the most significant prognostic value anticipating lethal outcomes for IS patients.

Audience Take Away Notes

- Clinicians responsible for the management of the Ischemic Stroke (IS) patients always encounter versatile comorbid conditions and threatening in-hospital complications. The audience will get the insight how to evaluate their significance to the outcomes of IS patients
- The attenders will experience which of the comorbidities and acute in-hospital complications are of greatest prognostic value anticipating pour outcomes of IS patients
- We will present the role of COVID-19 and the specific vaccination to the clinical presentations of IS.

Biography

Mrs. Jasukaitiene studied Health Policy and Management at Mykolas Romeris University, Lithuania and graduated as MS in 2022, formerly she studied Advanced Practice Nursing at the Lithuanian University of Health Sciences (LUHS), Lithuania, and graduated as MS in 2017. Since 2019 she has been working as Deputy director for nursing at LUHS Kaunas Hospital. Guided by Dr. Augustis she works in the Department of Population Studies, Institute of Cardiology, LUHS. Her clinical research is focused on the recurrent ischaemic and haemorrhagic stroke associations with the Charlson Comorbidity Index.

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Heroin induced transverse myelitis case report

Transverse myelitis is a rare but documented sequela of heroin use. While the underlying etiology is not clearly elucidated, the prevailing pathophysiologic mechanism amongst existing literature suggests an immune mediated hypersensitivity reaction due to heroin insufflation following a long period of abstinence. Here we describe a case of extensive transverse myelitis in a chronic heroin user following heroin insufflation. This report hopes to increase our clinical, pathophysiological, and prognostic understanding of this rare heroin associated complication.

A 50-year-old man with past medical history of heroin use and hypertension presented to the Emergency Department with acute onset right sided weakness. Vital signs were within normal limits. Patient reported symptom onset roughly 5 hours after smoking heroin earlier that day. Initial physical exam showed weakness of right upper and lower extremities with no sensory changes. Reevaluation 2 hours after admission showed progressive weakness now spreading to the left extremities. Paralysis and loss of sensation rapidly progressed ultimately requiring intubation due to decreased respiratory effort. Diagnosis was confirmed with MRI cervical spine revealing abnormal T2 signaling extending multiple levels down the central spinal cord tracts from C2-C7 with increased cord expansion suggestive of transverse myelitis.

Neurology was consulted for continued management. Our patient received a 5 day course of high-dose steroids with 1 gm IV methylprednisone. Unfortunately, symptoms did not improve following high dose steroids and paralysis remained at a GCS of 6-T with spontaneous eye opening and no verbal or motor response. Lumbar puncture was obtained and returned unremarkable, including Gram stain and culture. Plasmapheresis was initiated to empirically manage autoimmune transverse myelitis, but was discontinued after 3 days per neurology recommendations as negative anti-NMO (neuromyelitis optica) and anti-MOG (myelin oligodendrocyte glycoprotein) antibodies returned, indicating no evidence of autoimmune transverse myelitis. Serum autoimmune panel was negative. Patient course was complicated by persistent rhabdomyolysis with elevated Creative Kinase (CK) causing worsening renal failure, ultimately leading to patient requiring consistent hemodialysis. Family made the decision to place tracheostomy and percutaneous enterogastric tube for the patient given continued ventilator dependency and inability to swallow, and to work on recovery in long-term acute care facility.

To our knowledge, over the last 50 years roughly 10 cases of heroin induced transverse myelitis are available in the scientific literature. While high dose steroids have been successful in halting progression in some patients, prognosis is usually poor often resulting in death.

Limited previous literature most commonly describes heroin insufflation in a previous user following a period of non-use suggesting an immune mediated hypersensitivity reaction as the underlying cause of heroin induced transverse myelitis. However, different hypotheses have been proposed including vascular damage leading to ischemia, compression, direct/contaminant toxicity, and immunological effects from heroin or associated contaminants. Our patient's verbal history upon initial presentation and corroboration by close friends clarified a history of consistent heroin use prior to symptom onset. Due to our cases'

unique spontaneous onset of transverse myelitis during consistent heroin use, we would like to emphasize the impact this case report may have on current hypotheses behind heroin induced transverse myelitis.

Audience Take Away Notes

- Clinical presentation of acute onset transverse myelitis
- History findings and rapid diagnosis of transverse myelitis in heroin users in order to quickly start treatment
- Varying hypotheses for the underlying cause of heroin induced transverse myelitis
- Need for a better understanding of the pathophysiology behind transvers myelitis following heroin use

Biography

Drake Shafer is a third year medical student currently working towards an MD degree at California University of Science and Medicine, School of Medicine (CUSM). In 2020 he graduated with a BA from the University of California Berkeley with Honors in Molecular Cell Biology and Public Health. Recent research involvements include working with the Madsen Research Group at UC Berkeley, University of California Los Angeles (UCLA) Medical Student in Aging Research (MSTAR) program, and being part of the Public Health Scholar Program at California University of Science and Medicine.

Seham Azzam[1]*, Maria Manczak[2, 4, 5], Volker Neugebauer[2, 3, 5]

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Elucidating the consequences of mitochondrial dysfunction on alzheimer's pathology

Alzheimer's Disease (AD) is a neurodegenerative disease that causes cognitive impairment, characterized by progressive cognitive decline, memory loss, and neuronal death in the cerebral cortex, hippocampus, and other brain regions. Hallmarks of its pathology are Amyloid Beta (Aβ) plaques, neurofibrillary tangles of hyperphosphorylated tau, dysfunctional mitochondria and neuroinflammation. Mechanisms and relationship to the progression of AD are not well understood. For these reasons, our research focused on analyzing and extrapolating the effects of mitochondrial dysfunction, tau pathology, oxidative stress secondary to ROS production, ADAM10 (Alpha secretase) expression, and BACE1 (β-secretase) expression in MCI (Mild Cognitive Impairment) and AD groups. ADAM10 and BACE1 are enzymes involved in cleaving Amyloid Precursor Protein (APP). ADAM10 forms non-amyloidogenic APPα and BACE1forms amyloidogenic APPβ, which undergoes subsequent cleavage and processing until it forms Aβ plaques. Assessment was carried out using human brain tissue samples collected from the cortex of a control group, MCI group, and AD group from the Kentucky Brain Bank, and included multiple experiments such as SYBR-Green chemistry-based quantitative real-time PCR for measurement of gene expression, ELISA for measurement of Aβ42/Aβ40 peptides and levels of phosphorylated tau, ATP production measured with an ATP determination kit, and finally, oxidative stress assay that measured H2O2 production and lipid peroxidation level. Results indicated phosphorylated tau levels progressively increased from control to MCI to AD. We also found decreased levels of ADAM10 and Mitochondrial fusion genes (Mfn1, Mfn2, OPA) in MCI and AD groups in comparison with control, but increased levels in mitochondrial fission genes (DRP1, Fis1) and BACE1 in the AD group in comparison with control. Additionally, Aβ42 and soluble amyloid oligomer levels were higher in the AD group. Our data showed that mitochondrial dysfunction correlated with AD pathology (beta - amyloid, phosphorylated-Tau).

