

Correspondence: Valerie Humphreys, Drexel University, vh339@drexel.edu

47 Evolution of Brain Morphology and Cognitive Performance in Parkinson's Disease with Impulse Control Disorder

Adina Lorena Patru^{1,2}, Lucas Ronat^{1,2}, Alexandru Hanganu^{1,2}

¹University of Montreal, Montreal, Quebec, Canada. ²Research Center of the University Institute of Geriatrics of Montreal, Montreal, Quebec, Canada

Objective: Parkinson's disease (PD) affects the person's quality of life, but the comorbidity of PD and impulsive control disorder (ICD), which has an average prevalence of 23%, can enhance the disruption of quality of life for the patients and their caregivers. The effects of ICD in PD on brain morphology and cognition have been little studied. Thus, this study proposes to investigate the differences in the evolution of cognitive performance and brain structures between PD patients with ICD (PD-ICD) vs. without ICD (PD-no-ICD).

Participants and Methods: Parkinson's Progression Markers Initiative (PPMI) data of 58 patients with idiopathic PD, including their MRI data at baseline and three years later, were analyzed. The MRIs were processed with FreeSurfer (7.1.1) to extract cortical volumes, areas, thicknesses, curvatures and folding index as well as volumes of subcortical segmentations. All participants underwent cognitive evaluations. The Questionnaire for Impulsive-Compulsive Disorders in Parkinson's Disease was used to differentiate those with at least one ICD from those without any ICD. 12 of the 58 patients had an ICD at their first visit and 19 had an ICD at their visit three years later. There was no significant difference between PD-ICD and PD-no-ICD with respect to sex, use of overall medication, age, age of onset, age at diagnosis, years of education and the Montreal cognitive assessment score. Two-way mixed ANOVAs were performed for each neuropsychological test and brain structure extracted from MRIs with the time of the visit as the repeated independent variable (within participants) and the presence or absence of an ICD as the other independent variable (between participants).

Results: The mixed ANOVA revealed that PD-ICD had their performance decline after three years, for the Hopkins Verbal Learning Test delayed recall and the Symbol Digit Modalities Test while PD-no-ICD saw their performance increase. A whole brain analysis showed that PD-ICD had a significant decrease after three years of the right cortex area total brain volume in comparison to PD-no-ICD. Specific brain structures also underwent significant changes over three years. Cortical changes in PD-ICD were: (1) increased surface area in the left temporal parahippocampus and (2) decreased surface areas of the right insula, right middle and superior temporal regions, left occipital lingual as well as left cingulate isthmus. Furthermore, in the subcortical nuclei, PD-ICD showed (1) increased volumes of the paratenial thalamic nucleus and whole right amygdala and (2) decreased volumes of the right amygdalian basal nucleus and thalamic ventromedial nucleus.

Conclusions: This study suggests that PD patients who also have ICD might be prone to develop over three years: (1) significant changes in cognitive performance (memory, attention), (2) morphological changes in the amygdala and thalamic nuclei and (3) significant atrophy and area shrinkage in the temporal and insula regions.

Categories: Neurodegenerative Disorders

Keyword 1: Parkinson's disease

Keyword 2: neuropsychiatry

Keyword 3: neuroimaging: structural

Correspondence: Adina Lorena Patru adina.lorena.patru@umontreal.ca University of Montreal Research Center of the University Institute of Geriatrics of Montreal

48 Longitudinal Study: Impact of Anxiety on the Evolution of Cognitive Performance and Brain Morphology in Patients with Parkinson's Disease

Adriana Cannizzaro^{1,2}, Adina Lorena Patru^{1,2}, Alexandru Hanganu^{1,2}

¹Centre de recherche de l'Institut universitaire de gériatrie de Montréal, Montréal, QC, Canada.

²Université de Montréal, Montréal, QC, Canada