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# PATHOLOGICAL BIOMARKERS AND COGNITIVE CHANGE IN PARKINSON DISEASE

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Although Parkinson disease (PD) is primarily considered a movement disorder, there are also cognitive problems associated with this disorder that cause significant impairment to quality of life. There is, however, a high degree of inter-individual variability in cognitive dysfunction in PD, necessitating prognostic tools that can predict the trajectory of cognitive decline for a given individual. The current study investigates the utility of various biomarkers associated with the pathological progression of PD and their ability to predict cognitive change across different domains and time intervals. Data were obtained for 174 PD participants who were either cognitively normal ( $N = 93$ ) or cognitively impaired ( $N = 81$ ) at baseline. Regression analyses were conducted to determine associations between baseline biomarkers (including cerebrospinal fluid (CSF) amyloid-beta 1-42 ( $A_{1-42}$ ), tau, and alpha-synuclein ( $\alpha$ -syn); amyloid-beta deposition measured with Pittsburgh compound B (PiB); and regional gray matter volumes (GMV)) and reliable change indices (RCIs) for five cognitive domains across one, two, and three year intervals. Results indicated that CSF and PiB measures of amyloid-beta pathology predicted cognitive change across longer time intervals, whereas regional GMVs predicted more imminent cognitive change. Further, the timing of cognitive change varied based on the location of amyloid-beta deposition such that brainstem and posterior cortical amyloid-beta deposition was predictive of distant future cognitive change and anterior cortical amyloid-beta deposition was predictive of more imminent cognitive change, suggesting that amyloid pathology follows a caudo-rostral progression similar to Lewy body pathology in PD. These findings may have prognostic value, such that the presence of certain biomarkers and the location of pathology may predict which PD patients will develop cognitive impairment and when the decline will begin.