Audience Take Away Notes

- Studying the effects of mitochondrial dysfunction on Alzheimers pathology will allow us to have a better understanding of the pathophysiology and can help further research in determining a treatment
- This project provides information on specific mitochondrial proteins and how they relate to ROS and ATP production, with its implications to Alzheimers only partially understood
- Mild cognitive impairment is a poorly defined intermediate pathology that we included in our study and compared it to a control and Alzheimers group. This helps further the knowledge on this disease state so it may one day be better characterized, and clinicians can incorporate it into their practices to aid in early diagnosis and management

Biography

Seham Azzam is currently a medical student at the Texas Tech University Health Sciences Center School of Medicine (TTUHSC SOM). She graduated from the University of Texas at El Paso (UTEP) in 2019 with a Bachelor of Science in Microbiology and matriculated to medical school in 2020 with an expected graduation in May 2024. She has conducted research in different areas, with the current presenting project under the instruction of Dr. Maria Manczak and Dr. Volker Neugebauer in the Garrison Institute on Aging and Department of Neurology, TTUHSC.

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Balance control mechanisms in individuals with multiple sclerosis in virtual reality environment

Multiple Sclerosis (MS), a debilitating inflammatory disease of the central nervous system, afflicts approximately 2.5 million people worldwide. Manifesting through a variety of symptoms including gait and balance impairments, the progression of MS notably exacerbates balance difficulties, heightening the risk of falls and generating a subsequent fear of falling. As such, balance control has emerged as a critical target for gait rehabilitation within the MS population.

Numerous intervention programs have devised methods to enhance balance control, with exercise programs demonstrating promising improvements. Recently, virtual reality (VR) has gained attention as a potential balance-training tool, recognized for its superior user satisfaction and compliance. However, questions regarding the impact of VR on balance control mechanisms in MS patients compared to healthy individuals, or in traditional environments, remain unanswered.

This study aims to investigate how MS individuals manage their balance in VR contexts. Assessing balance and evaluating various physiological and biomechanical implications connected to neural activity and movement analysis respectively, the study may elucidate essential indicators of MS progression and contribute to more personalized treatment strategies. Previous literature suggests that patients can transfer skills learned in VR to real-world settings, and this study seeks to determine the effectiveness of VR in enhancing balance control in MS individuals.

Given the intriguing but underexplored potential of VR in neurological rehabilitation, especially in MS, systematic research using a VR environment is necessary. It will not only provide critical data to support this approach but also deepen our understanding of the physiological balance response and balance control mechanisms in people with MS. The study aims to bridge this research gap, proposing an empirical approach to estimate the role of VR in balance control.

Audience Take Away Notes

- Understanding Multiple Sclerosis (MS): MS is a progressive autoimmune disease that affects the central nervous system, damaging the protective sheath (myelin) that covers nerve fibers, and causing communication issues between your brain and the rest of your body. This damage often results in issues with balance and motor control
- MS and Balance Control: Balance issues are one of the most common problems faced by individuals with MS. These issues are often due to the combination of muscle weakness, muscle tightness, changes in joint sensation, or other neurological deficits
- Virtual Reality (VR) as a Therapeutic Tool: VR has been identified as an effective tool for therapeutic interventions in recent years. It provides immersive, engaging environments that can be customized to meet the specific needs of the individual patient, making it a versatile tool for a variety of conditions, including MS

- VR in MS Rehabilitation: Specifically in the context of MS, VR can be used to improve balance control and reduce the risk of falls. This is achieved through a range of exercises designed to target the various mechanisms of balance control that are commonly affected in MS, such as weight shifting, gait training, and enhancing proprioception
- Personalized Training: With VR, it is possible to create a personalized, adaptive training program for each individual based on their specific balance control deficits. This personalized approach is more likely to result in meaningful improvements in balance control
- Safe Environment: VR provides a safe environment for individuals with MS to work on balance control. They can push their boundaries without the risk of injury, something that may not be possible in the real world
- Motivation and Engagement: The engaging nature of VR environments can motivate patients to stick with their therapy programs, making them more likely to see improvements over time

Biography

Badriah Alayidi pursued my initial education in physical therapy and rehabilitation at Aljouf University, located in the dynamic region of Aljouf, Saudi Arabia. My passion for neurorehabilitation led me to the University of Nottingham, where I accomplished a Master's degree in Neurorehabilitation in 2020. Presently, I am advancing my knowledge and research skills at the same prestigious institution, where I am almost nearing the completion of my PhD in Physiotherapy.

