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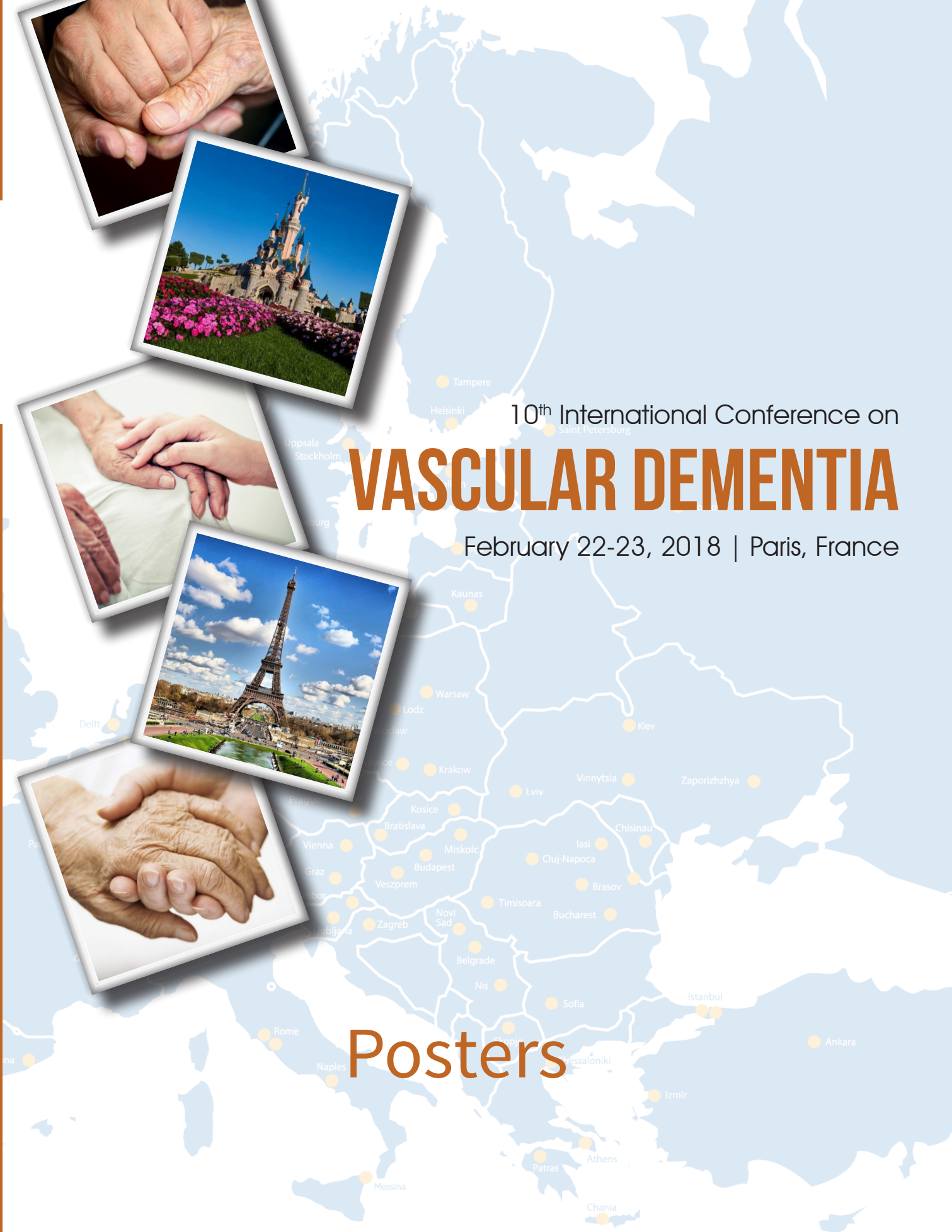
VASCULAR DEMENTIA 2018

10<sup>th</sup> International Conference on

# VASCULAR DEMENTIA

February 22-23, 2018 | Paris, France

## Posters



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## fMRI of healthy elderly during Stroop test and the serial count: Comparative analysis

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**Introduction & Aim:** The term executive function (EF) refers to a number of cognitive abilities that enable and control adaptive, goal-oriented behavior. EF is vulnerable to white matter injury and to perturbations in neurotransmitter systems. As a result, EF is impaired in plenty of neurologic and psychiatric conditions. The aim of the current study was to perform a comparative analysis of the cerebral cortex activation in healthy subjects during task-fMRI with a color-word Stroop test modification and a new suggested counting paradigm.

**Materials & Methods:** 12 healthy control subjects aged 45-63 (2 men) underwent blocked design fMRI on 3T scanner with Stroop test and serial count task. Pre- and post-processing of fMRI data were performed using SPM8.

**Results:** FMRI analysis showed presence of common activation areas across both tasks including bilateral dorsolateral prefrontal cortex (BA 46, 9), premotor cortex (BA 6), supplementary motor area (BA 6), bilateral parietal cortex (BA 39, 40), right anterior cingulate cortex (BA 32), anterior part of insular cortex (BA13), bilateral cerebellar hemisphere, integrated in executive networks. However, serial count task showed no activation in the lenticular nuclei and occipital cortex, unlike the Stroop test.

**Conclusion:** According to our results, serial count could be used as alternative paradigm for EF mapping, especially in patients with vision problems.

### Biography

Zuhra Gadzhieva is a student in the Research Center of Neurology, Department of Angioneurology and Early Rehabilitation after Stroke in the Research Center of Neurology, Moscow, Russian Federation. The main goal of her PhD work is to investigate the mechanisms of cognitive decline in patients with cerebral small vessel disease (multimodal neuroimaging and neuropsychological study).

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## Obesity impairs memory and hippocampal post-synaptic structure in chronic cerebral hypoperfusion in rats: Failure of compensatory mechanism

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Obesity is continuously increasing worldwide, and this trend is considered as obesity pandemic. The reason for focusing on obesity as a major health problem is that it causes various diseases such as metabolic diseases and cardiovascular diseases. As one of them, vascular dementia was reported to be high prevalence in obese population, which was associated with obesity-related insulin resistance or oxidative stress. Thus, previous studies focused on the obesity as a risk factor; however, there were few researches the effect of obesity on disease progression. To confirm the pathological changes in obese vascular dementia, obesity was induced by high-fat diet (HFD) feeding and then, vascular dementia model was preceded with biliateral common carotid artery occlusion (BCCAO) procedure in rats. After six weeks of the procedure, HFD+BCCAO exhibited worse memory performances in Morris water maze test ( $p < .05$ ) and radial arm maze test ( $p < .05$ ) than BCCAO. In addition, post-synaptic density-95 in hippocampus were significantly decreased in HFD+BCCAO than BCCAO ( $p < 0.05$ ). We confirmed that obesity aggravated memory impairment with disruption of post-synaptic proteins. On the other hand, brain-derived neurotrophin factor, phospho-extracellular signal-regulated kinase (p-ERK) and phospho-cAMP response element binding protein (p-CREB) was respectively increased in BCCAO (all  $p < 0.05$ ) more than Sham, but HFD+BCCAO (all  $p < 0.05$ ) showed lowest expression level. As a result, the decrease of BDNF, ERK and CREB in HFD+BCCAO, which are related to promote protein synthesis in neuronal dendrites, suggests interruption of a compensatory mechanism in BCCAO procedure. It is first finding that obesity exacerbates memory with damaged post-synaptic structure via disrupting BDNF-ERK-CREB compensatory mechanism. It is suggested that obesity should consider as an aggravating factor in vascular dementia and we should keep focusing on weight control in patient.

### Biography

Yoon Ju Kim is a Registered Nurse (RN) in South Korea. She has completed her Master of Nursing degree and she is currently a PhD student with a major in Biological Nursing Science at Kyung Hee University.

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## The 2018 Stockport vascular neurocognitive disorder investigation, treatment and annual review guidelines (including the spectrum from mild vascular cognitive impairment to vascular dementia) supporting primary and secondary care physicians

Sally Gilmour<sup>1</sup>, Peter Ngoma<sup>2</sup> and Rachel Price<sup>1</sup><sup>1</sup>The Meadows Hospital-Stockport Pennine Care NHS Trust, UK<sup>2</sup>Stepping Hill Hospital-Stockport NHS Foundation Trust, UK

Vascular neurocognitive disorder patients may already be receiving adequate treatment for other cardiovascular disease, but we should reassess ensuring optimum secondary cardiovascular risk prevention with new location target end organ damage. A minority are not receiving secondary cardiovascular prevention as vascular neurocognitive disorder is their first diagnosis of cardiovascular system disease. Many of these newly diagnosed patients may not subsequently receive secondary cardiovascular risk prevention perhaps especially with subcortical gradual reduction in activities of daily living and change to personality. There is no research evidence to treat cerebrovascular disease which is proportional to that expected for the patient age on MRI or CT brain. The MRI Fazekas score should reflect the clinical indication of brain target organ vascular disease more so than expected age related change. Gradient echo assesses micro hemorrhage which may mean anti-platelets or anticoagulants are contra-indicated, prevalent in cerebral amyloid angiopathy and mixed vascular and Alzheimer's pathology. Patient treatment advice leaflets assist informed shared decisions; although there is no consensus from research evidence that treating blood pressure, cholesterol and using anti-platelets or anticoagulation will reduce cognitive decline in vascular neurocognitive disorder, there is evidence for secondary cardiovascular prevention once there is diagnosis of target organ damage to the brain with vascular pathological brain target damage. Risk consideration assesses patients and carers, signpost to healthy lifestyle advocated by Lancet 2017 Dementia Commission. Vascular neurocognitive disorder support healthy lifestyle published leaflets examples include '4ME'.

### Biography

Sally Gilmour has worked in primary care for 18 years and in 2011 worked in Old Age Psychiatry with Dr. Katherine Hayden developing an interest in vascular dementia. She has produced a dementia podcast and a dementia review template; integrated into the Stockport primary care computer system and has lectured to the National Driving Assessors course regarding dementia. She works solely in Stockport Old Age Psychiatry since 2015.

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Accepted Abstracts



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## Exploring links between the microbiome and dementia

**Deborah Shoemark**

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Our microbiome composition likely influences health and how well we age. Here we provide a background describing the links between oral bacteria and sporadic Alzheimer's disease. We present our data from Next Generation Sequencing (NGS) comparing bacterial reads from AD and cognitively normal temporal cortex. Immunosenescence results in waning targeted immune responses and increased reliance on innate immunity. As a result, bacterial and inflammatory cytokine load, particularly in conjunction with e.g. poor oral hygiene, rise with age and many neurodegenerative diseases are associated with inflammation. Gum disease increases periodontal pocket depth and shifts the balance of the oral microbiome towards a more anaerobic population, capable of eliciting greater TNF-alpha release from buccal cells lining the mouth. High levels of pro-inflammatory cytokines e.g. TNF-alpha, compromise the integrity of the normally protective blood brain barrier. Bacteria escaping the mouth and gut are more likely to evade targeted immune responses, so low levels in the circulation fail to elicit classic signs of systemic infection, but instead contribute to local or generalized inflammation. Sensitive techniques such as NGS, now suggest biofilm can form on many surfaces, including blood vessels. Under some circumstances this may provide an environment that allows harmful or anaerobic bacteria, otherwise unable to adhere or survive in isolation, to thrive. Some oral bacteria are also known to subvert otherwise benign biofilm to an aggressively inflammatory form. A better understanding of the host/microbiome interplay in neurological disease may reveal opportunities for new therapeutic and preventive strategies.

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## Oxford study in Quantification of Parkinsonism (OxQUIP): Eye movements, gait tracking and cognitive function

**Chrystalina Antoniadou**  
University of Oxford, UK

The OxQUIP (Oxford Quantification in Parkinsonism) study has been recruiting patients with Parkinson's disease and progressive supranuclear palsy. Currently available treatments for these diseases are symptomatic only, and do not have any preventive or disease-slowing effect. As new drugs are developed, we need to be able to evaluate them quickly, so that precious time and resources can be devoted to those showing most promise. In this study, we follow participants intensively over a two year period, with the aim of identifying measures that can detect disease progression over much shorter time periods than is possible at present. During the study, participants are asked to perform simple tasks while we measure movements of the eyes, hands and body. We also do some tasks on a tablet computer that measure cognitive performance. Some of the recent exciting data from the OxQUIP study will be presented.

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## Dementia and the cycle of role reversal

**Lilly Naomi**

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**M**y grandmother is an 88-year-old African American woman with dementia. My project seeks to explore the role dementia has played within my family, specifically, how the cycle of role reversal has shaped the matriarch position my grandmother once held within my family. Discussion of the topic will be facilitated by my grandmother, her children, and grandchildren. Literary works include publications that focus on dementia as a symptom and dementia as it pertains to the role of caretakers. These works were used to demonstrate differences between written text and what it means to face dementia outside of text. The final project will take the form of a documentary that seeks to capture the emotions and realities my family has had to face as a result of my grandmother's condition. The documentary is different from a paper because in many ways, it serves as a case study that helps to build personality and impact. This personality and impact will ultimately help viewers paint an image of what life looks like for a person with dementia and how the conditions that are attributed to dementia, impact surrounding individuals (i.e. family). The documentary will be guided by the recognition of a role reversal and reflections on memories before and after my grandma's condition began and continued to worsen. These memories help to allow individuals to recognize the changes dementia can have on what may be considered a person's everyday routine. These memories will also help viewers connect to the content due to the raw nature of the responses given by interviewees and the unfortunate realities dementia presents. The analysis of the interviews, I have conducted has portrayed general disdain for my grandma's health status, but a fondness and admiration that can be attributed to the way she has helped to unite and lead my family throughout the years. This admiration was reflected heavily amongst my family members and their acceptance of the role reversal, due to the nurturing my grandmother has provided us throughout the years. Evidence for this claim can be greatly attributed to the heartfelt answers provided by family members. These answers help to paint the image of a matriarch and a change in the hierarchal roles within the family at large.



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## Psychosocial aspects of caring for dementia and Alzheimer in Qatar

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In 2012, the World Health Organization (WHO) projected a threefold increase in dementia cases over the next decade. This declaration, coupled with a notable increase in dementia cases locally, led the state of Qatar to evaluate and improve its healthcare provision for people with dementia. The most notable project was the establishment of the WHO global dementia observatory team in partnership with Hamad Medical Corporation, as well as a dedicated civil society organization Ehsan that cares for the wellbeing of elderly community members. The observatory project is the first of its kind in the Middle East and Arab region, and considered as one of several projects dedicated to people with dementia and Alzheimer in Qatar. Based on research project on dementia in Qatar, this presentation will reveal the work on dementia and Alzheimer in Qatar from the caregivers' and professionals' views. A multidisciplinary research team from the Center for Humanities and Social Sciences and the College of Medicine at Qatar University conducts the study, which is generously supported by civil society organization Ehsan-Center for Elderly Care and Empowerment, and in close collaboration with Hamad Medical Corporation. The study seeks to address the question: How are people living with Dementia and Alzheimer cared for in Qatar? Since the question is addressing processes, dynamics and attitudes, the researchers used qualitative research methodology. For collecting the data, the researchers used ethnographic-archival strategies that included the following tools: Open deep interviews, semi-structured interviews, focus groups interviews, active observations, and analyses of relevant documents. Drawing on all these data resources, the presentation will illuminate the psychosocial challenges that stand in the family's journey in caregiving and their psychosocial needs. Privileging caregivers and professionals' perspectives, this qualitative study explores the medical, religious and socio-cultural facets of dementia and Alzheimer care in Qatar. It will explore the integrated work between the different intervention agents of the formal and informal systems. The presentation will shed the light on the hidden, but heavy burden of care associated with caregiving and seeks to identify how pathways of care can be enhanced. Family decision-making and the navigation of patients from informal care within the domestic sphere to formal institutional care is also probed extensively in the research. Preliminary findings indicate that while elderly with dementia are greatly remembered in Qatar by families and several health care institutes, there still exists a need to promote social awareness of the disease in order to enhance support for caregivers translating into enhanced quality of life for people living with dementia in Qatar and by extension, the broader Middle East.

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## Corneal confocal microscopy: An imaging surrogate end point for mild cognitive impairment and dementia

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**Background:** The risk of dementia in people over 60 is 1 in 10. Imaging biomarkers of neurodegeneration could facilitate early diagnosis of dementia. Corneal confocal microscopy (CCM), a non-invasive ophthalmic technique may act as an imaging end point for neurodegeneration in patients with mild cognitive impairment (MCI) and dementia.

**Aim:** Aim of the study is to evaluate the diagnostic ability of CCM for MCI and dementia and determine the association between corneal nerve fiber loss and cognitive and physical impairment.

**Methods:** 79 patients with MCI (n=32), dementia (n=26) and age matched cognitively healthy controls (n=21) underwent clinical examination, neuropsychological testing, neuroimaging and CCM. Corneal nerve pathology was quantified by measuring corneal nerve fiber density (CNFD), branch density (CNBD) and length (CNFL).

**Results:** Comparing cognitively healthy controls to patients with MCI and dementia, there was a significant reduction in CNFD, CNBD and CNFL ( $P<0.01$  and  $P<0.0001$ , respectively). CNFL was significantly different between controls vs. MCI vs. dementia (25.67 [SD 5.85] mm/mm<sup>2</sup> vs. 19.61 [SD 5.85] mm/mm<sup>2</sup>,  $P<0.01$  vs. 15.65 [SD 7.19] mm/mm<sup>2</sup>,  $P=0.04$ , respectively). The AUC/sensitivity and specificity of CNFL for identifying patients with MCI were 0.75, 95% CI 0.66-0.90/72%/71% and for dementia 0.85, 95% CI 0.70-0.95/81%/81%, with a cut-off point of <21 mm/mm<sup>2</sup> for optimal diagnostic accuracy for dementia. Adjusted for confounders, corneal nerve fiber loss was associated with declining cognitive function ( $P<0.01$ -<0.001) and increased physical disability ( $P=0.03$ - <0.01).

**Conclusion:** This original research advocates CCM as a surrogate end point for neurodegeneration in patients with MCI and dementia, as the diagnostic accuracy of CCM for the detection of dementia is comparable to established Alzheimer's disease biomarkers. Furthermore, we show a strong association between corneal nerve fiber loss with cognitive decline and physical disability.

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## Aerobic exercises enhance cognitive functions and brain derived neurotrophic factor after ischemic stroke

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Cairo University, Egypt

**Background & Aim:** Brain derived neurotrophic factors (BDNF) have a role in increasing the brain's resistance to damage and degeneration with aging and enhances long term memory and learning. The current study aims to demonstrate the role of aerobic exercises enhancing cognitive functions and its effect on BDNF in post-ischemic stroke patients in territory of anterior circulation.

**Methods:** 30 stroke patients with different degrees of cognitive impairment measured by Addenbrooke's Cognitive Examination-Revised (ACER) were divided into two equal groups of 15 patients each; group 1 (G1) (considered as the control group) were treated by a designed standard physiotherapy program. This program was applied for 25-30 minute per session, three times per week, day after day for successive eight weeks. Group 2 (G2) were treated by the same designed physiotherapy program for 25-30 min. followed by a rest period for about 10-15 min, then aerobic exercise was done on a bicycle for 40-45 min, three times per week for eight weeks. After eight weeks patients in both groups were subjected to reassessment of cognitive functions using ACER. Levels of BDNF in venous blood sample were assessed before and after the eight weeks of physiotherapy.

**Results:** Comparison of the ACER total score post-treatment in G1 and G2 showed a statistically significant difference with increased values in the G2;  $75.93 \pm 4.9$  and  $81.07 \pm 6.16$  respectively ( $p=0.017$ ). Pre- and post-treatment serum level of BDNF did not show a significant difference in G1 ( $P=0.698$ ) but in G2, there was a high statistical difference ( $P=0.0001$ ). Pearson rank correlation ( $r$ ) between the post treatment changes in total score of ACER test and level of serum BDNF in G2 was 0.53. The result indicated significant positive correlation between improvement in total score of ACER test and increase in serum BDNF level in the study group ( $P=0.044$ ).

**Conclusion:** Aerobic exercises following an acute ischemic stroke in the territory of anterior circulation significantly improve cognitive functions measured in this study by ACER. This improvement is accompanied by an elevation in the serum level of BDNF.