

Dynamic and kinematic analysis of gait in Parkinson's disease: markers for diagnosis

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Introduction: Gait of Parkinson's disease (PD) patients differs from healthy subjects (HS) for both kinematic and dynamic features. However, which kind of analysis (dynamic or kinematic) is more informative to discriminate PD and HS gait features is a question still open.

Objective: The present study aims to evaluate the discrimination potential of dynamic and kinematic gait analysis between PD and HS.

Methods: In the present retrospective study, from two datasets were extracted gait dynamic and kinematic features of 108 PD patients and 88 HS. Gait data were collected through an instrumented force-sensitive insole placed in subjects' shoes.

Results: For all the dynamic central and dispersion indices, statistical analysis showed a non-significant difference between HS and PD. Conversely, kinematic features showed statistically significant differences between PD patients and HS for: gait speed, time-Up-and-Go test and for dispersion indices like standard deviation and interquartile range of stance, swing and double support time.

Conclusions: Despite a directly mathematical relationship between kinematics and dynamic features, the results of the present study highlighted the so-called force/rhythm dichotomy, due to the greater informativeness of kinematic features than dynamic ones in discriminating PD vs HS.