Alicia C Wells[1]*, Shahrdad Lotfipour[1,2]

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Prenatal nicotine exposure during pregnancy results in adverse neurodevelopmental alterations and neurobehavioral deficit

Maternal tobacco use and nicotine exposure during pregnancy have been associated with adverse birth outcomes in infants and can lead to preventable pregnancy complications. Exposure to nicotine and other compounds in tobacco and electronic cigarettes (e-cigarettes) has been shown to increases the risk of miscarriage, prematurity, stillbirth, low birth weight, perinatal morbidity, and Sudden Infant Death Syndrome (SIDS). Additionally, recent data provided by clinical and pre-clinical research demonstrates that nicotine exposure during pregnancy may heighten the risk for adverse neurodevelopmental disorders such as Attention-Deficit Hyperactivity (ADHD), anxiety, and depression along with altering the infants underlying brain circuitry, response to neurotransmitters, and brain volume. In the United States, one in fourteen women (7.2%) reported to have smoked cigarettes during their pregnancy with the global prevalence of smoking during pregnancy estimated to be 1.7%. Due to the large percentage of women utilizing nicotine products during pregnancy in the United States and globally, this review seeks to centralize pre-clinical and clinical studies focused on the neurobehavioral and neurodevelopmental complications associated with Prenatal Nicotine Exposure (PNE) such as alterations to the Hypothalamic-Pituitary-Adrenal (HPA) axis and brain regions such as the Prefrontal Cortex (PFC), Ventral Tegmental Area (VTA), Nucleus Accumbens (NA), hippocampus, and caudate as well as changes to nAChrR and cholinergic receptor signaling, long-term drug seeking behavior following PNE, and other related developmental disorders. Current literature analyzing the association between PNE and the risk for offspring developing schizophrenia, Attention-Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), Major Depression Disorder (MDD), anxiety, and obesity will also be discussed. Additionally, this review seeks to highlight the risks of nicotine replacement therapy and e-cigarette use during pregnancy and strategies for initiating smoking cessation in pregnant women.

Keywords: Nicotine, Tobacco, Prenatal Nicotine Exposure, Neurodevelopmental Disorders, Neonatal Exposure, Teratogen.

Audience Take Away Notes

- The audience will learn about recent advancements in our understanding of prenatal nicotine's effects on neurodevelopment and neurocognition during childhood and adolescence. Our review is novel in that both pre-clinical and clinical literature were utilized to create a comprehensive understanding of how nicotine affects prenatal and early postnatal development, neurobehavioral development, and the offspring's likelihood for future adolescent substance abuse. Due to the multifaceted nature of our review, both medical providers and basic or translational researchers will benefit from an in-depth review on the risks of smoking during pregnancy

Biography

Alicia Wells earned her degree in Neurobiology with Honors from the University of California, Irvine (UCI) in 2021 and is currently a second-year medical student at UCI School of Medicine. She is currently working under the direction of Dr. Shahrdad Lotfipour in his addiction laboratory at UCI where she seeks to integrate her medical knowledge with basic science research to better inform her future clinical practice.

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Leveraging intergenerational contact to reduce neuropsychiatric comorbidities in parkinson's disease via parkinson's pals

Background: Parkinson's Disease (PD) is a chronic neurodegenerative disease affecting more than 10 million people worldwide. PD is commonly associated with motor symptoms like bradykinesia and non-motor symptoms like autonomic changes. Oftentimes, these symptoms can be recognized and addressed through primary care checkups, pharmacological intervention, and physical therapy. However, PD patients also often experience neuropsychiatric comorbidities such as depression and anxiety. These comorbidities often go undiagnosed and untreated throughout a patient's PD treatment journey, which has been shown to Lower Quality of Life (QofL) and exacerbate PD progression. The prevalence of neuropsychiatric comorbidities in PD patients is estimated to be as high as 92%. Among these comorbidities, depression is responsible for 34.5% of cases, while anxiety accounts for 24% of cases. Thus, to reduce the social isolation that often drives these neuropsychiatric comorbidities in PD patients, we developed a novel program called Parkinson's Pals (Pdpals) that pairs students with PD patients and reintroduces interpersonal and intergenerational connections through 1-on-1 conversations.

Program Description & Goals: Patients and their student pals are matched based on personal interests, hobbies, and professional goals. Once matched, students must undergo an educational and clinical training session, which is provided by the Davis Phinney Foundation. Then, each student and patient pair meet virtually once per week for one hour. Discussions often involve childhood stories, common interests and hobbies, career aspirations, and lived experiences. We hope that this will reduce isolation by virtually connecting PD patients with students to talk, listen, and form new friendships. We also hope this will raise awareness and increase education about PD by connecting students with patients who have lived experiences with the condition. And lastly, we hope that Pdpals will help attenuate neuropsychiatric comorbidities, in particular apathy, demoralization, and loneliness, in PD patients.

Current Progress and Future Directions: At the University of Pennsylvania, we collected initial feedback from 7 students who were matched with 7 patients enrolled in the PdPals program over a 6-week time period to evaluate the benefits of the program. 6 out of 7 students (86%) continued their meetings in a regular manner past the mandatory 6 week time period, extending well into the Summer. Feedback demonstrated overall enjoyment and value of the program for both the students and the patients. One student from the pilot said: "Parkinson's Pals is an amazing program to help educate, inspire, and connect the younger generations with people living with Parkinson's. Through just 4 weeks, I formed a new friendship and gained new perspectives I never could've without meeting my pal!" As of May 2023, Pdpals has chapters in 9 universities: University of Pennsylvania, Cornell University, Harvard University, Columbia University, Stony Brook University, University of Wisconsin-Madison, Sophie Davis School of Biomedical Education, Rutgers University, University of Massachusetts—Amherst. There are a total of 235 students interested and a total of 14 PD patients matched with student pals. In the future, we hope to continue expanding in the United States and Internationally, while simultaneously evaluating the clinical effectiveness of Pdpals in reducing neuropsychiatric comorbidities.

Audience Take Away Notes

- Parkinson's Disease (PD) is a chronic neurodegenerative disease with motor and non-motor symptoms that can be treated, but it often co-occurs with neuropsychiatric comorbidities like depression and anxiety that often goes untreated, which can exacerbate PD progression and lower QofL
- Parkinson's Pals (Pdpals) is a program that pairs students with PD patients to reduce neuropsychiatric comorbidities and social isolation through 1-on-1 conversations, aiming to create intergenerational connections.
- PdPals provides training for the students and facilitates weekly virtual meetings with the goal of reducing isolation, raising awareness about PD, and alleviating neuropsychiatric comorbidities
- PdPals program has been positively received in a pilot program at the University of Pennsylvania, where 6 out of 7 students continued their meetings beyond the mandatory
- 6-week time period, and both students and patients reported overall enjoyment and value of the program.
- PdPals has expanded to 9 universities in total with future goals to continue expanding nationally and internationally while evaluating its clinical effectiveness in reducing neuropsychiatric comorbidities

Biography

Jaskeerat Gujral is a rising junior at the University of Pennsylvania studying neuroscience and chemistry. He is conducting Parkinson's disease research under the mentorship of Dr. Virginia Lee, while also conducting neurosurgical research under Dr. Omar Choudhri at the Perelman School of Medicine. In the past, Jaskeerat has interned under Dr. Roger Hartl at the Department of Neurological Surgery at Weill Cornell Medicine. He hopes to attend medical school and practice as a neurosurgeon, while simultaneously driving a significant impact in the field of Parkinson's through the Parkinson's Pals program.

