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13th World congress on

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Tamara C, J Neurol Neurosci 2018, Volume: 2
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VOICE IT OUT LOUD: VIEWING THE WORLD THROUGH AUTISTIC EYES USING ASSISTIVE TECHNOLOGY

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Statement of the Problem: 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.

Biography

Tamara (Tammi) 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. Tammi 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. Tammi's 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. Tammi currently holds dual bachelor's degrees in Psychology from Indiana University Northwest in Gary and a Master's of Arts degree from the Chicago School of professional Psychology, the concentration focus being Trauma and Crisis Intervention.

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DOES SEROTONIN AUGMENTATION HAVE ANY EFFECT ON COGNITION AND ACTIVITIES OF DAILY LIVING IN DEMENTIA RELATED TO ALZHEIMER'S? A DOUBLE-BLIND, PLACEBO-CONTROLLED CLINICAL TRIAL

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Objective: Recent studies suggest that cholinergic dysfunction does not provide a complete account of age-related cognitive deficits and other neuronal systems like monoaminergic hypofunction. In several studies, selective serotonin reuptake inhibitors demonstrated promotion in neurogenesis in the hippocampus and enhanced memory and cognition. The aim of this study is to survey the effect of serotonin augmentation on cognition and activities of daily living in patients with Alzheimer's disease.

Method: The trial was designed as a 12-week randomized, placebo controlled, double-blind study. 122 patients aged 55 to 85 years with mild-to-moderate Alzheimer's dementia were randomly allocated in one of the three treatment groups: fluoxetine plus rivastigmine, rivastigmine alone or placebo group. Efficacy measures comprised assessments of cognition, activities of daily living and global functioning. Hamilton depression scale also was used to assess changes in mood throughout the study.

Result: Fluoxetine plus rivastigmine and rivastigmine groups demonstrated improvement on measures of cognitive and memory without any significant difference. However, the former group did better in their activities of daily living and global functioning. Patients taking placebo had significant deterioration in all the efficacy measures. Patients taking rivastigmine or rivastigmine plus fluoxetine had improvements in Hamilton depression scale without significant differences.

Conclusions: Concomitant use of selective serotonin-enhancing agents and acetyl cholinesterase inhibitors can provide greater benefit in activities of daily living and global functioning in patients with cognitive impairment. Because our study is preliminary, larger double-blind studies are needed to confirm the results.

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CONNECTIONS AND DISCONNECTIONS OF *NIGELLA SATIVA* OIL IN ALCOHOL INDUCED BEHAVIORAL DEFICITS IN MALE WISTAR RATS

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There are many factors that can prevent or promote one's chances for the development of diseases. One example is alcohol use. Alcohol consumption remains part of our social milieu. Harmful alcohol use is a significant public health problem that often begins early in adult life. Globally, an estimated 2 billion people drink alcohol and 76 million have alcohol use disorders (AUD). Amongst a range of organ damage outcomes, chronic alcohol abuse and particularly binge-type alcoholism causes neuropathological sequelae leading to brain dysfunction and dementia. Due to this, alcohol is known to have effects on memory and other cognitive functions in humans and animals. Anxiety disorders frequently co-occur with alcohol-use disorders (AUDs), with 75% of individuals that abuse alcohol having a current or previous diagnosis of an anxiety disorder. *Nigella sativa* (NS) plant seeds are called black cumin or black seeds. *Nigella sativa* oil (NSO) has several physiological and pharmacological properties that can improve the behaviour and systems. As the attractive dietary approaches towards disease prevention involve inexpensive and low risk substances, one of the purpose of this study is to explore the ability of dietary supplementation of black cumin oil to prevent alcohol induced detrimental behaviour like anxiety and memory impairment. To explore the effects of NSO, male Wistar rats were used and divided into water and alcohol groups and given water or alcohol in drinking bottles for 28 days. NSO was administered by oral gavage. Animals weighted daily and behavioural measurements (weekly) and sacrificed. Brain and blood were collected and immediately frozen for molecular markers associated with behaviour like dementia.

