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Biomarkers in Alzheimer's disease: Understanding their association with neuropsychological performance among a Hispanic sample

Patricia Garcia
University of Miami Miller School of Medicine, USA

Statement of the Problem: The most promising biomarkers to date for Alzheimer's disease (AD) detection include Positron Emission Tomography of metabolic brain changes or cortical b-amyloid deposition, structural Magnetic Resonance Imaging for brain atrophy, and cerebrospinal fluid biomarkers. Volumetric changes in the entorhinal cortex and hippocampus have been noted in patients with AD and patients with mild cognitive impairment. However, the effects of the amyloid load on cognitive performance are less understood. Further studies looking at cultural variables in the context of AD are imperative given the current and projected growth of ethnic minorities in the US. The purpose of this study was to explore the relationship between AD biomarkers (regional brain atrophy and amyloid aggregation) with cognitive performance among Hispanic and white non-Hispanic older adults.

Methodology: Cross-sectional analyses were conducted among clinical samples, totaling 182 participants. Subgroups were created based on participants' cognitive diagnosis and ethnicity. Pearson correlations between AD biomarkers and neuropsychological tests were initially performed. A stepwise multiple regression analysis was used to develop a model for predicting the effects of medial temporal atrophy (MTA) and amyloid deposition on several cognitive tasks.

Findings: A positive correlation was noted between the right parahippocampal area and HVLT Immediate (β=0.494, p=0.005) in healthy Hispanics. Among Hispanics with dementia, a negative correlation between amyloid and HVLT delayed recall was found (β=-0.585, p=0.005). Regression analyses revealed that among healthy Hispanics, a significant predictive relationship was noted between HVLT Immediate and right-parahippocampus, R2=0.244, F(1,15)=4.837, p=<0.005. Among Hispanics with dementia, amyloid deposition significantly predicted performance on the HVLT delayed, R2=0.342, F(1,10)= 5.190, p=<0.005.

Conclusion & Significance: The small variance accounted by these biomarkers invites researchers and clinicians to identify other contributing factors to neurocognitive performance. Future studies should examine individual cultural factors contributing to these findings among clinical samples.

Biography

Patricia Garcia is a second-year neuropsychology fellow. She completed her first year of residency at the University of Miami Miller School of Medicine and worked in the outpatient neuropsychology clinic where she did neuropsychological evaluations of adults and geriatric patients, particularly assisting in the diagnosis of dementia at the outpatient neuropsychology center and at the memory disorder's clinic in the neurology department. She is now at Ryder Trauma Center located in Jackson Memorial Hospital, working primarily in the neurorehabilitation inpatient unit where she has the opportunity to assess and treat patients with traumatic brain injuries, cerebrovascular accidents, brain tumors, epilepsy, brain infections, among other neurological conditions, and communicate findings to an interdisciplinary team of professionals. She also provides consultative services at the neurosurgery ICU, trauma ICU, and the outpatient neuropsychology clinics. Her research interests include cross-cultural neuropsychology, AD biomarkers, psychiatric symptoms, and cultural variables in the assessment of dementia.

patricia.garcia@jhsmiami.org