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The role of calcitonin gene related peptide and associated treatment strategies for refractory vestibular migraine: A case study

Summary/Objective: To describe a patient who developed refractory vestibular migraine after a Motor Vehicle Accident (MVA) and COVID-19 infection with subsequent improvement while on multiple CGRP antagonists with off-label dosing and to provide support for the role of CGRP in vestibular migraine.

Background: Previous studies have found a significant association between elevated Calcitonin Gene Related Peptide (CGRP) plasma levels during migraine episodes, though little is known regarding the underlying mechanism for Vestibular Migraine subtype (VM). There is prior evidence in a study using rats to suggest a possible role of this peptide in the sensitization of the vestibular nuclei in chronic migraine, however. In addition, one small retrospective study found that 18 out of 25 patients treated with CGRP antagonists developed global improvement in both vertigo and migraine headache symptoms. Overall, there is still a paucity of information regarding the most efficacious treatment strategies for refractory cases of VM with CGRP antagonists.

Methods: A case report with literature review. PubMed literature review with MeSH terms “migraine disorder” and “calcitonin gene-related peptide” revealed 900 results.

Results: A male in his 40’s with hx of chronic myeloid leukemia developed 3 months of persistent vestibular migraine with circumferential headache, vertigo, and photophobia 3 days after a Motor Vehicle Accident (MVA) with associated head trauma but without loss of consciousness. A Magnetic Resonance Imaging (MRI) of the brain with and without contrast revealed no acute ischemic stroke or hemorrhage. He developed a severe COVID-19 pneumonia with hypoxia requiring intubation for 22 days. Post-hospitalization, he continued to have symptoms consistent with vestibular migraine including spontaneous vertigo, positional vertigo when leaning forward, and circumferential headache with associated photophobia. The patient was started galcanezumab with 2 weeks of relief, followed by refractory symptoms unrelieved with erenumab, rimepegnant, and fremanezumab. The patient received a first dose 100mg of eptinezumab, followed by fremanezumab at 6 weeks, a second dose of 100mg eptinezumab off-label at 7 weeks, and 300mg of eptinezumab at 12 weeks which finally resulted in the desired outcome of long-lasting relief for several months on outpatient hospital follow up.

Conclusion: CGRP likely plays an important role in the pathophysiology of VM. Additional off-label dosing of CGRP antagonists may be helpful to alleviate refractory VM.

Audience Take Away Notes

Pathophysiology of vestibular migraine

To describe a patient who developed refractory vestibular migraine after a motor vehicle accident (MVA) and COVID-19 infection with subsequent improvement while on multiple CGRP antagonists with off-label dosing and to provide support for the role of CGRP in vestibular migraine

Biography

Dr. Stephen Avila is a neurology resident at Cedars Sinai Medical Center who works with headache specialist, Dr. Nasima Shadbehr, in the neurology department. Dr. Avila obtained his medical degree at Indiana University School of Medicine.

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Neuralgic amyotrophy in a patient following a neck biopsy

Neuralgic amyotrophy, or Parsonage-Turner Syndrome (PTS), is a rare autoimmune inflammatory disorder of the brachial plexus. Patients will present with episodes of extreme shoulder pain with eventual development of paresis and atrophy of the innervated muscle. These symptoms may mimic other conditions, such as brachial plexus injury. Therefore, PTS may be difficult to recognize. Among the differential for PTS are radiculopathy from cervical disc herniation, compression of the brachial plexus by mass lesion, postherpetic neuralgia, calcific tendonitis, acute subacromial bursitis, and adhesive capsulitis. EMG showing denervation in an atypical pattern is highly supportive of PTS diagnosis. There are many trigger for the development of PTS, however the most common and documented is viral infection. We present a rare case in which PTS was diagnosed following biopsy over the right levator scapulae muscle. Initial physical exam findings were significant for right shoulder pain and droop with weakness in external rotation and shoulder abduction. As PTS is a diagnosis of exclusion, other conditions were first ruled out. To support the diagnosis of PTS, EMG was conducted and showed findings consistent with PTS. The patient was treated with analgesics and underwent physical therapy. Over the next eight months, EMGs were significant for spontaneous regeneration of nerve activity with concordant improved physical exam findings. This case highlights the importance of considering PTS when other leading differentials have been ruled out. Identifying PTS can protect the patient from excessive testing and inappropriate treatment. Regular administration of EMGs can identify improved nerve function that precede improvement in physical exam findings. Among PTS cases following surgery, this case brings attention to less invasive surgeries as a possible trigger of PTS. Our case shows that minor procedures with minimal risk of brachial plexus involvement can precipitate PTS. Confirmation of suspected PTS with EMG findings should be done. However, it is important to note that PTS is not reflected on EMG until at least 3 weeks after symptom onset. Most cases, including ours, report a self-limiting pattern of disease. Treatment is typically with analgesics and physical therapy. The patient in our case reported significant improvement in function and pain from physical therapy alone.

Audience Take Away Notes

- Early diagnosis of neuralgic amyotrophy can protect patients from excessive testing and inappropriate treatment
- Consideration for neuralgic amyotrophy as a diagnosis should not be limited to viral infections or highly invasive procedures
- Significant intervention is not recommend as most patients report improvement with analgesics and physical therapy
- EMG findings are critical to confirming the diagnosis and follow-up EMGs should be used to track recovery

Biography

Yaman Dalati studied Neuroscience at Michigan State University before enrolling in medical school at Michigan State University College of Osteopathic Medicine. He is currently a third year medical student. His research collaborations include with the MSU Department of Neurology and the MSU Department of Physical Medicine and Rehabilitation.

