Background: Older adults with mild cognitive impairment (MCI) or late-life depression (LLD) are at high risk for Alzheimer’s disease (AD). Few studies have examined the shared and specific clinical characteristics associated with these conditions. Yet, a great proportion of persons with MCI have depressive symptoms (MCI/D+), while LLD is often associated with cognitive deficits. Previous studies have shown that temporal lobe atrophy, which is typical in both MCI and LLD, is associated with cognitive decline and progression to AD. This study aims to compare atrophy of temporal lobe structures between MCI without depressive symptoms (MCI/D-), MCI/D+ and LLD. Methods: Participants were composed of older adults with MCI (Albert et al., 2011 criteria) with (n=32) or without (n=35) depressive symptoms as well as patients with LLD (DSM-V major depressive disorder; n=35). 3D T1-weighted magnetic resonance images were acquired on a 3.0-Tesla Phillips using a standardized ADNI protocol and were analyzed using FreeSurfer (5.3.0). Analyses investigated multiple temporal regions, including the hippocampus (H), parahippocampal cortex (PHC), entorhinal cortex (EC), and middle temporal cortex (MTC). Sociodemographic variables and global cognitive functioning (total MoCA score) were included as potential confounding covariates. A multifactorial analysis of covariance was used to compare groups regarding the volumes of the regions of interest. Results: There was a statistically significant difference between groups for the left H (p<0.009). No other statistically significant difference was observed (ps > .05) Pairwise comparisons revealed that volume of the left H was significantly higher for MCI/D- compared to MCI/D+ (p=0.007), while LLD did not statistically differ from either of those groups (ps > .05). Conclusions: These findings suggest that MCI/D+ and MCI/ D- can be distinguished using volumetric measures of the left hippocampus. These differences are observed even when global cognitive functioning and sociodemographic variables are controlled for, therefore indicating that the observed differences are due to inherent characteristics of MCI/D+ and MCI/D-. However, these findings reveal the absence of anatomical differences between MCI and LLD. Further research should study the incidence of such differences on progression towards AD risk and investigate other potential differences amongst these at-risk groups.

P3-370 A PERSPECTIVE IMAGING STUDY OF AGEING (PISA): GENETIC RISK PREDICTION FOR STUDYING AN AT-RISK POPULATION FOR ALZHEIMER’S DISEASE

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Background: While the burden of dementia occurs late in life, neuropathology accumulates for decades prior to onset of dementia. It is imperative to develop methods to identify those at the very early stage of dementia. This is the aim of the Prospective Imaging Study of Aging: Genes, Brain and Behaviour (PISA) study, which seeks to (1) Identify healthy middle-aged adults at high risk of dementia; (2) Discover biological and imaging markers of early neuropathology; (3) Identify modifiable risk factors; (4) Establish a cohort of preclinical patients for future clinical trials. Methods: The main study is a longitudinal cohort study on at risk younger adults (40-70 yrs) with no clinical symptom. This is achieved by leveraging our extensive in-house cohorts, comprising ~ 16,000 individuals in the target age range with available GWAS data. A genetically enriched cohort was selected to study the preclinical Alzheimer’s disease (AD), based on APOE genotype and polygenic risk scores (PRS). Results: The main study began early 2016. We have verified the predictin accuracy of PRS score on data from ADNI, Add-NeuroMed, Sydney MAS, OATS (presented in another abstract at AAIC). We developed an in-house online questionnaire to collect longitudinal data on cognition and lifestyle from the total cohort, and an onsite, multidisciplinary test battery to collect high-quality data from a subset of the cohort. As part of this onsite battery, we have developed and tested a comprehensive suite of imaging sequences on MRI and PET, including high resolution T1, T2, QSM, fMRI, ASL, and amyloid-PET (Florbetaben). A novel naturalistic fMRI paradigm is designed to study perception, attention and episodic memory. Furthermore, smart sensing devices are given to participants to collect groups. In addition, the diagnostic validities of these WM tracts were evaluated. Results: Decreased FA and increased MD values of memory related WM tracts were observed in the aMCI group compared with the control group. Among FA and MD value of each tract, the FA value of left cingulum angular bundle showed the highest area under curve (AUC) of 0.85 with a sensitivity of 88.2%, a specificity of 76.9%, in differentiating MCI patients from control subjects. Furthermore, the combination FA values of WM integrity measures of memory related WM tracts showed AUC value of 0.98, a sensitivity of 96%, a specificity of 94.2%. Conclusions: Our results with good diagnostic validity of WM integrity measurements suggest DTI might be promising neuroimaging tool for early detection of aMCI and AD patients.

P3-369 DIAGNOSTIC VALIDITY OF AN AUTOMATED PROBABLISTIC TRACTOGRAPHY IN AMNESTIC MILD COGNITIVE IMPAIRMENT

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Background: Although several prior works showed the white matter (WM) integrity changes in amnestic mild cognitive impairment (aMCI) and Alzheimer’s disease, it is still unclear the diagnostic accuracy of the WM integrity measurements using diffusion tensor imaging (DTI) in discriminating aMCI from normal controls. The aim of this study is to explore diagnostic validity of whole brain automated probabilistic tractography in discriminating aMCI from normal controls. Methods: One hundred two subjects (50 aMCI and 52 normal controls) were included and underwent DTI scans. Whole brain WM tracts were reconstructed with automated probabilistic tractography. Fractional anisotropy (FA) and mean diffusivity (MD) values of the memory related WM tracts were measured and compared between the aMCI and the normal control.