Correlation between Non-Motor Symptoms and 123I-FP-CIT SPECT in Sardinian Parkinson’s Disease Patients

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Background
Currently, there is not definitive evidence about possible correlation of data obtained at functional imaging of dopaminergic terminal with nuclear medicine techniques (such as 123I-CIT-SPECT) and non-motor symptoms in patients affected by Parkinson’s disease (PD).

Objective
To examine the correlation between dopaminergic deficits assessed by 123I-CIT-SPECT and non-motor symptoms in Sardinian PD patients.

Material and Methods
Consecutive PD outpatients from the Movement Disorders Center of the University of Cagliari and with 123I-CIT-SPECT examination were included in our study. Semi-quantitative estimation was performed with the assessment of specific Regions Of Interest (ROI) and the determination of ratio caudate/occipital cortex and putamen/occipital cortex, both at level of affected side and contralateral (Figure 1). Presence and severity of non-motor symptoms were evaluated with the Non Motor Symptoms Scale (NMSS). Motor symptoms and motor disability were assessed with the Modified Hoehn & Yahr (HY) staging and the Unified Parkinson’s Disease Rating Scale part-III (UPDRS III) and the analysis of different subtypes according to Williams classification.

Results and Conclusion
Fifty-two patients (27 male and 25 female) were enrolled. Mean age at enrollment ± standard deviation was 67.5 ± 9.2 years, with mean PD duration of 3.9 ± 2.3 years (Table 1). Analysis of the single items of NMSS showed a significant negative correlation between striatal uptake and item 28 (disturbances of smell and taste) both for the caudate \( r = -0.302; p = 0.030 \) and the putamen \( r = -0.290; p = 0.029 \) (Figure 2-3). No other significant correlations with the other non-motor symptoms were observed. Regarding the correlation between uptake deficiency and motor symptoms, a highly significant negative correlation with the reduced putaminal uptake was highlighted both in relation to the UPDRS score-III \( r = -0.590 (p <0.001) \), and for what concerns the subscores of UPDRS III rigidity \( r = -0.640 (p <0.001) \), bradykinesia \( r = -0.565 (p <0.001) \), and posture/postural instability \( r = -0.399 (p <0.003) \) (Table 2).

We demonstrated a clear correlation between loss of olfaction and taste reported by the patients and dopaminergic deficit relieved at 123I-FP-CIT SPECT, our results also confirmed previous studies evaluating the correlation between dopaminergic impairment at 123I-FP-CIT SPECT and severity of motor symptoms.

References