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Moya moya and atherosclerosis

Introduction: In the literature, there are not so many cases that connected Atherosclerosis to MMD and it hasn't been assured by pathological studies as well. Moya Moya disease is a unique cerebrovascular disease characterized by progressive large intracranial artery narrowing especially affecting the arteries of the Circle of Willis and the development of prominent small vessel collateral. This case report describes a 47-year-old Indian female who presented with symptoms of a stroke and was found to have Moya Moya Disease (MMD) and atherosclerosis. The patient had a right Middle Cerebral Artery (MCA) territory infarction due to a blocked MCA and slight narrowing caused by atherosclerotic calcification along the distal right Internal Carotid Artery (ICA). The patient was admitted for further assessment on a neuro telemetry floor.

MMD is a unique cerebrovascular disease characterized by the progressive narrowing of large intracranial arteries leading to the development of small vessel collaterals to compensate for decreased blood supply to the brain. It is named after the characteristic "smoky" appearance seen in angiography. MMD was first described in Japan in 1957 and is more common in Asia. It has a bimodal distribution, affecting children around age 5 and females over 40 more often than males. The cause of MMD is unknown, but genetic factors and associated conditions like atherosclerosis have been identified.

Case description: The patient is a 49-year-old Indian female with a history of diabetes for 18 years and is taking oral hypoglycemic medication. She presented to the emergency department with stroke-like symptoms including slurred speech, left facial droop, and left upper extremity weakness. No headache, vision changes, or drug, or alcohol abuse was reported. The physical exam showed a right central facial palsy with decreased strength in the right upper extremity. Blood work was normal except for slightly elevated glucose levels. A CT head showed an acute right middle cerebral artery infarction and a CTA brain showed severe stenosis of the left internal carotid artery with atherosclerotic calcification along the distal right ICA. MRI showed diffusion restriction in the right frontal lobe, right insula, and right basal ganglia, consistent with a right middle cerebral artery infarct without hemorrhage. A diagnostic cerebral angiogram showed an occlusion of the proximal right M1 with a moyamoya pattern, and moderate to severe multi-focal stenosis, including the left petrous cavernous junction of the ICA, the communicating segment of the left ICA, the clinoid segment of the right ICA, and right A1 A2 junction, indicating a possibility of underlying atherosclerosis. The patient was discharged on dual antiplatelet therapy (aspirin and Plavix), tight control of diabetes, blood pressure, and high-density lipoprotein.

Discussion: The term Moya Moya can be classified into 2 types according to the associated symptoms, the first type is called Moya Moya Disease (MMD) or primary/ Idiopathic Moya Moya which is usually discovered in children with genetic susceptibility without any associate conditions, and the other type is usually referred to as Moya Moya Syndrome (MMS) that's more common in adults where occlusion of the vessels is usually secondary to a variety of occlusive vasculopathy, including atherosclerotic disease, that involve the terminal ICA and its branches and according to Peerless report in 1997, it was reported

a histopathological evidence that atherosclerotic occlusive disease can lead to secondary Moya Moya collateral formation.

But recent studies had shown that there is some genetic susceptibility for Moya Moya syndrome, and detecting these genetic factors earlier might help with detecting the type 2 earlier, A polymorphism, R4810K (p.Arg4810Lys), in the Ring Finger Protein 213 (RNF213) gene at chromosome 17q25.3 was found as the most associated genetic factor for MMD in East Asian populations, using genome-wide linkage and exome analysis, And that RNF213 R4810K-related vasculopathy is not well characterized, except in MMD. However those variants were not only associated with MDD but other intracranial atherosclerosis and systemic vascular diseases, such as peripheral pulmonary artery stenosis and renal artery stenosis.

The R4810K variant was found in 95% of patients with familial MMD, 80% with sporadic MMD, and 1.8% of control individuals in a Japanese population, that variant is an Asian founder mutation and its prevalence is reported to be up to 2.5% in East Asians although it has not been reported in Western populations, and the spectrum of RNF213 cerebral vasculopathy was found to be more common in middle-aged onset adults who might be only homozygous or heterozygote for the gene but at that case, the cerebral vasculopathy will be associated with systematic involvement and there might be other underlying genetic factors.

However, Many non-R4810K variants (rs148731719 and rs397514563) were recently found in Caucasian, and East and South Asian cases, The R4810K variant was found to be related to ischemic-type MMD, whereas non-R4810K variants (especially A4399T) are related to hemorrhagic type MMD. And combinatorial interactions between RNF213 variants and other gene variants should be brought into consideration. A recent case series of European familial MMD showed rare candidate variants of RNF213 and PALD1 within the same families that were suggestive of synergism between the 2 sets of gens.

Systemic evaluation using poly vascular CT angiography should also be considered in R4810K homozygotes because of the high penetrance rate of systemic vascular involvement.

The treatment for Moya Moya typically involves a combination of surgical and medical management.

Surgical intervention:

- Direct bypass surgery: involves connecting blood vessels around the blocked arteries to reroute blood flow to the brain.
- Indirect bypass surgery: involves creating new blood vessels to reach the brain through a process called angiogenesis.

Medical management:

- Anti-platelet therapy: to prevent blood clots from forming in the affected blood vessels.
- Blood pressure management: to help prevent further damage to the affected blood vessels.
- Blood-thinning medications: to prevent blood clots from forming. Corticosteroids: to reduce swelling in the brain.

It is important to note that the type of treatment recommended for Moya Moya depends on the severity of the condition and the overall health of the patient.

