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Test-Retest Reliability and Learning Effect of the Modified CTSIB Balance Protocol in a Geriatric Population

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PURPOSE: The purpose of this study was to determine the test-retest reliability of the modified Clinical Test of Sensory Integration and Balance (CTSIB) test on a clinical balance system in a geriatric population. **METHODS:** Twenty individuals (15 males and 5 females, age = 82.5$\pm$7.0) were recruited through the retirement facilities' wellness program to participate in the study. The individuals reported to the wellness center on two different days with a minimum of 48 hours between testing sessions. The Biodex Balance System SD was used to determine the sway index during a modified CTSIB protocol that utilized four 30-second trials under different sensory conditions; eyes-open firm surface (EO-S), eyes-closed firm surface (EC-S), eyes-open soft surface (EO-U) and eyes-closed soft surface (EC-U). A 2 (day) x 4 (condition) ANOVA with repeated measures was conducted to determine significance ($p <$ 0.05). **RESULTS:** The main effect of day demonstrated high reliability. The day-to-day testing revealed no significant difference between days of testing with mean sway index scores of 1.28$\pm$.86 and 1.31$\pm$0.85, for Day 1 and Day 2 respectively. In addition, day-by-condition analysis and post hoc testing also showed high reliability with no significant differences from Day 1 to Day 2 for any of the 4 conditions. The main effect of condition revealed that as the CTSIB was able produce more challenging balance conditions as the test progressed (p=0.44). Post hoc analysis revealed that the sway index scores significantly increased from the most to least stable condition, EO-S = 0.62$\pm$0.16, EC-S = 1.09$\pm$0.30, EO-U = 1.19$\pm$0.49, and EC-U = 2.94$\pm$0.86. The only condition during the test that did not show a significant difference was the transition from EC-S and EO-U. **CONCLUSION:** The modified CTSIB demonstrated strong reliability for day-to-day comparisons suggesting no learning effect between trials. In addition, the CTSIB uses progressively challenging sensory conditions that stress the proprioceptive feedback system needed to maintain balance in older adults. The strong reliability of in this study suggest that the modified CTSIB is a reliable test for older adults and the sensory challenges used to test may help prescribe training or rehabilitation for older adults whose sensory system may be compromised.