Findings: Alcohol showed significant reduction in weight, weaken memory and anxiety level compared to water drinking animals. NSO treatment improved behaviour in alcohol drinking animals by enhancing the memory and reducing the anxiety but in water drinking animals NSO improved the memory only. Effects of NSO treatment on weight were not significant in both the groups.

Conclusion & Significance: *Nigella sativa* oil is capable of enhancing memory. It can significantly ameliorate the anxiety caused by chronic alcohol consumption.

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INNOVATIONS IN DEMENTIA CARE

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The Centre for Aging and Brain Health innovation is a solution accelerator focused on driving innovation in the aging and brain health sector. Established in 2015 through funding of $124 million (CAD), it is the result of the largest investment in brain health and aging focused on dementia care in Canadian history, and one of the largest investments of its kind in the world. CABHI is a unique collaboration of health care, science, industry, not-for-profit and government partners whose aim is to help improve quality of life for the world's aging population, allowing older adults to age safely in the setting of their choice while maintaining their cognitive, emotional, and physical wellbeing. CABHI currently has invested in 175+ projects with over half of them focused in dementia care promoting brain health, early diagnosis and interventions and innovative practices to care for dementia patients. The innovation themes are of aging in place: solutions that enable older adults with dementia to maximize their choice, independence and quality of life regarding where they live; caregiver support: solutions that support caregivers (formal and informal) in providing care to older adults with dementia; care coordination and navigation: solutions that help older adults, caregivers and healthcare providers coordinate care and transitions for older adults with dementia; cognitive health: solutions focused on health promotion, prevention, early diagnostics and slowing the progression of cognitive impairment in aging adults. The presentation will focus on outputs and outcomes highlighting some of the promising solutions that can be scaled and have the potential of making system-wide impact globally. In particular, the solutions for dementia that will be detailed include: devices and software applications that can help dementia patients live independently at home; innovative solutions for maintaining cognitive health, dementia assessment and tools; therapeutic recreation and social engagement, brain health promotion; solutions for dementia care in an institutional setting and solutions for reduction in caregiver burden and stress.

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PHOTOBIOMODULATION: CASES OF HEALING ALZHEIMER'S DISEASE WITH LIGHT

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Photobiomodulation (PBM) has been overlooked as a potentially potent modality for a variety of medical conditions. It involves delivering light, mainly in the red and near infrared (NIR) spectrum to the body and brain to achieve positive health outcomes. Research on PBM's effect on the brain is just now making some headway in human studies, in particular in dementia and Alzheimer's disease (AD). An early study investigated whether a group of patients with mild to moderately-severe dementia or AD, MMSE baseline scores of 10-24, would improve when treated with NIR PBM therapy. The study used 810 nm; 10 Hz pulsed, light-emitting diode (LED) devices combining transcranial plus intranasal PBM to treat the cortical nodes of the default mode network (DMN). The home-use devices were considered as low risk general wellness devices, exempted from medical device regulations in North America. Five patients with mild to moderately-severe dementia or AD were entered into 12 weeks of active treatment as well as a no-treatment, 4-week period. Patients were assessed with the MMSE and ADAS-cog tests. The protocol involved weekly, in-clinic use of a transcranial-intranasal PBM device and daily at-home use of an intranasal-only device. The results presented significant improvement after 12 weeks of PBM (MMSE, $p<0.003$; ADAS-cog, $p<0.03$). Increased function, better sleep, fewer angry outbursts, less anxiety and wandering were reported post-PBM. There were no negative side effects. Precipitous declines were observed during the 4-week follow-up period of no treatment, suggesting that PBM treatment for AD has to be regular and permanent. This case series study is the first completed PBM pilot study to report significant, cognitive improvement in mild to moderately-severe dementia and AD cases. Results suggest that larger, controlled studies are warranted, which are now underway. PBM shows potential for home treatment of patients with dementia and AD.