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The role of surveillance MRI in pediatric-onset demyelinating diseases nmosd and mogad: A retrospective cohort study

The standard of care for multiple sclerosis is to perform surveillance MRI to monitor disease activity, given that subclinical or 'silent' lesions can often occur. In two rare demyelinating diseases, Neuromyelitis Optica Spectrum Disorder (NMOSD) and Myelin Oligodendrocyte Glycoprotein Associated Disease (MOGAD), silent lesions are rare. The utility of surveillance MRI monitoring in NMOSD and MOGAD compared to MS is unknown, and application of the imaging surveillance standards for MS to other demyelinating conditions is variable, as data regarding the relevance of routine imaging for NMOSD and MOGAD in pediatric patients is scant. Our objectives were to determine if surveillance MRI is useful for management of NMOSD and MOGAD, to define the optimal time to repeat imaging to re-establish baseline after a flare, and to analyze the costs of MRI scans deemed unnecessary to the U.S. healthcare system. As a retrospective cohort study, chart reviews were conducted to assess clinical and MRI data of thirty-five patients at the Duke Autoimmune Brain Disease Clinic diagnosed with antibody-positive NMOSD or MOGAD by 18 years of age. Key variables included the date of each scan, the purpose (for symptoms or during remission), the type of scan (brain, optics, or spine), and findings of demyelination. Of the 11 NMOSD patients, 6 (54.5%) were female. The mean age at onset was 11.4 years (range, 3-16), and the mean time of follow-up since onset was 6.5 years (range, 1-15). Of the 24 MOGAD patients, 12 (50%) were female. The mean age at onset was 9.3 years (range, 1-17), and the mean time of follow-up since onset was 6 years (range, 1-16). The NMOSD patients had a total of 37 MRIs performed during remission, and the MOGAD patients had a total of 76 remission MRIs performed. None of these scans during remission yielded any lesions, indicating a silent lesion rate of 0% for both NMOSD and MOGAD groups. Of 12 MRIs of neuroaxis locations different from the symptomatic location performed for the NMOSD patients, two lesions (both Transverse Myelitis (TM)) considered unexpected based on clinical phenotype were found at presentation. Of 34 MRIs of asymptomatic neuraxis locations of MOGAD patients, four unexpected lesions (3 TM, 1 Acute Demyelinating Encephalomyelitis (ADEM)) were found at presentation. Clinical follow-up timing for evaluation and management of demyelination events was often inconsistent, but most flares improved within 2-4 months. In NMOSD and MOGAD, performing MRI of the brain, optics, and spine at presentation and of affected areas 3-4 months after a flare to re-establish baseline have clinical relevance. There were 31 MRI flares for both groups. If there was one MRI performed after every flare to re-establish baseline, this would be 31 clinically useful scans. The remaining 82 scans are potentially unnecessary, costing the healthcare system $150-650,000 (for only one part of the neuraxis, more if brain/orbits and/or spine were routinely imaged). Given the rare incidence of subclinical disease activity in pediatric NMOSD and MOGAD, as well as the costs of MRI, we recommend that further surveillance imaging is irrelevant and impractical.

Audience Take Away Notes

- Research on the utility of surveillance MRI for these diseases in pediatric cohorts has been lacking, making clinical protocol ambiguous
- The following are the imaging guidelines that we propose for monitoring pediatric NMOSD and MOGAD patients:
- Screen orbits, brain and spine in patients at presentation to provide complete radiographic diagnostic information
- Some initial MRIs found unexpected lesions (unrelated to clinical phenotype, on different neuraxis location from symptomatic location)
- Consider repeat imaging (of affected areas only) in 3-4 months to establish a "new baseline" for comparison, to determine if a new future flare and return of symptoms shows active lesions or old residual damage from prior flare
    - Most flares improved within 2-4 months, but still unclear since there are ongoing improvements likely past 1 year
    - Evidence-based and conservatively clinically-sound time to define patient status when asymptomatic
- After a new baseline has been established, further routine surveillance imaging is unnecessary, as it does not identify subclinical disease activity, inform treatment, or improve health-related outcomes, as opposed to MS
    - Ethical and financially practical protocol
- A significant number of financial resources would have been saved by ceasing the surveillance imaging that we found to be clinically irrelevant, given that none of these scans yielded any demyelination
    - In fact, in the later years of our cohort chart review, fewer routine MRIs were already being done as clinical reasoning supported this change
    - The potential guideline of performing a scan after each flare does add cost, but re-establishing baseline would be beneficial to patient outcomes, making the expense warranted
- Being a pediatric study proves as an advantage, because research of children with these diseases is significantly limited and less represented in currently available data

Biography

Jane Zebrack graduated with Distinction in Neuroscience from Duke University in 2023. She has been a Clinical Research Assistant for Stanford Medicine Immune Behavioral Health Clinic since 2020. She was the lead researcher for an article published in the Journal of Community Genetics in 2022. She wrote, illustrated, and published "An Introduction to Genetics for Kids," cited as a top five best genetics book by SCI Journal "15 Must-Read Biochemistry, Genetics & Molecular Biology Books." The book is available on Amazon, with all profits to Shriners Hospitals for Children.

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The efficacy of music therapy on behavioral and emotional recovery for patients with TBI

Background: Traumatic Brain Injury (TBI) is an injury to the brain caused by a blow to the head, which is commonly seen in motor vehicle accidents, sports injuries, falls, and assaults. Studies have shown that emotional states such as agitation can result in a longer hospital stay, reduced participation in rehabilitation, poorer cognitive and motor functioning, and an extended period of post-traumatic confusion for these individuals. Although non-pharmacological treatments, such as music therapy, have become more common in the treatment of TBIs, research on their effectiveness in managing emotional and behavioral dysregulations remains limited.

Methods: The application of music therapy in the treatment of TBI was thoroughly analyzed in recent studies. A comprehensive search of PubMed databases and the Bergen Open Research Archive yielded relevant papers published between 2018 and 2022. "To conduct the literature review, the following search terms were used: “traumatic brain injury” AND “music therapy” AND “cognitive rehabilitation OR emotional regulation OR emotional recovery OR behavioral recovery OR emotions OR mood” were among the search terms utilized. The chosen publications were then examined to find major themes, such as possible advantages and disadvantages of this technology, the ideal patient demographics, and future paths of study.

Results: One of the systemic review and meta-analysis studies focused on 6 studies suggested that there was a statistically significant improvement in the motor outcomes which consisted of gait velocity, cadence, and stride length. In addition, none of the studies highlighted serious side effects indicating that music therapy has benefits in recovering from TBI.

Another study suggests that music therapy provides several benefits for individuals with severe TBI, including emotional regulation, increased motivation, and improved communication skills. This study highlights the importance of providing individuals with severe TBI with customized and flexible music therapy interventions and collaboration between music therapists and other healthcare professionals.

