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ASSOCIATION BETWEEN 123I-FP-CIT SPECT AND COGNITIVE OUTCOME IN PARKINSON'S DISEASE: A LONGITUDINAL STUDY AT 5 YEARS OF FOLLOW-UP

G. Puccini[3], R. Ceravolo[1], D. Frosini[1], F. Guidoccio[3], U. Bonuccelli[1], S. Chiacchio[2], G. Manca[2], D. Volterrani[2]
[1]*Department of Clinical and Experimental Medicine, Neurology Unit, University of Pisa, Pisa, Italy*
[2]*Regional center of Nuclear Medicine, University of Pisa, Pisa, Italy*
[3]*Regional center of Nuclear Medicine, University of Pisa, Pisa, Italy*

BACKGROUND-AIM

Dopamine transporter (DAT) imaging is a common diagnostic tool for Parkinson's Disease (PD) but also evaluated as prognostic marker for both motor and non motor outcomes. The ability of coping an intersecting pentagons is considered an important clinical predictors of global cognitive decline. In this study we evaluated the prognostic role of DAT imaging and pentagon copy for cognitive outcome in a cohort of PD patients with a follow up of five years.

METHODS

Ninety-five de novo PD patients underwent DAT imaging at baseline. Striatal semiquantitative indices were calculated with basal ganglia matching tool. All the patients were assessed with Unified Parkinson's Disease Rating Scale (UPDRS) part III for motor related impairment and Mini-Mental State Examination (MMSE) for cognitive functions at baseline and each year of the five years of follow up. The occurrence of dementia in the five years of follow up was collected. According with MMSE and pentagon test score we further divided the subjects into two sub-groups.

RESULTS

During follow up 18% of patients developed dementia. Patients developing dementia in the follow up period had lower striatal binding at baseline ($p<0.01$). The frequency of impairment in pentagon copy was significantly higher in PD patients developing dementia ($\chi^2=9.9$, $p<0.001$). Rather not statistically significant, patients developing dementia showed higher level of motor impairment (UPDRS III 22 vs 18 respectively for PD with dementia and not developing dementia) and lower MMSE at baseline (MMSE 26 vs 28 respectively for PD developing dementia and not developing dementia). Binary logistic regression analysis was performed dichotomizing striatal uptake value according to striatal median uptake (2.3). The model contained two independent variables (striatal uptake and pentagon copy), the full model was statistically significant ($\chi^2=20.7$, $p<0.001$) and as whole was able to predict the 35% of the variance in cognitive status. Both variable independently contributed to the model with an Odd Ratio respectively of 15.9 and 4.9 for low striatal baseline uptake and pentagon copy impairment.

CONCLUSION

Our findings show that DAT imaging performed at baseline and visuospatial and constructional ability as evaluated by pentagon copy intersection performance are associated with cognitive outcome in PD patients. Multiple variables have been associated to the risk of dementia in PD. In line with previous findings our data confirm that the integration of dopaminergic deficit and the dysfunction of cortical posterior area are associated with the risk of cognitive impairment.