CAUDATE AND PUTAMEN VOLUMES ARE RELATED TO COGNITIVE PERFORMANCE IN PARKINSON'S DISEASE WITHOUT DEMENTIA

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Introduction: Patients with Parkinson Disease (PD) exhibit cognitive deficits which vary widely in extent and severity. Basal Ganglia atrophy has been also broadly described using structural MRI. However, not much attention has been put to the relationship between Basal Ganglia structures and cognitive functioning.

Aims: To investigate the possible relationship between neuropsychological performance in PD and Basal Ganglia structures volume.

Method: Fifteen PD patients without dementia (HY I to III) were evaluated with frontal (working memory, verbal fluency, categorization and shifting), memory, visuospatial and visuoperceptive neuropsychological tests. MRI measures were correlated with cognitive variables that were significantly different with respect to an age matched control group (action fluency, WCST, CVLT and 8/30 SRT learning and long term free recall, JLOT, and FRT). FreeSurfer was used for the MRI processing. Volumes of Caudate and Putamen were specifically selected for the analysis from its segmentation pipeline.

Results: Correlation analysis was performed between MRI variables and neuropsychological measures correcting for age. Right Caudate showed a significant positive correlation with both FRT and 8/30 SRT learning. Right Putamen showed a significant positive correlation with JLOT and Left Putamen with FRT.

Conclusions: Caudate and Putamen were related with visual memory, visuospatial and visuoperceptive functions in our sample. Previous MRI studies that attempt to study the relationship between Basal Ganglia and cognitive functioning have not reported conclusive associations. Our results suggest that using powerful automatic algorithms for the segmentation as implemented in FreSurfer could be useful in future studies of subcortical structures as Basal Ganglia.