Title

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The Neural Substrate of Memory Impairment in the Oldest old with Dementia; The 90+ Study (P5.1-021)

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Abstract

Objective: To test the hypothesis that memory impairment in the oldest old has different neural substrates in those with and without Alzheimer's pathology

Background: Memory impairment is the commonest feature of dementia in the oldest old. Unlike younger age groups, non-Alzheimer's pathologies, such as hippocampal sclerosis, are a common cause of memory impairment and dementia in the oldest old. Lack of reliable biomarkers has hampered the diagnosis of these important pathologies during life.

Design/Methods: 36 participants from The 90+ Study with mild dementia (CDR-total-score=0.5) completed volumetric T1 weighted brain MRI scan and California Verbal Learning Test-Delayed Recall (CVLT-DR) (mean interval=65 days). Volumes of CA1 and CA3 hippocampal subfields and cortical thickness of temporal lobe regions were estimated using freesurfer software. A subset of 27 participants also completed florbetapir amyloid PET scans that were dichotomized (positive/negative) by visual read. Regression analysis, adjusted for age, gender, and education, assessed the association between CVLT-DR as outcome and atrophy pattern.

Results: In the whole group (N=36), there was a trend of significant association between CVLT-DR and volume of CA1 subfield (estimate:0.35, p=0.08). No association was found between CVLT-DR and CA3 volume or temporal lobe cortical thicknesses. Restricting the analysis to the amyloid negative group (N=12, MMSE mean=23.4), there was a significant association between CVLT-DR and CA1 volume (estimate:0.45, p=0.04) but no association with CA3 volume or temporal lobe cortical thicknesses. In the amyloid positive group (N=15, MMSE mean=24.1), CVLT-DR was not associated with any of the hippocampal volumes. Rather, there was a positive association between CVLT-DR and cortical thickness of the left fusiform region (estimate:0.4, p=0.04).

Conclusions: Our results suggest that memory impairment in the oldest old might be due to atrophy of different brain regions in those with and without Alzheimer's pathology. This differential atrophy may serve as an imaging biomarker for non-Alzheimer's pathologies such as hippocampal sclerosis.

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