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JUNE 04 TO 06 2018

2nd Edition of International Conference on

NEUROLOGY & BRAIN DISORDERS

INBC 2018

THEME: Advancements and Challenges in Neuroscience & Brain Disorders

Venue
Holiday Inn Rome Aurelia
Via Aurelia, Km 8.400, 00165
Rome, Italy

https://neurologycongress.com

Anthony E. Kline
University of Pittsburgh
USA

Arun L. Jayaraman
Mayo Clinic Arizona
USA

Baranowska-Bosiacka Irena
Pomeranian Medical
University in Szczecin
Poland

Bartłomiej Stańczykiewicz
University of South Carolina
USA

Bernadete Marcia Voichcoski
Technological Federal University of
Parana/Electronica
Brazil

Bruna Silva Marques
Federal University of Sao
Carlos, Brazil

Carlos Eduardo Monici Fernandes
Federal University
Brazil

CarolAnn Peterson
University of Southern
California, USA

Cesar Garcia-Cruz
Centro de Investigación y de
Estudios Avanzados del IPN
México

Christian Saleh
Rehab Basel Neuro
Switzerland

Corina O. Bondi
University of Pittsburgh
USA

Dao Pan
Cincinnati Children's Hospital
Medical Center, USA

David Veerakone
CMDHB
New Zealand

Eleonora Palmieri
University in Macerata
Italy

Eugenia V Gurevich
Vanderbilt University
USA

Floyd Thompson
Brain Rehabilation Center
USA

Harry W.M. Steinbusch
Maastricht University Medical
Center, Netherlands

Hazem A. Mostafa
Ain Shams University
Egypt

Howard. H. Fenn
Stanford University
USA

Hyun Im Moon
Bundang Jesaeng Hospital
Korea

Ichiro Maruyama
Okinawa Institute of Science
and Technology Graduate
University, Japan

Izabela Gutowska
Pomeranian Medical
University in Szczecin, Poland

Jodie Marquez
University of Newcastle
Australia

Karol S. Bruzik
The University of Illinois at
Chicago, USA

Keerthi Madhurya Kethireddi
East Sussex Healthcare
NHS trust, UK

Ken Ware
NeuroPhysics Therapy Institute
and Research Centre
Australia

Kimberley Naylor
Central Otago Health
Services Ltd, New Zealand

Kruchinina Margarita Vitalievna
Siberian Branch of the Russian
Academy of Sciences, Russia

Leyla Djansugurova
Institute of General Genetics
and Cytology CS MES RK
Russia

Lorena Rubio
Universidad Nacional
Autonoma de Mexico
Mexico

Lucia Carvelli
Florida Atlantic University
USA

Marat Akhmet
Middle East Technical
University, Turkey

Margarit Tadevosyan
Artmed Medical Rehabilitation
Center, Armenia

Maria-Magdalena Georgescu
Louisiana State University
USA

Marta Goschorsk
Pomeranian Medical
University in Szczecin
Poland

Maurizio Petrarca
"Bambino Gesù" Children's
Hospital, Italy

Najib Murr
SIU Medecine
USA

Navid Tabibzadeh
Lehigh Valley Health Network
USA

Nicola Postol
University of Newcastle
Australia

Ozada Khamdiyeva
Institute of General Genetics
and Cytology CS MES RK
Russia

P. Hemachandra Reddy
Texas Tech University Health
Sciences, USA

Patrice Ntenga
Neurological Clinic of the
National Teaching Hospital
Senegal

Stephen Grossberg
Boston University
USA

Svyatoslav Medvedev
N.P.Bechtereva Institute of the
Human Brain of the russian
academy of sciences, Russia

Swetlana Sirko
Ludwig-Maximilians-University
Munich, Germany

Valida Isanova
Kazan State Medical
University, Russia

Vittorio Maglione
IRCCS Neuromed
Italy

Viviane Elsner
IPA Methodist University
Porto Alegre-RS Brazil

Wasik Agnieszka
Institute of Pharmacology PAS
Poland

Yasutoshi Koga
Kurume University Graduate
School of Medicine, Japan

Yu Liu
Jinan University
China

Zofia Rogoz
Institute of Pharmacology
Polish Academy of Sciences
Poland

Thank You All...

Welcome Message

It is indeed my great honour to have been invited by the Organizing Committee of INBC 2018 to warmly welcome all attendees to the 2nd Edition of 'International Conference of Neurology and Brain Disorders. INBC 2018 brings together scientists from many disciplines, who are explorers and seekers of the fundamentals realities and underlying processes that drive the biological dynamics of the human nervous system at every scale. This has had to be our first challenge and accomplishment in order for us to determine what happens when the underlying processes go wrong, leading to the establishment and incubation of neurological diseases and disorders, or how best to approach intervention for random events such as accidental lesions to the spinal cord.

"With knowledge comes the responsibility of sharing it"; Albert Einstein quoted and this quote in large, underpins motives to hold and attend this conference. I am sure that like myself, you will attend this conference to not only share your new research and your knowledge discovered along the way, but to also learn and be inspired by others. I am certain that there will be some exciting collaborations formed also that will accelerate wisdom in various disciplines.

On behalf of the Organising Committee, my warmest welcome, enjoyment and success for INBC 2018.

Ken Ware
NeuroPhysics Therapy Institute and Research Centre, Australia

Welcome Message

Following the success of INBC 2017 at Valencia, Spain, we take pleasure to announce the second edition "2nd International Conference on Neurology and Brain Disorders" held during June 04-06, 2018 in Rome, Italy. Research in Neurodegenerative diseases, i.e. Alzheimer's disease, Parkinson's Disease and depression continues to grow in size and scope. For people entering such a prolific environment, acquiring an initial understanding of these diseases becomes more difficult each year. Graduate students, postdoctoral fellows, or other early-stage scientists and senior staff focusing on Alzheimer's disease research, can take advantage of this opportunity to accelerate their knowledge immersion towards becoming an expert in this exciting field and discuss some of the latest trends in these research fields through close interaction with established leaders in the field. Workshop sessions are emphasized to open discussion between participants and lecturers, and immediate application of new knowledge. Students will participate in faculty-led exercises such as debates.

Prof.dr. Harry W.M. Steinbusch
Prof. in Cellular Neuroscience
Maastricht University
Maastricht, The Netherlands

keynote speakers

Stephen Grossberg
Boston University
USA

Maria-Magdalena Georgescu
Louisiana State University
USA

Ken Ware
NeuroPhysics Therapy Institute
and Research Centre, Australia

Corina O. Bondi
University of Pittsburgh
USA

Ichiro Maruyama
Okinawa Institute of Science
and Technology Graduate
University, Japan

Margarit Tadevosyan
Artmed Medical
Rehabilitation Center
Armania

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Viviane Elsner
IPA Methodist University
Brazil

Hazem A. Mostafa
Ain Shams University
Egypt

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 conference 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 80 different countries and 688 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.

About INBC 2018

Magnus Group is pleased to invite you to participate in the '2nd Edition of International Conference on Neurology and Brain Disorders' during June 04-06, 2018 at Rome, Italy.

INBC 2018 will bring together a collection of investigators who are at the forefront of their field and will provide opportunities for junior scientists and graduate students to interactively present their work and exchange ideas with established senior scientists.

The Neurology and Brain Disorders conference explores the entire breadth of Neurology with earlier and contemporary work and provides a critical review of the present state of the subject. INBC 2018 provides an international forum to intensify the information exchange and is an excellent opportunity for Researchers and Scientists in the domain of Neurology from around the world and to promote/present innovative ideas that will influence and foster continued research. The speakers and delegates come from academia, private and government laboratories across the world.

TABLE OF CONTENTS

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DAY 1

KEYNOTE FORUM

2nd Edition of International Conference on

Neurology and Brain Disorders

June 04-06, 2018
Rome, Italy

Biography

Stephen Grossberg is a principal founder and current research leader in computational neuroscience, theoretical cognitive science, and brain--inspired technology. He introduced the paradigm and equations for learning and memory that are used today. His work focuses upon how individuals adapt autonomously in real time to unexpected environmental challenges. Google Scholar reports more than 70,000 citations of his over 550 publications. He has received numerous awards and honors from around the world, most recently the 2015 Norman Anderson Lifetime Achievement Award of the Society of Experimental Psychologists (SEP), and the 2017 Frank Rosenblatt award of the Institute for Electrical and Electronics Engineers (IEEE).

Brain dynamics of normal and abnormal learning, memory, and cognition with applications to Alzheimer's disease, amnesia, autism, and neglect

Stephen Grossberg

Wang Professor of Cognitive and Neural Systems, Professor of Mathematics & Statistics, Psychological & Brain Sciences, and Biomedical Engineering Director, Center for Adaptive Systems, Boston University.

This talk will describe brain mechanisms of learning, memory, and cognition and how they may break down during mental disorders such as Alzheimer's disease, medial temporal amnesia, autism, and visual and auditory neglect. These processes are described by Adaptive Resonance Theory, or ART, which is the most advanced neural theory that explains and predicts how normal and abnormal brains may learn to attend, recognize, and predict objects and events in a changing world. In particular, ART explains how vigilance control determines whether learned categories will be general and abstract, or specific and concrete. Acetycholine (ACh) release at layer 5 neocortical cells alters vigilance via neocortical after-- hyperpolarization currents. This phasic ACh release is mediated by cells in the nucleus basalis of Meynert that are activated by unexpected events. ACh also mediates tonic control of vigilance. During autism, tonic vigilance can get stuck at high levels, leading to hyperconcrete category learning and recognition, and narrow attentional foci. During medial temporal amnesia, very low tonic vigilance leads to unlimited anterograde amnesia, limited retrograde amnesia, difficulties in orienting to novel cues, perseveration, and a failure of recombinant context -sensitive processing. The collapse of learning, recognition, and cognition during Alzheimer's disease may be explained by a collapse of tonic and phasicACh--mediated vigilance control in cortical layers 3 and 5. Sleep disruptions before and during Alzheimer's disease, and how they contribute to a vicious cycle of plaque formation in layers 3 and 5, are also clarified from this perspective. Conscious recognition of objects can occur when a feature-category resonance is triggered between prestriate visual cortex and inferotemporal cortex. Conscious seeing of objects can occur when asurface-shroud resonance occurs between prestriate visual cortex and parietal cortex. A surface--shroud resonance maintains sustained spatial attention upon an attended object and supports reaching behaviors directed towards it. Parietal lesions prevent a surface--shroud resonance from occurring, and lead to properties of visual neglect, including disturbances in reaching. In contrast, an inferotemporal lesion can lead to visual agnosias without impairing reaching.

This talk will provide mechanistic neural explanations of many known symptoms of clinical disorders that afflict millions of individuals. It also suggests predictions to test these explanations, and possible new clinical therapies. The talk is an invited keynote lecture.

Biography

Ken Ware is Founder of Neurotricional Sciences Pty Ltd and NeuroPhysics Therapy and Research. Been in private practice for almost 30 years, while doing independent and collaborative research. He Presented unique research at 10 major International Science Conference, including Neuroscience, Physics, Psychology and Life Sciences, which covers a very broad scientific audience. His Relative publications in 'Frontiers in Clinical Physiology' - 'World Journal of Neuroscience' – 'World Journal of Cardiovascular diseases'. And 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.

The significant outcomes and rationale of exploiting chaos in the CNS - to accelerate functional rejuvenation of the lesioned spinal cord

Ken Ware*

NeuroPhysics Therapy Institute and Research Centre, Australia

This presentation introduces The NeuroPhysics Therapy (NPT) phenomena, highlighting NPT's unprecedented accomplishments in effecting significant rescue of lost functions due to spinal cord injury and establishes the very reasons why NPT is outperforming all other forms of therapy and interventions that relate to rescues of the lesioned spinal cord. World renowned paraplegic John Maclean, in his internationally released book titled; "How Far Can You Go", describes how he began taking unassisted steps in 3 days of NPT with founder Ken Ware back in May 2013, post being wheelchair dependent for 25 years as an incomplete paraplegic. John went onto complete an able bodied triathlon 18 months after he took those first historical steps.

The many such repeatable outcomes of NPT for spinal cord injured patients, highlight that there exists scientific valid and diverse ways to view and to activate the human nervous system intrinsic ability to compensate for lesion. For one, considering how the human nervous system perceives and responds to the environment as a complex adaptive system (CAS) and as a CAS, it is intrinsically very sensitive to its initial conditions. Through this lens and through the understanding and exploiting of the role 'Chaos' plays in the maintenance of the healthy system, it is known that when given the right sets of initial conditions, the system at large can identify is own errors and self-organize to rapidly compensate for lesion in very small time scales.

Establishing initial conditions involves the destabilization of the CNS's neural communication networks that give rise to the existing communicative state of the lesioned spinal cord and the building up of a bottom up, lateralization program that follows simple rules; as in cellular automata that when initiated produces more complex behaviors of the system at large, enabling for the bypassing of the lesioned region of the spinal cord. Visual footage of SCI patients going through these process will be shown and explained.

"You cannot understand the complexity of the human nervous system by studying neurons in isolation of the complex adaptive organism they inhabit. Nor can you understand the complexity of the complex adaptive organism in isolation from the environment it inhabits"

Discovery of diagnostic markers and therapeutic targets for glioblastoma

Maria-Magdalena Georgescu

Department of Pathology, Louisiana State University, Shreveport, LA, USA

Biography

Trained as a medical doctor at the Carol Davila Medical School in Bucharest, virologist at the Pasteur Institute in Paris, cancer biologist at the Rockefeller University in New York and pathologist at the University of Texas Southwestern in Dallas, Dr. Georgescu is renowned for her pioneering work in the regulation of PTEN tumor suppressor and the activation of the PI3K/Akt/mTOR pathway. As Neuro-Oncology associate professor and principal investigator at the MD Anderson Cancer Center in Houston, she defined a network of tumor suppressors formed by PTEN, NHERF1 and PHLPP that controls tumor growth in glioblastoma. Her laboratory was also the first to implicate NHERF1 mechanistically in cancer, by suppressing the PI3K/Akt and Wnt/ -catenin pathways. She translated this work into clinic by establishing NHERF1 as progression marker in colorectal cancer and as diagnostic marker in ependymoma, meningioma and papillary tumors of the CNS. More recently, she devised an original model of glioblastoma that recapitulates the human disease and constitutes an excellent source for deriving disease progression markers and therapeutical targets. Dr. Georgescu serves now as Medical Director of Neuropathology at the Louisiana State University in Shreveport where she continues her high impact translational research in adult and pediatric diffuse gliomas.

Glioblastoma is a deadly brain tumor with a median survival of 1.3 years after surgery, radiotherapy and chemotherapy. The dismal prognosis is due to the propensity of the tumor to invade adjacent normal brain. Although next generation sequencing led to genomic landscaping of glioblastoma, there is little insight into the mechanism of neoplastic cell invasion, the detection of the invasive cells or their therapeutic targeting. To address these critical issues, we developed a murine model of invasive glioblastoma that mimics the human disease. Using a cancer stem-cell like human glioblastoma cell line in an orthotopic model, we isolated pairs of neoplastic cells growing either in the core of the tumor (Core cells) or away for the core, in the opposite hemisphere (Inv cells). A phenotypic assessment showed significantly decreased animal survival, increased cancer stemness and invasion but decreased proliferation of the Inv cells in comparison to Core cells. Activation of the PI3 kinase-Akt pathways characterized the Inv cells, whereas activation of the ERK/MAP kinase pathway was specific to Core cells. Microarray profiling of Core and Inv cells for differences of expression of mRNAs and microRNAs resulted in the identification of differentially expressed gene targets controlling metabolic pathways, cell-cell and cell-matrix adhesion and cell differentiation. Two categories of targets potentially relevant for diagnostic and therapy were further addressed: enzymes involved in metabolic pathways and receptor molecules expressed at the plasma membrane of neoplastic cells. These translational findings and the implications for the diagnosis and therapy of glioblastoma will be discussed.

Aging and traumatic brain injuries: involvement of cholinergic transmission in preclinical tests of executive function

Corina O. Bondi* PhD., Ihouma Njoku, B.S., Lindsay Kutash, Darik O'Neil, B.S., Jeffrey Cheng, B.S., and Anthony E. Kline, Ph.D.

Physical Medicine & Rehabilitation and Safar Center for Resuscitation Research, University of Pittsburgh

Biography

Corina O. Bondi, Ph.D., is a tenure-stream Assistant Professor in the Departments of Physical Medicine and Rehabilitation and Neurobiology, and Associate Director of Executive Function and Neuropharmacology at the Safar Center for Resuscitation Research at the University of Pittsburgh. Dr. Bondi's research interests focus on characterizing therapeutic strategies after experimental traumatic brain injury, such as pharmacotherapies and environmental enrichment, for complex cognitive processing deficits and distinct neurobehavioral and neurochemical alterations relevant to psychiatric disorders.

Traumatic brain injuries (TBI) impact millions of Americans, with older patients being more likely to have a co-occurring condition, particularly dementia. Galantamine (GAL), a first-line drug used to treat dementia, acts primarily as an acetylcholinesterase inhibitor and has been reported to positively impact cognitive function in older adults. Previously, we demonstrated that a controlled cortical impact (CCI) injury produced significant impairments in executive function in the attentional set-shifting test (AST), a complex cognitive paradigm analogous to the Wisconsin Card Sorting Test, which is used to measure strategy-switching deficits in patients with frontal lobe damage, TBI, and psychiatric disorders. In the current study, we predicted that daily GAL injections would normalize AST performance after a parietal lobe TBI in rats. Isoflurane-anesthetized adult male rats were randomly assigned to either a CCI or sham group. Surgery was administered following a previously established CCI protocol. Following surgery, rats were randomly distributed into three treatment groups: saline or GAL (1 or 2 mg/kg/day), until the test day 4 weeks later. AST results indicated that TBI significantly impairs performance on the first reversal stage, deficits attenuated by both GAL chronic doses ($p<0.05$). In particular, GAL (2 mg/kg/day) also significantly reduced TBI-induced cortical lesion volumes ($p<0.05$). In summary, chronic GAL administration provides an efficacious treatment for higher-order cognitive recovery following TBI. Ongoing studies are investigating whether these results are maintained when using aged Sprague-Dawley rats in order to mirror the elderly segment of adults typically treated with GAL in the clinic, as well as assess protein expression of brain cholinergic markers involved in the GAL mechanism of action for restoring executive function after TBI.

Audience Take Away:

- Clinicians and basic scientists alike will be presented with preclinical findings confirming that a therapy given for dementia is also beneficial as a treatment approach for experimental brain trauma.
- Combining aging processes with brain trauma in the laboratory mimics a large window of the clinical population suffering from brain injury, namely the elderly. The findings in terms of cognitive results and brain mechanisms are clinically relevant to researchers, clinicians, and rehabilitation therapists.
- The data showing that galantamine is effective at restoring cognitive function after brain trauma are of high importance to the clinic, considering that this pharmacotherapy is often prescribed to patients with dementia diagnosis.

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DAY 1

SPEAKERS

2nd Edition of International Conference on

Neurology and Brain Disorders

June 04-06, 2018
Rome, Italy

Brainstem Dysfunction in Neuropsychiatric Disorders – AD/PD/Depression

Harry W.M. Steinbusch[1,2]

1: Dept. Neuroscience, Faculty of Health, Medicine and Life Sciences, Maastricht University Medical Centre +, Maastricht, The Netherlands
2: European Graduate School of Neuroscience (EURON)

Despite the fundamental role of the brainstem in regulating vital functional abilities such as arousal, breathing, autonomic nervous system activity as well as regulating all higher cerebral functions via neurotransmitter projections systems originating in the brainstem, the role of the brainstem has received relatively little attention in most neuropsychiatric disorders. Besides the dorsal and median raphe nuclei complex comprising mainly serotonin-producing neurons, the brainstem also contains noradrenalin, dopamine and histamine-producing nuclei, i.e. resp. the locus coeruleus, the substantia nigra and the mamillary bodies. The brainstem is furthermore the relay station of afferent and efferent projections between the autonomic nervous system in the peripheral body and higher cerebral brain regions. The current presentation aims to review the neuroanatomy of the brainstem as well as the current status on findings, derived from a wide range of studies using molecular, cellular and imaging technologies, of brainstem involvement in neurodevelopmental (i.e. autism, schizophrenia) and neurodegenerative disorders (Alzheimer's and Parkinson's disease).

Over the past decades, the incidence of age-related, neurological and psychiatric disorders such as Alzheimer's disease (AD), Parkinson's disease (PD), but also depression has considerably increased. Mood disorders are strongly related to the exposure to stress. The hippocampus and other forebrain structures are the apex of the stress hormone control mechanism and damage to them may be one way in which stress hormone secretion escapes from inhibitory control in depression. In turn, stress, probably through toxic effects of glucocorticoids, decreases neurogenesis and cell survival while antidepressants enhance these processes in experimental animals. Therefore, since treatment strategies are not yet available, primary prevention in these age-related and stress related neurological disorders is of importance. As mentioned before most of the focus on neurobiological questions on above mentioned disease are related to forebrain structures since they are often associated with cognitive dysfunction. The brainstem is a highly neglected brain area in neurodegenerative diseases, including Alzheimer's (AD) and Parkinson's (PD) disease and frontotemporal lobar degeneration. Likewise, despite a long-standing recognition of brainstem involvement, relatively few studies have addressed the exact mechanisms that underlie brainstem autonomic dysfunction. Improved insight in the cellular and molecular characteristics of brainstem function is pivotal to study the developmental origins. As brainstem dysfunction also poses health issues in several other, neurodegenerative, disorders (like AD and PD), progress in these neurological fields will benefit from scientific advancement in the current proposal as well. In the area of depression, several observations have been made in relation to changes in one particular brain structure: the Dorsal Raphe Nucleus (DRN). In addition dysfunction of the cerebellum is also observed in AD and associated with pulmonary deregulation. The DRN is also related in the circuit of stress regulated processes and cognitive events. In order to gain more information about the underlying mechanisms that may govern the neurodegeneration, e.g. amyloid plaques, neurofibrillary tangles, and impaired synaptic transmission in AD, a rat dissociation culture model was established that allows mimicking certain aspects of our autopsy findings. We observed a similar phenomenon in brains from patients suffering from neurodegenerative disease since this also related to changes in BDNF levels. The ascending projections and multitransmitter nature of the DRN in particular and the brainstem in general stress its role as a key target for AD/PD research and autonomic dysfunction. It also points towards the increased importance and focus of the brainstem as key area in various neurodevelopmental and age-related diseases.

Biography

Dr. Harry W.M.Steinbusch is a Full Professor in Cellular Neuroscience & Director of the European Graduate School of Neuroscience, since 1996. He is Director for Institute Brain & Behavior & Mental Health and Neuroscience. He received his PhD from the Faculty of Medicine of the Catholic University, Nijmegen entitled: "Serotoninergic Neurons in the Central Nervous System of the Rat" in 1982.

His Research is focussing on the neuroanatomical, pharmacological, physiological and behavioral aspects of development and aging. Our general working hypothesis is that pre/ peri or postnatal stress can lead to depression and this by itself can be an early initiator of neurodegeneration. In addition, neurodegeneration and functional repair are studied in animal models and in human material obtained from patients. Topics are development, plasticity, brain aging and dementia, movement disorders, learning and memory. Research questions have primarily to do with the mechanism of changes in the nervous system in diseases and in development and aging. Participating disciplines are: Animal neuropsychology, genetics, neuroanatomy, neuropathology, neurochemistry, neuroimmunology, animal neuropsychology, molecular cell biology, neurophysiology, developmental neurobiology and neuropharmacology. He is an Editorial Board member & Reviewer for many Journals.

Intrathecal baclofen (ITB) combined with locomotor exercise provides better therapeutic outcome in reducing spasticity, improving anxiety, cognitive and activity performance, and no adverse effect on balance performance in a traumatic brain injury (TBI) rodent model

Thompson, F.J.*[1,2,4], Hou, J.[1,2], Nelson, R.[1], Mustafa, G.[1,2], Watts, J.[1], Joseph, J.[1], Tsuda, S.[1,2], Page, [L.5], and Bose, P[1,2,3].

[1]North Florida/South Georgia Veterans Health System, Malcom Randal VA Medical Center, Brain Rehabilitation Research Center of Excellence, USA

[2]Department of Physiological Sciences, University of Florida, Gainesville, FL

[3]Department of Neurology, University of Florida, Gainesville, FL

[4]Department of Neuroscience, University of Florida, Gainesville, FL

[5]Medtronic Restorative Therapies Group, Targeted Drug Delivery Research & Core Technology, Minneapolis, MN

Spasticity is a major health problem for patients with moderate to severe TBI. Progressive development of spasticity following TBI often represents a significant barrier for practical re-entry of TBI patients into the community. This preclinical study evaluated the safety and efficacy of acute ITB treatments and treadmill locomotor training (Tm), individually and as combined therapy. We employed a comprehensive series of long-term quantitative outcome measures to compare new versus standard of care with ITB treatment following TBI, where this combination therapy appears to potentially represent a paradigm shift in rehabilitation therapy. In these studies, ITB (Lioresal® baclofen injection; 0.8μg/hr) and Tm were initiated at one week after injury in a clinically relevant rodent TBI model where we observed enduring spasticity, balance, anxiety and cognitive deficits (Bose et al. 2013; Hou et al. 2017) (Marmarou model; 450g/1.5 m). Spasticity, anxiety-like behavior, balance, cognitive, and home cage activity performances were measured using velocity-dependent ankle torque, an elevated plus maze (EPM), rotorod, Morris water maze (MWM), and Noldus Phenotyper, respectively. One month of ITB and Tm combined treatment completely blocked early onset spasticity and also positive impacts on cognitive, balance, anxiety and activity recoveries. More importantly, this significant therapeutic benefit persisted even after cessation of ITB therapy. The combined therapy group exhibited significantly reduced MWM latency at the fourth day of testing, and significantly less anxiety-like behavior in the EPM. Twelve hour video-tracked activity monitoring data (recorded 6pm - 6am) revealed that compared with non-treated TBI animals, the ITB+Tm group exhibited home caged behavioral patterns that were most similar to normal animals. These observations indicated that initiating ITB in combination with a Tm produced a robust rehabilitation that was more effective than either therapy implemented individually. This improved spasticity outcome was accompanied by marked up-regulation of GABA/GABAb, norepinephrine and BDNF expression in the spinal cord tissue. These data will be compared and discussed with a data set derived from another study where ITB treatment alone initiated at a chronic time point (post-TBI 1 month) showed less attenuation of spasticity, and it adversely affected balance performance. This broad spectrum of comprehensive data supports confidence in the safety, feasibility, and efficacy of early intervention ITB treatments for TBI using with locomotor and ITB therapy for TBI-spasticity. Supported by Medtronic, PLC. and VA Merit Review B6570R.

