

CHARACTERIZING SWAY IN PATIENTS WITH PERSISTENT POSTURAL-PERCEPTUAL DIZZINESS (PPPD) USING A WEARABLE MOTION SENSOR: CLINICAL UPDATE

Houser JP, Kerzman KL, Koepcke EC, Moore SA, Shepard NT, Hollman JH, Staab JP, McCaslin DL

Mayo Clinic School of Health Sciences

No Funding

IRB #10429.004 - There was compliance with protection of subjects in this study

BACKGROUND AND PURPOSE: Persistent postural-perceptual dizziness (PPPD) is the second most common condition identified in patients referred to Mayo Clinic for chronic dizziness. A common symptom of PPPD is unsteadiness, which may manifest itself in subtle changes in posture and gait. The purpose of this study is to confirm preliminary findings from a previous pilot study demonstrating that motion detectors in the BalanceBelt™ are capable of providing differential information about body sway movements in patients with PPPD compared to normal counterparts.

METHODS AND MATERIALS: In this cross sectional study, subjects (n=28, ages 25-75) diagnosed with PPPD by Mayo Clinic physicians were compared to age and gender matched controls. Motion detectors contained in the BalanceBelt™ recorded subtle changes in posture and gait. Objective measures of sway and gait performance were obtained using routine clinical balance and gait tasks: Dynamic Gait Index (DGI), Functional Reach (FR), and Sensory Organization Test (SOT).

ANALYSES: Pearson product-moment correlations were used to estimate the relationship between SOT, FR, DGI, and the BalanceBelt™ test variables in the two groups. A repeated measures ANOVA and post hoc analyses evaluated differences in BalanceBelt™ parameters and the six conditions of the SOT for both groups.

RESULTS: Subjects with PPPD had significantly more sway on all SOT tasks except for the sixth condition, and demonstrated poorer performance on the DGI and FR when compared to controls. There was a significant correlation between measures captured by the sensors and the functional tests of balance.

CONCLUSION: This study supports the BalanceBelt™ as providing differentiating information beyond that found from routine clinical tests to characterize postural control strategies in PPPD patients. Future research should verify these results in a large clinical trial.

IMPLICATIONS: The BalanceBelt™ could be an affordable way to objectively assess postural outcomes following physical therapy intervention, which could inform guidelines in treating patients with PPPD.