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Effects of opicapone in Parkinson's disease as assessed by kinematic techniques

Alessando De Biase[1], M. Bologna[1,2], D. Colella[1], A. Cannavacciuolo[2], L. Angelini[1], A. Guerra[2], G. Paparella[2], A. Berardelli[1,2], G. Fabbrini[1,2]

[1]Department of Human Neuroscience, Sapienza University of Rome, Rome, Italy
[2]IRCCS Neuromed, Pozzilli (IS), Italy

Background: By increasing L-dopa bioavailability, catechol-O-methyl transferase inhibitors are currently used as first-line add-on therapy to L-dopa to treat end-of-dose motor fluctuations in the advanced stages of Parkinson's disease (PD). In this study, we aimed to objectively investigate the effects of Opicapone on bradykinesia in PD by kinematic analysis.

Methods: We studied 13 patients with PD (mean age ± one standard deviation: 69.0 ± 7.4 years) and motor fluctuations (mean disease duration ± one standard deviation: 9.8 ± 4.4 years) being treated with dopaminergic drugs. Bradykinesia was measured by recording repetitive finger movements (finger tapping). All the patients were tested in two separate and randomized experimental sessions (with and without Opicapone), at least one week apart. In each session, patients were clinically and kinematically assessed before and after their usual morning dose of L-dopa (and the motor performance was followed up to 3.30 hours after L-dopa intake). The data were analyzed by analysis of variance (ANOVA) using the withing group factor SIDE (two levels: more vs. less affected), SESSION (two levels: without vs. with Opicapone), and TIME POINT of analysis (four levels: baseline, 30 min, 1 hour and 30 min and 3 hours and 30 min after L-dopa intake).

Results: Movement velocity during finger tapping was lower in PD patients without opicapone than in patients with opicapone [$F(1, 12) = 9.11$, $P=0.01$]. When tested without opicapone, PD patients also had a lower movement amplitude than in the assessment session with opicapone [$F(1, 12) = 4.91$, $P=0.04$]. opicapone intake, however, did not modify the sequence effect in patients. Finally, as expected, we also observed velocity and amplitude improvement related to L-dopa ($P<0.05$ for both parameters) while the sequence effect did not change.

Conclusions: We here provided the first objective assessment of the effects of opicapone on bradykinesia in PD. The study results confirm that bradykinesia features (i.e., velocity, amplitude, and sequence effect) have different sensitivity to change after administration of dopaminergic drugs.