Frameless stereotactic radiotherapy alone and combined with temozolomide for canine gliomas

Mario Dolera, Luca Malfassi* Cristina Bianchi, Nancy Carrara, Laura Corbetta, Sara Finesso, Silvia Marcarini, Giovanni Mazza, Simone Pavesi, Massimo Sala

DVM, SPCAA (Neurology), La Cittadina Fondazione Studi e Ricerche Veterinarie, Romanengo, Italy

Gaetano Urso, Phisicist, La Cittadina Fondazione Studi e Ricerche Veterinarie, Romanengo, Italy and Azienda Socio Sanitaria Territoriale di Lodi, Italy

We evaluated stereotactic volume modulated arc radiotherapy (VMAT RT) for canine gliomas, alone (RT) and in combination with temozolomide (RT+TMZ), compared to palliation. Overall and disease-specific survival times were estimated. Thirty dogs were palliated, 22 dogs were treated with RT and 20 with RT+TMZ. Complete and partial responses were observed in 63.2% and 90.9% of patients in the RT and RT+TMZ arms, respectively, that were alive at one year. Median survival in the palliation arm was 94 days. Median survivals of the RT arm (383 days) and RT+TMZ arm (420 days) were not significantly different (p=0.61). Positive correlation with survival was found both for the ratio between target and brain (relative) volume of the tumor of <5% (p=0.013) and for a clinical presentation with normal mentation (p=0.032). Volume modulated arc radiotherapy is feasible and effective for canine brain gliomas. Combining this therapy with TMZ did not elicit any additional improvement in survival time.

Toward selective modulators of GABA-A receptors

Karol S. Bruzik*, PhD.,
The University of Illinois at Chicago, USA

Heteropentameric GABA-A receptor is a principal drug target whose function is allosterically modulated by general anesthetics, sedatives and anticonvulsants, such as propofol, etomidate, barbiturates and neurosteroids. The current clinically used general anesthetics have numerous disadvantages including low potency, low receptor-type selectivity among the various Cys-loop receptors, low receptor isoform selectivity and resulting therefrom low therapeutic indices. Determining the locations and structures of modulator sites and the mechanisms that trigger conformational changes to the receptor is essential to the design and development of the next generation of these drugs. The approach presented here garners this information using chemical synthesis of analogs of the general anesthetic drugs equipped with small photoactivatable residues such as a diazirine or an azide, characterization of the pharmacology of the new agents to verify the identity of their binding sites with those of the original drugs, photolabeling of a specific molecular isoform of the receptor, and performing Edman sequencing of the photolabeled fragments of the receptor to determine the position of modification. Using this approach, binding sites of etomidate, propofol, barbiturate and neurosteroids have been determined. Overall, a general picture emerges where agents belonging to the four different classes mentioned above bind to disparate regions of the receptor protein.

Audience Take Away:

- The audience ¬will learn about the complexity of the GABAA receptor protein and its multimeric architecture that provide dissimilar binding environments for different types of allosteric modulators.
- Information on specific binding sites for the modulators will be provided, with some modulators having inhibitory and some excitatory effects, all allosterically linked to the agonist (GABA) binding site.
- The way forward will be mapped out toward more selective modulators.

Biography

Karol Bruzik received his BSc degree (1972) from the Technical University of Lodz, Poland, and his PhD (1980) and DSc (1987) degrees from Polish Academy of Sciences. After postdoctoral work at The Ohio State University (1981-83 and 1990-93) he joined the Department of Medicinal Chemistry and Pharmacognosy at the University of Illinois at Chicago as Assistant Professor, and is now Professor and Associate Head for Curriculum. He is an author of more than 100 peer review publications in the area of organic and bioorganic chemistry, enzyme mechanisms, phosphoinositide signaling and allosteric modulators of ligand-gated ion channels, with emphasis on GABAA receptors.

Astrocytes as the pivotal damage--management and repair cells after focal injury in the CNS

Swetlana Sirko*[1,2]

[1]Physiological Genomics, Biomedical Center, Ludwig--Maximilians--University Munich and
[2]Institute for Stem Cell Research, Helmholtz Center Munich, Germany

Astrocytes have a critical role in ensuring optimal brain functions, from supporting neuronal metabolism and survival to maintenance of blood--brain barrier. However, it took a long time to recognize the central role of astrocytes in response to diverse types of CNS damage, such as traumatic brain injury or neurodegenerative diseases. Due to the multiple roles of astrocytes in such context, I will discuss some aspects of region-- and pathology specific reactivity of astroglial cells: in particular I will focus on the subsetof reactive astrocytes that acquire proliferative capacity and stem cell potential in the injured brain. This leads to examine our current knowledge on the role of injury--induced astrocytes proliferation in regulating inflammation and restoration of blood-- brain barrier, as well as their impact on the area adjacent to the damage site, and on scar formation. The last part of my talk will consider how astrocyte plasticity changes during the aging process and how this affects the severity of tissue damage as well as post--traumatic structural and functional recovery.

Audience Take Away:

- Since the understanding of events that regulate reactivity--associated plasticity in astrocyte and their beneficial consequences for post--traumatic progression of tissue recovery has the potential to identify novel targets for ameliorating post--traumatic brain injury and promoting tissue repair, I believe that my presentation meets the interests and needs of students in medicine as well as biology and neurobiology, but will be also of great benefit for professionally satisfying and rewarding interest for neuroscientists and neurologists.

Biography

Dr. Sirko studied first Medicine and then Biology & Biotechnology. During her PhD, she linked the neural stem cell (NSC) behavior of radial glia to the expression of receptor protein tyrosine phosphatase zeta/beta, and discovered on method for isolation of NSCs from the embryonic and adult brain. Upon graduation, she joined the Magdalena Götz' Laboratory at Institute for Stem Cell Research (Helmholtz Center Munich) and the Department of Physiological Genomics at theLMU Munich. During her postdoctoral work, she investigated the endogenous plasticity of reactive astrocytes in the injured brain and identified the Sonic Hedgehog Signaling as a key determinant of NSC--properties in these cells. In March 2016, Dr. Sirko obtained venia legendi at the Medical Faculty of LMU, where she is currently Professor of Physiology. Her research focuses on elucidating key mechanisms of astroglial plasticity in the adult mouse and human brain, in the hope of activating post--injury mechanisms that instruct endogenous regeneration after brain injury.

New perspectives for a more suitable therapeutic approach for Huntington's disease

Vittorio Maglione*, PhD
IRCCS Neuromed, Pozzilli (IS), Italy

Huntington's disease (HD), the most common dominantly inherited neurodegenerative disorder is characterized by a progressive striatal and cortical neurodegeneration associated with cognitive and behavioral disturbance. The disease-causing mutation is an polyglutamine (polyQ) stretch (>36 repeats) in N-terminal region of huntingtin, a ubiquitous protein with multiple functions.

So far, many are the aberrant molecular mechanisms described to be associated with the disease, however much remains to be defined. In the past years, we have described that sphingolipid (ganglioside) metabolism is also perturbed in HD. In particular, we have found a significant reduction of ganglioside GM1 levels both HD preclinical models and HD patient.

New data indicate that lipid breakdown is not only restricted to ganglioside metabolism, but it also affects regulation of Sphingosine-1-phosphate (S1P), a potent signaling sphingolipid that regulates a number of processes essential to cellular homeostasis, and viability. Our findings indicate that S1P metabolism is significantly disrupted in HD even at early stage of the disease and importantly, revealed that such a dysfunction represents a common denominator among multiple disease models ranging from cells to humans through mouse models. Interestingly, the in vitro anti-apoptotic and the pro-survival actions seen after modulation of S1P-metabolizing enzymes allows this axis to emerge as a new "druggable" target and unfolds its promising therapeutic potential for the development of more effective and targeted interventions against this incurable condition.

Biography

Vittorio Maglione has completed his PhD in Neurobiology at the age of 33 years from University of Catania (Italy) and postdoctoral studies first from Neurological Institute "IRCCS Neuromed" (Italy) and successively from University of Alberta (Canada). After he have been awarded a Marie Curie Fellowship, he became Group Leader at Centre for Neurogenetics and Rare Diseases of IRCCS Neuromed. He is author of more than 35 scientific papers. He is also Associate Editor for Frontiers in Neuroscience and Member of the Editorial Board of Neural Regeneration Research.

Antigravity suit "Atlant" in neurological rehabilitation of patients with motor and cognitive impairments

Valida Isanova[1]*, M.D., Dr. Sci., Aliya Yakubova[2], M.D.,

[1]Professor, Department of neurology, neurorehabilitation and sports medicine, Kazan State Medical University, Kazan, Russian Federation;
[2]Kazan Federal University, Kazan, Russian Federation

The nervous system disorders and mental impairments still remain to be among the main causes of children and adults incapacity. Currently neurorehabilitation has a particular relevance and importance among people suffering from nervous system disorders, incapable of moving independently, self-care, performing socially important work that provides satisfaction and self-esteem, emotional balance and wealth. However, commonly used schemes of exercise therapy, massage, apparatus physiotherapy are of limited value in rehabilitation of motor and cognitive dysfunctions.

In the rehabilitation context, there has to be an integrated, pathogenetically valid comprehensive rehab method developed for neurological patients.Following international practices, in Tatarstan (Russian Federation) were developed the unique kinesiotherapeutical method and an antigravitational pneumosuit called "Atlant" for medico-conductive rehabilitation of patients with motor and cognitive impairments. The method is based on higher nervous activity teachings of I.Pavlov, I.Sechenov, V. Bekhterev and C.Sherrington With the help of straining devices, installed in the pneumosuit "Atlant" along the antagonistic muscles of the body and limbs, the myotatic reflex on extension is triggered in each segment, which activates the motor centres functions in all CNS levels.

There is promoting a restoration of muscle tone, affecting reticular formation, which is the main regulators of vital functions, including motor functions. Rehabilitational pneumosuit "Atlant" stimulates the hierarchy of movement's organization at all levels of the central nervous system, positively changes the structural and functional reorganization of the nervous system, activates the restoration of the disturbed muscle tone, and creates conditions for the initiation of lost motions and sanogenesis.

The kinesiotherapeutical method in "Atlant" creates the conditions for the patient's active participation in mobility rehabilitation process. The patients gain walking skills and other daily important moving skills, which become possible only with the adequate position of the body and limbs. Through the available objective trainings with the usage of pneumosuit "Atlant", the patients establish social activity and communication, normal for various functional systems in the motor-cognitive interaction.

Audience Take Away:

- The audience will get acquainted with the unique author technologies of Professor Valida Isanova, accelerating the processes of motor functions' restoration through powerful proprioceptive afferent-efferent stimulation by the method of kinesitherapy in the antigravitational rehabilitation suit "Atlant".
- The author's method of kinesiotherapy in medical-conductive rehabilitation of neurological patients with motor impairments has properties of temporal and spatial summation of impulses. The implementation of motor patterns in three-dimensional space affects the mechanisms of autoregulation of the alpha-gamma motor neuron system at all levels of the CNS to restore the disturbed muscle tone, postural stability and postural control.
- The report will show the pathogenetic basis of the author's kinesiotherapy method and of the antigravitational suit "Atlant". The mechanism of action of the rehabilitational suit in the method will be shown. The results of years of experience in the application of the author's method and antigravitational suit "Atlant" in Russia will be presented, the effectiveness of which is reliably higher than the commonly used schemes of exercise therapy, massage and apparatus physiotherapy. Thus, the attention of the audience will be drawn to the importance of using pathogenetic methods in the rehabilitation of neurological patients.

Biography

Valida A. Isanova was born in 1942, graduated from the Astrakhan State Medical University. Doctor of medical sciences, Professor of department of neurology, rehabilitation and sports medicine of Kazan State Medical University. Worked as the chief physician of the Republican Center of Rehabilitation, Kazan. A member of the Board of the All-Russian Society of Neurologists, chief rehabilitologist of the Ministry of Social Protection in the Republic of Tatarstan (Russia), a member of the editorial board of several peer-reviewed journals. The author of 7 monographs, one of which ("Early Stroke") was awarded at the international exhibition in London in 2017, has four valid patents for the invention, including development of a rehabilitational suit "Atlant", has more than 100 scientific publications, 30 methodical recommendations, takes part in international conferences, including "Movement. Brain. Cognition 2017" conference in Oxford.

Do lower limb robotic exoskeletons have a role in neurological rehabilitation? A systematic review

Marquez J*[1 2], Spartalis S[1], Postol N[1 2], Bivard Dr A[1 2], Spratt Professor N[1 2 3]
University of Newcastle[1], Hunter Medical Research Institute [2], Hunter New England Area Health Service [3]

Background: Technological advances have led to the emergence of robotic exoskeletons as a potential therapy option for patients with neurological conditions. To date, the body of evidence has focused on the spinal cord injury population but more recently there has been growing interest in people with acquired brain injury. Several different exoskeletons are currently available for purchase, and given the expense of these devices, careful evaluation of the proposed benefits is warranted before therapeutic recommendations can be made by therapists.

Method: A systematic review was conducted to synthesise all the available evidence relating to powered lower limb robotics in adults with acquired brain injury. This review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. The quality of the evidence was evaluated and recommendations provided using the GRADE classification system. The primary outcome of interest was neuromuscular function and secondary outcomes included quality of life, mood, acceptability and safety.

Results: 16 studies with 325 participants were available, of which 6 studies included data suitable for meta-analysis. Overall, the included studies were of "fair" methodological quality and consistently reported positive findings but the size of the treatment effect varied widely. When data from the controlled studies were pooled, robotic therapy did not produce statistically significant improvements on endurance (MD = 8.80, CI = -14.75 – 32.35, P =0.46) or velocity (MD = 0.97, CI = -0.06 - 2.00, P = 0.06). The pooled data from three studies suggested a beneficial effect on balance as assessed by the Berg Balance Scale (MD = -2.84, CI = -4.46, -1.22, P = 0.0006). The robotic therapy was deemed acceptable with few drop outs and no severe adverse events. No studies commented on the effect of robotic therapy on quality of life or mood.

Conclusion: This review suggests there are limited short-term advantages associated with the use of robotic therapy in patients with acquired brain injury compared to conventional therapy. The strength of recommendations was graded as low-moderate, therefore we are unable to comment on many important rehabilitation outcomes due in part to the lack of evidence available, the heterogeneity of the participants and range of robotic devices.

Audience Take Away:

- Robotic lower limb exoskeletons offer a safe and acceptable mode of therapy for patients with acquired brain injury.
- There is inadequate evidence to endorse robotic therapy in lieu of conventional therapy to improve gait in patients with acquired brain injury but it may be considered as a means for improving balance.
- Given the range of robotic devices and heterogeneous nature of acquired brain injury further research is required to determine the clinical merits of this emerging modality.

Biography

Jodie Marquez graduated from a Bachelor of Applied Science (Physiotherapy) in 1991 and gained over 20 years of clinical experience in a variety of rehabilitation settings in Australia and overseas. Her primary clinical interest has been neurological dysfunction, in particularly stroke recovery. Since leaving a clinical role in 2010 Dr Marquez has been employed as a full time academic and researcher at the University of Newcastle, Australia. Her research has centered on investigating emerging interventions for stroke rehabilitation including robotic exoskeletons and non-invasive brain stimulation.

Continued refinement of environmental enrichment as a preclinical model of neurorehabilitation after experimental brain trauma

Anthony E. Kline*, PhD and Corina O. Bondi. PhD
Physical Medicine & Rehabilitation and Safar Center for Resuscitation Research, University of Pittsburgh, USA.

Traumatic brain injury (TBI) affects two million people in the United States each year and several million more worldwide, making it a significant health care issue. Brain traumas range from mild to severe with the former being the case in most occurrences and generally not displaying marked behavioral symptoms, while the latter occurs less often, but presents significant motor and/or cognitive dysfunction. Numerous preclinical pharmacotherapies have been evaluated, but have not translated to the clinic. Rehabilitation is currently the best option for TBI patients. Hence, in this presentation, environmental enrichment (EE), a preclinical model of neurorehabilitation that has been shown to confer motor, cognitive, and histological benefits after TBI will be discussed. Specifically, EE studies that range from the early and continuous exposure paradigm (i.e., typical EE) to some of the latest work where delayed and abbreviated EE, that more likely mimics the clinic, will be described. The data presented are derived from anesthetized adult male/female rats that received a cortical impact of moderate severity or sham injury and were then randomly assigned to EE or standard (STD) housing. The results generally show that motor and cognitive function is significantly improved in the EE vs. vehicle control groups and that EE can be considered a robust preclinical model of neurorehabilitation.

Audience Take Away:

- The findings presented will provide a therapeutic approach for experimental brain trauma
- The data showing that EE does not have to be provided immediately after TBI or continuously as has been the norm will help researchers design more clinically relevant EE experiments.
- The data showing that brief EE coupled with a pharmacotherapy improved outcome after TBI is clinically relevant as patients will not receive continuous rehabilitation and may also receive a pharmacotherapy as part of their treatment.

Biography

Anthony E. Kline, Ph.D., is a Professor in the Departments of Physical Medicine and Rehabilitation, Critical Care Medicine, and the Safar Center for Resuscitation Research at the University of Pittsburgh. Dr. Kline's research includes neurobehavioral recovery and learning after traumatic brain injury (TBI). Therapeutic strategies that include pharmacotherapy and environmental enrichment are utilized alone or in combination to restore function and/or attenuate TBI-induced deficits. Another interest is the evaluation of pharmacological agents that may alter TBI and to elucidate potential mechanisms for the observed effects.

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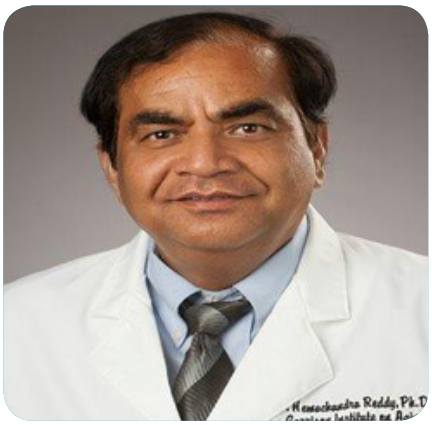
DAY 2

KEYNOTE FORUM

2nd Edition of International Conference on

Neurology and Brain Disorders

June 04-06, 2018
Rome, Italy



Biography

P. HemaChandra Reddy is an Executive Director and Chief Scientific Officer of Garrison Institute on Aging. He is also a Professor of Cell Biology/ Biochemistry, Neurology and Neuroscience/ Pharmacology Departments, and Adjunct Professor of Speech, Language and Hearing Sciences Department, Texas Tech University Health Sciences Center. He was Elected Fellow of American Neurological Association, and having 30 years of experience. He is also an Editorial Board Member for Journal of Neurochemistry and many renowned journals. His research interest includes Aging, Neurodegenerative diseases - Alzheimer's, Huntington's, Parkinson's and multiple sclerosis, Mitochondria, Oxidative Stress, Diabetes/Obesity, Gene Expression Analysis and Gender-based neuronal changes.

Abnormal Mitochondrial Dynamics and Defective Synapses: Protective Role of Reduced Dynamin-related protein 1 in Alzheimer's Disease

Hemachandra Reddy* [1,2,3,4,5,6]

[1.] Garrison Institute on Aging, [2.] Cell Biology & Biochemistry, [3.] Pharmacology/Neuroscience, [4.] Neurology, [5.] Department of Public Health and [6.] Speech, Language and Hearing Sciences Departments, Texas Tech University Health Sciences Center, Texas, USA.

Synaptic pathology and mitochondrial oxidative damage are early events in AD progression. Loss of synapses and synaptic damage are the best correlates of cognitive deficits found in AD patients. Recent research on Aβ, tau mitochondria and synapses in AD revealed that Aβ and tau accumulates in synapses and synaptic mitochondria, leading to abnormal mitochondrial dynamics and synaptic degeneration in AD neurons. Further, recent studies using live-cell imaging and primary neurons from amyloid precursor protein transgenic mice revealed reduced mitochondrial mass, defective axonal transport of mitochondria and synaptic degeneration, indicating that Aβ is responsible for mitochondrial and synaptic deficiencies. We recently found that abnormal physical interaction between mitochondrial fission protein, Drp1 and Aβ and Drp1 and phosphorylated tau (p-Tau), leading to excessive mitochondrial fragmentation, reduced mitochondrial fusion (Manczak et al 2011 Hum Mol Genet and Manczak and Reddy 2012 Hum Mol Genet). Based on these observations, we hypothesized that a partial reduction of Drp1 inhibits and Drp1and Aβ and Drp1-pTau interactions and protects neurons from pTau-induced mitochondrial and synaptic toxicities, and maintains neuronal function in AD progression. To test our hypothesis, we created double mutant (Drp1+/-xTau and Drp1+/-xAPP. Using molecular, biochemical, Golgi-cox staining and transmission electron microscopy studies, we investigated mRNA, protein levels of mitochondrial dynamics, biogenesis, autophagy and synaptic genes, dendritic spines, mitochondrial number and morphology and Morris Water Maze based cognitive behavior in 12-month-old Drp1+/-x Aβ and Drp1+/-xTau mice. We found significantly increased dendritic spines, significantly reduced fragmented and structurally damaged mitochondria and reduced mRNA and protein levels of fission genes and increased levels of fusion, biogenesis, autophagy and synaptic genes in the brains of 12-month-old Drp1+/-x Aβ and Drp1+/-xTau mice relative to age-matched APP and Tau mice. Importantly, we also found ameliorated cognitive deficits in 12-month-old Drp1+/-xAPP and Drp1+/-xTau mice relative to age-matched APP and Tau mice. These observations strongly suggest that reduced Drp1 is beneficial to AD neurons and may have a therapeutic value to AD patients.

Biography

Ichiro Maruyama is a Professor at the Okinawa Institute of Science and Technology Graduate University (OIST). He received his Ph.D. from University of Tokyo, Japan. Subsequently he was trained as a post-doctoral fellow in MRC Laboratory of Molecular Biology, Cambridge, UK, where he started to work on neurobiology of the nematode Caenorhabditis elegans. Ichiro then moved to The Scripps Research Institute, La Jolla, California, USA, where he started to study molecular mechanisms underlying activation of cell-surface receptors. At OIST, Ichiro continues to work on molecular mechanisms of transmembrane signaling mediated by various cell-surface receptors as well as on learning, memory and decision-making in C. elegans.

Mechanism of activation of EGFR by oncogenic mutations in glioblastoma

Ichiro N. Maruyama, Ph.D.

Okinawa Institute of Science and Technology, Japan.

Glioblastoma multiforme (GBM) is a common form of adult primary brain tumor, and diffusely and aggressively invade both hemispheres of the brain. Patients prognosis is dismal with median survival times ranging from12 to 15 months after diagnosis. In primary GBMs, the epidermal growth factor receptor (EGFR) is overexpressed in nearly 50% cases, and approximately half of these cases additionally possess receptor mutations. The amplification of the EGFR gene is the major cause of the overexpression, and often accompanies deletions, insertions and missense mutations. Most of these mutations constitutively activate the receptor in the absence of bound ligand, and confer anchorage-independent growth and tumorigenicity to cells expressing the mutants. The most common EGFR mutation in GBMs is EGFRvIII, in which a portion of the extracellular ligand-binding domain is deleted. Other mutations termed EGFRvIV were also identified in GBMs, and have the carboxyl terminal deletions. As an insertion mutation, a tandem kinase domain duplication termed TDK-EGFR has been detected in two GBM biopsy panels. Missense mutations in the extracellular domain were found in GBM, which conferred anchorage-independent growth and tumorigenicity to NIH 3T3 cells. Sequencing of EGFR in a large cohort of GBM patient also identified over 30 different missense mutations within the extracellular domain. Among them, cysteine residues present in Subdomain IV of the extracellular domain of the receptor. Constitutive activation of EGFR by the overexpression and oncogenic mutation of the receptor have traditionally been explained by dimerization of the receptor monomers. A plethora of diverse studies, however, demonstrate that EGFR is present in a pre-formed, yet inactive, dimeric form prior to ligand binding. Furthermore, recent progress in structural studies has provided insight into conformational changes during the activation of the pre-formed dimeric receptor. Upon ligand binding to the extracellular domain of EGFR, its transmembrane domains rotate or twist parallel to the plane of the cell membrane, resulting in the reorientation of the intracellular kinase domain dimer from a symmetric inactive configuration to an asymmetric active form (the “rotation model”). This model is also able to explain how the oncogenic mutations described above activate the receptor in the absence of bound ligand, without assuming that the mutations induce the receptor dimerization. In this conference, we shall discuss how the diverse mutations in GBM constitutively activate the receptor based upon the “rotation model”.

