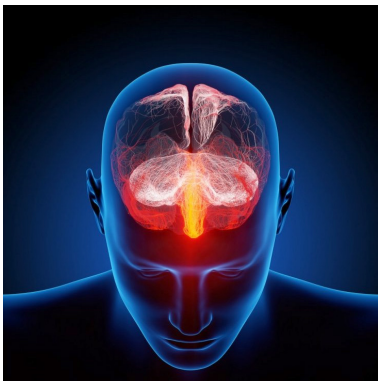
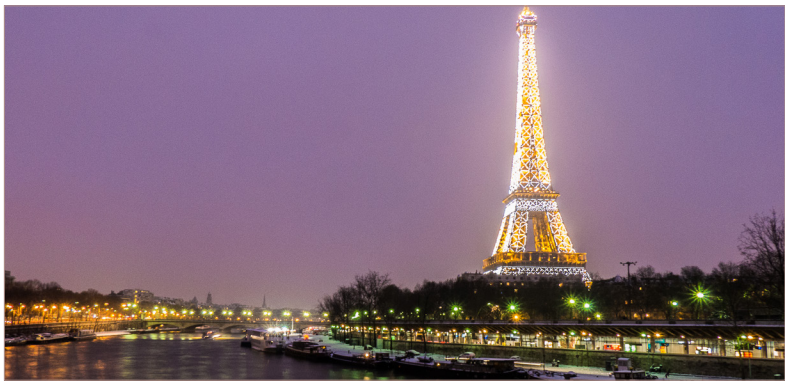
Poster Presentation

CNS-2018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Five years of Hybrid Operating Theatre for the treatment of complex Neurovascular lesions at a major Sydney Hospital

Charles Fish
Royal Prince Alfred Hospital, Australia

Background: This study demonstrates the utility of a hybrid angiogram theatre in the management of complex operative cerebrovascular cases.

Methods: 27 patients over 5 years underwent combined surgical and endovascular procedures in a single theatre session. 13 patients underwent emergency surgery for acute vascular events and 14 patients underwent scheduled elective cases. Of the emergency cases, 3 had ruptured intracranial aneurysms, 3 ruptured AVMs, one a ruptured dural AV fistula, and 6 ECIC bypasses for complex neurological pathologies. The elective cases included 2 AVMs, 2 carotid cutdowns for endovascular treatment of intracranial aneurysm, 9 craniotomies for aneurysm and one EC-IC bypass for aneurysm bypass and trapping. The average age for AVM treatment was 40 years (range 18-60) and 63 (46-79) for aneurysm clipping. Of 11 patients with aneurysms treated operatively, 7 required sub-temporal craniotomies for clipping of large basilar tip aneurysms not amenable for endovascular treatment.

Results: Angiogram post AVM resection demonstrated no residual nidus in all cases. Angiogram post aneurysm clipping (n=11) demonstrated complete obliteration of the aneurysm at time of closure, with no recurrences on delayed imaging out to five years for the earliest cases. 4 of the aneurysm cases underwent multiple on table angiograms with clip adjustment subsequent to these to ensure occlusion of the aneurysm sac and filling of the PCA and SCA vessels despite what was initially felt to be appropriate clip position.

Conclusion: We feel that these cases in particular demonstrate the utility and cost effectiveness of the hybrid theatre in preventing stroke, returns to theatre and post-operative patient morbidity and mortality. The disadvantages of the hybrid theatre include prolonged setup time, longer procedure time with subsequent possibility of infection and venous thrombosis, and a decreased case load.

Speaker Biography

Charles Fish completed a Bachelor of Science in Tasmania, followed by MBBS in Wollongong, Australia. He is currently a third year Neurosurgical Registrar at Royal Prince Alfred, Australia.

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Video Presentation

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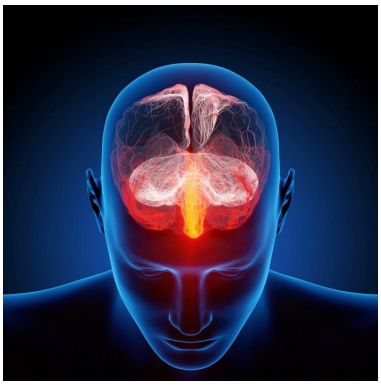

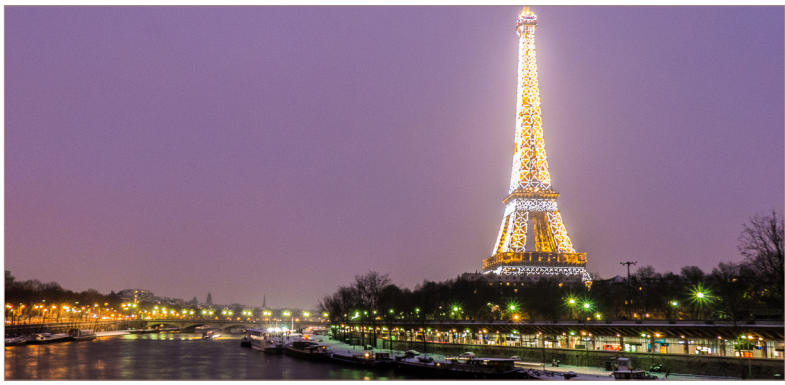

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Voice it out loud: Viewing the world through Autistic eyes using Assistive Technology

Tamara C McGill-Carter
Chicago School of Professional Psychology, USA

DeVillers and DeVillers(2014) and Iacoboni (2009) discovered that the ability for one to find their voice and actively engage in the world around them, mirror neurons take part in speech production. However, for several sets of children with verbal delays and who are non-verbal who Speech Generating Devices (SGD). The question posed is whether the devices are more effective in school settings considering the nature of communication and interactions that occur in that setting than other settings. Past researchers made convincing cases regarding the role of language development using SGD in several settings, but the one setting that has limited literature is SPG device use in the home (Thunberg, Ashlen, & Sandberg, 2011). More specifically, a child with definite understanding of their own feelings and desires, it is necessary to hear language used by them to understand what they most desire (DeVillers & DeVillers, 2014). We can observe behavior in expressing wants and needs, but the proper verbal expressions for that child's age range can indicate the maturity of the ToM and development of the executive functioning for their stage of life (DeVillers & DeVillers, 2014). That would lead to the second case of how the child obtains the information for a conversation. For example, when we hear someone try to get things that they want and driven by those wants, they voice and go to the place to get those wants. This approach to ToM development, therefore, focuses on the importance of learning words as labels for mental states (DeVillers & DeVillers, 2014).

What kind of language reflects or supports the developments of ToM reasoning to give researchers an understanding of the child's maturity is what several studies seeks to answer. Recent research focused on the verbs that reflect the child's mental state (Devillers & DeVillers, 2014). Rarely do children express their own and/or another's' beliefs until around four year of age. This study has been replicated with children who are slightly and moderately language delayed, but has not been studied with adults whom are non-verbal and severely delayed in language (DeVillers & DeVillers, 2014). Therefore, to fill the research gap, examining data provided by the population of non-verbal/severely delayed individuals using Voice Output Command Aides (VOCA's) in either a school, home or day program setting will hopefully answer the researcher's pressing research question.

Speaker Biography

Tamara C McGill-Carter's expertise is in Neuro-anatomy and Neuroscience with a focus on the intricate workings of the Limbic and Memory systems. Her master's thesis surrounds Human Memory and Encoding, detailing the fundamental changes that creates as well as destroy memories. She also excels in psychological theories and is currently in her final year of the Chicago School of Professional Psychology's Educational Psychology and Technology doctorate program, due to graduate by next summer. Her dissertation's focus centers on Autism, Theory of Mind, and Executive Functioning. She expertise in neuro-anatomy further expanded while working with individuals with developmental disabilities/delays at several Home Health Agencies, which created several projects centering on how autism and developmental delays affect the brain. She currently holds dual bachelor's degrees in Psychology from Indiana University Northwest in Gary and a Master of Arts degree from the Chicago School of professional Psychology, the concentration focus being Trauma and Crisis Intervention.

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Posture and mobility as CNS markers

Nicolas **Desjardins**
Institute Neuro Performance, Canada

What would be the easiest way to unload the brainstem, driving our sympathetic response to the roof? Let me show you how I manage it, by loading the frontal cortex and by optimizing the sensory inputs of the system.

Speaker Biography

Nicolas Desjardins is working in Institut Neuro Performance, Canada.Living with a partial handicap from childhood to 25 yo, Nicolas decide to learn about the human body. He first starts as a massage therapist. 10 years later, and still passionate, he has now more than 5000 hours of training that he has acquired in 7 different countries and 10,000 hours of clinical practice. He has taught for 4 schools in 3 countries and wants to share his knowledge by offering courses to therapists in the world in order to change the current practices to a higher level. Since winter 2017, he's doing a Doctorate / Ph.D in Integrative Medicine at Quantum University, in the USA.

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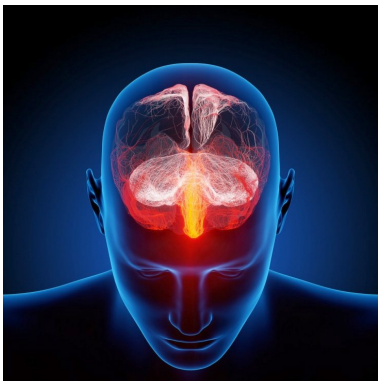
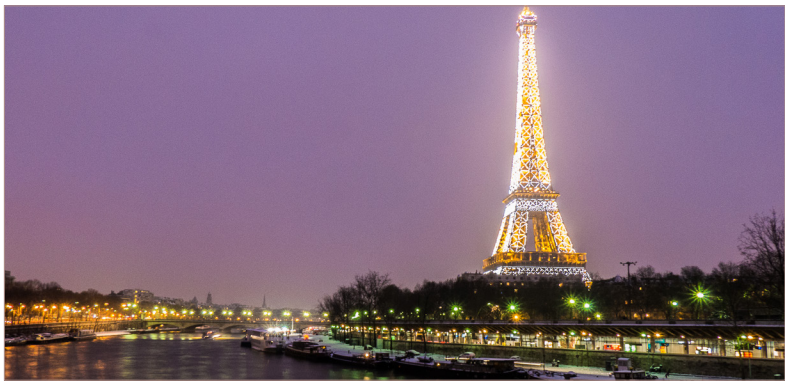


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Prevention of Dementia by means of Robotic Music Therapy

Kazue Sawami[1], Kimura M[1], Kitamura T[1], Kawaguchi M[1], Suishu C[2], Morisaki N[3] and **Hattori S[4]**

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Introduction: Our preliminary trial revealed the results of music therapy involving a combination of brain training tasks, which was performed for three months. A significant improvement in the participants' cognitive ability was identified ($p<0.05$) 1. We developed a method whereby the elderly participants danced to familiar music while performing brain training tasks 2. We set the music therapy to be delivered by a robot in order to more widely promote the value of such therapy for elderly persons. Since therapy delivered by robots can additionally be expected to promote psychological healing effects, we also investigated this expectation.

Method: A questionnaire concerning the uses of robot therapy was distributed to a group of elderly participants in a health promotion program.

Results: The responses of 62 participants (28 male, 34 female) were analyzed. The average age of the participants was 67.7 ± 5.3 years. Some 62.9% of the elderly people expected to develop an intimate friendship with the robot. Further, 19.4% of the elderly wanted to perform music therapy and brain training with the robot, while 6.5% of them wanted the robot to be responsible for their physical care.

Discussion and conclusion: The majority of elderly people exhibited a psychological attachment to their therapy robot. In addition, the elderly people wanted the robot to perform both brain training and care-related tasks. The value of brain training delivered by robots is likely to be significantly enhanced by the psychological attachment felt by the elderly in relation to the robot.

Speaker Biography

Kazue Sawami of the presenter of this research is a professor at Nara Medical University. Her Ph.D. acquisition is a health science, and the recent study is the prevention of dementia in elderly people. Research currently being developed is the intervention by artificial intelligence, and support of the elderly by the information equipment remote control system.

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Accepted Abstracts

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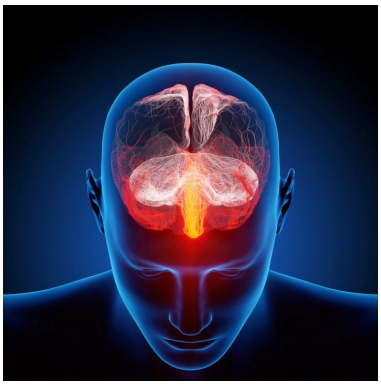
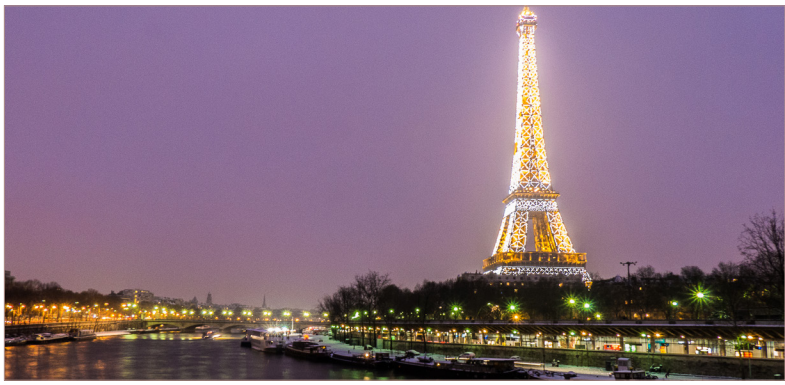


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Transcranial doppler in non-severe Traumatic Brain Injury

Infante Valenzuela Adrián
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Background: The role of Transcranial Doppler Ultrasound (TDU) in the prognostic orientation of cases with severe TBI is known, but its application to evaluate cases with mild or moderate severity is actually unknown.

Methods: Patients with non-severe TBI were prospectively evaluated to demonstrate the applicability of transcranial doppler in the acute period for orientation in pronostic, with its probable inclusion among the variables of prognostic calculators; as well as the association of variables as serum biomarkers and with the different types of lesions evidenced with Computed Axial Tomography.

Forty no severe Traumatic Brain Injury patients were evaluated within the first 24 hours of the lesion, a computerized axial tomography image was obtained, parameters were measured by transcranial doppler of bilateral middle cerebral artery; in addition to obtaining serum sample (3 vials of 1cc) that were kept freezing at -80 degrees for subsequent measurement of IL-1, IL-6 and tumor necrosis factor alpha, neurospecific enolase and S100beta. Statistical analysis was performed with SPSS V.23 software.

Results: The results with cytokines did not show a significant difference between the medians of IL-1, IL-6 and THF-alpha and the groups with and without alteration in UDT (hypoperfusion and non-hypoperfusion); in the analysis by type of lesion on CT, patients with wubdural hemtoma by CT and a substantially lower concentration of IL-1 (45pg/ml), IL-6 (460pg/ml, p=0.029) and TNF- α (94pg/ml, p=0.0001) compared to patients who did not have this lesión (186 pg/ml, 649 pg/ml and 388 pg/ml, respectively). A decrease perfusion by transcranial doppler (VMF below 35 cm/s) correlated positively with the presence of Subarachnoid Hemorrhage and Parenchymal Hemorrage (p=0.045, p=0.039, respectively). We conclude that, in patients with non-severe traumatica brain injuries, the evaluation with transcranial doppler also plays an important role in prognostic orientation; in addition and even without the computerized axial tomography data, it can facilitate the classification for risk of development secondary neurologic complication.

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Awake Craniotomy the future of Neurosurgery

Debabrata Mukhopadhyay and **Asha Bakshi**
Kailash Health care, India

Introduction: Surgical treatment of intrinsic brain tumour in the eloquent areas like speech or motor is always a risk factor for major deficit. Awake craniotomy is a useful surgical approach to identify and preserve functional areas in brain and maximizes tumour removal. The other advantages are very short hospital stay, bypassing general anaesthesia, therefore lesser risks and cost effective. These advantages of awake craniotomy is encouraging to operate on all intraxial supratentorial tumours irrespective of eloquent areas.

Methods: Retrospective analysis was done with selected patients admitted from July 2011 to February 2018 for awake craniotomy. Patient presentations, co- morbid conditions, tumour locations and the histopathological features were documented. The presentation was seizure and/ progressive neurological deficit. Long acting local anaesthesia was used for scalp block. Anaesthesia was performed in a state of sleep-awake-sleep pattern, keeping patients fully awake during tumour removal. The brain eloquent functions were closely monitored whenever tumours were in eloquent areas of brain clinically during surgery. However, unlike routine, brain mapping was not performed due to lack of resources.

Results: A total of 55 patients were included in the study of age between 24-55 years (mean 36). 31 (56.36 %) were females and 24(43.63%) males.31(56.36%) patients presented with predominantly seizure disorders and rest with progressive neurological deficit. 47 (85.45%) patients were discharged on second postoperative day. Complications was encountered in 6 (10.90 %) patients who developed brain swelling intraoperatively and 8(14.54%) deteriorated neurologically in the immediate postoperative period however managed successfully. Patients with prior neurological deficit only deteriorated. No complications were encountered who was neurologically intact. 8(14.28%) patients require ICU/ HDU care for different reasons. There was no mortality during the hospital stay. Histopathology revealed 39 (70.90%) patients low grade glioma, 13 (23.63%) high grade glioma and 3 (5.45%) metastases.

Conclusion: Awake Craniotomy is a safe surgical management for intrinsic brain tumours irrespective of eloquent area of brain although surgery and anaesthesia is a challenge. It offers great advantage towards disease outcome.

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Transcutaneous Vagus Nerve Stimulation (TVNS) – from concept to reality

Enrique Ventureyra
International Neurosurgical consultants Inc., USA

Vagus Nerve Stimulation (VNS) has proven benefitial effects for the treatment of intractable Epilepsy and other CNS disorders. Nevertheless, due to the potential risks associated with the surgical implant of the device and cost of the equipment it's utilization and clinical indications have been limited.

TVNS is an innovative and noninvasive method of Neuromodulation that has evolved in the last two decades from a theoretical Concept to an effective treatment modality for a variety of CNS (Epilepsy , Parkinson, Anxiety, Depression, OCD, Tinnitus, Chronic pain, etc.)and other disorders (Atrial fibrillation, Obesity, etc.) involving systems influenced by the Vagus Nerve. Additionally due to its noninvasive nature the TVNS device is a useful, reusable and low cost research tool.

It has been demostrated that tVNS is as effective as the implantable VNS stimulator, thus an available alternative to decrease the risks and the cost associated with the device and its surgical implant. Additionally, the costs and toxic effects of medications such as AEDs and ADDs are either decreased or eliminated.

In conclusion, being noninvasive TVNS has contributed to expand the indications and benefits of VNS, decreasing the risks and the costs of the surgical implant. Consequently, many more patients around the world could benefit from this form of treatment.

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Automatic reporting of Lumbar Magnetic Resonance Imaging in patients with low back pain

Mohammed Al Jumaily
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Introduction: Chronic Lower Back Pain (CLBP) is one of the major types of pain that is affecting many people around the world. It is estimated that 28.1% of US adults suffer from this illness and 2.5 million of UK population experience this type of pain every day. Currently the diagnostic imaging of the lower back pain is mainly done by a visual observation and analysis of the lumbar spine MRI images by radiologists and clinicians and this process could take up much of their time and effort. In addition, not all clinicians who see these images could interpret them, these facts, therefore, rationalize the need for a new approach to increase the efficiency and effectiveness of the diagnostic imaging reporting.

Material and Methods: We are proposing to develop a new methodology to automatically aid clinicians in performing diagnosis of CLBP. Our approach will be based on the current accepted medical practice of manual inspection the MRI scans of patients' lumbar spine. The latter is done through visual observation and analysis of specific slices in both axial and sagittal views of the lumbar spine MRI. To detect lumbar spinal stenosis and disc herniation, the clinicians locate the boundaries of the different parts of the lumbar spine on the MRI image. They then identify the distances between them.

Our proposed methodology will capture and model these processes as algorithms. It starts with identifying slices in a lumbar spine MRI that are useful and necessary for the detection process. These slices are 2D at certain locations and orientations. The images will be then divided spatially into separate regions, each related to a specific organ by performing image segmentation.

We developed a patch-based classification neural network consisting of convolutional and fully connected layers to classify and label pixels in the selected MRI slices. The classifier is trained using overlapping patches of axial-view T2-weighted MRI images of the bottom three intervertebral discs.

Results: The results of the computer-aided MRI reporting are highly sensitive and correlate very well with the human radiologist reporting of the images.

Conclusion: Computer-aided reporting of lumbar spine MRI scans is a reliable method and could well reduce the cost and time needed to report these images.

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ICT for language learning

Rachel M Paling
Efficient Language Coaching, UK

Neurolanguage Coaching incorporates the latest findings in neuroscience as well as principles and tools from coaching into the traditional process of language teaching with practical steps to facilitate learning. Through neuroscience we know that every brain is unique, so neurolanguage coaching is tailor-made learning to clients' needs, without books, but with clear and structured targets to achieve in defined periods of time. This method and approach potentially creates the perfect learning conditions for the brain leading to faster, more efficient, sustainable and cost-effective results. It is essential as an educator to fully understand how the brain is impacted and affected while learning and for us to engage and empower our learner to their full potential. When we create brain friendly interactive conversations, in a non-directive style, provoking brain connections whenever possible, then we come into a perfect learning state. NL Coaching is new and unique, going one step beyond "language coaching" adding the practical application of "neuroscientific principles". Teachers are introduced to the 7 underlying principles of neuroscience pervasive in NL coaching, highlighted in the book Neurolanguage Coaching – Brain friendly language learning.

The new method/approach of "Neurolanguage coaching" has been introduced by Rachel Marie Paling. This is a hybrid of both method and approach, whereby it not only encompasses the traditional principles of coaching within the language knowledge transmission process, but it also incorporates aspects of neuroscience and the ideal learning state according to neuroscience, in which this ideal learning state of the brain is explored through knowledge of the limbic system and how the brain works. By fully understanding and acknowledging that no two brains are alike, the neurolanguage coach then is able to adapt to the individual coachee in front of him/her and is able to recognize how that coachee can relate to, learn and commit to long term memory the information that the language coach is transmitting. Perhaps this is the first time in the pedagogy of language that the learning process really focuses learner-centrically on the individual´s capacity for learning, recognizing that all brains are different and the neuroscientific principles underlying this process. The neurolanguage coach is trained to deliver a constant brain friendly approach which is non-directive, non-threatening, abundantly empathetic, but provocative in the sense that he/she will constantly be stimulating the learner's brain into language connections and insights throughout the process. There may also be conversations to discover how the learner learns best, and how he/she can connect language learning to real life and to personal situations. The neurolanguage coach is skilled in the technique of chunking language down, providing a safe learning environment and developing spacing techniques for learning. Additionally, he/she is skilled in getting the coachee to set own goals and actions for the process, ensuring maximum ownership from the learner. Motivation and commitment conversations are essential, as well as the awareness of "emotional triggers" which could hamper learning and progress, so there are continuous coaching conversations that keep the brain in a calm learning state, whereby even grammar is delivered through calm step by step coaching conversations, so that the learner can quickly "normalise" the language.

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Early childhood vaccines and Regressive Autism: Is there a connection?

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Regressive Autism may be defined as a rapid-onset loss of previously acquired milestones in central nervous system (CNS) development that occurs usually within the first several years of life and may also be associated with seizures or other abnormal CNS activity. Clinically, this abnormal response to vaccination is termed "vaccine encephalopathy", in which developmentally normal infants or children display a sudden developmental regression, reduced developmental progression and/or seizures with rapid onset following vaccine administration. That the dramatic CNS changes associated with regressive autism so rapidly follow the administration of vaccines is highly suggestive of a causative connection which, however, has been disputed by some reputable epidemiological studies. The Quantitative Threshold Hypothesis (QTE) proposes that autism results from the accumulated exposure to genetic and environmental causes that impinge upon immunological factors linked to CNS development to produce a critical incidence threshold for Autism Spectrum Disorder (ASD). The proposed connection between vaccines and regressive autism is based on an application of this model, in which at-risk individuals may develop regressive autism and associated sequelae in response to vaccine administration if this causes an individual to cross the threshold boundary for CNS impairment. The physiological basis of the proposed vaccine/autism connection results from the fundamental association between vaccine-induced programming of adaptive immune system responses and its direct dependence upon innate immune system inflammatory responses to the vaccine. In some at-risk individuals predisposed to neuroinflammation due to the combined effects of genetic and environmental immuno-stimulatory risk factors, the threshold to immunopathology resulting in neuroinflammation and impaired neural function may thus be induced by vaccine administration. This paper will present risk-factor assessment parameters that can be used preventively to identify children for whom vaccine protocols should be adjusted to reduce the incidence of regressive neurological impairment.

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Imaging of Alzheimer's misfolded proteins in the retina

Umur Kayabasi[1] and **John Rose Sr**[2]
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Background: Recent research suggests that Tau is the culprit lesion along with neuroinflammation in the etiology of Alzheimer' s Disease (AD). Retina is the extention of the brain and is the most easily approachable part of the central nervous system. Detection of the pathological protein accumulations may be possible by using spectral domain optical coherescent tomography (SD-OCT) and fundus autofluorescein (FAF). There is evidence showing that retinal plaques start accumulating even earlier than the ones in the brain. Most recent Tau protein images in the brain consist of normal or reverse C-shaped paired hellical filaments.

Methods: 20 patients with PET proven AD were examined by SD-OCT and FAF. Mean age was 72. Hypo or hyperfluorescent retinal lesions were scanned by SD-OCT and C shaped paired hellical filaments were investigated in a masked fashion. The researchers agreed on the shape of the lesions. Both C-shaped (normal or reverse) filaments and thinner fibrillary structures were taken into consideration.

Results: In all the patients, paired hellical filaments that exactly corresponded with the histopathologic and cryo-EM images of Tau in terms of shape and dimension were detected along with thin fibrils and lesions similar to amyloid beta. The number of the retinal filaments and other abnormal proteins was in concordance with the severity of the disease process. The advanced retinal filaments had normal or reverse paired C shapes and thin fibrils had the shape of histopathologic images seen in early developmental stages of the disease.

Conclusions: Retinal images of Tau were disclosed for the first time in live AD patients. Retinal neuroimaging is a trustable biomarker and tool for monitoring the disease.

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