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BEST MEDICAL PRACTICES: UNDERSTANDING PERSPECTIVES OF A LOST IDENTITY IN DEMENTIA CARE

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This session identifies common misconceptions about identity and thought processes for persons living with Alzheimer's disease and related to dementias. Beyond diagnostic brain imaging and neurocognitive testing scales, case studies and research from around the United States highlights persons with dementia by utilising expressive arts therapy techniques as a way to examine diagnosis, assessment and treatment interventions from a person centered approach. From prodromal mild cognitive impairment to late stage Alzheimer's, consciousness seems to remain intact despite neural death. In addition, this session aims to alter the perceptions of how persons living with dementia are perceived by the medical community, with reliance in lessening psychotropic drug usage, discouraging poor spending allocations and establishing meaningful care. From Alzheimer's clinical research trials to expressive art therapies, the importance of why the arts and sciences are needed is demonstrated to enhance quality of life and well-being for those living with neurocognitive impairments, and ways in which to establish a better medical model practice.

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GENETIC AND CLINICOPATHOLOGICAL CONTRIBUTION OF RARE ABCA7 MUTATIONS IN BELGIAN EARLY ONSET ALZHEIMER'S DISEASE PATIENTS

Liene Bossaerts[1,2,3], Tobi Van den Bossche[1,2,4,5], Arne De Roeck[1,2,3], Sebastiaan Engelborghs[2,3,4], Karin Peeters[1,2,3], Marleen Van den Broeck[1,2,3], Annelies Laureys[1,2,3], Peter P De Deyn[2,3,4], Kristel Sleegers[1,2,3], Patrick Cras[2,5] and Christine Van Broeckhoven[1,2,3]

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Recent genetic studies suggested an important role for rare deleterious premature termination codon (PTC) mutations in ABCA7 in early-onset Alzheimer's disease (EOAD). ABCA7 was originally associated with late-onset Alzheimer's disease (AD) in genome-wide association studies. These ABCA7 mutations are predicted to lead to a loss of functional protein, though their exact mode-of-action is still under investigation. The pathogenicity and segregation patterns of specific mutations and possible modifiers thereof are still poorly understood. We investigated the frequency of ABCA7 PTC mutations in 734 Belgian EOAD patients (mean onset age 61.2±7.0 years) and the clinicopathological features of the mutation carriers. We identified 13 different ABCA7 PTC mutations in 32 carriers (32/734, 4.36 %). Carriers had a mean onset age of 61.7±5.9 (48-70) years. Clinical presentation was predominantly amnestic, except for one patient. No clear distinguishing features were present in the clinical neurological examination or ancillary investigations. A positive first-degree familial history was present in 73.7% (14/19). Neuropathological examination (n=5) showed hallmark AD lesions in 80% (4/5) combined with a pronounced cerebral amyloid angiopathy (CAA). In summary, PTC mutations in ABCA7 are relatively frequent in Belgian EOAD patients, particularly in familial EOAD. Most carriers have a predominant amnestic presentation and their neuropathology shows AD hallmarks in combination with CAA. Continued identification and characterization of ABCA7 mutations is necessary to allow implementation of ABCA7 screening in clinical practice and genetic counselling. Also, ABCA7 PTC carriers might represent an important genetic subtype of AD and more knowledge might improve genetic diagnosis, risk prediction and development of targeted therapeutics.

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PRACTICAL APPLICATIONS OF CURRENT RESEARCH IN THE INSTITUTIONALIZED CARE OF THOSE LIVING WITH DEMENTIA DIAGNOSES

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Research outcomes mean very little if they are not translated into improving quality of life for those living with diagnoses of Alzheimer's disease or related forms of dementia. However, there remains much research that goes untranslated into care practices in institutionalized settings due to a lack of knowledge regarding research outcomes. Institutional leaders who are unwilling to change current care practices or a lack of funds enabling the purchase of new resources needed to implement care practices that have been empirically demonstrated to improve the quality of life for affected individuals. Additionally, institutional administrators often persist in putting those diagnosed with dementia in a deficit-based perspective rather than seeking proven methods to maximize quality of life by practicing abilities-based and wellness-based philosophies of care. This presentation will seek to review current research depicting state of the art quality of life interventions available for those living in institutionalized care and will demonstrate some of the said interventions. Additionally, the presenter will discuss some of the factors impeding the translation of proven, empirically-demonstrated interventions into institutional practice and will provide suggestions for overcoming these factors. Finally, a wellness-based daily program will be presented, featuring eight domains of wellness and that emphasizes person centered approaches which has been shown to improve quality of life for those living in institutional settings in the United States.