Audience Take Away:

- The audience will be able to learn how oncogenic mutations constitutively activate the receptor in the absence of bound ligand.
- The audience will be able to understand transmembrane signaling by cell surface receptors from a complete different angle, and to interpret their research results based on the new knowledge.
- Based on the mechanism, the audience will be able to design novel pharmaceuticals that prevent tumour growth by inhibiting the EGFR.

Investigation of brain systems: from activations to interactions

Svyatoslav Medvedev*

N.P.Bechtereva Institute of the Human Brain of the Russian Academy of Sciences, Russia

Biography

Prof. Medvedev received his Ph.D. degree in Theoretical Physics from Lenigrad State University in 1972. His further research interests were devoted to the mechanisms of the human brain in both healthy and diseased states, with a special interest in brain functions inherent to humans: speech, emotions, creativity, etc. In 1988, he received his Dr.Sci degree in neurophysiology. In 1990, Prof. Medvedev organized and headed the Institute of the Human Brain of the Russian Academy of Sciences. In 1997, he was elected Corresponding Member of the Russian Academy of Sciences, and in 2016, Full Member of the Russian Academy of Sciences.

Currently, the so-called activation studies are the dominant approach to investigate the functional organization of the brain. Within the framework of these studies, the functional specialization of certain brain structures with respect to the types of activity under investigation is judged by their energy state. More often, an increase in local neuronal activity is considered as evidence of the involvement of brain structures in maintaining ongoing activities. However, the significant experimental material accumulated to date indicates the unproductive nature of this approach. And although for each function or mechanism it is possible to define a set of brain structures that are reproducibly involved in their maintenance, it is still unclear how exactly these structures work and whether their sets can be considered as specialized brain systems. Activation studies do not take into account the known properties of brain systems, according to which any activity is provided by the combined work of distantly located links of neuronal systems. At the moment, methods have been created that make it possible to study the interactions and interrelationships between brain structures as the links of such systems that reflect the nature of their combined work. The studies carried out by us with functional magnetic resonance tomography have shown that the brain systems maintaining the current activities are significantly richer than it appears from the standpoint of activation studies. Namely, it was found that the brain systems are far from being limited to those links that show their participation in its work by changing the level of their neuronal activity. This radically changes our understanding of how brain systems are organized. For the further study of functional brain systems new methods are needed to analyze precisely the functional interactions between the involved structures of the brain.

The study was supported by the Russian Science Foundation grant # № 16-18-00040”

Posttraumatic stress disorder: functional organic transition.

Tadevosyan Margarit*; Ph.D., Sukiasyan Samvel MD, Ph.D., Prof.;

''Stress center" Artmed Medical Rehabilitation Center, Armania

Biography

Tadevosyan Margarit, PhD psychiatrist, working experience 28 years, more than 36 articles and abstracts. Born on 29.05.1964. Graduated from Yerevan State Medical University after Mkhitar Heratsi in 1988. Works at "Artmed" Medical Rehabilitation Center, Mental health rehabilitation center ''STRESS". The major task of the center is the therapy of patients with borderline mental disorders. Also works as lecturer in Armenian Medical Institute, Department of psychiatry and clinical psychology.Member of ''Armenia psychiatric assossiation" since 2009, member of ''World federation of medical biology" since 2009.

Today combat-related mental disorders related to the extraordinary stress are the most commonly reported mental health disorders among medical and sociological problems. The actuality of these disorders is determined by polygenic and multifactorial essence of combat trauma (the impact of psychogenic trauma, ecological factors, physical brain injury etc) as well as by increasing prevalence of current disorder.

According to the clinical practice data clinical manifestations of PTSD and patients personality have been firstly essentially and formally changed during the long term dynamic of current disorder: secondly PTSD is transformed from social-psychological phenomenon into clinical phenomenon; third transformation of the content of combat trauma observed in peacetime determined that combat trauma is changed into moral trauma; at least PTSD is associated with somatic or mental health pathology (mostly with organic brain disorder).

Clinical-psychopathological and psychological researches (15-18 years postwar) among war veterans with PTSD elicited unique dynamic of clinical disorders while observation period. Syndromes and nosological manifestation of the disorder developed after combat trauma were studied. Preliminary results, suggested by a number of biological researches, confirmed the hypothesis of inflammatory – related nature of PTSD. Our research data confirms viewpoint on possible functional-organic transition of PTSD in distant result. It is emphasized that increasing of somatisation leads to decreasing of emotional component. As a result the psychiatric (psychological) process transforms into organic associated with increasing of aggression. It is indicated that current disorder in ex-combatants is qualified as organic emotionally unstable, psychopathic–like, postcontusionand psycho- organic disorders at the stage of distant results.

Audience Take Away:

- In this article significant essential and formal changes during the long-term dynamics of the disease are found.
- Transformation of combat trauma into moral injury is found.
- Association of PTSD with somatic or mental health pathology (mostly with organic brain disorder) is determined.

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DAY 2

WORKSHOP

2nd Edition of International Conference on

Neurology and Brain Disorders

June 04-06, 2018
Rome, Italy

The intersections of traumatic brain injury, strangulation and domestic violence

CarolAnn Peterson*, Ph.D.

Certified expert strangulation witness – University of Southern California Suzanne Dworak-Peck School of Social Work, USA

Biography

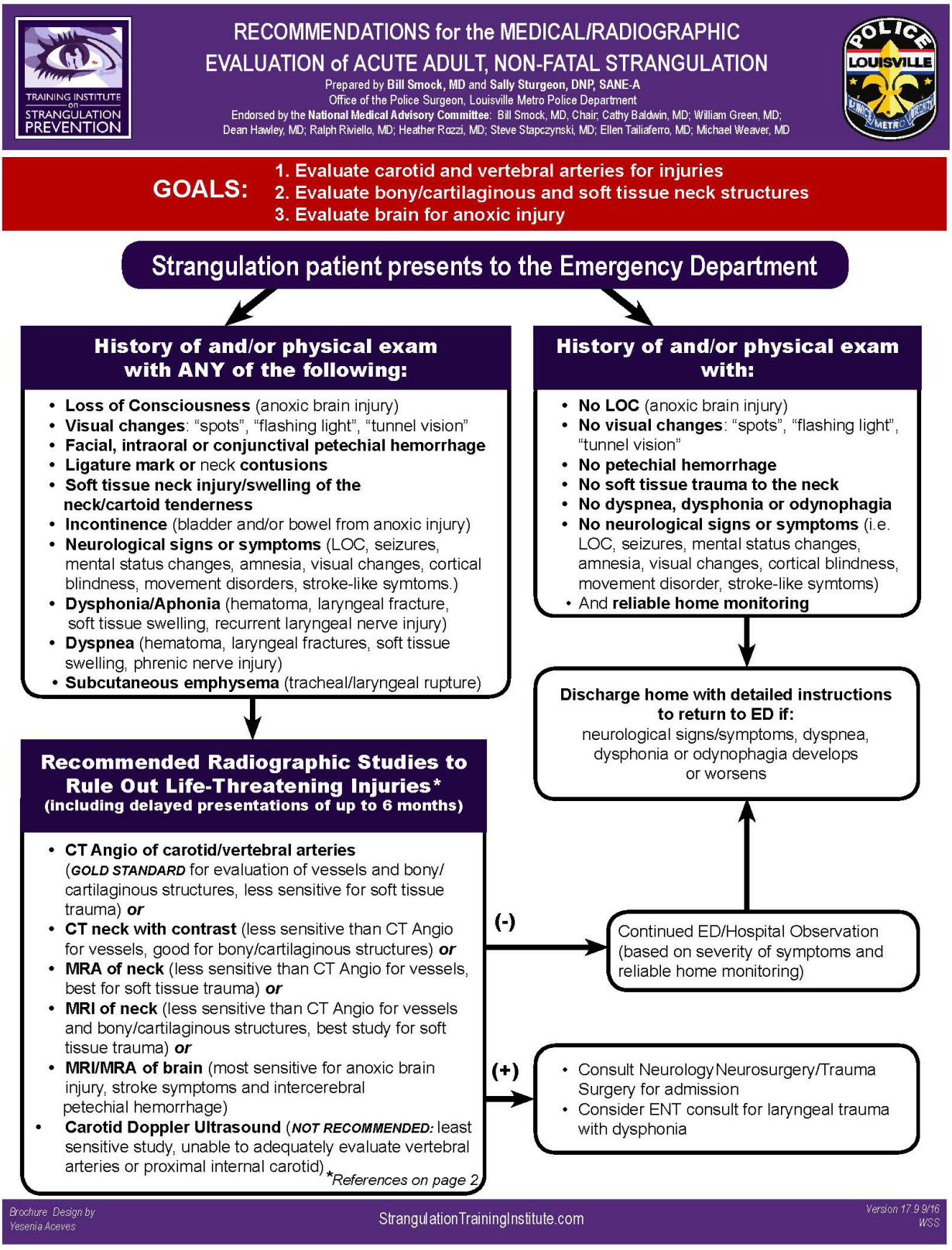
Dr. Peterson is an Adjunct Professor at the University of Southern California and joined the School of Social Work in January, 2004 where she teaches a course on domestic violence, a course on leadership and a course on policy and advocacy. She was recently appointed to the Los Angeles Mayor's DV Steering Committee. This committee will oversee the research design of a needs assessment, with funding provided by Blue Shield of California Foundation; and will review the final report.

Dr. Peterson is also a certified strangulation expert witness. She was trained by the topic forensic medical doctors in the USA, along with the founders of the National Training Institute on Strangulation Prevention – Casey Gwinn and Gael Strack. Dr. CarolAnn Peterson was Chairwoman of the Board of Directors and CEO of a company which she founded, Peterson Professional Alliance. In this capacity she worked with corporate America on recognizing domestic violence in the workplace and how domestic violence impacted their organizations; she assisted other organizations regarding welfare reform and its impact on victims of domestic violence; and she provided training on domestic violence to private, public and non-profit organizations. Dr. Peterson has done trainings for the Federal Law Enforcement Training Center (part of Homeland Security) where they train rural law enforcement officers and domestic violence advocates to be trainers in their own communities. She was a consultant for the City of Tel Aviv, Israel and the City of Los Angeles regarding a joint project between the two cities on workplace domestic violence. She was part of this project for 8 years. She has a Bachelor's Degree in political science and a Master's Degree in Public Administration, both from Loyola Marymount University of Los Angeles; and her Ph.D. in philosophy from Sanctus Theologica and is a survivor of domestic violence.

The workshop is designed to inform researchers, doctors, faculty, advocates and others who may interact/encounter victims of domestic violence, strangulation and/or traumatic brain injury; along with the ability to ask the appropriate questions of all 3 types of clients/patients. The workshop is also structured for those in attendance to realize that they interact/encounter these clients/patients more than they realize.The workshop will demonstrate how all 3 issues overlap and are quite common for domestic violence victims.

Audience Take Away:

- The information will assist researchers to better evaluate assessments; enhance the assessment of doctors and advocates of patients and clients. The information will assist in saving lives of victims along with reducing the homicide rate of victims; since one attempted non-fatal strangulation increases the likelihood of a domestic violence homicide by 750%.
- The information will assist researchers and/or teachers educate others to the intersections of traumatic brain injury, strangulation and domestic violence. This information will also provide researchers to determine the prevalence of the intersections.


RECOMMENDATIONS for the MEDICAL/RADIOGRAPHIC EVALUATION of ACUTE ADULT, NON-FATAL STRANGULATION
Prepared by Bill Smock, MD and Sally Sturgeon, DNP, SANE-A
Office of the Police Surgeon, Louisville Metro Police Department
Endorsed by the National Medical Advisory Committee: Bill Smock, MD, Chair; Cathy Baldwin, MD; William Green, MD; Dean Hawley, MD; Ralph Riviello, MD; Heather Rozzi, MD; Steve Stapczynski, MD; Ellen Tailiaferro, MD; Michael Weaver, MD
TRAINING INSTITUTE on STRANGULATION PREVENTION
POLICE LOUISVILLE
GOALS:
1. Evaluate carotid and vertebral arteries for injuries
2. Evaluate bony/cartilaginous and soft tissue neck structures
3. Evaluate brain for anoxic injury
Strangulation patient presents to the Emergency Department
History of and/or physical exam with ANY of the following:
• Loss of Consciousness (anoxic brain injury)
• Visual changes: "spots", "flashing light", "tunnel vision"
• Facial, intraoral or conjunctival petechial hemorrhage
• Ligature mark or neck contusions
• Soft tissue neck injury/swelling of the neck/cartoid tenderness
• Incontinence (bladder and/or bowel from anoxic injury)
• Neurological signs or symptoms (LOC, seizures, mental status changes, amnesia, visual changes, cortical blindness, movement disorders, stroke-like symtoms.)
• Dysphonia/Aphonia (hematoma, laryngeal fracture, soft tissue swelling, recurrent laryngeal nerve injury)
• Dyspnea (hematoma, laryngeal fractures, soft tissue swelling, phrenic nerve injury)
• Subcutaneous emphysema (tracheal/laryngeal rupture)
History of and/or physical exam with:
• No LOC (anoxic brain injury)
• No visual changes: "spots", "flashing light", "tunnel vision"
• No petechial hemorrhage
• No soft tissue trauma to the neck
• No dyspnea, dysphonia or odynophagia
• No neurological signs or symptoms (i.e. LOC, seizures, mental status changes, amnesia, visual changes, cortical blindness, movement disorder, stroke-like symtoms)
• And reliable home monitoring
Discharge home with detailed instructions to return to ED if:
neurological signs/symptoms, dyspnea, dysphonia or odynophagia develops or worsens
Recommended Radiographic Studies to Rule Out Life-Threatening Injuries*
(including delayed presentations of up to 6 months)
• CT Angio of carotid/vertebral arteries (GOLD STANDARD for evaluation of vessels and bony/cartilaginous structures, less sensitive for soft tissue trauma) or
• CT neck with contrast (less sensitive than CT Angio for vessels, good for bony/cartilaginous structures) or
• MRA of neck (less sensitive than CT Angio for vessels, best for soft tissue trauma) or
• MRI of neck (less sensitive than CT Angio for vessels and bony/cartilaginous structures, best study for soft tissue trauma) or
• MRI/MRA of brain (most sensitive for anoxic brain injury, stroke symptoms and intercerebral petechial hemorrhage)
• Carotid Doppler Ultrasound (NOT RECOMMENDED: least sensitive study, unable to adequately evaluate vertebral arteries or proximal internal carotid)
*References on page 2
(-)
Continued ED/Hospital Observation (based on severity of symptoms and reliable home monitoring)
(+)
• Consult Neurology Neurosurgery/Trauma Surgery for admission
• Consider ENT consult for laryngeal trauma with dysphonia
Brochure Design by Yesenia Aceves
StrangulationTrainingInstitute.com
Version 17.9 9/16 WSS

RECOMMENDATIONS for the MEDICAL/RADIOGRAPHIC EVALUATION of ACUTE ADULT, NON-FATAL STRANGULATION

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Brochure Design by Yesenia Aceves

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STRANGULATION
ASSESSMENT CARD

SIGNS

- Red eyes or spots (Petechiae)
- Neck swelling
- Nausea or vomiting
- Unsteady
- Loss or lapse of memory
- Urinated
- Defecated
- Possible loss of consciousness
- Ptosis – droopy eyelid
- Droopy face
- Seizure
- Tongue injury
- Lip injury
- Mental status changes
- Voice changes

SYMPTOMS

- Neck pain
- Jaw pain
- Scalp pain (from hair pulling)
- Sore throat
- Difficulty breathing
- Difficulty swallowing
- Vision changes (spots, tunnel vision, flashing lights)
- Hearing changes
- Light headedness
- Headache
- Weakness or numbness to arms or legs
- Voice changes

CHECKLIST

S **Scene & Safety**. Take in the scene. Make sure you and the victim are safe.

T **Trauma**. The victim is traumatized. Be kind. Ask: what do you remember? See? Feel? Hear? Think?

R **Reassure & Resources**. Reassure the victim that help is available and provide resources.

A **Assess**. Assess the victim for signs and symptoms of strangulation and TBI.

N **Notes**. Document your observations. Put victim statements in quotes.

G **Give**. Give the victim an advisal about delayed consequences.

L **Loss of Consciousness**. Victims may not remember. Lapse of memory? Change in location? Urination? Defecation?

E **Encourage**. Encourage medical attention or transport if life-threatening injuries exist.

TRANSPORT

If the victim is **Pregnant** or has life-threatening injuries which include:

- Difficulty breathing
- Difficulty swallowing
- Petechial hemorrhage
- Vision changes
- Loss of consciousness
- Urinated
- Defecated

DELAYED CONSEQUENCES

Victims may look fine and say they are fine, but just underneath the skin there would be internal injury and/or delayed complications. Internal injury may take a few hours to be appreciated. The victim may develop delayed swelling, hematomas, vocal cord immobility, displaced laryngeal fractures, fractured hyoid bone, airway obstruction, stroke or even delayed death from a carotid dissection, bloodclot, respiratory complications, or anoxic brain damage.

Taliaferro, E., Hawley, D., McClane, G.E. & Strack, G. (2009), Strangulation in Intimate Partner Violence. *Intimate Partner Violence: A Health-Based Perspective*. Oxford University Press, Inc.

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ADVISAL TO PATIENT

- After a strangulation assault, you can experience internal injuries with a delayed onset of symptoms, usually within 72 hours. These internal injuries can be serious or fatal.
- Stay with someone you trust for the first 24 hours and have them monitor your signs and symptoms.
- Seek medical attention or call 911 if you have any of the following symptoms: difficulty breathing, trouble swallowing, swelling to your neck, pain to your throat, hoarseness or voice changes, blurred vision, continuous or severe headaches, seizures, vomiting or persistent cough.
- The cost of your medical care may be covered by your state's victim compensation fund. An advocate can give you more information about this resource.
- The National Domestic Violence Hotline number is 1-888-799-SAFE.

NOTICE TO MEDICAL PROVIDER

- In patients with a history of a loss of consciousness, loss of bladder or bowel control, vision changes or petechial hemorrhage, medical providers should evaluate the carotid and vertebral arteries, bony/cartilaginous and soft tissue neck structures and the brain for injuries. A list of medical references is available at www.strangulationtraininginstitute.com
- Life-threatening injuries include evidence of petechial hemorrhage, loss of consciousness, urination, defecation and/or visual changes. If your patient exhibits any of the above symptoms, medical/radiographic evaluation is strongly recommended. Radiographic testing should include: a CT angiography of carotid/vertebral arteries (most sensitive and preferred study for vessel evaluation) or CT neck with contrast, or MRA/MRI of neck and brain.
- ED/Hospital observation should be based on severity of symptoms and reliable home monitoring.
- Consult Neurology, Neurosurgery and/or Trauma Surgery for admission.
- Consider an ENT consult for laryngeal trauma with dysphonia, odynophagia, dyspnea.
- Discharge home with detailed instructions to return to ED if neurological signs/symptoms, dyspnea, dysphonia or odynophagia develops or worsens.

TRAINING INSTITUTE on STRANGULATION PREVENTION

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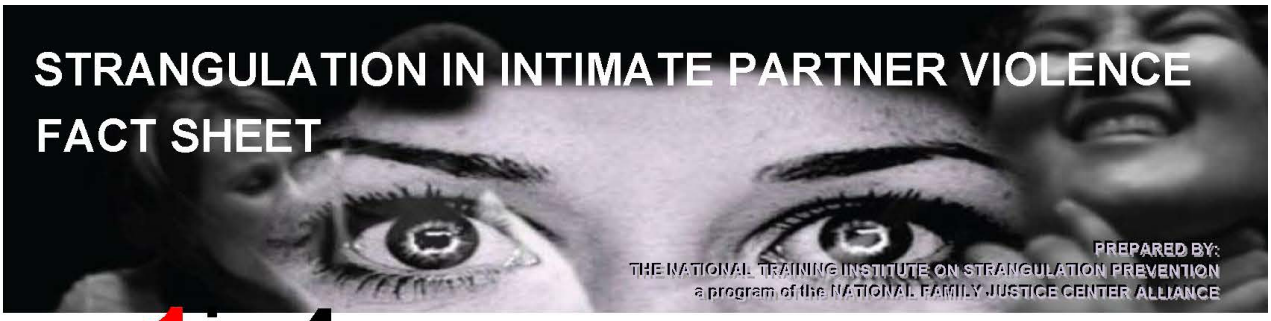


1 in 4 women will experience intimate partner violence (IPV) in their lifetime.

Of women who experience IPV...

10% experience near-fatal strangulation by their partner.

Strangulation: the obstruction of blood vessels and/or airflow in the neck resulting in asphyxia.

Loss of consciousness can occur within 5-10 seconds.

Death within 4-5 minutes.[i]

Are strangled manually (with hands).[i]

are strangled along with sexual assault/abuse.[iv]
9% are also pregnant.[ii]

report losing consciousness.[ii]

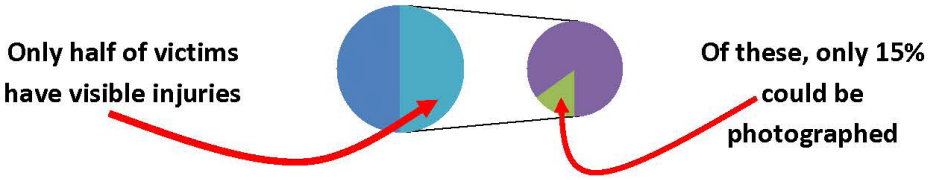
of strangled women believed they were going to die.[v]

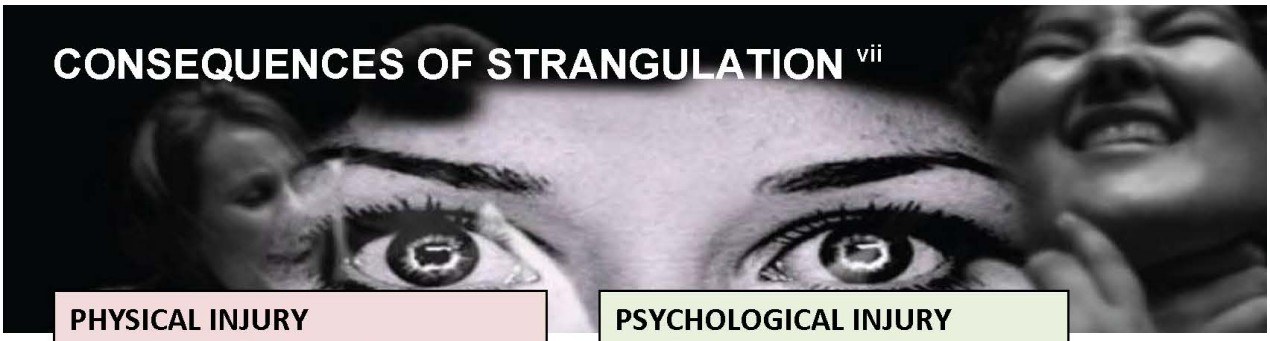
And odds for homicide increase 7x

for victims who have been previously strangled, compared to victims who have never been strangled.[iii]

HOWEVER...

Oftentimes, even in fatal cases, there is no external evidence of injury.[i]





PHYSICAL INJURY
death, unconsciousness, fractured trachea/larynx, internal bleeding (*hemorrhage*) and artery damage (*intimal tears*), dizziness, nausea, sore throat, voice changes, throat and lung injuries, swelling of the neck (*edema*),

PSYCHOLOGICAL INJURY
PTSD, depression, suicidal ideation, memory problems, nightmares, anxiety, severe stress reaction, amnesia and psychosis

NEUROLOGICAL INJURY
facial or eyelid droop (*palsies*), left or right side weakness (*hemiplegia*), loss of sensation, loss of memory, paralysis

DELAYED FATALITY
death can occur days or weeks after the attack due to carotid artery dissection and respiratory complications such as pneumonia, ARDS and the risk of blood clots traveling to the brain (*embolization*).

WHERE DO YOU STAND ON STRANGULATION?

FAMILY JUSTICE CENTER ALLIANCE

707 Broadway, Suite 700
San Diego, CA 92101
1-888-511-3522
strangulationtraininginstitute.com

i Strack, G.B., McClane, G.E., & Hawley, D. (2001). A review of 300 attempted strangulation cases: Part I: Criminal Legal Issues. Journal of Emergency Medicine, 21(3), 303-309.
ii Shields et al. (2010). Living victims of strangulation: A 10-year review of cases in a metropolitan community. American Journal of Forensic Medical Pathology, 31, 320-325.
iii Glass et al. (2008). Non-fatal strangulation is an important risk factor for homicide of women. The Journal of Emergency Medicine, 35(3), 329-335.
iv Plattner, T. et al. (2005). Forensic assessment of survived strangulation. 153 Forensic Sci. Int'l 202
v Wilbur, L. et al. (2001). Survey results of women who have been strangulated while in an abusive relationship. 21 J. Emergency Med. 297.
vi Mack, M. States with strangulation legislation. A product of the Training Institute on Strangulation Prevention. www.strangulationtraininginstitute.com
vii Funk, M. & Schuppel, J. (2003). Strangulation injuries. Wisconsin Medical Journal, 102(3), 41-45.