This randomized controlled crossover trial found that Neurological Music Therapy (NMT) had a significant positive effect on executive and emotional functioning when done immediately after a TBI. Additionally, qualitative data suggests that patients found the NMT to be very useful for emotional regulation.

Conclusion: The findings support that music therapy has shown significant changes in patients recovering from TBI. Patients have shown improvement in their psychological, emotional, and motor outcomes indicating music therapy to be a favorable therapy for patients that are intolerable to pharmacological treatments. In addition, music therapy could be combined with other treatments and rehabilitation techniques to expedite behavioral and emotional recovery for patients with TBI to help them return to their everyday life.

This study shows promise for music therapy as a potential treatment option for individuals with TBIs. Future research should investigate the objective measures of the neuroplastic, cognitive, and behavioral

effects of music therapy on both short-term and long-term recovery. Music therapy may provide a cost-effective and conservative approach for healthcare providers to improve the quality of life of TBI patients, and this paper contributes to the literature on the effects of music exposure on this population.

Audience Take Away Notes

- Music therapy has shown significant improvement in psychological, emotional, and motor outcomes for individuals recovering from Traumatic Brain Injury (TBI)
- There is a lack of research on the effectiveness of non-pharmacological interventions for managing emotional and behavioral dysregulations in TBI patients
- Collaboration between music therapists and other healthcare professionals is essential to providing customized and flexible music therapy interventions for individuals with severe TBI
- Neurological Music Therapy (NMT) immediately after TBI has a significant positive effect on executive and emotional functioning
- Future research should investigate the objective measures of the neuroplastic, cognitive, and behavioral effects of music therapy on short-term and long-term recovery to improve the quality of life of TBI patients

Biography

Priyamvada Joshi, OMS-1 holds a BA in Cell Biology and Neuroscience from Rutgers University, where she conducted Lesch-Nyhan disease research under Dr. George Wagner, PhD. She is currently studying at Rowan-Virtua School of Osteopathic Medicine and is involved in dementia research with Dr. Mitchel Kling, MD. Pranav Reddy, OMS-1 graduated with a BS in Exercise Science from Rutgers University and worked in the Rutgers Sleep Lab with Dr. Andrea Spaeth, PhD researching sleep deficiencies. Currently, he is studying at Rowan-Virtua School of Osteopathic Medicine and participating in sleep medicine research under Dr. Venkataraman Venkateswar, PhD and Dr. Mitchel Kling, MD.

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Unremitting faciobrachial dystonic seizures in lgi1-antibody encephalitis: A case report

Introduction: Leucine-Rich Glioma-Inactivated 1 (LGI1)-antibody encephalitis can be difficult to diagnose. It should be considered when there is clinical presentation of brief, unilateral jerking of the face and arm, termed Faciobrachial Dystonic Seizures (FBDS), which is a hallmark feature. Additionally, hyponatremia and brain Magnetic Resonance Imaging (MRI) demonstrating insular lesions are helpful, but not always present. In the case described, only FBDS was noted, which was initially diagnosed as focal motor status epilepticus. The diagnosis was achieved with laboratory data.

Case Description: A 64-year-old male with a history of coronary artery disease, diabetes mellitus type 2, and hypertension presented to the emergency department with left-sided FBDS. Brain MRI revealed right-sided hippocampal sclerosis as well as moderate white matter disease. Electroencephalography (EEG) captured one stereotypical spell with rhythmic activity that spread, concerning for seizures. Keppra was started which decreased the frequency of spells. The patient was then discharged home with follow-up.

One week later, the patient returned following a fall with loss of consciousness. Upon awakening a few minutes after the incident, he reportedly had repetitive uncontrolled movements of the left upper extremity. He was admitted to the intensive care unit for suspected focal motor status epilepticus. Cerebrospinal fluid analysis was inconclusive and Biofire panel was negative. His FBDS with hyponatremia raised suspicion for LGI1-antibody encephalitis. Encephalopathy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid (ENC2) Mayo Clinic panel was ordered and the patient was started on Intravenous (IV) Solumedrol 1 gram daily for 5 days, then IV Immunoglobulin 0.4 grams/kg/day for 5 days, and IV Valproic acid for high suspicion of LGI1-antibody encephalitis. The patient's labs later returned positive for LGI1-antibody encephalitis. The patient was successfully treated and discharged home with close follow-up.

Discussion: This case demonstrates the difficulty of diagnosing LGI1-antibody encephalitis. The patient presented with focal seizures and was initially diagnosed with focal tonic-clonic seizures that were seemingly controlled with Keppra. However, the patient returned to the Emergency Department one week later with FBDS symptoms and worsened hyponatremia, which was suggestive of an encephalitis. While in most encephalitis cases there will be atypical findings in CSF, LGI1-antibody encephalitis will typically have normal CSF findings. Serum and CSF markers for autoimmune encephalitis confirmed the diagnosis in our patient. Patients with LGI1-antibody encephalitis exhibit pathognomonic FBDS, which presented in our patient one week after his initial encounter.

With early diagnosis and treatment, patients with LGI1-antibody encephalitis may fare favorably. However, even with treatment, patients may never return to their baseline cognitive function, with serum LGI1 antibodies still detectable in those that recover clinically. This points to the variability of this elusive and poorly understood diagnosis that causes autoimmune encephalitis.

Audience Take Away Notes

- Early recognition of the atypical characteristics of a patient with LGI1-antibody encephalitis for an accurate diagnosis and prompt treatment
- Clinical presentation of faciobrachial dystonic seizures, which may seemingly present initially as focal motor status epilepticus, suggest LGI1-antibody encephalitis
- Value of diagnostic tools such as CMP for hyponatremia, CSF analysis with ENC2 Mayo Clinic panel, EEG, and MRI in the diagnosis of LGI1-antibody encephalitis
- Treatment of LGI1-antibody encephalitis with Keppra, Solumedrol, IVIG, and Valproic acid, which may be variably efficacious

Biography

Johny Tran studied Molecular & Cell Biology with an emphasis in Neurobiology at the University of California, Berkeley, where he graduated with a Bachelor's Degree. After graduating, he joined the Institute of Neurosurgical Innovation, where he served as Director of Research and Operations. In 2020, he began medical school at the California University of Science and Medicine to pursue his MD and is expected to graduate in 2024, after which he hopes to continue his training as a neurology resident physician. His research primarily focuses on neuroscience and neurological surgery. He hopes to continue expanding his research in clinical neurology.

