A comparison of psychometric properties between the Smart Balance Master system and the Postural Assessment Scale for Stroke in people who have had mild stroke

Abstract

Objective: To compare the psychometric properties (including the test-retest reliability, responsiveness, and predictive validity) of the Smart Balance Master system (SBM) and the Postural Assessment Scale for Stroke patients (PASS) in patients with mild stroke.

Design: One repeated-measures design (at a two-week interval) was used to examine the test-retest reliability of the SBM and PASS, and another similar design was applied to investigate their responsiveness. The patients who participated in the responsiveness study were followed up approximately one year later, and the predictive validity of the SBM and PASS was examined by assessing the patients’ comprehensive activities of daily life (ADL) function.

Settings: Three rehabilitation units in Taiwan.

Patients: Twenty patients with chronic stroke in the reliability study; 40 and 32 patients who had recently had a stroke in the responsiveness and predictive validity studies, respectively.

Interventions: Not applicable.

Main Outcome Measures: Three computerized tests of the SBM (the equilibrium score [ES] in the sensory organization test, the scores in rhythmic weight shifting [WS] tests, and the scores in the limits of stability [LOS] test) and the PASS were used. The combination of the Barthel ADL Index and Frenchay Activities Index was used to represent the comprehensive ADL function.
Results: For the SBM, all but the WS tests of the SBM had moderate to high reliability ($0.78 \leq$ intraclass correlation coefficient [ICC] $\leq 0.91$). The responsiveness of the ES and the LOS test were moderate (effect size $[d] = 0.63$) and small ($0.27 \leq d \leq 0.33$), respectively, while the responsiveness of the WS tests were limited ($0.04 \leq d \leq 0.29$). All but the WS tests of the SBM in the second evaluation had acceptable predictive validity for comprehensive ADL function ($0.15 \leq r^2 \leq 0.17$). The PASS showed high reliability (ICC = .84) and small responsiveness ($d = .41$), and the PASS in the second evaluation had acceptable predictive validity ($r^2 = .24$).

Conclusions: The PASS and the ES and LOS scores of the SBM had acceptable test-retest reliability, responsiveness, and predictive validity in patients with mild stroke, but the psychometric properties of the WS tests of the SBM should be further examined before consideration of their usage in patients with stroke.