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magnus Group

DAY 2

SPEAKERS

2nd Edition of International Conference on

Neurology and Brain Disorders

June 04-06, 2018
Rome, Italy

Exploiting the CNS's Natural Chaotic Neural Phenomena to Optimize the Return of Lost Motor Function Causal of Variable Forms of Lesions to the CNS

Ken Ware
Head of Research and Development at the NeuroPhysics Therapy Institute,, Australia

In 2013 world renowned Paralympian John Maclean became the first long term paraplegic to walk again. Maclean had been 25 years wheelchair dependent pre engaging in NeuroPhysics Therapy (NPT) and within the first 3 days of this controversial therapy Maclean took his first recorded unassisted steps in 25 years. 18 months post NPT, Maclean completed an able bodied Triathlon. 60 minutes Australia picked up the story in which experts and spinal cord injury researchers referred to MacLean's ability to walk again as a miracle given the significance of the lesion to his spinal cord at T12. Maclean describes the events that lead to him being able to walk again in his bestselling book titled 'How Far Can You Go'. However Maclean had originally sought NPT to assist him to overcome chronic debilitating pain. It was during the treatment process for his pain that the chaotic neural dynamics, which naturally emerge in every human being during the NPT process, revealed that his CNS had developed significant means for bypassing the lesion to his spinal cord. The task was to then convince Maclean that he had the potential to walk again and that he should consider approaching the balance of the therapy with walking as a goal; his long term pain issues were resolved on day 1 of NPT. To do this he had to cognitively override his beliefs that had been programed by experts in the field 'that he would never be able to walk again'.

Despite John Maclean's well-publicized unprecedented transition from wheelchair athlete to able bodied athlete and other continued promoted successes of NPT in assisting large numbers of people suffering from complex neurological conditions and enabling other paraplegics and quadriplegics to either walk again or significantly enhance their functional capacity in very small timescales, other researchers in the given fields seem reluctant to inquire or collaborate with the NeuroPhysics Therapy Institute, to better understand the discrete values of the CNS's natural chaotic neural phenomena and how this phenomena can be systematically exploited to dramatically enhance the complexity of the CNS to compensate for variable lesions to the CNS; including Stoke, Acquired Brain Trauma, Parkinson's disease, Epilepsy, MS, Muscular Dystrophy. As well as psychophysical based disorders such as CRPS, Dystonia, Fibromyalgia. The success of NPT hinges upon a Complex Adaptive Systems (CAS's) approach and the understanding of disease and disorder through the lens of complexity as a loss of the systems complexity. This presentation will review the non-ambiguous step by step scientific principles and rational that produce unprecedented benefits in very small time scales to clients who have often suffered from long term complex neurological diseases and disorders, along with supportive electro-psychophysical data and extracts from relative peer reviewed publications. As well, reconfirm the undeniable successes of NPT and the need to make NPT available to the global community. To accomplish this more research and publications collaborations are sought.

Audience Take Away:

- Most research and therapeutics involves a mechanistic and reductionism approach based upon cause and effect. This presentation highlights and encourages the benefits of including scale free systems thinking and approaches along with networks science wisdom to better solve complex problems involving lesions of the human CNS. The negative phenotypic plasticity involved in the development of neurological disorders are subject to perception and environment. The disorder is often the end result of perception of environment and all envisaged pursuits to alter the phenotype must be sensitive to the roles that perception and environment play in the day to day evolution of the CNS. You can't understand the living cell in isolation to the organism it inhabits; you can't understand the organism in isolation to the environment it inhabits. Likewise, you cannot understand disease, disorder and psychophysical functionality in isolation to the organism and the relationship it has with the environment it inhabits. Through novel perspectives and approaches the audience will be able to better understand the intrinsic nature of problems they are often faced with in research and therapeutics and why hypothesis does not often agree with the results of experiment.
- The audience will be introduced to meaningful ways of acquiring, viewing and analyzing data that enable for better descriptions and predictions for the future outcomes of the systems they are studying. It is envisaged that from this information the audience will be able to construct a point of difference with their proposals for funding and be able to design more meaningful ways to do research that will produce more desirable outcomes compared to others in their field who are doing comparative research.

Biography

Ken Ware is Founder of Neurotricional Sciences Pty Ltd and NeuroPhysics Therapy and Research. Been in private practice for almost 30 years, while doing independent and collaborative research. He Presented unique research at 10 major International Science Conference, including Neuroscience, Physics, Psychology and Life Sciences, which covers a very broad scientific audience. His Relative publications in 'Frontiers in Clinical Physiology' - 'World Journal of Neuroscience' – 'World Journal of Cardiovascular diseases'. And 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.

Determining the merits of the REX Bionics Exoskeleton in neuro-rehabilitation post stroke.

Postol N*[1 2], Marquez J[1 2], Bivard Dr A[1 2], Spratt Professor N[1 2 3]
University of Newcastle1, Australia.
Hunter Medical Research Institute 2, Australia.
Hunter New England Area Health Service3, Australia.

Background: Access to high intensity weight-bearing exercise for those with severe mobility impairment post stroke is very limited. Technological advancements have led to the development of a variety of overground lower limb robotic exoskeletons. Only the REX Bionics Exoskeleton is free-standing, which may therefore offer a potential option for upright exercise in those with hemiplegia, as they do not need to use a walking aid with the device. To date, there is no published research in the stroke population with this device.

Method: Four stroke patients with ≤3 on the mobility section of the Motor Assessment Scale were recruited to a 12-week waitlist controlled trial. The treatment phase included twice weekly robotic treatment in the REX Bionics exoskeleton, for 12 weeks. The primary outcome of interest was function, measured by the Motor Assessment Scale. Secondary outcomes were balance, spasticity, strength, quality of life, mood, level of impairment, fatigue, fitness and perceptions of the device.

Results: Four participants completed the trial, with no adverse events occurring. One participant was lost to follow up. The questionnaire on perceptions of the device yielded favourable responses, with all four participants enjoying the opportunity to exercise in a supported upright position. There were however no meaningful changes in any outcome measure.

Conclusion: These are the preliminary findings of this ongoing pilot feasibility study to determine the potential merits of this device. Future studies would require bigger samples to make any valid conclusions about the use of this device as an adjunct tool in neuro-rehabilitation.

Audience Take Away:

- This is the first stroke specific trial with this device in the world. This research team are interested in collaboration with other neurology researchers involved in robotics.
- Robotic exoskeletons merit further research. Are participants passively receiving treatment, or can they be actively involved? How do we establish whether severely mobility impaired participants can benefit?
- Many health professionals have had no exposure to robotics in neuro-rehabilitation. This presentation will provide some background to how they have evolved and which devices are available for research activities.

Biography

Nicola Postol graduated from a Bachelor of Science (Physiotherapy) with Honours in 2000. Having originally qualified in the UK, she has over 17 years of clinical experience in both public and private healthcare in both the UK, and Australia. The majority of Nicola's clinical experience is in general rehabilitation and neurology. Nicola commenced her PhD (Physiotherapy) in Robotics in Neuro-rehabilitation in September 2016, with the University of Newcastle, Australia. The focus of her research is robotic exoskeletons in neuro-rehabilitation. The research team Nicola is a part of are assessing the potential benefit of the REX Bionics robotic exoskeleton with those who have severe mobility impairment due to Stroke or Traumatic Brain Injury, and Multiple Sclerosis.

Executive Disorders. Functional analysis, habilitative treatments and early prevention.

Prof. Piero Crispiani[1], Palmieri Eleonora*[2], Mary Mountstephen[3]
[1]Full Prof. Department Special Pedagogy University Macerata, Italy
[2]Clinical Psychologist, Researcher, Director of Psychological and Pedagogical Victor Center
[3]Doctorate University Of Reading in London, UK

Today neurobiological and pedagogic convergences allow the development of knowledge of Executive Functions (E.F.) and their contributions to the activation of useful forms of early intervention and habilitative treatment (or interventions). The paradigm of Executive Functions, definable a messy and not fluent execution of intentional actions in relationship to the environment, from a selective point of view, concerns a neurophysiological condition for the optimization of global human action: general coordination, activation of the incipit, self-regulation, spatial-temporal organization, lateral dominance, etc.

The approach and a long professional experience in the specialized pedagogic field regains theoretical concepts and intuitions expressed since 20th century , to arrive at today's neurophysiology which pays particularly attention to the phenomenon of neurological disorder/disorganization concerning dyspraxia (motor coordination,language, ideation emotion , grapho – motor skill): space-time disorders, executive disorders and development disorders.The scientific and experiential contribution belongs to a theoretical model which is defined as Cognitive Motor Training and develops an intense and ecological practice recording and documenting sensible instrumental developments, in the sense of fluidity and accuracy and a general improvement of cognitive participation and motor speed. In particular, the functional gains are related directly to reading, writing and maths performance.

Audience Take Away:

- Pratical solution to improve learning
- Solutions to work with the Cognitive Motor Training
- Data and functional gains published
- Better exchange between hemispheres
- Improvements in planning and reaction time

Biography

Dr. Eleonora Palmieri is the Director of Psychological and Pedagogical Victor Center Macerata (Italy) involved in dyslexia, dyspraxia, autism. She is a psychologist and she works as a researcher at University in Macerata (Italy) concerning Special Pedagogy and disability. She has been involved in international projects as a trainer and she often attends as expert speaker at International Conferences. She has developed and coordinated partnerships with many experts in different countries, including universities (Poland, England, Spain, Hong Kong), training organizations, research centre. She is the author of many articles, Video Motor Training Itard , Working Method of Champion LIRM (intensive reading and Speed Motor) and book Champion Pressing Training.

Therapeutic Regimen of L-arginine for Patients with MELAS: 9-year, Prospective, Multi-center, Clinical Research Integrating the Data from Two 2-year Clinical Trials with 7-year Follow-up.

Koga Y*, M.D., Ph.D.,
Kurume University, Japan.

Among pediatricians and neurologists who treat patients with MELAS, there is an urgent need for clinical evidence on the effective treatment for them. To date, pharmacotherapy with L-arginine has been suggested to be promising for patients with MELAS. We conducted 9-year clinical research with MELAS, into which the data from two 2-year, phase 3, multicenter, open-label clinical trials of oral and intravenous L-arginine involving 7-year follow-up were integrated as pooled data. We will discuss the therapeutic regimen in the presentation.

Audience Take Away:

- Therapeutic regimen for MELAS using L-arginine.
- Pharmacotherapy with L-arginine has been suggested to be promising for patients with MELAS.
- Patients with MELAS can be well controlled and disease progression may be retarded when this therapeutic regimen is conducted strictly.
- Physicians who treat patients with MELAS are strongly encouraged to implement the regimen as strictly as for clinical trials.

Biography

Dr. Yasutoshi Koga is a professor of Pediatrics and Child Health, Kurume University Graduate School of Medicine, Japan. After he finished the research at NCNP, he joined the Mitochondrial Research Group at the Department of Neurology, College of Physicians and Surgeons of Columbia University (Profs. DiMauro S and Schon EA). He discovered a novel therapeutic procedure and has completed the investigator-mediated clinical trial of L-arginine on MELAS in Japan. In 2012, he started the new national project to cure the lactic acidosis. He investigated the new biomarker and develop the diagnostic device of GDF15 for mitochondrial disorders. He has published more than 200 papers in reputed journals.

Arrestin-3-dependent activation of the JNK pathway as a therapeutic target for L-DOPA-induced dyskinesia

Eugenia V Gurevich*, PhD; Gurevich, Vsevolod V, PhD.,
Vanderbilt University, USA.

Arrestins were first discovered as the key proteins responsible for the shutoff of the G protein-dependent signaling by G protein-coupled receptors. Later arrestins were found to regulate multiple signaling pathways, including mitogen activated protein (MAP) kinase pathways, by scaffolding the pathways' components. One of the two ubiquitously expressed arrestin subtypes, arrestin-3, is the only isoform capable of activating the JNK pathway, with the preference for the JNK3 neuro specific isoform. L-DOPA-induced dyskinesia (LID) is a severe side effect of the most commonly used L-DOPA therapy in Parkinson's disease that severely compromised the quality of life of PD patients. We recently found that mice lacking arrestin-3 (KO) display lower level of LID in rodent models of LID but preserved antiparkinsonian effect of L-DOPA. These data suggested that arrestin-3 contributes uniquely to LID and could be a selective target for anti-LID therapy. The lentivirus-mediated delivery of wild type (WT) arrestin-3 fully restored LID, whereas the expression of mutant arrestin-3 defective in the JNK activation was ineffective pointing to the role of arrestin-3-dependent JNK activation in LID. We further probed the contribution of arrestin-3-dependent JNK activation by using specific short peptides derived from the JNK3-binding region of arrestin-3 that effectively mimic the full-length arrestin-3 protein in the ability to activate the JNK pathway. These peptides also fully restored LID when expressed in the motor striatum of arrestin-3 KO mice. Further deletion of a few amino acids yields peptides that bind some, but not all, kinases in the JNK pathway, thereby recruiting them away from productive arrestin-3-dependent scaffolds and inhibiting JNK3 activation via the dominant-negative mechanism. Such peptides ameliorated LID in animal models of LID acting as selective inhibitors of arrestin-3-dependent activation of JNK3. Our data suggest that arrestin-3-depepndent activation of JNK3 is an important mechanisms mediating LID and could be a promising target for anti-LID therapy. The importance of this mechanism is further underscored by the finding that arrestin-3 is not required for the anti-parkinsonian, beneficial effect of L-DOPA, which is fully preserved in arrestin-3 KO mice. Furthermore, these data suggest that signaling peptides could be used as highly selective therapeutics for brain diseases. Such protein-derived peptides capable of fulfilling select functions of the parent multi-functional protein have a great potential as therapeutic tools, specifically to target protein-protein interactions, which are notoriously hard to modulate with small molecule therapeutics.

Audience Take Away:

- Our data present a novel pathway implicated in LID that could also be a promising target for anti-LID therapy.
- Our studies demonstrate a constructive way or using mutant proteins combined with gene delivery and genetically engineered mouse strains to elucidate the contribution of specific signaling pathways to the brain diseases.
- Our experience in using peptides to treat a brain disease would be helpful to other scientists interested in neurodegenerative and other brain disorders;
- The design of the therapeutics targeting protein-protein interactions could also be advanced by our studies. Since most regulatory functions in the cells are performed via protein-protein interactions, this would help to open up a large pool of novel therapeutic targets that would become "druggable".

Biography

Dr. Eugenia V Gurevich completed her doctorate in neuroscience in Moscow State University. She trained as a postdoctoral fellow with Dr. Jeffrey Joyce at the University of Pennsylvania, Pennsylvania, USA, and then accepted the position as the Brain Bank Director and Staff Scientist at Sun Health Research Institute in Sun City, Arizona, where she conducted research on dopamine receptor functions in Parkinson's disease and schizophrenia with the focus on postmortem studies of the human brain. Since 2003, Dr. Gurevich is a faculty member of the Department of Pharmacology at Vanderbilt University, Tennessee, (Assistant Professor 2003-2009, Associate Professor from 2009), where she conducts research on the regulation of dopaminergic signaling in the normal and diseased brain. She is particularly interested in the functional role of proteins, G protein-coupled receptor kinases (GRKs) and arrestins, controlling desensitization of G protein-coupled receptors n neural pathologies such as Parkinson's disease, L-DOPA-induced dyskinesia, and drug addiction. She is an expert on the use of viral gene transfer technology to induce protein expression or knockdown in the brain of living animals. Dr. Gurevich has pioneered the study of the role of GRKs and arrestins in L-DOPA-induced dyskinesia with the goal of targeting these proteins to control dyskinesia and other L-DOPA-induced motor complications. This work may eventually lead to the development of novel therapies for Parkinson's disease and drug discoveries targeting GRK proteins.

Identification and Mitigation of Post-operative Delirium

Arun L. Jayaraman* MD, PhD;
Mayo Clinic Arizona, USA

Delirium is a frequently preventable complication associated with significant morbidity and mortality. Post-operative delirium occurs in up to half of all elderly patients undergoing anesthesia and surgery. Not only does this result in increased hospital length of stay and cost, it may predispose to post-operative cognitive dysfunction and reduced functional status. With an ageing population accounting for one third of surgeries performed in the United States, it is imperative that we learn to identify patients at risk of developing post-operative delirium and strategies to mitigate its incidence. Such strategies include pre-operative optimization, careful medication selection including maximizing non-narcotic analgesics, routine delirium screening, and post-operative multi-component interventions. Fast tracking and enhanced recovery after surgery pathways may also be beneficial.

Audience Take Away:

- Understand the significance of post-operative delirium
- Recognize post-operative delirium
- Describe risk factors for post-operative delirium
- Learn strategies to mitigate the incidence of post-operative delirium

Biography

Arun L. Jayaraman M.D., Ph.D. was born and raised in the Philadelphia, PA USA area. After graduating from Temple University School of Medicine with M.D. and Ph.D. degrees in 2008, Dr. Jayaraman completed an internship in internal medicine at Hahnemann University Hospital (Philadelphia, PA USA) in 2009, residency in anesthesiology at University of Pittsburgh Medical Center (Pittsburgh, PA USA) in 2012, fellowship in adult cardiothoracic anesthesiology at Duke University Medical Center (Durham, NC USA) in 2013, and fellowship in critical care medicine at Columbia University Medical Center (New York, New York USA) in 2014. He is board certified in anesthesiology, critical care medicine, and advanced perioperative echocardiography. He is presently a faculty member in the departments of Anesthesiology and Perioperative Medicine and Critical Care Medicine at Mayo Clinic Hospital (Phoenix, AZ USA).

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DAY 2

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Rome, Italy

An unusual case of Takayasu arteritis aneurysm

Francis R* MBBS, Reddy P MBBS, Ponambath S MRCP, Maxwell A MRCP
Royal united hospital, UK

Takayasu Arteritis is a large vessel vasculitis more commonly affecting the aorta and its direct branches (Silver 2012). Cerebral aneurysms are uncommon; but associated with Takayasu's and are routinely found in areas of increased haemodynamic stress with a significant predilection for posterior circulation compared to the general population. This increased predilection is felt to be due to the increased pressure from an obstructed carotid system (Camara et al. 2016). We present the case and imaging of a patient with known Takayasu's arteritis and new right midbrain infarct secondary to compression from a known basilar artery aneurysm.

Audience Take Away:

- Importance of considering a wide differential
- Great images and revision of an uncommon condition
- The vital role of neuro-imaging in quickly facilitating the correct treatment plan

Biography

Graduated from Barts and the London School of Medicine in 2013, now working in intensive care at the Royal united hospital in Bath, UK. Intending to enter Haematology training next year. Speaks fluent English, French and Japanese.

Pre- and neonatal exposure to lead (Pb) induces alteration in energy metabolism in developing brain of rat offspring

Izabela Gutowska Prof., Irena Baranowska-Bosiacka* Prof., Agnieszka Łukomska Ph.D., Marta Goschorska Ph.D., M.D., Karolina Dec Ph.D., Maciej Tarnowski Prof., Anna Pilutin Ph.D., Bosiacki Mateusz, Dariusz Chlubek Prof.
Pomeranian Medical University in Szczecin, Poland.

Lead (Pb) is an environmental neurotoxin which particularly affects the developing brain but the molecular mechanism of its neurotoxicity is not fully understood. The aim of our study was to examine whether pre- and neonatal exposure to Pb (concentration of Pb in rat offspring blood below the "threshold level") may affect the brain's energy metabolism in neurons and astrocytes via the amount of available glycogen. We investigated the glycogen concentration in the brain, as well as the expression of the key enzymes involved in glycogen metabolism in brain: glycogen synthase 1 (Gys1), glycogen phosphorylase (PYGM, an isoform active in astrocytes; and PYGB, an isoform active in neurons) and phosphorylase kinase β (PHKB). Moreover, the expression of connexin 43 (Cx43) was evaluated to analyze whether Pb poisoning during the early phase of life may affect the neuron-astrocytes' metabolic cooperation. This work shows for the first time that exposure to Pb in early life can impair brain energy metabolism by reducing the amount of glycogen and decreasing the rate of its metabolism. This reduction in brain glycogen level was accompanied by a decrease in Gys1 expression. We noted a reduction in the immunoreactivity and the gene expression of both PYGB and PYGM isoform, as well as an increase in the expression of PHKB in Pb-treated rats. Moreover, exposure to Pb induced decrease in connexin 43 immunoexpression in all the brain structures analyzed, both in astrocytes as well as in neurons. Our data suggests that exposure to Pb in the pre- and neonatal periods results in a decrease in the level of brain glycogen and a reduction in the rate of its metabolism, thereby reducing glucose availability, which as a further consequence may lead to the impairment of brain energy metabolism and the metabolic cooperation between neurons and astrocytes.

Audience Take Away:

- The audience will have an opportunity to learn about suggested molecular mechanisms of lead (Pb) neurotoxicity. The results of this study appear significant in clinical practice. Previous studies have provided evidence for an association between the elevated levels of lead (Pb) in the blood in children and impaired memory, concentration, learning, and lowered IQ. This work shows for the first time that exposure to Pb in early life can impair brain energy metabolism by reducing the amount of glycogen and decreasing the rate of its metabolism.

Biography

Irena Baranowska-Bosiacka works at the Department of Biochemistry and Medical Chemistry at the Pomeranian Medical University, Szczecin Poland. She is a researcher and university teacher. For many years she has been involved in the research related to the influence of environmental and epigenetic factors on the human and animal body. The main subject of the research are issues related to metallomics and toxicology, with emphasis on neurobiology and neurotoxicology. She has involved in many research projects explaining the molecular, biochemical and genetic mechanisms of adaptation to xenobiotics. At the cellular level, she conducts research on energy metabolism, oxidative stress, inflammatory and degenerative processes.

In vitro effect of acetylcholinesterase inhibitor donepezil on prostaglandin E2 and thromboxane B2 concentrations and on cyclooxygenases expression in THP-1 macrophages

Marta Goschorska* Ph.D., M.D., Irena Baranowska-Bosiacka Prof., Izabela Gutowska Prof., Maciej Tarnowski Prof., Katarzyna Piotrowska Ph.D., Emilia Metryka Msc, Krzysztof Safranow Prof., and Dariusz Chlubek Prof.,
Pomeranian Medical University, Szczecin, Poland.

Pathogenesis of neurodegenerative diseases (i.e. Alzheimer's disease) is supposed to be associated with neuroinflammation involving the activation of i.e. macrophages. Macrophages are a diverse group of cells which includes microglia in the central nervous system. Beyond macrophages prostaglandin-peroxide synthases - cyclooxygenases: cyclooxygenase 1 (COX-1) and cyclooxygenase 2 (COX-2) play a key role in inflammation.

One of the most commonly used drugs for the treatment of Alzheimer's disease is donepezil, a selective noncompetitive acetylcholinesterase inhibitor. The anti-inflammatory properties of donepezil on microglia have also been demonstrated, suggesting a more complex mechanism of their action.

The aim of this study was to examine the effect of donepezil on the concentrations of prostaglandin E2 and thromboxane B2 and on the activity and expression of cyclooxygenases in THP-1 macrophages.

The experiments were performed using macrophages obtained from the THP-1 monocytes. The monocytes were cultured in RPMI-1640 medium with the addition of 10% PBS and penicillin and streptomycin, at a temperature of 370C. The macrophages were obtained after 24 hours of incubation with PMA. Donepezil was used at the concentrations of 20 ng/ml (D1) and 100 ng/ml (D2). Drug concentrations were selected on the basis of plasma concentrations of patients receiving the lowest and maximum recommended doses. To the estimation of the PGE2 concentration in cell supernatants a PGE2 immunoassay kit was used. TXB2 concentration was determined by TXB2 immunoassay kit. Cyclooxygenases expression was determined by confocal microscopy. Expression of Ptgs1 and Ptgs2 genes was estimated by qRT-PCR method. In statistical analysis Shapiro-Wilk W-test and Wilcoxon matched-pair test were used. The value of $p<0.05$ was considered significant.

Exposure to 20 ng/ml of donepezil (D1) resulted in decrease in the concentration of PGE2 and decrease in the TXB2 concentration in cells supernatants. The decrease in COX-1 and COX-2 proteins expression was confirmed by fluorescence microscopy. Reduction of the COX-1 and COX-2 mRNA expression was also observed. In the cells cultured with donepezil at the higher concentration (100ng/ml) (D2) decrease in PGE2 and TXB2 concentrations was observed. Fluorescence microscopy confirmed a significant decrease in the COX-1 and COX-2 proteins expression as well as COX-1 and COX-2 mRNA expression.

The results of this study suppose the anti-inflammatory effects of acetylcholinesterase inhibitor donepezil used both in lower and higher concentrations. This observation is valuable because in current literature there are no reports on the influence of donepezil, a key medicament in the treatment of Alzheimer's disease and other types of dementia, on the levels of PGE2 and TXB2 and on the expression of protein and mRNA of cyclooxygenases.

Audience Take Away:

- The audience will have an opportunity to learn about suggested anti-inflammatory properties of donepezil, one of the most commonly used acetylcholinesterase inhibitors.
- The results of this study appear significant in clinical practice. The inflammation is the process being involved in the pathogenesis of neurodegenerative diseases or dementias. Dementias are common problem among populations of the developed countries. The suggested novelty properties of the acetylcholinesterase inhibitors can appear, as mentioned above, with the important role in treatment of many diseases.

Biography

Marta Goschorska works at the Department of Biochemistry and Medical Chemistry at the Pomeranian Medical University, Szczecin Poland. She is a researcher and university teacher. She also works as the physician neurologist. In 2007 she graduated Pomeranian Medical University and started her work as a physician. Marta Goschorska received her PhD from the Pomeranian Medical University in 2009. In 2014 she passed her medical specialty exam and became a physician specialist in neurology. As the researcher she is especially interested in neurobiology and neurobiochemistry. She works on the neuroinflammation, antioxidant systems, oxidative stress and potentially proinflammatory factors in nervous system. Marta Goschorska is the coauthor of many scientific articles published in journals with impact factor. She is the member of the Polish Biochemical Society and Polish Neurological Society.