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INTRANASAL ADMINISTRATION OF HSP70: MOLECULAR AND THERAPEUTIC CONSEQUENCES

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Hsp70 and other molecular chaperones function as a complex neuroprotective system, which fails in the brains of aged people and Alzheimer disease (AD)-type neuropathologies. It was demonstrated that intranasally injected exogenous Hsp70 (eHsp70) effectively bypassed the blood-brain barrier and penetrates brain regions of the model animals. It was shown that chronic administration of eHsp70 decreases beta-amyloid level and the number of Aβ-plaques in two mouse models of AD. In both cases, eHsp70 restored learning and memory parameters as well as functional state of neurons. Characteristically, eHsp70 treatment increased synaptophysin level and protects neurons in brain areas most affected in AD patients such as hippocampus and neocortex. It was also demonstrated that eHsp70 can promote longevity and life quality in male mice. The eHsp70 treatment decreased accumulation of aging marker lipofuscin and modulates the activity of UPS by increasing expression of several proteasome subunits including immunoproteasome subunit β5i. Deep sequencing studies exploring mice of brain regions of AD-model 5XFAD different age groups treated with eHsp70 revealed candidate genes and signal pathways probably underlying beneficial effects of eHsp70 treatment. Taken together, our findings established intranasal administration of exogenous human Hsp70 as a practical therapeutic approach for the treatment of various neurodegenerative diseases and aging.

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AMYLOID DEPOSITION IN BRAIN AGING: CAUSAL AGENT OR INNOCUOUS BY STANDER ?

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PET amyloid imaging has been initially considered as the main tool to investigate the beginning of the AD process in cognitively intact individuals. The percentage of PET-amyloid positive controls is of 6% at age 60 but reaches 50% at age 90 in community-based sample pointing to the fact that amyloid deposition (as amyloid plaque formation) is closely related to aging process. In fact, increased PiB (Pittsburgh Compound B) binding has been reported in almost 20%-30% of cognitively preserved elders mainly in posterior cingulate cortex, precuneus and prefrontal cortex. Compared with amyloid-negative, amyloid-positive controls showed moderate decline in verbal and visual episodic memory over 36 months but no changes were seen in non-memory functions. Most importantly, the absence of amyloid in mild cognitive impairment (MCI) cases is associated with cognitive stability at 36 months. Increased PET-PiB binding is associated with brain atrophy, cortical thinning but also decreased cortical metabolism, aberrant functional connectivity at rest and decreased task-related deactivation of the default mode network. Altogether these data suggest that contrasting with CSF Aß and tau changes that sign a biological diathesis to neuro-degeneration, amyloid positivity in the human brain is present as a part of the aging process representing a critical step preceding the installation of AD pathophysiology. However, not all cases with elevated PET-PiB bindings evolve to AD and several cases develop dementia not necessarily related to amyloid aggregation. Several recent contributions revealed that neurodegeneration takes place without a temporal link with fibrillar amyloid deposits. Alternative but less frequent pathways exist starting from tau deposition with modest Aß pathology.

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NON-INVASIVE HOME-BASED BRAIN MONITORING FOR DEMENTIA AND PRE-DEMENTIA PATIENTS

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Over two billion people worldwide are estimated to suffer from a disease of the central nervous system. Over half of the people satisfying the criteria for dementia have never received a diagnosis. In US, a lower bound of 5.7 million individuals is believed to have Alzheimer's disease (AD). Given this population's reduced ability for self-assessment, it can hardly accurately report changes in physiological state, including seizures and their causes, rendering it all the more vulnerable to undetected injury and drug side effects which is compounded in the US drug where over 70% of the population is at least on one prescription and more than half takes at least two thus delaying care. Given that compromised sleep is the first hallmark of AD and possibly a precursor as sleep may be critical in reducing β-amyloid build-up. Moreover dynamic oscillations during sleep can be harnessed to identify subtle changes in neurophysiology, tracking the fine nature of sleep in AD. Mild cognitive impairment (MCI) patients presents a significant opportunity to address the vulnerabilities described above as well as to evaluate compounds, diets and changes in lifestyle which may be more potent in the MCI stage than in AD. In this lecture, human-based, sleep-based, non-invasive neurotechnology platforms will be discussed, including one specific for gathering drug response data and a sensitive one for identifying at risk subjects. Applications of these technologies regarding other CNS disorders, including Lewy body dementia, will be discussed.

