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Blood-Brain Barrier permeability in mid-age APOE e4 carriers

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Background: Studies suggest that neuropathology of Alzheimer's disease (AD) begins years before clinical diagnosis is made. Early structural brain changes may include increased permeability of the blood-brain barrier (BBB), microhaemorrhages, and increased deposition of haemosiderin. We ask whether such changes are present in healthy people at a higher risk for late onset, non-familial AD, namely carriers of the Apolipoprotein E epsilon-4 genotype.

Objectives: To assess whether APOE4 status is associated with subtle brain changes in mid age and whether such changes, if any, are related to fine deficits in cognition.

Methods: Healthy mid-age adults (45-55) will be genotyped and pseudo-randomly selected to participate in the second part of the study, which comprises a blood sample for biomarker analysis, a memory task and a Gadolinium-based MRI scan.

Measures: Measures will include structural imaging to measure brain volume differences, quantitative susceptibility mapping to look at microbleed information and iron deposits, post

gadolinium T1 weighted imaging to measure BBB permeability, blood markers to measure inflammation and Ferritin levels, and prospective memory and attention.

Expected Outcomes: Significant differences are anticipated in the composite profiles between healthy mid-age APOEe4 carriers and non-carriers, matched on age, education and gender. Biomarker differences are anticipated to correlate with cognitive performance and indices of the presence of inflammation. The results from this study will have a significant potential for impact on early diagnosis of Alzheimer's disease before symptoms even show and will facilitate early interventions to help reverse and/or slow down the trajectory of decline.

Speaker Biography

Nourah Alruwais is a second year PhD student at the college of Psychology, Sussex University, UK. She completed her MSc in Medical Imaging from Surrey University, UK in 2014. She is a scholar from King Saud University, Saudi Arabia where she has taught Medical Imaging Courses since 2006. She is interested in Neuroimaging research and Dementia.

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