Role of fluoride in changes of metalloproteinases activity in brain

Izabela Gutowska* Prof., Irena Baranowska-Bosiacka Prof., Agnieszka Łukomska Ph.D., Marta Goschorska Ph.D., M.D., Karolina Dec Ph.D., Maciej Tarnowski Prof., Anna Pilutin Ph.D., Bosiacki Mateusz.
Pomeranian Medical University, Szczecin, Poland.

Fluorine is a strong neurotoxin which causes the degeneration of structures such as hippocampus, prefrontal cortex, and cerebellum. Fluorine exposure inhibits the activity of brain receptors and decreases the production of neurotransmitters. Exposure to fluorine in childhood can decrease the intelligence quotient and causes problems with learning and concentration. The Extracellular Matrix (ECM) of the central nervous system serves as the environment for neurons and glial cells, and at the same time, it plays the role of a modifier of these cells. Changes in the structure and the functioning of synapses are caused by ECM enzymes. These enzymes, especially matrix metalloproteinases (MMPs), accompany both physiological processes, such as learning or memorizing, and pathological processes. Metalloproteinases 9 and 2 (MMP-9 and MMP-2) seem to be particularly interesting. Also, tissue inhibitors of metalloproteinases-3 and -2 (TIMP-3 and TIMP-2) are very important in the process of neuroplasticity.

There is no data regarding the influence of low concentrations of fluorine on the expression of proteins of these enzymes and their inhibitors in the brain. The aim of the research is to analyze the role of MMP-9, MMP-2 and their inhibitors TIMP-3 and TIMP-2 in the neurotoxicity of fluorine.

In the research, the rats were exposed to sodium fluoride (50 mg/L) already in the prenatal period until they reached the age of three months. After this time, the hippocampus, prefrontal cortex, cerebellum, and striatum were collected. In all of the aforementioned structures, the expression of proteins MMP-9, MMP-2, TIMP-3 and TIMP-2 was carried out by means of ELISA. Gene expression of these enzymes was carried out using RT real time PCR. The immunolocalization of these proteins was performed using immunohistochemistry and microscopic visualization.

On the basis of the results, it can be concluded that fluorine influences the expression of MMP-9, MMP-2, TIMP-3 and TIMP-2. In the study group, a statistically significant expression of MMP-2 was observed in the prefrontal cortex, striatum, and cerebellum, and a decrease in the expression of MMP-9 was noted in the prefrontal cortex and cerebellum in relation to the control group. We also saw the difference between TIMP-3 and TIMP-2 levels in the study group compared to control.

Our research suggests that changes in the expression of metalloproteinases and their inhibitors in the brain, caused by fluorine, could be an important factor of neurotoxicity of fluorine. The disorders of neuroplasticity processes can be considered as a biochemical basis for the decrease in the intelligence quotient caused by fluorine.

Audience Take Away:

- The audience will have an opportunity to learn about suggested molecular mechanisms of fluoride (F-) neurotoxicity.
- The results of this study appear significant in clinical practice. Previous studies have provided evidence for an association between the elevated levels of fluoride (F-) in the blood in children and impaired memory, concentration, learning, and lowered IQ.
- This work shows for the first time that exposure to fluoride in early life can disrupt neuroplasticity processes and it can be considered as a biochemical basis for the decrease in the intelligence quotient caused by fluorine.

Biography

Izabela Gutowska, PhD, Associate Professor at the Department of Biochemistry and Human Nutrition, Pomeranian Medical University in Szczecin.

The author and co-author of 259 scientific publications with the total impact factor: 167.188. Her research interests, associated with broadly understood biochemistry, from the beginning have concerned mineral metabolism of humans and animals, with particular emphasis on fluoride metabolism. Much of the research has addressed the impact of various factors on the metabolism of trace elements in humans and animals. In parallel with research on ecotoxicology and mineral metabolism in human and animal tissues, she also researched fatty acids and their metabolites in vitro and in vivo. For several years, she have been mainly interested in the effect of fluoride and lead on the metabolism of eicosanoids in macrophages and in brain, which may lead to the development of inflammatory-proliferative process.

Astrocyte Reactivation is Concerned in BBB Recovery from Breakdown

Hiroko IKESHIMA-KATAOKA*[1, 2], Motoko FURUKAWA[2], Sayaka INUI[2], Manae IMAMURA[2], Yoko HONJYO[2], Masato YASUI[2]
[1]WASEDA University Faculty of Sci. and Engineering. Japan, 2Keio University Sch. Med, Japan.

Brain is not easy to cure when it has damage or inflammation occurs, because neurons are never regenerate after the degeneration. We have been focusing on one of the glial cells, astrocytes which has the important role in the central nervous system to transfer some of the nutrition or Ca2+ signaling between neurons and blood vessels. However, astrocytes become active when the brain had injury or inflammation though the functional significance of the astrocytic activation is not yet clarified. To examine the functional role of reactive astrocytes, we used some of the gene deficient mice with stab wound injury on the cerebral cortex with needle from rostral to caudal axis. By the immuno-fluorescent analysis on the brain sections using antibody against bromo-deoxy-uridine for proliferating cells, GFAP for astrocytes, Iba1 for microglial cells, and IgG for blood brain barrier breakdown, IgG leakage level and reactivation level was almost correlated. Furthermore, expression levels of some molecules concerned in the BBB integrity was well paralleled to IgG leakage. From these results, reactivation of astrocytes might be concerned in recovery of BBB breakdown caused by stab wound injury to the brain.

Audience Take Away:

- Glial cell become active when the brain had injury or inflammation.
- The molecules related to the BBB integrity is down regulated just after the stab wound but recovered in 7 days after the injury.
- astrocyte reactivation can be examined with GFAP immunofluorescent analysis and real time PCR method.

Biography

Dr. Ikeshima-Kataoka was graduated from Keio Univ. Sch. Med. (Dept. of Microbiol.) and got Ph.D. on the functional analysis of calmodulin genes using transgenic mice. At the National Institute of Neuroscience researched on the molecular mechanism of neuronal development using fly genetics. Then, promoted back to Keio Univ. Sch. Med. (Dept. Neuroanat.) and started to focus on the "reactive astrocytes" in injured mouse brain. At Jikei Univ. Sch. Med., focus on neuroimmunological analysis in injured brain. Promoted back to Keio Univ. Sch. Med. (Dept. Pharmacol. & Neurosci.) and found that some important molecules are concerned in neuroimmunological functions of astrocytes. Now, using in vivo imaging with mouse to analyze functional role of "reactive astrocytes" at Waseda Univ., Facul. Sci. and Engin.

Culprit Lesions Responsible for Impaired Visual Perception in Post-stroke Patients

Hyun Im Moon*, M.D., Seo Yeon Yoon, M.D., Tae Im Yi, M.D., Yoon Jeong Jeong, M.D., Tae Hwan Cho, M.D.
Bundang Jesaeng Hospital, Republic of Korea

Introduction: Visual perception (VP) is a process that involves 'visual acceptance' and 'visual cognition' through interaction between multiple areas in the human brain. About 35-75% of patients with brain damage have particular impairments in VP that influence the activities of daily living. We aimed to clarify the clinical characteristics that affects on VP and elucidate the lesion location correlated with impaired VP such as visual discrimination, form consistency, visual short term memory, visual closure, spatial orientation assessed with 3rd version of motor-free visual perception test (MVPT-3).

Methods: We reviewed 91 patients with stroke. Clinical assessments such as Korean version of Mini-mental status exam (K-MMSE), MVPT-3, functional independence measure (FIM) were used to evaluate the impairment and limitation of patients after stroke. The patients were divided into 2 groups according to lesioned hemisphere, and we analyzed the differences in characteristics such as demographic factors, lesion factors, cognitive function, and visual perception. Regression analyses were performed to examine the predictors of impaired VP. Lesion location and volume were measured on brain magnetic resonance images. We generated statistic maps of lesions related to impaired VP in swallowing using voxel-based lesion symptom mapping (VLSM).

Results: The group of patients who have right hemispheric lesion had significantly low VP function, especially in subscore of visual discrimination and visual short-term memory. Also, in a regression model, impaired VP was predicted with low K-MMSE, age, and lesioned hemisphere. Using VLSM, we found the lesion location to be associated with impaired VP after adjusting for age and K-MMSE score. Although these results did not reach statistical significance, they showed the lesion pattern with predominant distribution in the right parietal lobe and deep white matter.

Conclusion: Impaired VP in post-stroke patients was not negligible clinically. Patients' age and cognitive impairments affect the result of VP test. Even when adjusting it, we found a trend that the lesion responsible for impaired VP was located in the right parietal lobe and deep white matter, though the association did not reach significance. It confirms the right hemispheric dominance for VP using VLSM. The deficits in white matter lesion might be related to disconnection of fibers.

Audience Take Away:

- The present study demonstrates that cognitive impairment could affect on the visual perception in post-stroke patients. Moreover, these effects were independent of gender, type of stroke, lesion location, and lesion volume in a regression model.
- Previous studies about lesion location and visual perception were focused on the viuospatial neglect. However, in this study, we analyzed the lesion location correlated with various subscore of visual perception test such as visual discrimination, form consistency, visual short term memory, visual closure, spatial orientation.
- We used the voxel-based lesion symptom mapping (VLSM) technique. Recently, numerous studies dealing with brain mapping have used the VLSM technique. VLSM is able to statistically assess a lesion's effect on behavioral scores on a voxel-by-voxel basis.

Biography

Hyun Im Moon is a graduate of Korea University College of medicine. I trained in Physical Medicine and Rehabilitation at the Korea University Medical Center and was board certified in rehabilitation medicine. I started working at Bundang Jesaeng General Hospital. My practice specialized in the neurorehabilitation and electrodiagnosis. My interests also include neuroimaging analysis and prediction of prognosis of brain injured patients such as stroke, TBI. My recently published articles were as follows; "Lesion location associated with balance recovery and gait velocity change after rehabilitation in stroke patients", "Periventricular White Matter Lesions as a Prognostic Factor of Swallowing Function in Older Patients with Mild Stroke", "Sonography of Carpal Tunnel Syndrome According to Pathophysiologic Type: Conduction Block Versus Axonal Degeneration" and so on.

The role of red blood cell as a participant in vasoregulation in the patients with ischemic stroke

Kruchinina M. V*., Doctor of Sc.[1], Gromov A. A., Ph.D.[1], Generalov V. M, Doctor of Sc.[2], Kruchinin V. N., Ph.D.[3], Volodin V.A., Doctor of Sc. [3,4]

[1] Research Institute of Internal and Preventive Medicine - Branch of the Institute of Cytology and Genetics, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Boris Bogatkov

[2] The State Research Center of Virology and Biotechnology VECTOR, Novosibirsk region, Koltsovo

[3] Institute of Semicontuctor Physics named after A.V. Rzhanov, Novosibirsk, Akademic Lavrentev av.,

[4] Novosibirsk State University, Novosibirsk, Russia

The aim of the work was to assess the red blood cell (RBC) role as a participant in vasoregulation in the patients with ischemic stroke (IS) from two points: first, as a direct deliverer of NO and a stimulator of NO-release via RBC generated ATP.

Materials and methods: 467 patients (49,1+4,7 years old) with IS at its sub-acute or residual stage and 35 healthy controls were included into the study. The study of RBC properties was performed by dielectrophoresis, chromatography, 31P NMR spectroscopy. Changes in the content of Hb complexes were studied by Raman spectroscopy.

Results: IS patients had marked disturbances of RBC deformability (low amplitude of deformation at the background of high summarized rigidity, viscosity), RBC's membrane characteristics (high electrical conductivity, low capacitance), low surface electric charge (reflected as the low dipole moment, the speed of RBC movement to electrodes) ($p<0,0001$-$0,05$), the last one correlated with the level of Von Wilebrand factor ($r=0,72$, $p<0,033$). These changes were associated with high levels of cholesterol fraction, an index of cholesterol/phospholipids in RBC membranes against decrease in total lipids, easily oxidable PHL, omega-3 index ($p<0,0001$-$0,02$).

We found low levels of intracellular macroergs (2,3-DPG, alpha-, beta-, gamma-ATP) in rigid RBC in IS patients than those in controls ($p<0,0001$-$0,05$). In patients with IS the content of the Hb-NO (II) complexes were sharply reduced ($p<0,01$-$0,05$), which led to a significant reduction in oxygen discharge and reflected the decline reserves of erythrocyte NO. Under hypoxic conditions as in the case of ischemic stroke, it is apparent that the RBC does release both ATP and NO. Is it possible that one of the molecules (ATP) is designed to stimulate NO in the endothelium, while the NO derived directly from the RBC has another function - to inhibit platelet aggregation in the presence of high levels of ATP being secreted by the RBC under hypoxic conditions. At the same time we revealed elevated levels of platelet aggregation with different types of inductors in patients with IS ($p<0,01$-$0,02$) as well as leukocytic-and-platelet aggregation ($p=0,04$). Probably the changed parameters of RBC in patients with IS contribute to the altered vasoregulation.

Conclusion: The decline reserves of intracellular NO, macroergs in rigid RBC in patients with ischemic stroke has been revealed. This fact as well as altered release of these compounds, associated with low deformability of RBC, may lead to modified vasoregulation in ischemic stroke.

Audience Take Away:

- This study demonstrates the possible pathogenetic mechanisms of the development of ischemic stroke, shows the role of red blood cells, which can be useful for expanding research, education.
- The results show new information, significant for the development of cerebrovascular pathology.
- Potentially, this study determines the new prospects for therapy.

Biography

Kruchinina Margarita Vitalievna , graduated from Novosibirsk Medical Institute, Russia, "medical case" in 1989, specialty "doctor", diploma with honors. I studied in Residency in Therapy in 1989-1991, Postgraduate course on Therapy in 1991-1994, Doctorate in 2002-2005 (Institute of Internal Medicine SB RAMS, Novosibirsk). I defended my doctoral thesis in 2007(Doctor of Medical Sciences, Diploma DDN № 003697). From 2009 to the present time I am Leading researcher of Research Institute of Internal and Preventive Medicine – Branch of Federal State Budget Scientefic Institution The Institute of Cytology and Genetics, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia. I am the author of more than 120 publications, including 1 monograph, 5 teaching aids, 8 patents. Areas of scientific interests are microcirculation, rheology, membrane disorders in cerebrovascular, cardiovascular pathology, diagnosis of diffuse liver pathology, oncopathology.

The neuroprotective effect of 1-methyl-1,2,3,4-tetrahydroisoquinoline against perinatal exposure of fluorine

Agnieszka Wąsik* PhD, Irena Romańska Msc and Prof. Lucyna Antkiewicz-Michaluk
Polish Academy of Sciences, Department of the Neurochemistry, Kraków, Poland

Background: Human population living in urban environment is exposed to excessive levels of toxins, such as fluorine (F). Fluorine present in excess, e.g. in water or soil have a strong impact on living organisms. Passing through the blood-brain barrier, it damage the central nervous system (CNS). It is especially dangerous for young animals and children, because in these organisms the blood-brain barrier is still not mature. 1-Methyl-1,2,3,4-tetrahydroisoquinoline (1MeTIQ) is an endogenous compound, which exhibits the neuroprotective, antidepressant-like effect and MAO-inhibiting properties.

Methodology: The aim of the present study was to investigated the impact of acute and chronic (once during 14 days) treatment of 1MeTIQ (50 mg/kg i.p.) on the disturbances in dopamine metabolism and release evoked by perinatal exposure of fluorine. The fluorine (NaF) model involves the administration of sodium fluoride in drinking water to pregnant rats and born pups till 1 month of age i.e. to sexual maturity. We performed both ex vivo and in vivo microdialysis study. The dopamine and its metabolites were assayed in dialysates or in the tissue using HPLC with ED.

Results: The present ex vivo study showed that perinatal exposure to fluorine caused not significant increase the concentration of DOPAC and HVA in the frontal cortex and this effect was completely inhibited by chronic treatment with 1MeTIQ. Additionally, fluorine induced decrease of NA and 5-HT concentration in the nucleus accumbens and this effect was also reversed by chronic 1MeTIQ administration. Moreover, the in vivo microdialysis study indicated that exposure to fluorine induced significant elevation in DOPAC and HVA concentration in the extracellular space. This toxic effect was completely blocked by chronic treatment with 1MeTIQ.

Conclusions: 1MeTIQ has shown the neuroprotective activity in animal model of fluorine poisoning. The mechanism responsible for the neuroprotection of 1MeTIQ against fluorine toxicity may be connected with the antagonism to fluorine-induced oxidative stress and reduction of free radicals production in the rat brain structures.

Audience Take Away:

- The impact of fluorine on the central nervous system (CNS)
- The methodology of microdialysis in vivo study
- The neuroprotective properties of 1-methyl-1,2,3,4-tetrahydroisoquinoline

Biography

Agnieszka Wąsik PhD, from 2007 to currently employed as assistant in the Department of Neurochemistry, Institute of Pharmacology of the PAS in Kraków. Author of 88 publications, including 27 original article. I conduct research in the field of neuropsychopharmacology. The scientific interests are focused around research of endogenous amines from tetrahydroisoquinoline (TIQs) family e.g. anti-addictive potential of 1MeTIQ; neuroprotective potential of 1MeTIQ measured in the different animal models of Parkinson's disease; evaluation of toxic effects produced by salsolinol and 1BnTIQ; antidepressant-like effects of TIQs measured in the different animal models.

The participation of dystrophin Dp40 and Dp40L170P in the neuronal differentiation process of PC12 cells

César García-Cruz*[1], M. Sr; Candelaria Merino-Jiménez[1], Ph. D; Víctor Ceja[1], B. Sr; Brenda Gonzalez-Assad[1], M. Sr; Jorge Aragón[1], Ph. D; Juan Pablo Reyes-Grajeda[2], Ph. D; and Cecilia Montañez[1], Ph. D
[1]Departamento de Genética y Biología Molecular, Centro de Investigación y de Estudios Avanzados del IPN, México
[2]Instituto Nacional de Medicina Genómica, Ciudad de México, México

Dystrophin Dp40 is the shortest dystrophin described to date. Role of this protein in the cognitive impairment described in patients with Duchenne Muscular Dystrophy (DMD) is still unclear. Dp40 is expressed in a ubiquitous manner from the same promoter for dystrophin Dp71 (Tinsley et al., 1993). This protein interacts with presinaptic proteins as VAMP2 (Vesicle-associated membrane protein), sintaxin 1A and SNAP25 (Tozawa et al., 2012). Dp40 is mainly located at the membrane and nucleus of hippocampal neurons and is expressed in post-natal stages to adult mouse brain (Fujimoto, 2014), and accumulates in the nucleus during the neuronal differentiation process of PC12 cells, while the mutant Dp40L170P promotes a nuclear distribution in undifferentiated and NGF-differentiated cells through transient transfection.

To explore the role of Dp40 in neuronal differentiation, our group has obtained the PC12-Dp40, PC12-Dp40L170P and PC12-control cell lines that stably and inducible express the recombinant proteins Myc-Dp40, Myc-Dp40L170P and Myc respectively. The morphometric analysis of these clones showed that overexpression of Dp40 promotes the neurite outgrowth during the NGF-differentiation of PC12 while overexpression of Dp40L170P decreases the neurite outgrowth compared to PC12-control and PC12-Dp40 cells. As a next step, a protein expression profile through two dimensional gel electrophosis was performed comparing PC12-Dp40L170P and PC12-control in NGF-differentiated cells. Eight proteins up-regulated in PC12-Dp40L170P were identified by mass spectrometry; S100a6 and alpha-internexin (Int) neurofilament were the proteins mostly increased. It has been speculated that S100a6 regulates the actin cytoskeleton and Int is related to immature neurons (Faussone et al., 1999) and filament inclusion in neurons (Cairns et al., 2004). The expression of neurofilament light chain (NF-L) as a differentiation biomarker and HspB1 as a polymerization promoter of actin was verified. NF-L is lowly expressed in undifferentiated while in NGF-differentiated is increased in PC12-control compared to PC12-Dp40 and PC12-Dp40L170P cells. On the other hand, HspB1 was not detected in undifferentiated and is little expressed in NGF-differentiated cells. Additionally, we observed a significant increase of VAMP-1/2 in PC12-Dp40 cells compared to PC12-control and PC12-Dp40L170P NGF-differentiated cells.

Thus, our results suggest that dystrophin Dp40 could be related with the synaptic vesicle exocytosis and the mutation in the amino acid 170 may disrupt this process. In addition, mutant Dp40L170P could generate damage or immature neurons through overexpression of alpha-internexin that alter important cellular processes as neuronal differentiation.

Audience Take Away:

- The audience will learn that dystrophin Dp40 increases the neurite outgrowth while mutant Dp40L170P has an inhibitory effect on this function. They will also learn an approach to characterize dystrophin mutations involved in cognitive impairment.
- The use of neuronal cell models in the Duchenne muscular distrophy simplifies the characterization of factors involved in this disease.
- To know the specific participation of dystrophin Dp40 in cognitive impairment could help to design new therapy approaches.

Biography

In 2011 I finished the Bachellor in Biology at the Univerdad Veracruzana in México. Subsequently, in 2012 I carried out a Master in Science degree in Genetics and Molecular Biology at the Centro de Investigaciones y de Estudios Avanzados del IPN (CINVESTAV) in México. Currently, since 2014 I am a PhD student at the Department of Genetics and Molecular Biology at CINVESTAV, Mexico.

Intraperitoneal injection of VUF-8430 in mice induced a decrease in CREB and CREB phosphorylation levels in the cerebellar vermis and prefrontal cortex, but not in amygdala and hippocampus.

C.E.M. Fernandesa*; K.R. Serafima, A.C.L. Gianlorenco and R. Mattiolia
a* Laboratory of Neuroscience, Physiotherapy Department, Center of Biological Sciences and Health, Federal University of Sao Carlos, SP, Brazil.

Histamine H4 receptors agonist VUF-8430 have been shown participate in emotional memory. In the present study, the aim was to verify if the intraperitoneal (i.p.) injection of VUF-8430 (1.48 nmol; 10 ml / kg) in mice, acts on the protein synthesis required in memory consolidation processes, activating the phosphorylation of CREB (pCREB) in classical structures linked to emotional memory (prefrontal cortex, amygdala and hippocampus) and the cerebellar vermis, a structure that is recently also had its role attributed to emotional memory, using the Western blotting technique. The results obtained demonstrated that VUF-8430 induced a decrease in CREB and pCREB levels in the cerebellar vermis and prefrontal cortex of the animals, suggesting that this dose impaired the activation of cell signaling pathways in these structures. However, there was no change in this protein expression in the amygdala and hippocampus. These results can be attributed to a feedback between anatomically distinct neural circuits that promote the modulation of signaling pathways associate to emotional memory.

Histamine improves mice rota-rod performance through H1 and H2 receptors in the cerebellar vermis

B. Silva-Marquesa*, E.M. Guilhermea, A.C.L. Gianlorençoa R. Mattiolia.
Federal University of Sao Carlos, 13565-905, Sao Carlos, Brazil.

The neural histaminergic system innervates the cerebellum, with high density of fibers in the vermis and flocculus. Experimental evidence indicates that cerebellum is involved in various non-motor as well as motor operations. However, the role of histaminergic system in these functions is not clear. Since our recent results have demonstrated the participation of the cerebellar histaminergic system in the consolidation of emotional memory, this study aims to investigate a possible interaction of this system in processing motor and non-motor function. First of all, we've conducted an experiment to investigate the dose-dependent effects of histamine, H1-receptor antagonist chlorpheniramine and H2-receptor antagonist ranitidine microinjected in the cerebellar vermis on motor performance and motor learning in mice. For this, we used Swiss albino mice (weighing 25-35g) and maintained in a thermoregulated environment. The drugs used were histamine (0.54nmol, 1.36nmol, 2.72nmol and 4.07nmol), chlorpheniramine or CPA (0.016 nmol, 0.052 nmol, 0.16 nmol), ranitidine (0.57 nmol, 2.85 nmol e 5.7 nmol) and saline 0.9%. After being anesthetised, a guide cannula was implanted into the cerebellar vermis following coordinates from the mouse brain atlas of Paxinos and Franklin. The protocol was divided in five steps, which were named habituation, microinjection, stage 1, stage 2, and stage 3. Twenty four hours later, the animals received a microinjection of saline or drugs. Five minutes later, the mice were submitted to stage 1, where they were placed in rota-rod and in the balance beam, each for 3 times, with 5 minutes of rest between each time. The protocol was repeated 4h later for stage 2 and repeated again 24h later for stage 3. Statistical analysis included the homogeneity test and multi-factor analysis of variance (ANOVA) followed by Duncan's Multiple Range test. A p value of ≤0.05 was required for significance. The results showed a possible facilitation of histamine at the highest dose in the evaluation of learning and motor performance in the rota-rod. In addition, the results showed an impairment when tested at the 0.052 dose of CPA and at the lowest doses of ranitidine. This suggests that cerebellar histaminergic projections are involved in motor learning and make a modulating role in the cerebellar circuit to ensure that movements are performed efficiently.

Co-treatment with antidepressants and aripiprazole reversed the MK-801-induced schizophrenia-like behavior in rats

[1, 2]Zofia Rogóż* Ph.D., [1]Kinga Kamińska Ph.D. student
[1]Institute of Pharmacology, Polish Academy of Sciences, Kraków, Poland,
[2]The Podhale State Higher Vocational School, Institute of Health Sciences, Faculty of Cosmethology, Nowy Targ, Poland

Schizophrenia is a devastating psychiatric disorder that impairs mental and social functioning and affects approximately 1% of the world's population. It is known that in contrast to pharmacotherapy with typical antipsychotics, atypical antipsychotic agents alleviate not only the positive symptoms of schizophrenia but also the negative ones, but those effects are small and mechanisms of this action are still unknown. A few clinical reports have suggested that antidepressant drugs are able to augment the activity of atypical antipsychotic drugs, thus effectively improving treatment of the negative and some cognitive symptoms of schizophrenia. Thus, the aim of the present study was to investigate the effect of antidepressant escitalopram or mirtazapine and aripiprazole (an atypical antipsychotic), given separately or jointly, on the deficits induced by MK-801(a noncompetitive N-methyl-D-aspartate receptor antagonist) in the social interaction and in novel object recognition tests in male Sprague-Dawley rats. The social interaction was measured for 10 min, starting 4 h after MK-801 (0.1 mg/kg, sc) administration. In the novel object recognition test rats were tested for the ability to discriminate between an old, familiar and a novel object. Antidepressants and aripiprazole were given 30 min before MK-801, and MK-801 (0.1 mg/kg, ip) was administered 30 min before the first introductory session. Memory retention was evaluated for 5 min, starting 60 min after the introductory session. WAY 100635 (a 5-HT1A antagonist, 0.1 mg/kg, sc) and SCH 23390 (a dopamine D1 antagonist, 0.25 mg/kg, ip) were give 20 min before the tests. The present results showed that MK-801 (0.1 mg/kg)-induced deficits in the social interaction test and decreased memory retention in the novel recognition test. Aripiprazole (0.3 mg/kg) reversed those effects. Co-treatment with an ineffective dose of aripiprazole (0.03 mg/kg) and escitalopram and mirtazapine (5 mg/kg, ip) abolished the deficits evoked by MK-801, and those effects were partly blocked by a 5-HT1A receptor antagonist (WAY 100635) or a dopamine D1 receptor antagonist (SCH 23390). The obtained results suggest that ameliorate the antipsychotic-like effects of aripiprazole by antidepressants in the MK-801-induced deficits in the social interaction and memory retention may associated with serotonin 5-HT1A and dopamine D1 receptors.

Audience Take Away:

- We suggest that ameliorate the antipsychotic-like effects of aripiprazole by antidepressants in the MK-801-induced deficits in the social interaction and memory retention may associated with serotonin 5-HT1A and dopamine D1 receptors what may be useful in the clinical practice.

Biography

I began the work in Institute of Pharmacology, Polish Academy of Sciences, where I am continuing my research up to the present. In 1999 I received my Ph.D., and in 2008 title of associated professor. Until 2002 the studies of our group were focused on the search of the mechanism of action of antidepressants. Currently we are interested the mechanism of action of a combination of a low dose of atypical antipsychotic drug such as risperidone or aripiprazole and antidepressants, in behavioral and biochemical tests. Throughout all period of my research I published 142 papers (Rogoz Z; Index H 28).

The amygdala modulates H1-induced memory retrieval deficit via nicotinic acetylcholine receptors

K.R. Serafim*a, C.E.M. Fernandes and R. Mattioli
aPhysiotherapy Department, Center Universitary Central Paulista, Brazil.
*Laboratory of Neuroscience, Physiotherapy Department, Center of Biological Sciences and Health, Federal University of Sao Carlos, Brazil.

Pharmacological studies have demonstrated that histaminergic and nicotinic cholinergic receptors modulate the mechanisms involved in the amygdala-dependent memory formation. The aim of the present study was to investigate whether an agonist of the alpha 7 nicotinic cholinergic receptor (PNU-282987) into the amygdala reverses the emotional memory retrieval deficit induced by an H1 receptor antagonist (Chlorpheniramine-CPA) in an inhibitory avoidance test. Forty adult male Swiss mice were bilaterally cannulated into the amygdala and memory retrieval was measured in an inhibitory avoidance apparatus. The animals received intra-amygdala combined microinjections of SAL or CPA (0.16 nmol), and 5 min later, microinjections of SAL or PNU (1.0 μg), prior retention test. The isolated microinjections of PNU-282987 facilitated the emotional memory, while the combined injections of PNU-282987 and CPA were able to reverse the deficit in memory retrieval induced by CPA. These results indicated that an interaction between the histaminergic and nicotinic cholinergic systems in the amygdala modulates aversive memory retrieval in mice.

Properties of the ovocystatin in APP/PS1 mice model

Bartłomiej Stańczykiewicz*, PhD[1], Maria Rutkowska, PhD[2], Marta Lemieszewska, MSc[3], Marta Jakubik-Witkowska, PhD[3], Prof. Jakub Gburek[4], PhD, Krzysztof Gołąb, PhD[4], Katarzyna Juszczyńska, MSc=, Aleksandra Piotrowska, PhD[5], Prof. Piotr Dzięgiel, MD, PhD[5], Prof. Tadeusz Trziszka, PhD[6], Prof. Joanna Rymaszewska, MD, PhD[3]

[1]Department of Nervous System Diseases, Faculty of Health Science, Wroclaw Medical University, Wroclaw, Poland
[2]Department of Pharmacology, Wroclaw Medical University, Wroclaw, Poland
[3]Division of Consultation Psychiatry and Neuroscience, Department of Psychiatry, Wroclaw Medical University, Wroclaw, Poland
[4]Department of Pharmaceutical Biochemistry, Wroclaw Medical University, Wroclaw, Poland
[5]Department of Human Morphology and Embryology, Wroclaw Medical University, Wroclaw, Poland
[6]Department of Animal Products Technology and Quality Management, Wroclaw University of Environmental and Life Sciences, Wroclaw, Poland

Cysteine proteases inhibitors play an important role in the neurodegenerative disorders. Cystatin isolated from chicken egg white, called ovocystatin has been widely used in pharmaceutical and medical research due to its structural and biological similarities to human cystatin C. Moreover, it has been recently suggested that ovocystatin has procognitive properties in young rats (Stańczykiewicz et al, 2017a), as well as may prevent aging-related cognitive impairment (Stańczykiewicz et al., 2017b). Thus, the presented study focused on the histochemical and biological evaluation of the ovocystatin properties in APP/PS1 transgenic mice, including cognitive functions' assessment. The study was conducted on transgenic B6C3-Tg(APPswe,PSEN1dE9)85Dbo/Mmjax mice. Ovocystatin was administered intraperitoneally for four weeks (at a dose of 40/ mouse) to 35-weeks-old transgenic (AD) and wild type (NCAR) mice. The locomotor activity and cognitive functions were determined using an actimeter and the Morris water maze test, respectively. Histopathological evaluation comprised antibodies directed against Beta-Amyloid (1:400, SIG-39320-1000, Covance), Tau (1:4000, AHB0042, Invitrogen), RBFOX3/NeuN (1:1000, NBP1-77686, Novus Biologicals) and CD107b (1:100, 108502, BioLegend). The study was conducted within the framework of the POIG 01.03.01-00-133/08 „Innovative Technologies of production of biopreparations based on new generations of eggs (OVOCURA)"- Task 8. Assessing the biological activity of the obtained biopreparations. It was expected that the study may provide a significant contribution to the development of research on neurodegenerative disorders, by describing their effects on cognitive function and biological activity. The authors will present the results of the study and key findings.

Audience Take Away:

- Ovocystatin may reduce memory impairment in the course of Alzheimer's disease,
- Ovocystatin might be suitable for nutritional adjuvant treatment of cognitive impairment,
- Ovocystatin appears safe in short-term use.

Biography

Bartłomiej Stańczykiewicz, MSc in Biology, MA in Psychology, PhD in Medicine Science. Currently works as an assistant professor at Department of Nervous System Diseases, Faculty of Health Sciences, Wroclaw Medical University, Poland. He defended his PhD thesis in 2014 at Department of Psychiatry (Wroclaw Medical University). A major focus of research is to identify the possible factors that inhibit pathology development in neurodegenerative disorders. Additionally, his interests include inflammation in schizophrenia-spectrum and neurodegenerative disorders, supportive biological and psychological approach in mood and anxiety disorders, as well as in aged-related cognitive impairments.

Impact of disease acceptance, life satisfaction and stress perception on the quality of life among multiple sclerosis patients - a preliminary study

Bartłomiej Stańczykiewicz* PhD, Aleksandra Kołtuniuk PhD, Aleksandra Pytel PhD, Robert Dymarek PhD, Prof. Joanna Rosińczuk PhD
Wroclaw Medical University, POLAND.

Multiple sclerosis (MS) is a chronic demyelinating disease of the nervous system, which is most often diagnosed between 20 and 40 years of age. The lack of known etiology, the young age of illness onset, a multitude of symptoms, and the lack of complete cure possibilities are real stressors that make it difficult to accept the disease and thus may affect the level of satisfaction with life. OBJECTIVE: To evaluate the impact of the level of illness acceptance, life satisfaction, and intensity of perceived stress on the quality of life (QOL) of MS patients treated with immunomodulatory drugs (IMD). DESIGN: This was a cross-sectional, prospective, observational study. METHODS: The study was conducted among 100 MS patients (62 women and 38 men) treated with IMD. The study used the World Health Organization Quality of Life Brief (WHOQOL-BREF) questionnaire for assessment of QOL, Acceptance of Illness Scale (AIS) for disease acceptance, Perceived Stress Scale (PSS-10) for stress intensity, Satisfaction with Life Scale (SWLS) for global life satisfaction, and a questionnaire of the author's design (ADQ) for socio-demographic data. RESULTS: Analysis of the research material showed that (1) women accept their illness significantly worse than men (20.1 and 26.3 points, respectively) ($p<0.05$); (2) along with the duration of the MS disease, the level of life satisfaction decreases ($p=0.007$); (3) over 40% of respondents defined the level of perceived stress as average; and (4) almost half of the respondents evaluated their QOL on a good or very good level. CONCLUSION: A high level of disease acceptance and satisfaction with life as well as a low level of perceived stress significantly affect the higher level of QOL in MS patients treated with IMD.

Audience Take Away:

- The high QOL of MS patients is one of the outcomes that testify to indicate a properly provided therapeutic process. Knowledge of factors significantly affecting QOL of MS patients allows to plan and coordinate the treatment, nursing care, and rehabilitation procedures more effectively.
- The high level of illness acceptance and life satisfaction positively affects the QOL of MS patients. Providing psychological care and displaying support allows MS patients to cope with the disease and contributes to the growth of a sense of satisfaction despite their obvious physical ailments.
- A high level of stress perception negatively affects QOL of MS patients. Therefore, implementation of preventive activities should be taken into account in the therapeutic process to assess the occurrence of stressors and their intensity as well as educational activities conducted in order to learn ways to manage stress with techniques and stress-management strategies.

Biography

Bartłomiej Stańczykiewicz, MSc in Biology, MA in Psychology, PhD in Medicine Science. Currently works as an assistant professor at Department of Nervous System Diseases, Faculty of Health Sciences, Wroclaw Medical University, Poland. He defended his PhD thesis in 2014 at Department of Psychiatry (Wroclaw Medical University). A major focus of research is to identify the possible factors that inhibit pathology development in neurodegenerative disorders. Additionally, his interests include inflammation in schizophrenia-spectrum and neurodegenerative disorders, supportive biological and psychological approach in mood and anxiety disorders, as well as in aged-related cognitive impairments.

Time course changes in mood disorders in mice after the systemic administration of lipopolysaccharide

Yong-Hyun Ko, MS, Bo-Ram Lee, MS, and Choon-Gon Jang*, Ph.D.
School of Pharmacy, Sungkyunkwan University, Korea

It has been well known that lipopolysaccharide (LPS) induces neuroinflammation in rodents. However, anxiety- and depressive-like symptoms induced by LPS are known to be controversial. In the present study, we performed various mood disorder experiments such as open field test (OFT), elevated plus maze (EPM), and tail suspension test (TST) at different hours to investigate the time course effects of LPS (0.83 mg/kg, i.p.) on behaviors in mice. The LPS-treated group showed a significant reduction in food intake after 6 and 24 h of treatments and water intake only after 24 h of treatment compared with the vehicle group. In addition, changes in body weight were significantly lower than those of vehicle group at 3, 6, and 24 h after LPS treatment. Also, LPS significantly induced hypothermia after 3 and 6 h in mice. However, these anorexia and sickness behaviors were recovered after 1 week. Additionally, LPS significantly increased anxiety-like behaviors at 1, 6, and 24 h after the administration in the OFT and EPM. Moreover, in the TST, treatment with LPS increased depressive-like behaviors in mice. However, all increases in LPS-induced behaviors substantially restored after 24 h. Surprisingly, changes in the TST were relapsed again after 1 week. Taken together, our results demonstrate that LPS causes sickness symptoms, which resulted in several mood disorder behaviors in mice. The effects of LPS were most severe at 1 and 6 h after administration, but recovered generally after 24 h, which remained until 1 week.7.

The Geriatric Psychiatry Inpatient: an Anatomy of Care

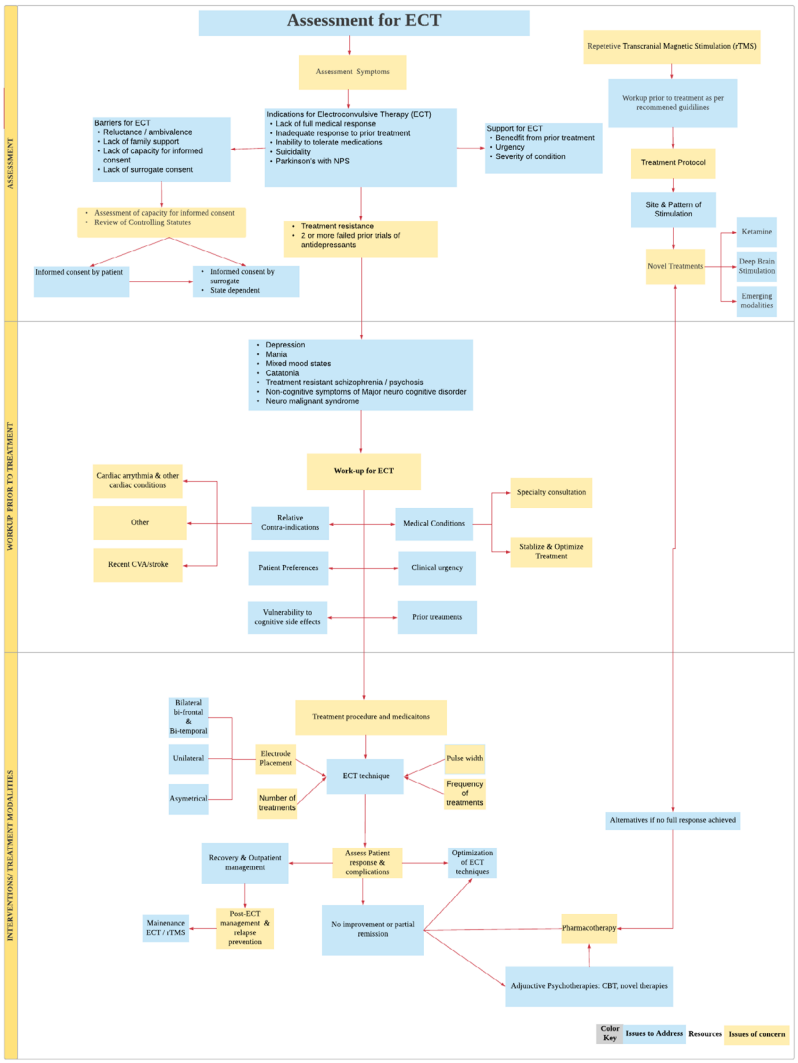
Howard. H. Fenn, MD
Stanford University, USA.

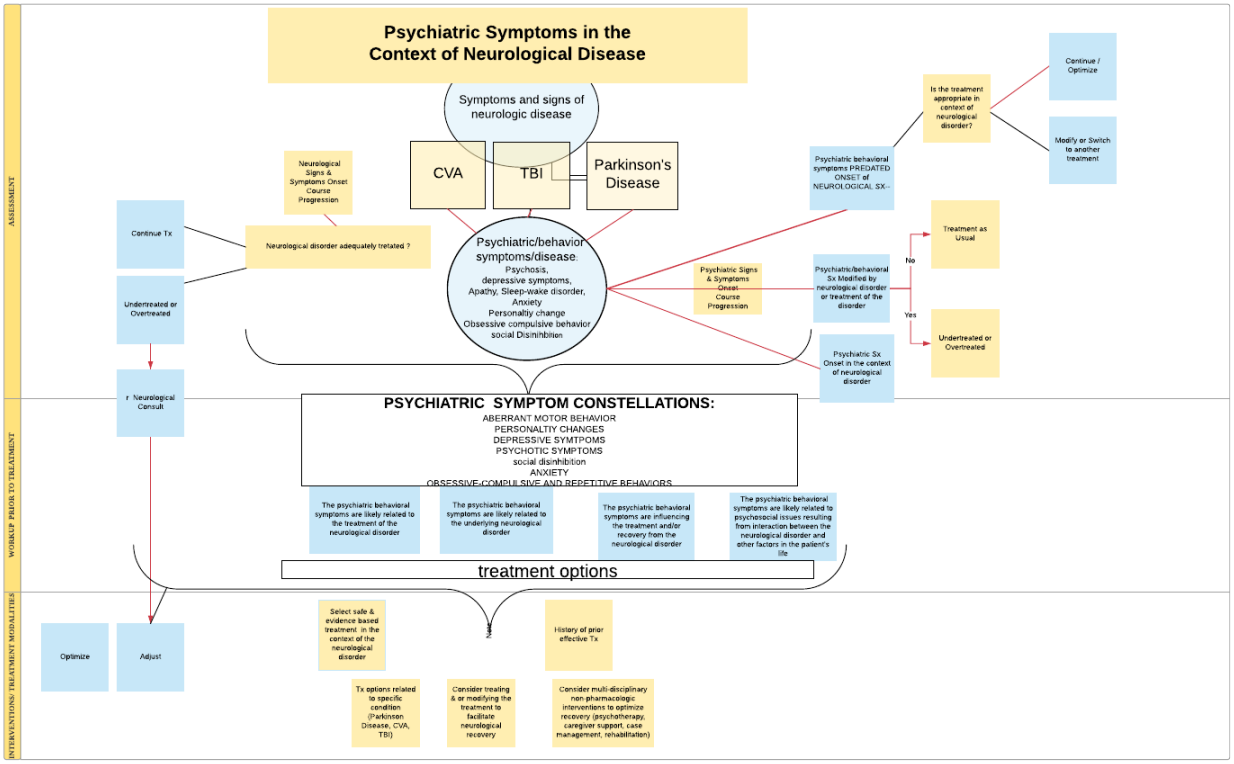
Treatment of the geriatric patient on an inpatient unit is among the most complex challenges in clinical psychiatry. The patient is at the nexus of a number of problems, all interacting in ways that are often impossible to parse: aging, neurocognitive decline, non-cognitive symptoms of dementia, acute and chronic medical symptoms, medication interactions, family dynamics, psychosocial losses, and psychiatric/behavioral symptoms. All factors interact to contribute to hospitalization, with the expectation of some clarification and/or resolution. This, in the context of hospitalization days limited by utilization review/insurance coverage, as well as conditions which have no certainty of definitive cure or even amelioration, is of the utmost challenge.

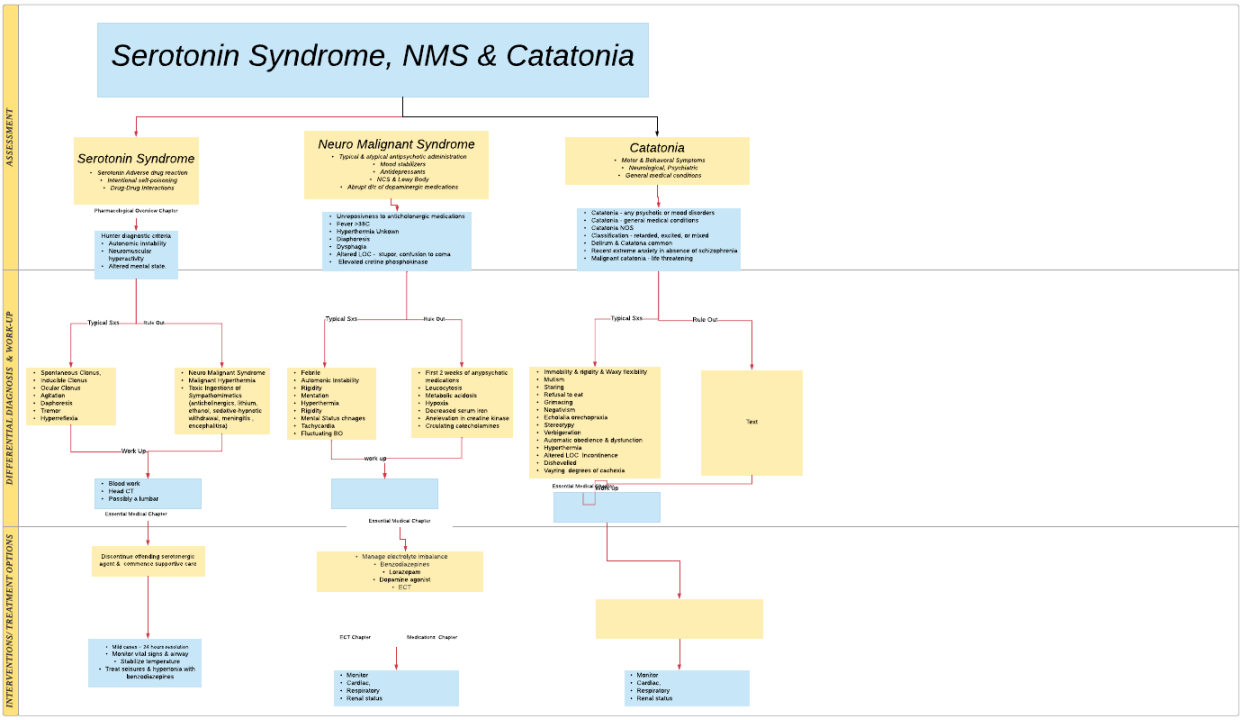
We have developed several algorithms, or Flow-Charts to describe the Decision-analysis of several of the most difficult and complicated inpatient psychiatric problems. The search for diagnoses, which is necessary and helpful, often does not permit the exploration of the interactions or borders of these problems. Hopefully, presentation of the decision-analysis, facilitates an understanding of the interfaces between these several problems.

We believe that the Flow-charts can also be used to illustrate to patients the process of assessment and decision-making, in a clear, understandable fashion.

SAMPLE FLOW-CHARTS:




Psychiatric Symptoms in the Context of Neurological Disease
ASSESSMENT
WORK-UP PRIOR TO TREATMENT
INTERVENTIONS/ TREATMENT MODALITIES
Symptoms and signs of neurologic disease
CVA
TBI
Parkinson's Disease
Neurological Signs & Symptoms Onset Course Progression
Continue Tx
Undertreated or Overtreated
Neurological disorder adequately treated ?
r Neurological Consult
Psychiatric/behavior symptoms/disease:
Psychosis, depressive symptoms, Apathy, Sleep-wake disorder, Anxiety
Personality change
Obsessive compulsive behavior
social Disinhibition
Psychiatric behavioral symptoms PREDATED ONSET of NEUROLOGICAL SX-
Is the treatment appropriate in context of neurological disorder?
Continue / Optimize
Modify or Switch to another treatment
Psychiatric Signs & Symptoms Onset Course Progression
Psychiatric/behavioral Sx Modified by neurological disorder or treatment of the disorder
No
Yes
Treatment as Usual
Undertreated or Overtreated
Psychiatric Sx Onset in the context of neurological disorder
PSYCHIATRIC SYMPTOM CONSTELLATIONS:
ABERRANT MOTOR BEHAVIOR
PERSONALTIY CHANGES
DEPRESSIVE SYMTPOMS
PSYCHOTIC SYMPTOMS
social disinhibition
ANXIETY
OBSESSIVE-COMPULSIVE AND REPETITIVE BEHAVIORS
The psychiatric behavioral symptoms are likely related to the treatment of the neurological disorder
The psychiatric behavioral symptoms are likely related to the underlying neurological disorder
The psychiatric behavioral symptoms are influencing the treatment and/or recovery from the neurological disorder
The psychiatric behavioral symptoms are likely related to psychosocial issues resulting from interaction between the neurological disorder and other factors in the patient's life
treatment options
Optimize
Adjust
Select safe & evidence based treatment in the context of the neurological disorder
History of prior effective Tx
Tx options related to specific condition (Parkinson Disease, CVA, TBI)
Consider treating & or modifying the treatment to facilitate neurological recovery
Consider multi-disciplinary non pharmacologic interventions to optimize recovery (psychotherapy, caregiver support, case management, rehabilitation)


Serotonin Syndrome, NMS & Catatonia
ASSESSMENT
DIFFERENTIAL DIAGNOSIS & WORK-UP
INTERVENTIONS/ TREATMENT OPTIONS
Serotonin Syndrome
Neuro Malignant Syndrome
Catatonia
Typical Sxs
Rule Out
Work Up
Essential Medical Chapter
Medications Chapter
ECT Chapter

Steps	Recommendations
Step 1	• Assessment of capacity to give informed consent to specific medication. • If capacity is present, document results and discuss with family, caregiver, significant others. • If capacity not present, institute procedure to obtain informed consent. • Document informed consent of family and caregivers, in addition to adjudicated surrogate.
Step 2	• Start Donepezil 5mg BID. • Cholinesterase inhibitors alone have not shown consistent evidence of any difference in efficacy for treatment of NCS of MNCD. • Evidence for prevention or delay of onset of NCS.
Step 3	• Start Memantine 20 mg daily to a stable dose of donepezil, to reduce agitation/aggression, irritability, and appetite/eating disturbances. • Donepezil 5mg BID, increasing dose to 10mg BID. • Galantamine - binds to nicotinic-acetylcholine receptor, and may potentiate action of acetylcholine. • Once initiated, do not discontinue these medications abruptly. [Rivastigmine - inhibits butyrylcholinesterase].
Step 4	• No improvement in NPS or NCS. • Consider citalopram 10mg daily. Increase at increments of 10mg every 4 weeks to see full benefit. • Highest dose is 40mg.
Step 5	• No improvement and/ or partial improvement and behavior is dangerous and/or disruptive to self/others • Rx: SGA—risperidone, aripiprazole, olanzapine.
Step 6	• For severe aggression, consider Haloperidol.
Step 7	• For severe apathy, consider Methylpenidate, monitoring for agitation.
Step 8	• Novel medication approaches: None or limited improvement. • Consider dextromethorphan or quinidine and other novel medication treatments.