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HOLISTIC WELLBEING AND MINDFULNESS THERAPY FOR ALZHEIMER AND DEMENTIA

Rebecca Clingan
Holistic Therapist, UK

This presentation reveals how holistic therapy can assist in the treatment of patients with Alzheimer's and dementia irrespective of religious belief, focussed on the placebo effect. Each unique treatment that is an amalgamation of Reiki, massage, music, chat, mindfulness and eye contact, using the healing power of touch, focusses on their individual feelings and emotions to provide a bespoke treatment. I believe that medicine aids in the physical balance and wellbeing of an individual and continued research is required in the fields of Alzheimer and dementia, however, the feelings and emotions that are linked to memories still exist and I have found, using my methods, that an inner calm is reached creating a feeling that stimulates a positive, calming effect on my clients who live with a wide range of dementias and other life changing illnesses. As a result of my work, I have documented evidence which proves that my treatments are safe and effective with no reported negative effects. Used in conjunction with other 'alternative' therapies including massage and music therapy, my treatments are well received and effective, resulting in the majority of clients becoming calm, relaxed, more approachable and generally happier. I have found that this benefits not only the client but the families and carers who report finding "inner peace" and the ability to continue their own schedule knowing that their loved one feels safe and less anxious. When providing a group treatment within an EMI unit, not all the clients may receive a one to one treatment however others react positively from the ambiance created; sometimes instantly, sometimes many hours later.

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OPPORTUNITIES, CHALLENGES AND ETHICS IN AMYLOID AND NEUROIMAGING

Natasha Staneva
Sr CRA in a global contract research Organisation, Scotland

Imaging can have positive impact in identifying patients with AD before the onset of the symptoms. There are studies suggesting that machine learning techniques such as support vector machine (SVM) and fMRI can be used successfully in identifying patients 5 to 10 years before the onset of AD. However, there are some important items that has to be addressed: validation of machine learning and fMRI as in vitro diagnostic methods, access to that information (insurance companies, healthcare providers), high cost.

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MICROSTRUCTURAL CHANGES REVEALED BY DIFFUSION TENSOR IMAGING (DTI) IN ALZHEIMER'S DISEASE

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Background: Alzheimer's disease (AD) is a progressive and degenerative Process in gray (GM)) and White (WM) matter of the human brain. Recent studies have been focused on pre symptomatic microstructural changes that will assist the early diagnosis of AD. To date Magnetic resonance imaging (MRI) based microstructural changes research looked into neuronal destruction in gray matter whereas, there are fewer studies on white matter abnormality.

Methods: Long term DTI data from the Alzheimer's disease Beginning in 2 database were used to test. (A): the within-group microstructural white matter changes in Samples with AD and healthy controls at baseline and The first six months ; and (B): the between-group microstructural changes differences in Samples with AD and healthy controls at both Time points.

Results: (A): Within-group: longitudinal Tract-Based study disclose that Samples with AD and healthy controls both had decreased fractional anisotropy (FA) and increased mean diffusivity (MD) with changes in the hippocampal cingulum exclusive to the AD group.(B): Between-group: relative to healthy controls, Samples with AD had lower FA and higher MD in the hippocampal cingulum, as well as the corpus callosum, internal and external capsule; corona radiata; posterior thalamic radiation; superior and inferior longitudinal fasciculus; fronto-occipital fasciculus; cingulate gyri; fornix; uncinate fasciculus; and tapetum

Conclusion: The results of current study highlight that sensitivity toward white matter microstructure is a promising target for AD microstructural changes research. Further longitudinal studies on both white and gray matters are recommended to get a deeper understanding of these microstructural processes.

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AN INTERVENTIONAL PHASE III ACCELERATED STUDY TO DETERMINE THE EFFICACY AND SAFETY OF RECEPTOL® ORAL SPRAY (RADHA108 NANO PEPTIDES) USED IN HIV POSITIVE PATIENTS WITH MULTIPLE SYMPTOMS AS A STAND-ALONE MONO THERAPY AND THAT COULD BE AN ANSWER TO ALZHEIMER'S AND DEMENTIA AND OTHER IMMUNITY DISORDERS

Pawan Saharan
Biomix Network Inc., USA and India

Receptol® oral spray was used in HIV positive patients as a model with CD4 counts of more than 100 cells/cmm and CD8 count of more than 400 cells/cmm to determine its immunity boosting capacity based on large number of indications approved by US and EU PTO (US Patent# 9,249,188) in 2016 including for Alzheimer's and Dementia. Receptol® oral spray is assessed for its efficacy in treatment of HIV in a study without anti-retroviral therapy/observed therapy-short course (ART) based on the reduction in viral load and clinical symptoms as primary efficacy results. Absolute CD4/CD8 counts and various physical parameters were evaluated as secondary efficacy results. Receptol active ingredient is Patented Radha108 nano peptides, isolated from mammalian colostrum with vaccine like antiviral and immunomodulator activity via building body's own immune system and attachment inhibition on the cell surface receptors. The mode of action is based on Radha 108 crossing the blood brain barrier and sending signals via pituitary to thymus and bone marrow to build body's own immune system naturally strong via release of cytokines, interleukins and interferon etc. creating paradigm shift in healthcare from prevention to cure which was exhibited in this study. It cures all clinical and physical symptoms associated with AIDS and reduction in viral load and increase in CD4 absolute count with in a period of 3 months accelerated study conducted by Indian Council of Medical Research, Govt of India. Similar effects were observed in observational study conducted on Alzheimer's and dementia and other immunity disorders.

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HOW IS CARE COMPLEXITY ASSOCIATED WITH MEDICATION CONFIDENCE AND ADHERENCE? AN ANALYSIS OF THE SAFE-PHASE STUDY IN SINGAPORE

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As the number of patients with high morbidity and medication burden increases, it is important to understand care patterns and patient behaviors in complex populations. Few studies on confidence and medication adherence have been conducted among older East Asian populations. The aim of this study was to investigate whether older adults who demonstrate care complexity (multiple providers or outpatient healthcare visits) express varying levels of confidence in medication use and non-adherence. Participants of a nationally representative survey of older Singaporeans were selected for analysis (N=1302). Associations of interest were assessed using logistic regression, controlling for age, gender, ethnicity, education, medications and comorbidities. Compared to participants who had no visits to a provider in the past 3 months, participants with one visit to a single provider (OR=3.05, 95% CI 1.81-5.14), two visits-each to a different provider (OR=2.49, 95% CI 1.34-4.65) and multiple visits or providers (OR=2.51, 95% CI 1.62-5.03) expressed lower confidence in medication use. There was no association between care complexity and medication non-adherence. Among older Singaporeans, high care complexity was associated with lower confidence in medication use, but not to medication non-adherence.

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NEUROPROTECTIVE POTENTIAL OF *DECALEPIS HAMILTONII*: A STUDY WITH TRANSGENIC A30P AND A53T α-SYNUCLEIN PARKINSON DISEASE MODEL OF *DROSOPHILA MELANOGASTER*

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Human neurodegenerative diseases such as Parkinson's disease (PD) and Alzheimer's disease (AD) are recognized clinically by dementia in aging populations. They are characterized by enhancement in oxidative stress and reduction in antioxidant defence mechanisms in neurons that result ultimately in neuronal death. Prevailing FDA approved drugs cannot cure or stop the progression of the disease. These drugs also cause many undesirable side effects. Since PD is a relentless disease without a cure, the need of the hour for these patients is to provide palliative care. Several promising drugs are being screened and the quest for discovery of new drugs continues. Drosophila serves as an ideal organism for high throughput screening of drugs due to possibility of generating neurodegenerative disease model and the rescue achieved by administrating potential drug. Epidemiological data suggests that phytochemicals can protect the nervous system against degeneration. Based on the cytoprotective and neuroprotective properties of the extract from edible roots of *Decalepis hamiltonii* (Dh) in mammalian model and cells in culture, we investigated the neuroprotective potential of the extract by employing A30P and A53T α-synuclein PD model of *Drosophila melanogaster*. The study revealed improvement in climbing ability, circadian rhythm of locomotor activity, antioxidant defences, protection against paraquat sensitivity and delay in the onset of PD like symptoms in Dh fed transgenic flies. In a separate line of investigations on *D. melanogaster*, we found that *Dh* feeding markedly enhances cognitive ability of aged flies and their offspring. To extend our investigations, we created transgenic human apolipoprotein E model of neurodegenerative disease to characterize and work with Dh. With the desirable properties, we foresee that the Dh cocktail could be a promising elixir of natural origin that can improve the life of patients suffering from neurodegeneration.

