TITLE: How Well Do Clinical Walking Measures Predict Natural Walking Behavior in Parkinson Disease?


ABSTRACT BODY:

Purpose Hypothesis: Declines in the amount and intensity of natural walking behavior in people with Parkinson disease (PD) may precede declines in motor behavior, gait, and balance.[1,2] Physical interventions targeting walking behavior in PD may have the greatest impact on slowing the progression of disability.[3-5] Despite a lack of supporting evidence, however, clinicians may be more likely to rely on quick performance measures of walking speed, capacity, and balance to make inferences about a patient’s walking health, rather than direct measures of natural walking behavior. Our primary purpose, therefore, was to examine the extent to which clinical walking measures might predict natural walking behavior in early to mid-stage PD. Secondarily we sought to explore differences in the predictive capability of clinical measures between relatively less active and more active participants.

Number of Subjects: 28

Materials/Methods: Data were collected from 20 males and 8 females (age 69.0 ± 7.0 years; Hoehn & Yahr Stages 2.0-3.0) as part of the baseline assessment for a larger prospective study of individuals with PD [6]. Clinical measurement of comfortable walking speed (10 Meter Walk Test; 10MWT), capacity (6 Minute Walk Test; 6MWT) and balance (Mini-BESTest; MBT) were collected from participants prior to wearing a Step Activity Monitor for seven days. Walking behavior was defined as the mean number of daily (1) steps and (2) minutes of moderate intensity walking. Subgroups of less and more active participants were created post-hoc based on a cutoff of 7,500 daily steps. Non-parametric bivariate correlations were used to characterize relationships between clinical and walking behavior measures.

Results: Participants collectively displayed variable walking speed (10MWT = 1.19 ± 0.2 m/s), capacity (6MWT = 478.3 ± 94.3 m), balance (MBT = 19.2 ± 3.1), daily steps (7683 ± 4386), and daily minutes of moderate intensity walking (8.1 ± 9.8). For the full sample, correlations between each clinical and walking behavior measure were positive but relatively weak (0.12 < ρ < 0.44). Among less active participants (n = 15), 10MWT and 6MWT correlations with daily steps and moderate intensity minutes were somewhat stronger (0.54 < ρ < 0.66). Among more active participants (n = 13), correlations were similar to the full sample, with the exception of 10MWT vs. daily steps (ρ = -0.80, p < 0.001).

Conclusions: The small, preliminary sample included a range of clinical walking performance and natural walking behavior representative of individuals with early- to mid-stage PD. More data are forthcoming. Results suggested that clinical walking measures may be relatively poor predictors of natural walking behavior. Gait and balance capability may be more likely to determine the daily walking activity among those who are relatively less active than those who are more active.

Clinical Relevance: For their patients with PD, clinicians should exercise caution in making inferences about natural walking behavior based on clinical walking measures.

References:


