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Multimodal prediction of subtle cognitive decline in elderly controls: An update

Introduction & Aim: The presence of apolipoprotein E4 (APOE*E4) is the strongest currently known genetic risk factor for Alzheimer's disease and is associated with brain gray matter loss, notably in areas involved in Alzheimer's disease pathology. Our objective was to assess the effect of APOE*E4 on brain structures in healthy elderly controls who subsequently developed subtle cognitive decline.

Materials & Method: This prospective study included 382 community dwelling elderly controls. At baseline, participants underwent MR imaging at 3T, extensive neuropsychological testing and genotyping. After neuropsychological follow-up at 18 months, participants were classified into cognitively stable controls and cognitively deteriorating controls. Data analysis included whole-brain voxel-based morphometry and ROI analysis of GM.

Results: APOE*E4 related GM loss at baseline was found only in the cognitively deteriorating controls in the posterior cingulate cortex. There was no APOE*E4-related effect in the hippocampus, mesial temporal lobe, or brain areas not involved in Alzheimer disease pathology. Controls in the cognitively deteriorating group had slightly lower GM concentration in the hippocampus at baseline. Higher GM densities in the hippocampus, middle temporal lobe, and amygdala were associated with a decreased risk for cognitively deteriorating group status at follow-up.

Conclusions: APOE*E4 related GM loss in the posterior cingulate cortex (an area involved in Alzheimer disease pathology) was found only in those elderly controls who subsequently developed subtle cognitive decline but not in cognitively stable controls. This finding might explain the partially conflicting results of previous studies that typically did not include detailed neuropsychological assessment and follow-up. Most important, APOE*E4 status had no impact on GM density in areas affected early by neurofibrillary tangle formation such as the hippocampus and mesial temporal lobe.

Biography

P Giannakopoulos has obtained his MD at University of Athens in 1989 before completing a full training on Psychiatry and Psychotherapy in London at Maudsley Hospital and Geneva as well as Post-doctorate training in Paris at La Pitié-Sâlpetrière Hospital, Federation of Neurology. In 1998, he has been appointed as an Associate Professor and Medical Head of the Division of Geriatric Psychiatry of the University Hospitals of Geneva. Later on he obtained the position of full tenured Professor of Psychiatry at University of Geneva. From 2003 to 2011, he also assumed a parallel position of Full Professor of Old Age Psychiatry at University of Lausanne in order to promote the academic careers of junior staff locally. He has been the Chairman of the Department of Mental Health and Psychiatry in Geneva for 10 years (2005-2015); Vice Dean of the Faculty of Medicine at University of Geneva and; In-charge of postgraduate and continuous education (2003-2011). From December 1st 2015, he is the Medical Head of the Forensic Psychiatry Development in Geneva County. He has published more than 220 peer reviewed articles in the field of neurobiology of aging with particular focus on predictive biomarkers of cognitive decline.

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