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ADVANCING DRUG DEVELOPMENT IN ALZHEIMER'S DISEASE

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Converging evidence suggests that the pathophysiology of neurodegenerative diseases (NDDs) begin years, if not decades, prior to the onset of clinical symptoms, including memory impairment, motor disturbances and non-motor related abnormalities. Therefore, individuals at very early stages are the most likely to benefit from disease-modifying therapies should they become available. Currently, NDDs are viewed as multi-etiological disorders with a concomitant occurrence of several pathogenic mechanisms and thus, the challenge is to find the meaningful biological targets for a rapid translation of knowledge into clinical drug development. In addition, significant efforts are put in the development of novel drugs to address symptomatology with compounds directed towards biochemical systems that not necessarily constitute the underlying pathology of the disease in question but might contribute to a significant relief in patient's quality of life. In my talk, I will elaborate on strategic pre-clinical steps and major considerations in drug design intended to accelerate the drug candidate development process. Also, which pre-requisites a candidate must fulfil in the path to IND-enabling studies to reduce the time and risk of Alzheimer's disease drug development. I will provide examples of molecules which do or do not meet industry criteria such as compounds with insufficient PK characterization, small molecules that generates a toxicchemically reactive metabolite in vivo, insufficient potency, selectivity or efficacy, poor target engagement, model predictability etc. and a priori comprehension of these essentials will help the translation into clinic more efficient and reliable.

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NEUROCHEMICAL, BEHAVIOURAL AND MOLECULAR LEVEL STUDIES OF METHYLPHENDIATE IN RATS

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Methylphenidate (MPD) is widely prescribed drug for the treatment of attention deficit hyperactivity disorder (ADHD). Despite its therapeutic importance, there is growing evidence that patients treated with MPD develop an addiction to their therapy. The drug is also used as a cognitive enhancer to improve academic performances. It is therefore important to monitor abuse potential of clinically useful doses of MPD and molecular mechanism associated with its cognition enhancing and reinforcing effect. The present study is designed to study abuse potential, if any, of clinically relevant doses of MPD. The levels of dopamine (DA), dihydroxphenyl acetic acid (DOPAC), homovanillic acid (HVA), 5-hydroxytryptamine (5-HT), 5-hydroxyindole acetic acid (5-HIAA), and noradrenaline-hydrochloride (NA-HCl) are monitored in the hippocampus and caudate. In view of role of 5HT-1A receptor in cognition as well as addiction, the expression of 5-HT1A receptors in the prefrontal cortex and nucleus accumbens is monitored in rats repeatedly treated with MPD. We report that lower doses (0.5 and 2.5 mg/kg) of MPD enhance learning acquisition and memory retention in a dose dependent manner in Morris water-maze test. Higher dose (5 mg/kg) of MPD however impairs these. The drug administered repeatedly at dose of 2.5 mg/kg is reinforcing in conditioned place preference paradigm. Sensitization like effect produced transient and are not consistently shown. Result shows an increase in 5-HT metabolism in the hippocampus as well as caudate. Effects of DA metabolism are not consistent. HVA levels are decrease markedly in hippocampus but are increases in the caudate. The expression of 5HT-1A receptor attenuated markedly in the nucleus accumbens, but no effect on 5HT-1A receptor occurs in the prefrontal cortex. The results strengthen our previous studies of a role of 5HT-1A receptors in addiction. The findings may be of use in improving therapeutics in ADHD and developing non addictive cognitive enhancers.

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