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A case of posterior reversible encephalopathy syndrome leading to bilateral occipital strokes

Introduction: Posterior Reversible Encephalopathy Syndrome (PRES) is a rare neurological disorder that classically presents with sudden onset of visual disturbances, seizures, headaches, and altered mentation in the context of uncontrolled hypertension. The diagnosis of PRES can be made both clinically and radiographically. The radiographic findings would reveal white matter edema typically in the posterior cerebrum in a symmetric fashion, though can also localize in other areas. Though PRES is potentially reversible, if not recognized at an appropriate time it can lead to irreversible neurological deficits.

Case: 68 year old female with a past medical history of type 2 diabetes mellitus, major depressive disorder, hypertension, fibromyalgia, heart block, sinus bradycardia status post dual chamber pacemaker, IBS, and GERD presented to the ED after a ground level fall with unknown down time. Upon arrival to the ED, the patient was confused and agitated with elevated systolic blood pressures. Later, she expressed that she had a new onset of blurry vision and bilateral lower extremity numbness and weakness with worse weakness in the left leg. Physical exam revealed decreased visual acuity in both eyes and severe vibration and proprioception loss in the bilateral lower extremities. CT head showed hypoattenuation in the bilateral parietal occipital lobes which worsened on repeat imaging. MRI imaging later showed bilateral acute posterior parietal-occipital infarcts with hemorrhagic petechial conversion, an acute left PICA infarct involving the inferior dorsal medial left cerebellar hemisphere, and parapontine perforator ischemic change with gliosis of the pons. Additionally, the patient was found to have decreased folate and vitamin B12 levels. Patient was put on B-vitamin supplementation, hypertension medications to control blood pressure, and Plavix, and a statin medication for secondary stroke prevention.

Discussion: Adequate additions to blood pressure medications improved some of the patient's symptoms such as the blurry vision and confusion. However, the patient's repeat CTs continued to show hypoattenuation of the parietal occipital lobes bilaterally, likely explained by malignant PRES from the unknown time of uncontrolled hypertension, resulting in multi-territorial ischemic infarcts leading to permanent neurological deficits. Despite having these imaging findings, localization of patient symptoms is important to accurately assess the underlying cause of presentation. It was noted that the patient's severe vibration and proprioception loss in the bilateral lower extremities do not localize to the imaging results seen and fit more with a large fiber sensory neuropathy. In this case, it is suspected that the patient's confusion caused by the malignant PRES, she was unable to provide an accurate history of symptoms and that she most likely has an undiagnosed large fiber sensory neuropathy for some time.

Conclusion: Posterior Reversible Encephalopathy Syndrome requires prompt identification and treatment to control the underlying cause of the uncontrolled hypertension to avoid long term neurological consequences. PRES can have many diverse presentations, but it is important to recognize its manifestation and employ therapeutic strategies. The careful and comprehensive treatment of PRES can allow patients to have a full course of recovery.

Audience Take Away Notes

- Broaden the spectrum of knowledge of posterior reversible encephalopathy syndrome to aid in more accurate diagnosis and proper treatment
- To highlight the importance of localization of imaging findings when discussing patient symptoms
- Review the consequences of delay of treatment of posterior reversible encephalopathy syndrome and severity of prognosis

Biography

Student Dr. Saniya Ahmed studied Biological Sciences at the University of Illinois at Chicago and graduated as BS in 2019. She joined West Virginia School of Osteopathic Medicine in 2020 and is currently in her fourth year of medical school, anticipating to graduate in May 2024. She is pursuing a career in neurology and exploring her interests in the field with a focus in neurocognitive disorders.

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Deficits in behavioral and neuronal pattern separation in temporal lobe epilepsy

In temporal lobe epilepsy, the ability of the dentate gyrus to limit excitatory cortical input to the hippocampus breaks down, leading to seizures. The dentate gyrus is also thought to help discriminate between similar memories by performing pattern separation, but whether epilepsy leads to a breakdown in this neural computation, and thus to mnemonic discrimination impairments, remains unknown. Here we show that temporal lobe epilepsy is characterized by behavioral deficits in mnemonic discrimination tasks, in both humans (females and males) and mice (C57Bl6 males, systemic low dose kainate model). Using a recently developed assay in brain slices of the same epileptic mice, we reveal a decreased ability of the dentate gyrus to perform certain forms of pattern separation. This is because of a subset of granule cells with abnormal bursting that can develop independently of early EEG abnormalities. Overall, our results linking physiology, computation, and cognition in the same mice advance our understanding of episodic memory mechanisms and their dysfunction in epilepsy.

Audience Take Away Notes

- Most temporal lobe epilepsy-related dentate gyrus pathologies have been investigated on a computational model, this paper provides experimental evidence that temporal lobe epilepsy is characterized by impairments in mnemonic discrimination and neuronal pattern separation deficits
- We found a deficit that is not as large as many previously studied models, therefore introducing a possibility of plasticity's role in functional regain. This can help during treatment plans for patients recovering from temporal lobe epilepsy and subsequent dentate gyrus related memory consolidation problems
- This is research that needs expanding upon as this is a primary study establishing the mnemonic and spatial related memory problems that arise secondary to temporal lobe epilepsy. Expansion particularly in different testing models, treatment options and early diagnostic tools
- In this paper it is found that there is a subset of granule cells with pattern separation deficits which can develop without EEG hallmarks of epilepsy. Therefor this is an early mechanism of impairment in electrogenesis. This information is valuable in the future of research
- Additionally, we have improved and expanded upon existing pattern separation protocols on the mouse model

Biography

Swetha Ravi graduated from University of Wisconsin-Madison in 2018 with a degree Biology with an emphasis in Neurobiology. While obtaining her bachelor's degree she worked as a research assistant at Dr. Jones's research lab funded by the Lily foundation for epilepsy. She then received her Master's in Molecular and Integrative Physiology at the University of Michigan in 2020. She is currently a second-year medical student at the Michigan State University College of Osteopathic Medicine.

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