

Autonomic nervous system impairment and impulsive compulsive behaviours in Parkinson's Disease

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Objective: Aim of the present study was to evaluate the relationship between impulsivity, impulsive compulsive behaviors (ICB) and autonomic nervous system dysfunction in people with Parkinson's disease (PD) using a structured clinical assessment and objective measures of autonomic functions and autonomic reactivity.

Background: Increased impulsivity and ICB are common in PD. A recent study has showed that PD patients who develop ICB over the course of the disease have more pronounced autonomic impairment.

Methods: Thirty consecutive patients with PD were included, 14 with and 16 without ICB. They underwent an extensive clinical evaluation of motor and non-motor symptoms including autonomic dysfunction, behavioral disorders, and neuropsychiatric symptoms. Objective autonomic assessment included recording of blood pressure, heart rate and heart rate variability (HRV) over six consecutive minutes at rest and after orthostatic challenge. Patients were evaluated both OFF and ON levodopa.

Results: A repeated measured analysis of variance (ANOVA) was conducted with medication (ON and OFF levodopa) and position (sitting versus standing) as within factor and group (ICB versus no-ICB) as between factors. We found a significant interaction position*medication ($F(1,25)=5,26$; $p=0,030$) and a trend toward significant effect of the interaction between medication and group ($F(1,25)=3,58$; $p=0,070$).

Indeed, ON levodopa there was an increase in the LF/HF ratio among ICB patients when sitting as compared to OFF levodopa ($p=0,002$), while the opposite effect was obtained in patients without ICB ($p=0,047$).

We did not find any significant correlation between heart rate variability parameters in sitting position and autonomic dysfunction scores, nor any differences in autonomic sub scores between the two groups.

Conclusions: Our results suggest that ICB patients show an increase in sympathetic tone when on levodopa compared to patients without ICB.

This is the first study to show that levodopa increases the LF/HF ratio in PD subject with ICB as measured by HRV and has an opposite effect in patients without this condition.