Take-away points

•Rule out and treat delirium.
•Identify any treatable factors or conditions which contribute to NCS/NPS, such as pain and disruption of sleep.
•Identify co-morbid conditions: delirium, exacerbations of pre-existing major mental illnesses (PMMI), substance intoxication/ withdrawal, and medication effects.
•
•Obtain baseline ratings, course, onset, immediate precipitants to the onset of the NCS or NPS—which can improve development of interpersonal management strategies and assessment of outcome over time.
•
•Document baseline ratings of NCS/NPS
•Obtain history of precipitants of NCS/NPS which may help develop management strategies.
•Recognize and minimize environmental stressors which exacerbate NCS, such as disruption of sleep.
•Document informed consent for the use of antipsychotics, antidepressants, and other medications—from patient, surrogate decision-maker, and family members.
•Obtain and document informed consent for any intervention from family and caregiver--<u>whether or not</u> the patient has been formally adjudicated as lacking capacity
•Develop non-pharmacologic interventions based upon the D-I-C-E model.
•Use psychotropic medications judiciously to avoid adverse effects. Avoid medications with little evidence of benefit, especially those with significant risk, such as benzodiazepines.
•Use psychotropic medications judiciously to avoid adverse effects. Avoid medications with little evidence of benefit, and/or significant risk, such as benzodiazepines.

ANGIOTROPHIC B CELL LYMPHOMA: A Great Chameleon

KM Kethireddi* MRCP, Z Ali FRCPath, M. Filyridou FRCR, Y.K. Lee
MRCP(Neurology).
East Sussex Healthcare NHS trust,UK

Background: Angiotrophic B cell lymphoma, also called as Intravascular Lymphoma is a rare extra nodal type of lymphoma. The Clinical symptoms of the disease depends on the organs involved. It often presented atypically and that makes timely and accurate diagnosis of angiocentric lymphomas very difficult and often delayed. It can present with neurological, dermatological symptoms, Fever of unknown origin, Haemophagocytic syndrome (fever, amemia, thrombocytopenia). Majority of the cases are presented with Central Nervous System (CNS) involvement with diffuse encephalopathy and subacute multiple focal neurological deficits resembling vasculitis / neuroinflammation. Majority of the patients have poor prognosis2.The prognosis of the patient was primarily dependent on early diagnosis and treatment with chemotherapy, with or without radiotherapy.

Case Summary: A 60 year old gentleman had a past medical history of alcoholism & symptomatic anaemia for 6 months. He was under observation by haematologist and transient lymphadenopathy was found on CT neck/thorax/abdomen/pelvis. However, transient reactive cause was thought to be the most probable cause. Attempted ultrasound guided biopsy did not materialised due to resolution of lymphadenopathy. Three months later, he was admitted with severe delirium. He was initially treated as alcoholic related meningoencephalopathy. Blood tests showed borderline pancytopenia and raised ESR. CSF was acellular with raised protein. Matched oligoclonal band were found subsequently. MRI brain showed multiple foci of T2 lesion in the cerebral hemisphere which are nonspecific and could be in favour of neuroinflammation process, infective or infarction. He received an empiric acyclovir and corticosteroid therapy for which he showed partial transient response. Neuroradiological & Neurosurgical opinion were sought. He was scheduled for brain biopsy in a Tertiary Centre. Unfortunately, he suddenly developed seizure and steroid related gastrointestinal bleed. He was managed in Intensive care unit (ITU). Whilst having treatment in ITU, he had myocardial infarction (NSTEMI) and had cardiac arrest. Despite all active treatment, he deteriorated and passed away. His post mortem examination revealed angiotrophic B Cell Lymphoma in multiple organs.

Investigations: Histopathology specimen showed microscopic angiocentric lymphoma involving brain, lungs, kidneys and lymph nodes. The Immunohistochemistry has been done and the tumour cells showed strong CD20 & CD79a expression with negative staining for CD10 consistent with angiotrophic B cell Lymphoma.

Discussion: Repeated and partial response to steroid therapy in patient with suspect neuro-inflammatory encephalopathy should always prompt one to consider rare diagnosis that is partially steroid responsive e.g. Sarcoidosis, Lymphoma, Vasculitis and multicentric glioblastoma multiforme.

Sometimes repeated attempt to have image guided biopsy may be needed due to inconclusive histopathology initially. Rarity of this lymphoma subtype and lack of simple blood test to aid diagnosis often resulted in delayed diagnosis. More research into angiocentric lymphoma to find a surrogate biomarker is urgently needed to help early diagnosis.

Audience Take Away:

- A delayed diagnosis in this rare lymphoma is not uncommon. Strong clinical suspicion and repeated attempt for tissue biopsy should be considered including post mortem as in our case.

Biography

Keerthi Madhurya Kethireddi is a core medical trainee, currently working in East Sussex Healthcare NHS trust. She graduated from NTR University of Health sciences, India with her medical degree (MBBS) in 2013. Thereafter training in UK, she obtained her Membership of Royal College of Physicians (MRCP) in 2017.She is interested in pursuing her Career in Neurology.

SPECTRUM OF SCHIZOPHRENIA AND ALCOHOLISM: A comparative cognitive

Voichcoski, B.M*.[1], Machado, V. N.[2], Sovierzoski, M.A.[3], Sbalqueiro, R.[4], Liberalesso, P.B.N.[5]
Technological Federal University of Parana/Electronica, Biomedical Engineering, Curitiba, Parana, Brazil

The Schizophrenia Spectrum is a set of neuroencephalo abnormalities that occurs at different levels and can cause delusions, hallucinations, behavioral disorders and causes cognitive impairment. The initial diagnosis is not easy and the delay in treatment causes irreversible brain damage. Alcoholism is a disease neglected by society at the beginning, with simple and uncontrolled intoxication episodes, but progresses sneaky way to settle permanently in the life of alcohol user. Usually begins in adolescence, during family parties or friends and progresses to solitary drinking in pubs or at home. What usually begins in joy or glamor and many companies eventually end without joy, without glamor and solitude. This study aims cognitive comparison between a group of patients with schizophrenia and a group of patients in treatment for dependence on alcohol. Reports the results of a survey realized in a hospital that does treatment for Schizophrenia spectrum and dependence on alcohol. A survey was conducted by applying of 5 psychological tests of objective nature, in two groups of volunteers, being a group composed of 9 patients with schizophrenia, organized, owners of their mental faculties and willingly; and the other group of 15 volunteers, hospitalized for the treatment of alcohol dependence having passed the detoxification period. The mean age is 40.22 and 45.93 years respectively and both schooling are similarly. All tests were applied and corrected for a qualified and accredited professional in accordance with the rules in force in the country. From the analysis of Boxplot, as shown in Figure 1, it can be seen that the performance of volunteers undergoing treatment for alcohol dependence has fallen short of the performance of subjects with the disorder of schizophrenia spectrum, with 95% confidence interval and p-value 0,314, characterizing high similarity between the groups. There are treatments for alcohol dependence that simply not offer results. It may not be the lack of individual effort in treatment. It may be a failure of the reward circuitry of the brain that go beyond the psychological causes and electrochemical causes. This physiological change would be called the spectrum of schizophrenia? The intended result of this project is to draw attention to the treatment of people who have alcohol addiction and who cannot get rid of the addiction, even after several hospitalizations and lonely attempts to get away from alcoholism. The biochemical change in the brain for many years, with neurons immersed in solutions chemically modified by alcohol, may have caused electrophysiological changes in the brain to point of the brain have become a schizophrenic brain performance.

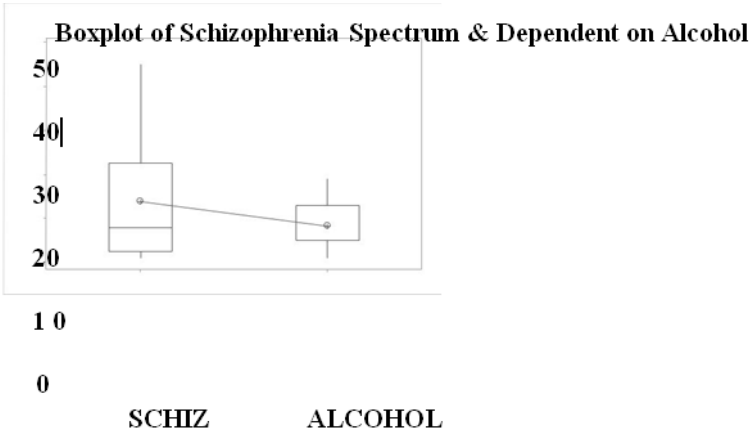


Figure 1: Overall Performance

Biography

Bernadete has completed his University undergraduate at Electrical Engineering and MSc in Biomedical Engineering studies from Technological Federal University of Parana, Curitiba, Brazil. She is a MBA student of the Information and Communication Management in the same school, where she is professor. She has published two papers in two Congress.

Comprehensive evaluation of blood-brain barrier-forming micro-vasculatures: Reference and marker genes with cellular composition

Mei Dai, PhD[1]; Yi Lin, PhD[1]; Salim S. El-Amouri, PhD[1]; Mara Kohls,BS[2], Dao Pan*, PhD[1,2]
[1]Division of Experimental Hematology & Cancer Biology, Cincinnati Children's Hospital Medical Center, OH 45229, USA; [2]Department of Pediatrics, School of Medicine, University of Cincinnati, OH 45219, USA

Primary brain microvessels (BrMV) maintain the cellular characters and molecular signatures as displayed in vivo, thus serve as a vital tool for biomedical research of the blood-brain barrier (BBB) and the development/optimization of brain drug delivery. The variations of relative purities or cellular composition among different BrMV samples may have significant consequences in data interpretation and research outcome, especially for experiments with high-throughput genomics and proteomics technologies. In this study, we aimed to identify suitable reference gene (RG) for accurate normalization of real-time RT-qPCR analysis, and determine the proper marker genes (MG) for relative purity assessment in BrMV samples. Out of five housekeeping genes, ß-actin was selected as the most suitable RG that was validated by quantifying mRNA levels of -L-iduronidase in BrMV isolated from mice with one or two expressing alleles. Four marker genes highly/selectively expressed in BBB-forming capillary endothelial cells were evaluated by RT-qPCR for purity assessment, resulting in Cldn5 and Pecam1 as most suitable MGs that were further confirmed by immunofluorescent analysis of cellular components. Plvap proved to be an indicator gene for the presence of fenestrated vessels in BrMV samples. These methods open the door to more accurate investigations of the BBB for determining changes in physiological and relevant clinical conditions, and for developing RNA-Seq-based molecular atlas of the BBB in animals and humans for new targets, signaling pathways within the neurovascular unit, and new therapies. This study may contribute to the building blocks toward overarching research needs to surmount challenges around the interface between the blood and the brain.

Biography

Dr. Pan is a tenured associate professor of pediatrics with primary appointment in the Division of Experimental Hematology and Cancer Biology at Cincinnati Children's Hospital Medical Center, and a secondary appointment at the University of Cincinnati College of Medicine. Dr. Pan obtained her PhD degree in Molecular, Cellular, and Developmental Biology & Genetics from University of Minnesota. Pan lab has focused on combining translational and basic research for virus-mediated (in vivo and ex vivo) gene transfer into stem cells and other primary cells, and their potential application toward treatment for patients with neuronopathic lysosomal storage diseases. Dr. Pan has published over 50 research articles, and serves as faculty member on Genetic and Metabolic Diseases Committee for the American Society of Gene and Cell Therapy and an ADHOC member for several NIH Grant Review panels.

Clinical-epidemiological characteristics of autism spectrum disorder in the Republic of Kazakhstan

Anastassiya Perfilyeva* Ph.D., Kira Jantayeva, Lilia Skvortsova, Azada Khamdieva, Bakhytzhan Bekmanov Ph.D., Leyla Djansugurova Ph.D.,
Laboratory of Molecular Genetics, Institute of General Genetics and Cytology, Almaty, Kazakhstan.

Autism spectrum disorder (ASD) is a complex heterogeneous childhood neuropsychiatric disorders mainly characterized by deficits in verbal and non-verbal communication, reciprocal social interactions, and stereotyped behavior. Despite the increased worldwide interest of scientists and statisticians to the problem of autism, the disorder has not been studied much in Kazakhstan.

In this work, we, for the first time, attempt to summarize the available statistical data and conduct a clinical and epidemiological analysis of ASD in the Republic of Kazakhstan. Overall morbidity and prevalence are important indicators, which allow evaluation of the epidemiological significance of ASD. In the last five years, the number of reported cases of children diagnosed with ASD in Kazakhstan has increased by 1.8 times. According to the official data obtained by the Ministry of Healthcare of the Republic of Kazakhstan, the ASD prevalence rate in 2018 year is 2.6 per 100.000 children, which is lower than the global statistics. WHO estimated that worldwide 1 in 160 children has an ASD with the incidence rate of 6.25 per 100.000 people. We assume that the official data do not reflect the true picture of prevalence in Kazakhstan due to the difficulties of diagnosis of ASD in our country.

A study, involving 22 Kazakhstani families of 23 children diagnosed with autism, evaluated gender differences in ASD. According to obtained results, ASD was observed 3.6 times more often in boys than in girls. Thus, in Kazakhstan, the ratio of the frequency of ASD in male and female children corresponds to that observed in the world statistics (4: 1). On average, the age for having a child with autism was 29.9 for women and 31.9 for men. Interestingly, there was an almost equal ratio between mothers who gave birth to a child with ASD at the age of 20-29 years and 30 and above (1: 1.2). These data are different from those obtained by other authors who showed that women over age of 30 are more likely and more often to have a child with ASD. These differences are likely due to the small number of patients.

Also, we studied the ethnic composition of families with autistic children. Due to the heterogeneity of Kazakhstani population, the ethnic composition was very diverse. Most cases occurred among Kazakh (67%), Russian (16%) and Uighur (12%) families, but there were also cases of ASD in Korean, Tatar, Uzbek families. Thus, ASD has been reported to occur in all ethnic groups of the Kazakhstani population.

Thus, in this work some clinical and epidemiological aspects of ASD in Kazakhstan are evaluated. We show that for a number of characteristics they correspond to the world data. The future direction of our research will be focused on genetic factors relating to the development of ASD within the framework of the state grant "Molecular genetic aspects of autism in Kazakhstan" 2018-2020.

Audience Take Away:

- The presentation will help to assess the epidemiological situation of ASD in developing countries on the example of Kazakhstan and to compare with global data.
- This presentation is fundamental, and does not have any immediate practical benefit. However, it will be interesting for those who study statistics of neurobiological diseases. Before, information on the spread of autism in Kazakhstan did not appear at the international level, which is an advantage of this work. In addition, audience will have an idea of the situation of autism in Kazakhstan, and we will also show in what direction we will move further on this issue.

Biography

Perfilyeva Anastassiya, Ph.D. Working in Molecular genetics laboratory, Institute of General Genetics and Cytology, Almaty, Kazakhstan. Position - Leader Researcher. Supervisor of the state grant "Molecular genetic aspects of autism in Kazakhstan" 2018-2020.

De novo mutations of *SCN1A* and *KCNT1* genes at patients with channelopathy forms of epilepsy from kazakhstan

Ozada Khamdiyeva[1], Tileules Zhanerke[1], Baratzhanova Gulminyam[1], Anastassiya Perfilyeva[1] Ph.D., Zulfiya Menlimuratova[2] MD, Yana Akchurina [2] MD, Leyla Djansugurova*[1] Ph.D.,
[1]Laboratory of Experimental Mutagenesis, Institute of General Genetics and Cytology, Almaty, Kazakhstan.
[2] SVS clinic by V.M. Savinov (Almaty, Kazakhstan)

Epilepsy is one of the most common and heterogeneous neurological diseases. In Kazakhstan, more than 45,000 people suffer from epilepsy, 40% of them are children, adolescents and young people, 38% of patients become disabled, and their life quality reduces by 85% on average. The main perspectives in reducing such high rates of morbidity and mortality associate with the improvement of diagnostic methods that have scientifically based effectiveness. Both hereditary and environmentally acquired factors are involved in epilepsy pathogenesis. The molecular mechanisms underlying the various epileptic seizures have been intensively studied for more than two decades. The genetic impact plays a big role in the etiology of epilepsy idiopathic forms. Recent data indicate that remaining 70-80% of cases development due to genetic background. Most of the epilepsy hereditary forms with established gene mutations are caused by the damage of ion channels that ensure the neuronal membrane polarization. Such epilepsy forms are referred to the channelopathy group. First of all, they include the genes of sodium, potassium, calcium and chloride channels.

The purpose of our research is to determine the spectrum of cause-effect mutations in SCN1A and KCNT1 genes at patients suffered from channelopathy forms of epilepsy. Mutations in the sodium channel gene SCN1A were described for 70% of children suffering from Dravet syndrome, most of the mutations had spontaneous nature. SCN1A mutations can cause the development of severe myoclonic epilepsy in infancy (SMEI) and borderline (SMEB), which related to symptomatic forms. The dominant mutations in the KCNT1, sodium-potassium channel gene intensely expressed in the brain, cause autosomal dominant night frontal lobe epilepsy (ADNFLE), malignant migrating partial seizures of infancy (MMPSI), and temporal lobe epilepsy (TLE). Mutations in this gene increase the membrane permeability that leads to unregulated excitation of neurons in the brain.

44 patients of different ages with SMEI, SMEB, ADNFLE, MMPSI, TLE, and Drave syndrome were screened by PCR-RFPL analysis for key mutations of SCN1A and KCNT1 genes. Mutation of SCN1A gene - p.Ala1783Thr (c.5347G>A) was identified in one patient (2.5 years old) with the Dravet syndrome. Surveys of parents and a 3 months-year-old sister did not reveal a mutation in this codon, which indicated the de novo occurrence of this mutation. For the first time convulsions in the patient arose in 3 months and were repeated 2 times a month with different semiotics. Febrile convulsions did not registered. 3 cases of de novo mutation of KCNT1 gene 934 codon - c.2800G>A (p.Ala934Thr) were detected: 2 patient suffering from TLE (born in 1972 and 1988), 1 patient with residual encephalopathy (born in 1987). TLE patients were differed by form of seizures. One TLE patient demonstrates the secondary generalized seizures, another individual shows paroxysmal seizures. But, both had attacks of psychomotor automatism. Patient with residual encephalopathy had primary generalized seizures. De novo origin of KCNT1 (p.Ala934Thr) mutation at 3 families was verified by analysis of close relatives.

Audience Take Away:

- It will be interesting for those who study genetics of neurobiological diseases. Before, information on the spread of epilepsy in Kazakhstan did not appear at the international level, which is an advantage of this work. In addition, the audience will have an idea of the situation of epilepsy in Kazakhstan.
- The determination of the spectrum of cause-effect mutations of epileptic syndromes will allow not only to determine the nature of the spread of hereditary forms of epilepsy in our country, but will also improve the quality of treatment.

Biography

Leyla Djansugurova, Ph.D. Working at Institute of General Genetics and Cytology, Almaty, Kazakhstan. Position - Director from 2006 – Director of the Institute of General Genetics and Cytology CS MES RK. Supervisor of the state grant "The study of molecular genetic aspects of hereditary forms of epilepsy in populations from Kazakhstan" 2018-2020.

A3 adenosine receptor agonists did not protect hippocampal slices under excitotoxicity conditions

Karine Bertoldi[1]*; Natália Barcellos[2]; Laura Reck Cechinel[3]; Bruno Batista[1], Bruno Arbo[4]; Rafael Roesler[1]; Ionara Rodrigues Siqueira[1,2,3]

[1]Departamento de Farmacologia, Instituto de Ciências Básicas da Saúde, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brasil
[2,3]Programa de Pós-Graduação em Farmacologia e Terapêutica, Instituto de Ciências Básicas da Saúde, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brasil
[4]Instituto de Ciências Biológicas, Universidade Federal de Rio Grande, Rio Grande, RS, Brasil

A neuroprotective function of adenosine against ischemic/excitotoxic cell damage has been demonstrated. The adenosine receptors named A1, A2A, A2B, and A3 have been implicated in a wide range of biological functions as well as in pathological states such as ischemic injury. However, the involvement of A3 receptor is unclear and controversial. The aim of this study was to investigate the effect of A3 adenosine agents, NECA and HEMADO on glutamate-induced excitotoxicity model using hippocampal slices of Wistar rats. Male Wistar rats aged 3 months (n=6 per group) were killed and hippocampi were quickly dissected out; transverse sections (400 μm) using a McIlwain tissue chopper were obtained. This study was approved by the Local Ethics Committee (CEUA—Comissão de Ética no Uso de Animais—UFRGS; nr.29819). Hippocampal slices were incubated with Krebs-Henseleit medium containing the adenosinergic compounds NECA [5-(N-ethylcarboxamido)-adenosine] or HEMADO [2-(1-Hexynyl)-N6-methyladenosine]. After, the slices were incubated with a solution containing 10 nM of glutamate for 60 min at 37 °C to induce excitotoxicity followed by a recovery period (150 min). Then, the cell viability was determined through the ability of cells to reduce MTT (3-(4,5-dimethylthiazol-2-yl-diphenyltetrazolium bromide). The glutamate incubation, in the tested times and concentrations, increases the mitochondrial activity (about 20%). The HEMADO in vitro incubation did not alter the mitochondrial activity either in basal conditions neither in slices submitted to glutamate-induced toxicity. In despite of the in vitro incubation of NECA, we observed a tendency to decrease the mitochondrial activity in basal conditions as well an increase in a glutamate-induced toxicity (not statistically significant). It is possible to conclude that A3 agents were unable to protect hippocampal slices under excitotoxiciy conditions, suggesting that A3 receptors are not associated with protective adenosine effects. However, further experiments evaluating different glutamate concentrations, incubation times and other damage models are necessary to better understand the role of A3 receptor in ischemic injury.

Biography

Karine Bertoldi is undergraduated in Nursing from Universidade Federal do Rio Grande do Sul (UFRGS), Brazil. She has a master's degree and a PhD in Physiology from UFRGS. She currently is an associated collaborator in the Neuropsychopharmacology Laboratory coordinated by Prof. Ionara Rodrigues Siqueira (UFRGS) and works as a nurse at the Radiology Service of the Hospital de Clínicas de Porto Alegre, Brazil. She has experience with studies involving the physical exercise effects on inflammatory, epigenetics and oxidative parameters in rats at different development stages, specially aged animals. Her PhD thesis was focused in the modulation of treadmill exercise and aging process on secretases activities and profile of circulating vesicles in healthy rats.

Quality of Life of Patients with Parkinson's Disease and X-linked Dystonia Parkinsonism who underwent Deep Brain Stimulation

Arjay Dannug*, MD
Cid Czarina Diesta, MD, FPNA

Introduction: Parkinson's disease (PD) and X-linked dystonia parkinsonism (XDP) cause dramatic disease burden to patient's quality of life and even to the family members or caregivers. Symptoms eventually progress in time but is not necessarily equated to decline in quality of life. Neurostimulation was found to be superior to medical therapy in patients with advanced and even early PD and yielded promise on alleviating dystonia and parkinsonian symptoms among post-neurostimulation XDP patients (1-10).

Objective: This study described the quality of life among PD and XDP patients post-DBS in terms of physical and psychosocial domains.

Methodology: The registry of PD and XDP patients who underwent DBS was reviewed. There were a total of 11 patients who satisfied the eligibility criteria, but only 7 (63%) gave consent to be included in the study. Sickness Index Profile (SIP) Questionnaires were administered to these patients and/or caregivers during their regular follow-up consult. The scores were computed and compared to a set of cut-off values.

Results: The subjects consisted of 7 post DBS patients, 2 were diagnosed with Parkinson's Disease and 5 with X-linked Dystonia Parkinsonism. Age ranged from 35 to 59; 2 individuals were female and 5 were male. The mean sickness index profile score of the subjects was 38.85 (28.5%). This score is higher compared to the general adult population's score of 5(5) and to the cut-off SIP score of 33 +/- 13 (5). The result may indicate a poor quality of life post-DBS. Five patients obtained a score more than 33 while only 2 scored less than 20. The psychosocial domains are the most affected among our subjects.

Conclusion: Our subjects have poor quality of life based from the mean SIP score of 38.85. Psychosocial domain is more impaired than the physical. However, this finding is inconclusive because their current quality of life is not compared to their baseline status prior to the procedure. Thus, their current quality of life can not be solely attributable to the procedure or disease process but also to other factors that affect their way of living prior to the procedure or even prior to diagnosis of PD or XDP.

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DAY 3

KEYNOTE FORUM

2nd Edition of International Conference on

Neurology and Brain Disorders

June 04-06, 2018
Rome, Italy

Biography

Najib Murr, MD, is an associate professor in the Department of Neurology at SIU Medicine. He is a neurologist who specializes in epilepsy and seizure disorders. Dr. Murr is the program director for the Neurology Residency Program and the director of the EEG Lab at Memorial Medical Center.

Dr. Murr earned his medical degree at Lebanese University Faculty of Medical Sciences in Beirut, Lebanon. He completed his residency in neurology through a partnership between the University of Nebraska Medical Center in Omaha and Creighton University. He then completed a fellowship in neurophysiology/ epilepsy at Vanderbilt University Medical Center. He completed his postdoctoral training at Lebanese University, Beirut Governmental University Hospital and Sacre Coeur Hospital in Beirut, Lebanon.

