POSTURAL SWAY PARAMETERS IN SUBJECTS AT HIGH RISK FOR PARKINSON'S DISEASE

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Introduction: Parkinson's disease (PD) is a progressive neurodegenerative disorder with predominantly motor dysfunction. Sway is relevantly affected within the disease course. However, there is a lack of knowledge about subtle motor dysfunction - in particular about sway parameters - in high-risk subjects for PD (HR, here defined according to [Berg, Mov Dis, 2010]).

Aims: To evaluate sway in HR subjects.

Methods: Twenty-one HR subjects, 14 PD patients (OFF-medication), and 15 matched controls were investigated. Sway was assessed in semi-tandem stance for 30s with an inertial sensor (DynaPort Hybrid, McRoberts) at the center-of-mass level, in four different conditions randomly assigned: eyes-open (EO); eyes-closed (EC); eyes-open with foam (EOF); eyes-closed with foam (ECF). We computed the following parameters from the 2-D horizontal acceleration signals: Root-mean-square of sway (RMS) acceleration, mean sway velocity (MV), frequency comprising 95\% of the signal (F95), and sway smoothness (JERK). Statistical analyses were performed with the Linear Mixed Model.

Results: In the ECF condition, mean RMS was higher in HR compared to both PD and control subjects (p< 0.05), and JERK was higher in HR compared to PD subjects (p< 0.05). Differences were present only in anteroposterior, not in mediolateral direction. MV and F95\% were comparable between groups. The other conditions (EO, AC, EOF) did not add relevant information.

Conclusions: HR Subjects have altered postural sway under a difficult sway condition, compared to both PD patients and controls. Observed effects in these high risk subjects may be best explained by an overcompensation of a latent postural deficit.