Perceived Financial Vulnerability is Associated with Lower Cortical Thickness in Brain Regions Vulnerable to Early Alzheimer's Disease

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Objective

There is evidence to suggest financial vulnerability may be an early behavioral manifestation of brain changes occurring in preclinical Alzheimer's disease (AD). Prior work has identified a pattern of cortical thinning (i.e., an AD cortical signature) exhibited in individuals with mild AD and in asymptomatic, amyloid-positive individuals (Dickerson et al., 2009). We hypothesized that greater perceived financial vulnerability would be associated with lower cortical thickness in an AD cortical signature measure.

Participants and Methods

The study participants were 74 cognitively normal older adults (mean age = 70.09 ± 6.74, mean education = 16.85 ± 2.09, 74% female, 16% non-White). All participants completed the Perceived Financial Vulnerability Scale (Lichtenberg et al., 2020), a 6-item measure derived from the Lichtenberg Financial Decision Rating Scale (Lichtenberg et al., 2015). Brain structural images were collected on a 7 Tesla Siemens Magnetom with the following parameters: TE=2.95ms, TR=2200ms, 240 sagittal slices, acquired voxel size (avs)=0.7mm x 0.7mm x 0.7mm. Images were processed using FreeSurfer version 7.2.0. Cortical thickness measures were generated using the Killiany/Desikian parcellation atlas. The AD cortical signature measure consisted of right and left entorhinal, parahippocampal, inferior temporal, temporal pole, superior parietal, supramarginal, and precuneus thickness. Linear regression models were adjusted for age, sex, education, income, and global cognition (i.e., performance on the Mini Mental State Exam (MMSE)).

Results

Lower thickness of the AD cortical signature measure was significantly associated with greater perceived financial vulnerability (β = -0.39, *SE* = 0.16, *p* = 0.02). Global cognition measured via the MMSE was not significantly associated with thickness of the AD cortical signature measure (β = -0.08, *SE* = 0.15, *p* = 0.58).

Conclusions

These results suggest that lower cortical thickness of brain regions sensitive to early AD are associated with greater perceived financial vulnerability. This finding supports the idea that financial vulnerability may be a very early manifestation of preclinical AD, before more overt

cognitive changes are detectable. However, longitudinal studies are needed to make causal inferences about these relationships.