Dr. Murr is certified by the American Board of Psychiatry and Neurology (ABPN) and is eligible for certification in epilepsy, a subspecialty of the ABPN. He is also certified by the Clinical Neurology and Epilepsy Board. He is a member of numerous professional organizations including the American Academy of Neurology, American Epilepsy Society, and the epilepsy and clinical neurophysiology sections of the American Academy of Neurology.

Non Convulsive Status Epilepticus

Najib Murr*, MD,

Director, Neurology Residency Program and Associate Professor of Neurology, Southern Illinois University School of Medicine, USA

This presentation will discuss the definition of NCSE, types, classifications, epidemiology and pathophysiology in addition to treatment and outcome. Will highlight the importance of early diagnosis. Uncommon presentations and EEG features. This is not a research presentation.

Audience Take Away:

- Suspecting NCSE based on clinical presentation
- When to consider LTM-EEG recording
- Management and medical treatment

Relationship between spinal cord injury, epigenetic and physical exercise

Viviane Rostirola Elsner

Post Graduate Program in Biosciences and Rehabilitation.
IPA Methodist University. Porto Alegre, RS, Brazil.

Biography

Dr. Viviane Elsner has completed her PhD at the age of 28 years from Universidade Federal do Rio Grande do Sul, Brazil. Currently she has 32 years old and is professor/research in a Post Graduate Program and guides 7 master students. She coordinates the "Interdisciplinary Group of Study on Epigenetics Applied to Health and Disease" and their academic production primarily involves the line of research related to the effects of physical exercise on the modulation of epigenetic mechanisms in healthy subjects or patients with chronic diseases". She published 10 papers in reputed journals in the last year regarding this theme.

Emerging evidences have been pointed out that the imbalance of epigenetic machinery exert a pivotal role in the physiopathology of several neurological, neurodegenerative and neuropsychiatric conditions. However, this relationship in spinal cord injury (SCI) have been poorly investigated. Therefore, our research group firstly evaluated the modulation of global histone H4 acetylation levels, an important epigenetic mark, after a thoracic SCI model in rats. Male Wistar rats aged 3 months were submitted to a thoracic SCI model and global histone H4 acetylation levels were measured at different time-points: 6h, 24h, 48h, 72h and 7days after. The Animal Bioethics Committee of both Federal University of Rio Grande do Sul (number 26116) and Pontifical Catholic University of Rio Grande do Sul (number 15/00492) approved the study protocol. It was observed that global histone H4 acetylation levels changed at the evaluated time-groups ($P=0.0001$). Post hoc tests showed the 72h post-SCI group was significantly increased from all the other groups ($P\leq0.03$). Taken together, our findings suggested that histone H4 acetylation levels might emerge as novel possible biomarker in SCI. These preliminary findings may open new avenues for introducing therapies and strategies in the preventive management and treatment of SCI, regarding therapeutic epigenetic modulation in this devastating and life-changing disease. Thus, based on these findings, and considering that it is widely described in the literature that physical exercise, a non-invasive and easily accessible intervention, is an important epigenetic modulator agent in different populations, we investigated the effect of a single bout of gait training with body weight support (BWS) on global histone H4 acetylation levels in peripheral blood of incomplete SCI adult patients. Interestingly, we also compared this response when training was performed on the floor (walker) or in a treadmill. This study was approved by the Ethics and Research Committee of the Centro Universitário Metodista IPA (1.940.987). No difference was observed in histone H4 global acetylation levels after BWS gait training both when the patients were submitted to the treadmill or to walker sessions. We suggest that chronic interventions must be performed to analyze the long-term effects of physical exercise on epigenetic modulation in SCI, as well the possible involvement of other epigenetic markers such as histone H3 acetylation, DNA methylation and microRNA in this response. Future studies should be done in order to elucidate these questions.

Synchronization and Chaos in Brain Activity

Marat Akhmet*,

Department of Mathematic, Middle East Technical University, Turkey

We will consider two subjects of nonlinear dynamics: synchronization of integrate-and-fire biological oscillators; global chaos in neural networks and discuss their importance for brain activity from the dynamical systems and information dynamics point of view.

The collective behavior of biological and chemical oscillators is a fascinating topic that has attracted a lot of attention in the last 50 years. The integrate-and-fire processes were developed by C. Peskin to a population of identical pulse-coupled oscillators. It was conjectured that the model self-synchronizes such that: for arbitrary initial conditions, the system approaches a state in which all the oscillators are firing synchronously; b) this remains true even when the oscillators are not quite identical. The first conjecture is solved by C. Peskin for a system with two oscillators, and R. Mirollo and S. Strogatz for the generalized model of two and more oscillators (J. Phys. A 21: L699–L705, 1988). The second conjecture was solved in the paper by M. Akhmet (Nonlinear Stud. 18:313–327, 2011). There are still many issues related to the nature and types of couplings. The couplings may be impulsive, continuous, delayed, or advanced, and oscillators may be locally or globally connected. Consequently, it is reasonable to consider various ways of synchronization if one wants the biological and mathematical analyses to interact productively. We investigate the integrate-and-fire model in both cases— one with identical and another with not-quite-identical oscillators. A combination of continuous and pulse couplings that sustain the firing in unison is carefully constructed. Moreover, we obtain conditions on the parameters of continuous couplings that make possible a rigorous mathematical investigation of the problem. In the present talk we will discuss the role of synchronization and desynchronization for the brain activity.

It was observed in experiments by Freeman that a rabbit olfactory bulb EEG is with limit cycle if an odorant is familiar, and it transforms to near-limit cycle chaos otherwise. Watanabe observes that chaos increases the memory capacity. Breakspear and Terry reported the detection of generalized synchronization between different brain regions by means of electroencephalogram signals. Inspired by the phenomena, we have developed chaotic neural network chains. New terminology such as replication of chaos, entrainment by chaos, attraction of chaos by dissipative systems, attraction of chaotic cycles are used for the description of our research (M. Akhmet, M.O. Fen, Replication of chaos in neural networks, economics and physics, Springer, 2016) and can be usefull for the aforementioned observations.

Biography

Marat Akhmet is a professor of mathematics at Middle East Technical University (Ankara, Turkey) known for his research on the chaos and bifurcation theory in differential equations and hybrid systems with applications in physics, neural networks, biology, medicine and economics . Born in Kazakhstan, he studied at Aktobe State University. He received his doctorate in 1984 at Kiev University . He has been awarded a Science Prize of TUBITAK (Turkey, 2015), for best achievments in scientific research. He is an author of five books: "Principles of Discontinuous Dinamical Systems", Springer, 2010, "Nonlinear Hybrid Continuous Discrete-Time Models", Atlantis Press (Springer), 2011, "Neural networks with Discontinuous Impact Activations," Springer, 2014, "Replication of Chaos in Neural Networks, Economics and Physics", Springer&HEP, 2015 and "Bifurcations in Autonomous and Nonautonomous Differential Equations with Discontinuities," Springer, 2017 . He has solved the Second Peskin conjecture for Integrate-and-fire biological oscillators, has introduced and developed theory of differential equations with piecewise constant argument of generalized type, many aspects of discontinous dynamical systems. The last decade his main subject of research is input-output analysis of chaos and irregular behavior of hybrid neural networks.

The Integral Role of Neurosurgery in Managing Rare Craniofacial Anomalies

Hazem A. Mostafa*

Professor of Neurological Surgery Department, Ain Shams University, Cairo, Egypt. *

Craniofacial anomalies are rare complex pathologies which needs a craniofacial team composed of neurosurgeon, a craniofacial plastic surgeon, and an ophthalmologist. Anomalies at craniofacial region either due to developmental malformation of the brain (neural tube defects) or premature closure of cranial or skull base sutures resulting in skull deformities and problems in normal physiological neurological development. Each of pathologies needs special neurological surgery management, sometimes the management is multi-staged. Neurosurgical management varied from diagnosis, the surgical procedures and long-term follow up. Hence, we describe the pathology of craniofacial anomalies and its associated syndromes in addition to the proper investigation needed for diagnoses and predict possible short and long-term complication. Also, what craniofacial anomalies care giver should be focusing on regarding neurological issues such as intra-cranial pressure early detection and treatment if high and optic nerve problems. Also dural repair, dealing with brain parenchyma and its vasculature, and better cosmetic outcome according to craniofacial metrics.

Biography

Dr. Hazem Ahmed Mostafa, MD., PhD, is an internationally recognized neurosurgeon with over two decades of clinical and research experience. He has devoted his career to developing and providing rigorous,comprehensive and compassionate care to those with cancer, neurological degenerative diseases and pediatric disorders. He's affectionately known as Dr Brain and Spine. Dr. Hazem Ahmed Mostafa MD.,Ph.D,is a professor in the Department of Neurosurgery at Ain Shams University Cairo, Egypt since 2014, where he joined the faculty as an Assistant Lecturer of Neurosurgery in 1997. He is a Consultant of Neurosurgery at his own private clinics Neuro Clinic Cairo and Hurghada-Red Sea, Egypt since 2001. Prior to his current position, he was a lecturer of Neurosurgery at Ain Shams University Hospital, Cairo, Egypt and a Consultant of Neurosurgery at El-Gouna Hospital, Hurghada-Red Sea, Egypt. Hazem is a native of Egypt. He graduated from the Faculty of Medicine Ain Shams University in 1992, at taining magnacum laude honors with dual degree and B.Ch., and completed a combined residency in Neurosurgery and Cerebrovascular Stroke Unit at Ain Shams University Specialized Hospital, Cairo, Egypt in 1995. He later went on to complete his Masters Degree of General Surgery (MS) in 1997 and M.D. Degree of Neurosurgery (Doctoral Degree of Neurosurgery) in 2001. Dr. Hazem's has dedicated a significant part of his career to developing innovative educational research with over 33 published research papers in the Egypt ian Society journal. Among his research interest includes The Correl at ion between the Site of the Herniated Lumbar Disc and the Surgical Approach and its Clinical Outcome, A Modified Surgical Correct ion of Plagiocephaly to Achieve Symmetry and Supraorbital craniotomy Via Eyebrow Incision for Anterior Cranial Fossa and Cellar Lesions. Dr. Hazem is an active member of the Egyptian Society of Neurological Surgeons since 1997. He is an international Faculty at AO Trauma Foundation. He is also an international fellow member of the Institute of Brain Chemistry and Human Nutrition (IBCHN-UK). Hazem joined the North American Spine Society in 1999. He trained as a fellow at the Spine Center Munich 2005–2006. He is participating in the education programs of the junior Neurosurgeons in Egypt and member of examiners' board of the Ph.D, M.D and Masters' Degree of Neurosurgery.

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DAY 3

SPEAKERS

2nd Edition of International Conference on

Neurology and Brain Disorders

June 04-06, 2018
Rome, Italy

Chronic amphetamine exposure during development causes epigenetic and behavioral effects in adult animals and progeny

[1]Lucia Carvelli*, PhD. [2]Ganesh Ambigapathy, PhD. [3]Archana Dhasarathy, PhD.

[1]Brain Institute and Harriet Wilkes Honors College, Florida Atlantic University – Jupiter, FL USA

[2,3]Department of Biomedical Sciences, University of North Dakota - Grand Forks, ND USA

Amphetamine (AMPH) is used as psychostimulant, appetite suppressant and to treat Attention Deficit Hyperactive Disorder (ADHD). Among other effects, AMPH has been shown to alter the function of proteins uniquely associated with the reward system, i.e. the dopamine transporter (DAT). Similarly to mammals, the nematode Caenorhabditis elegans (C. elegans) exhibits changes in behaviors when treated with AMPH, and we showed that these AMPH-induced changes are in part mediated by the C. elegans DAT (DAT-1). Since AMPH is used, either as recreational drugs or therapeutically for extensive periods, we investigated the long-term effects of AMPH by treating chronically C. elegans embryos with AMPH or control solution, and then challenged adult animals with one dose of AMPH during a behavioral assay. We found that in the group which received AMPH during development, the number of adult animals exhibiting AMPH-induced behaviors was higher than the group that was exposed to control solution. Interestingly, we found that the behavioral effects caused by AMPH exposure during development were transmitted to progeny. Because DAT-1 is one of the proteins required to generate AMPH-induced behaviors in C. elegans, we tested whether embryonic exposure to AMPH alters expression of the dat-1 gene in adults and progeny. Among other epigenetic mechanisms, histone methylation has been shown to be altered by drugs of abuse. Thus, we investigated whether AMPH changes the methylation status of the histone 3 (H3) at the promoter of dat-1. ChIP assays showed a significant decrease of the level of trimethylation at the lysine 4 of H3 (H3K4me3) and an increase of H3K9me2 at the promoter of dat-1 of adult animals and progeny whose parental lines were exposed to AMPH during development. As H3K4me3 and H3K9me2 are associated with gene activation and inactivation respectively, our data suggest that AMPH treatment during early development causes long-term and transgenerational depression of the dat-1 gene expression. These results were supported by functional studies showing a significant decrease in [3H]DA uptake in primary cultures from embryos (F1 generation) originated from animals exposed to AMPH during development (F0 generation) with respect to control cultures.

Audience Take Away:

- Because many of the components of the dopaminergic system as well as epigenetic mechanisms are highly conserved between C. elegans and mammals, these results could be critical for our understanding of how drugs of abuse initiate and promote addiction in adults and future generations.

Biography

Dr. Carvelli earned her doctoral degree in Molecular Pharmacology at the Institute of Pharmacological Research, Mario Negri in Milan (Italy). After being a postdoc at the University of Texas Health Science Center, she became a Research Associate at Vanderbilt College of Medicine before joining the Department of Biomedical Sciences in the University of North Dakota School of Medicine & Health Sciences. She is currently an Associate Professor at the Brain Institute at the Florida Atlantic University. Dr. Carvelli's research focuses on the molecular mechanisms of action of drugs of abuse at the dopaminergic synapses.

Effects of 20-HETE on angiogenesis and neurovascular remodeling during stroke recovery

Yu Liu*[1], MD, PhD; Meixiao Zhan[1], PhD; Yong Li[1], MD, PhD; Gaojun Teng[2], MD, PhD and Ligong Lu[1], MD, PhD

[1]. Zhuhai Precision Medicine Center, Zhuhai People's Hospital, Jinan University, Zhuhai, China

[2]. Jiangsu Key Laboratory of Molecular and Functional Imaging, Department of Radiology, Zhongda Hospital, Medical School of Southeast University, Nanjing, 210009, China

20-Hydroxyeicosatetraenoic acid (20-HETE), a cytochrome P450 (CYP450) metabolite of arachidonic acid (AA), is one of the primary eicosanoids in most of microcirculatory beds. Studies have indicated that this compound has important physiological and pathological functions in the modulation of vascular tone, ion transport, cellular proliferation, and inflammation reaction. Both we and others have demonstrated that 20-HETE plays an important role in acute phase of ischemic stroke. However, little is known about the effect of 20-HETE on stroke recovery. We found that 20-HETE promotes angiogenesis both in cell culture experiments and animal model of experimental stroke. Besides, we further investigated the crosstalk between the brain and systemic responses in blood to explore the underlying mechanisms of the effect of 20-HETE on angiogenesis. We demonstrated that the expression of CYP 4A is upregulated in reactive astrocytes which can release 20-HETE that promotes endothelial progenitor cell (EPC)-mediated neurovascular remodeling during stroke recovery. siRNA suppression of CYP 4A in astrocytes or 20-HETE inhibitor prevents this effect. In a mouse model of transient focal cerebral ischemia, reactive astrocytes in the peri-infarct cortex upregulate CYP 4A at 14d poststroke, along with an accumulation of endogenous EPCs. In vivo siRNA suppression of CYP 4A blocks this EPC response, reduces peri-infact angiogenesis, and worsens neurological deficits. Taken together, we first demonstrated a positive influence of 20-HETE in angiogenesis in later stages of poststroke mice. Furthermore, these molecular and in vivo findings also support a previously undescribed mechanism of crosstalk between reactive astrocytes and EPCs wherein 20-HETE promotes neurovascular remodeling and functional recovery after ischemic stroke.

Audience Take Away:

- A potential novel option focusing on CYP 4A/20-HETE-induced angiogenesis is provided to design therapeutic strategies for ischemic stroke.
- Our present findings show a unique mechanism for crosstalk between central and systemic responses, and may also provide an opportunity for therapeutic interventions aimed at promoting neurovascular repair and remodeling after stroke.

Biography

Yu Liu has graduated in 09/2010–11/2013 PhD (Neurology) Department of Neurology, the Second Affiliated Hospital of Harbin Medical University, Harbin, China. M.Sc. (Neurology) Department of Neurology, the Second Affiliated Hospital of Harbin Medical University, Harbin, China. B.Sc. (Medicine) Mudanjiang Medical College, Mudanjiang, China.

Movement Analysis and Technological Rehabilitation in the field of pediatric neurological disorders

Maurizio Petrarca*
Head of Movement Analysis and Robotics Laboratory, Ph.D., "Bambino Gesù" Children's Hospital, Rome, Italy

The focus of the presentation will be the use of technological tools for the assessment and the rehabilitation of children with neurological disorders. A brief historical introduction will be produced. Specific tools for the multi-factorial analysis of the movement have been developed during the end of 1980's decade mainly for children with cerebral palsy. They produced new knowledge on the clinical interpretation of the movement disorders that will be discussed. These new notions and ideas on the motor functions promoted the extension of the use of these tools in all the fields of the movement disorders. Besides, departing from 1980's to the present days, new tools were developed due to the new opportunity provided by the technological solutions and in order to overcome the existing limits in the analysis. The new interpretations on pathological movements opened the perspective to train the motor functions with innovative outlook. Furthermore, more recently, robotics devices were introduced in the fields both of movement assessment and rehabilitation. They permitted to perform tasks otherwise not practicable, but in restricted context, that is, the context of the single device. It is clear that high technology will permeate the future of the clinical activities; a process that need to be ruled. A process that is influencing our opinion on clinical running. More stringent relations need to be interlaced between research progress and manufacturing. Success and failure in the introduction of the technological tools will be presented in order to discuss which path will be more promising in future incarnation of this topic. All the items will be discussed providing clinical example in different neurological conditions.

Audience Take Away:

- The audience will be informed on the existing tools for movement analysis in the clinical context.
- The participants will be educated on the use of technological tools for the movement training in pathologic conditions.
- Interpretative tools for the understanding of movement disorders will be provided.
- These knowledge will help the participants in future decisions on the selection of the more adequate solutions for specific clinical purposes.
- Furthermore, thoughts on future areas and lines of research will be suggested.

Biography

Education: 1984, BSc (Rehab Ther) "Spolverini" Hospital, Rome, Italy; 2004, BSc (Phys Ther) "Tor Vergata" University of Rome; 2007, MSc (Rehabilitative Sciences) "Tor Vergata" University of Rome; 2011, PhD (Engineering and Mechanical Measurement) University of Padua, Italy.

Dr Petrarca practiced for fifteen years at the "San Giovanni Battista" Hospital in Rome, specialized in neurological rehabilitation, where he built an original optoelectronic system for movement analysis on a microcomputer. Then he practiced, since 1999 to present, at the "Bambino Gesù" Children's Hospital. Dr Petrarca patented an original dynamic mechanical temporary orthosis for gait re-education in 1996 and an ankle and knee robotic orthosis in 2012 and published several papers.

A BTBED child with Comorbidity of Cerebral Palsy, the Cyst of the Corpus Callosum, Parenchymal Cyst, Epilepsy and Cardiac Disease: About an Observation

Patrice Ntenga[1,2*] , K. Kabulo[3], Patrick Mutombo[2], A. Mulumba[2], E. Lowakondjo[2], Dirk Teuwen[2], Marième Soda Diop-Sène[1], A. A. Nahantchi[1], N. S. Diagne[1], K. Touré[1,4], M. Ndiaye[1], A. Gallo Diop[1]

[1]Neurological Clinic of the National Teaching Hospital, FANN, Dakar, Senegal

[2]Neuropsychiatric Center Joseph Guislain of the Brothers of Charity, Lubumbashi, Congo

[3]Department of Neurosurgery, University of Zimbabwe, Harare, Zimbabwe

[4]Department of Preventive Medicine and Public Health, Faculty of Medicine, Pharmacy and Odontostomatology, University of Cheikh Anta Diop, Dakar, Senegal

Motor impairment of cerebral origin is a syndrome that induces a reduction in activity, the origin of which is brain injury or a non-progressive and definitive abnormality occurring in a developing immature brain. Motor disability, spastic, dyskinetic or ataxic, is often associated with sensory, cognitive, sensory and behavioral disorders with or without epileptic disease. View of accidental discoveries of corpus callosum abnormalities, most often asymptomatic or associated with psychomotor retardation, epilepsy, neurological disorders or cardiomyopathy, a high technical platform must be available for its diagnosis. We report in this communication a child we call BTBED (back-thigh-bed). 7-year-old boy followed at the neuropsychiatric center Joseph Guislain of the Brothers of Charity of Lubumbashi in Congo (DRC) since 2016 for generalized tonic-clonic seizures, in whom the diagnosis of cerebral palsy on cyst of corpus callosum and in the right parietal lobe, as well as cardiopathy was posed during its consultation in September 2017.

Audience Take Away:

- For researchers, we want to find the link between these symptoms(this tetrad), because this is a whole syndrome
- What is the future of these children who live in environments where neurologists, neurosurgeons, physiotherapists, speech therapists .... are rare or absent
- what INBC think about these children who are dying because they are in a bad geographical position

Biography

Patrice N. Ntenga is a fourth year Neurology resident in Neurology at Universite Cheikh Anta DIOP (UCAD) de Dakar, Sengal.

Long-term effect of early undernutrition on social transmission of food preferences in rats.

Rubio, L* PhD..; BS. Téllez, L.; MSc. Regalado, M.; BSN. Torrero, C.; PhD. Salas, M.
Institute of Neurobiology, Universidad Nacional Autónoma de México, México

The brain nucleus involve in learning flavors and food preferences appear early in life and continue through adulthood. Epigenetic factors like undernutrition can alter the brain process involved in food preferences. In the other hand, undernutrition is a public health problem of undeveloped countries and predispose to neurodegenerative disease. Olfactory recognition deficits serve as clinical marker to differentiate Alzheimer's disease (AD) subjects from healthy aging groups and olfactory dysfunction in AD can present as impairment in olfactory recognition, emerging during early stages of the disease. The social transmission of food preferences (STFP) is a test of associative olfactory learning not previously used to investigate the effects of early undernutrition in adult rats. This study analyzed how the undernutrition interfere with changes in social interaction, olfactory perception; make a decision and olfactory memory in Male Wistar rats. The rats were divided into two groups randomly control group (CG) and undernourished groups (UG). UG received different percentages of a balanced diet during pregnancy. After birth, by alternating two lactating dams between litters every 12h, one with ligated nipples. Weaning was at 25 days old, followed by an ad-lib diet until post-natal day 90. Before the STFP, the rats were fasted 12h. These procedures included a three-stage protocol: odor exposure, social interaction and preference test. Odor exposure, the demonstrator rats (DR) was exposed to powdered food mixed with a cue spice cinnamon (CI); after that during social interaction, the DR interacted with the observer rats (OR) during 30 minutes; and finally, in the preference test the OR was exposed a two-choice test of powered food with CI and a novel spice cocoa (CO). Results: DR in both groups ingest the necessary amount of CI to be considered in the next stage. During social interaction, in the UG the social transmission is disrupted in OR as evidenced by the significant prolonged latency to initiate social interaction, reduced frequency and duration of head contacts, but increased duration of muzzle investigation directed to DR ($p \leq 0.05$). In the preference phase, the OR undernourished prolonged the latency for explore both stimuli contrasted with CG, the underfed OR decreased the frequency of visits for COC but increased the time to explore COC comparing with CIN ($p < 0.05$) in contrast with CG. Finally, during the immediate preference testing, rats of both groups had a clear preference for food containing CI. The results suggest that UG rats during interaction needed increased the time expose to olfactory information in the breath of the DEM to obtain the olfactory cue and encoded. Furthermore, alterations on make a decision during the preference phase could be associated with alterations in olfactory process. Undernutrition do not alter the olfactory short-term memory in STFP. This is a robust and relevant response because the crucial role in survival. Further studies are needed to evaluate the olfactory recognition in undernourished subjects to support like a measure that could be integrated in subclinical early detection of patients at nutritional risk and prone to AD.

Audience Take Away:

- The audience will be able to use this information to better understanding cognitive function of nutrition risk subjects. Short-term olfactory memory is a robust response necessary to modulate the food intake and avoid noxious substances between conspecifics. Early undernutrition disturbed the social processes between partners in adult rat. The current studies describe a method that can be using in malnourished animals to further studies orientated to confirm an early deficit in olfactory recognition and in forebrain network involved in the make a decision. Undernutrition alter the olfactory detection, discrimination, recognition and identification in the STFP protocol, hence the need to stablish an early marker for disease prior to clinical manifestations in subject prone to neurological disorder such as Alzheimer disease and with nutritional risk.

Biography

Lorena Rubio work at Department of Developmental Neurobiology and Neurophysiology at the National University of Mexico, Querétaro, México. She is a researcher and teacher. For many years she has been involved in studies related to the effect of undernutrition on the developing brain. The main subjects are issues related to gustatory system with emphasis on neurobiology and early development. Research interest development of cognitive responses food preferences in early food restricted rats, effects of perinatal undernutrition on the morphology of the gustatory pathway in pre-weaning and adult rat and the effects of pre- and neonatal under nutrition on the development of the papillae and taste buds in Wistar rat.

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