

Mobile health technology identifies gait impairment in newly diagnosed Parkinson's disease

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Introduction: Gait alterations are heterogeneous in the early phases of Parkinson's disease thus limiting their diagnostic relevance when evaluated clinically. Mobile health technologies enable the objective evaluation of gait pattern alterations and might increase the sensitivity for these symptoms compared to standard neurological examination.

Aim of the study: Aim of the study was to evaluate patterns of gait in supervised conditions in newly diagnosed Parkinson's disease with and without clinically relevant gait alterations.

Methods: The prospective study included consecutive early PD patients with and without dopaminergic treatment, subdivided into PDs with (PD-G) and without (PD-nG) clinically evident gait alterations, respectively, and age-matched controls. Each subject underwent gait analyses in supervised normal and dual-task conditions using mobile health technology. The study evaluated gait parameters differentiating HC from both PD-G and PD-nG.

Results: Seventy-one early PD patients (including 45 drug-naïve), including 37 Normal Gait PDs and 34 Impaired Gait PDs, and forty-four age-matched controls entered the study. PD-G and PD-nG patients showed shortened mean step lengths in comparison to HCs both in single gait and dual task tests. Step time under supervised conditions had a longer duration in both simple gaits and while performing checking boxes in PD-G, while step time duration in PD-nG was longer only in dual task tests in comparison to controls. Double limb support showed longer duration only in dual task tests in both PD-G and PD-nG in comparison to HCs. The two early PD subgroup were similar in clinical and gait characteristics except for the mean value of MDS-UPDRS-III.

Conclusion: Mobile health technologies are able to identify altered gait parameters even in early PDs without clinically relevant gait alterations. Larger ongoing longitudinal studies are needed in order to evaluate gait alterations within the prodromal phases of the disease and the impact of dopaminergic medication on gait performance over-time.