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Neurogenic orthostatic hypotension worsens gait performances in Parkinson's disease: an instrumental kinematic assessment

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Introduction: Recent studies based on clinical scales revealed that orthostatic hypotension (OH) could influence ambulatory capacity in patients with Parkinson's disease (PD). Preliminary use of kinematic assessment suggested their utility to predict risk of falls related to OH and found correlation between orthostatic arterial pressure and gait parameters like gait speed and stride length. However, the association between neurogenic OH (nOH) and gait parameters modification still needs further investigation.

Objective: To assess the influence of nOH on postural and gait parameters with APDM Mobility Lab™ motion sensors.

Methods: We evaluated consecutive advanced PD patients in their "best-on" state, with bedside assessment of nOH (using the DHR/DSBP ratio), and gait/balance parameters acquisition by means of wearable motion sensors (Sway test, 3-meters Timed-up and go test (TUG test), Two-minute walk test [2MWT]). We used analysis of covariance (adjusting for age, disease duration and Hoehn and Yahr stage [H&Y]) to evaluate differences in kinematic parameters between the two groups.

Results: We enrolled 91 patients, 18 with nOH (19.8%) and 63 without nOH (69.2%).The two groups showed similar age (62.3±7.3 vs. 60.3±8.3 years, p=0.094), levodopa equivalent daily dose and H&Y, while disease duration was longer in patients without nOH (12.8±5.4 vs. 10.2±2.3 years; p=0.03). After correcting for age, disease duration, and H&Y stage, patients with nOH showed lower stride length (p=0.011), lower gait speed (p=0.010), longer time of double support (p=0.042), and longer time of execution of TUG test (without reaching full statistical significance, p=0.062). Sway test presented no differences between groups.

Conclusion: nOH is independently associated with poorer objective gait performances in PD patients, probably due to a detrimental effect during prolonged walking. nOH assessment should be included in the evaluation of complicated gait issues, and its management could be of utmost importance in reducing falls, fractures, and other important PD complications.

References:

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