

SWACSM Abstract

Relationship of Reacstick® Inhibition Accuracy and Inhibitory Control During Balance Recovery

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ABSTRACT

The ability to stop action is rarely considered when avoiding a fall, but mounting evidence indicates performance on traditional cognitive tests of response inhibition is related to fall prevalence. This suggests the ability to suppress action is important in how we control balance, and therefore, identifying practical ways to detect this important fall risk factor has potential clinical value. **PURPOSE:** Our aim was to assess inhibitory control using a simple hand reaction task (ReacStick®) in relation to performance on a reactive balance test where step suppression was occasionally required. **METHODS:** Eighteen adults (18-30 years) were first assessed on a ReacStick® which uses a ruler-drop paradigm to measure both simple reaction time and go/no-go reaction accuracy under time pressure. When evaluating reaction accuracy, the participant needed to either catch, or let the falling device drop based on the random illumination of lights affixed to the device. Next, for the balance test, we measured inhibitory control using a customized lean and release protocol. On most balance trials (80%), participants were required to take a rapid step forward to recover balance when released from the support cable. On some trials (20%), an auditory tone instructed participants to suppress a step upon release and simply relax into a catch harness. Ground reaction forces measured stepping performance whereby lifting the leg from the force plate after a tone was counted as a step error. Inhibition accuracy was measured on the balance and ReacStick® tests as the percentage of successful stops (i.e., catches or steps) relative to total stop trials. **RESULTS:** Two-tailed, Pearson's correlation testing revealed a significant correlation between response inhibition accuracy measured by the ReacStick® and the ability to suppress a balance recovery step ($r = 0.633$, $p = 0.005$). **CONCLUSION:** Stopping ability measured in the balance recovery task is related to inhibition accuracy of the ReacStick® task and this relationship may support the use the ReacStick® as a potential proxy measure of reactive balance capacity. The simplicity of this device could make this a practical bedside assessment and future work should test populations with greater fall risk to determine if the ReacStick® is an alternative to reactive balance testing.