Memory Assessment and Dementia Risk in the PREVENT Study

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Background: Promising memory markers for Alzheimer´s dementia (AD) tap into either relational (face-name) or conjunctive (object-colour) functions (Rentz et al., 2013). Whereas relational functions appear affected in the early symptomatic stages of AD, conjunctive functions have been found impaired in the pre-symptomatic stages. Relational but not conjunctive functions are age sensitive. This can delay the detection of AD-related impairments. No study to date has traced the progression or memory decline in people at risk of AD using these markers. This is an aim of the PREVENT study.

Methods: A cohort of 183 healthy adults with age ranging from 40-60 years (M: 52) underwent assessment at baseline and two-year follow up (T1). The assessment consisted of the neuropsychological test battery COGNITO (Ritchie et al., 2017), a demographic questionnaire, and four memory tests (relational: Virtual Reality Supermarket Trolley Task (VRST), Name-Face Association Test (NFAT), and 4 Mountain Test (4MT), and conjunctive: Visual Short-Term Memory Binding Test (VSTMBT)). Participants also underwent genetic testing to identify APOE genotypes. Risk profiles were defined by the present of Family History and APOE4, with High Risk subjects being positive to both, Middle Risk to either, and Low Risk to neither. Cross-sectional and longitudinal comparisons were carried out within and across risk groups.

Results: Neither cross-sectional nor longitudinal comparisons revealed differences across risk groups on the memory markers. Only the NFAT significantly correlated with age ($p<0.01$). The VRST and VSTMBT were not associated to the level of education while the NFAT and 4MT were ($p<0.05$). Correlations between baseline and T1 were large for all the tests. Performance on the VSTMBT did not correlate with that on any relational memory tasks. The VSRT and 4MT did reveal significant correlations ($p<0.001$).

Conclusion: We have identified an early time window in the ageing continuum where people at risk of dementia show intact cognitive functions known to be markers of AD. We have replicated the previously reported patterns of sensitivity to demographic variables (age and education) and confirmed their potential to dissociate trajectories of memory decline across constructs and risk profiles.

Use knowledge about novel neuropsychological assessment to enhance risk profiles in still asymptomatic individuals

Rentz, D., Parra, M. A., Amariglio, R., Stern, Y., Sperling, R., & Ferris, S. (2013). Promising developments in neuropsychological approaches for the detection of preclinical Alzheimer's disease: a selective review. *Alzheimer's Research & Therapy, 5*(6), 58. doi:10.1186/alzrt222

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Ritchie, K., Carrière, I., Su, L., O'Brien, J. T., Lovestone, S., Wells, K., & Ritchie, C. W. (2017). The midlife cognitive profiles of adults at high risk of late-onset Alzheimer's disease: The PREVENT study. *Alzheimers Dement, 13*(10), 1089-1097. doi:10.1016/j.jalz.2017.02.008