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Chronic Cognitive Deficits after mild traumatic brain injury: Do Standard Clinical Tests Relate to Real World Deficits?

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Abstract

Cognitive deficits are common following mild traumatic brain injury (mTBI) but there is limited evidence that standard evaluations are useful for detecting impairments in the chronic stage of mTBI. This study examined three cognitive tests to determine which best discriminates between people with and without chronic mTBI. A total of 51 subjects with chronic mTBI (mean age = 38.8 ± 11.0 ; mean Neurobehavioral Symptom Inventory [NSI] Score = 35.9 ± 15.8 ; median days since injury = 385), and 58 age and sex matched healthy control subjects (mean age = 36.9 ± 12.7 ; NSI Total Score = 3.9 ± 4.1) were used for analysis. Subjects completed a traditional computerized neuropsychological test - the Automated Neuropsychological Assessment Metrics (ANAM), and a motor-cognitive dual task (DT) test which assesses both motor performance with a cognitive task as well as the cognitive task accuracy. Subjects first completed a single task (ST) test of a seated auditory Stroop test, followed by a DT trial of walking 9 m while performing the auditory Stroop. Area Under Curve (AUC) from Receiver Operating Characteristic curves were used to identify which outcomes best discriminated groups. The DT gait speed had the largest AUC (AUC = 0.75). Comparatively, the ANAM composite score had the second largest AUC (AUC = 0.73). However, both ST and DT Stroop accuracies were unable to discriminate groups (AUCs = 0.59 and 0.55, respectively). For people with chronic mTBI, cognitive deficits may still be present months after the initial injury. These deficits can be detected using traditional neuropsychological evaluations. While people with mTBI demonstrate both motor and cognitive deficits during DT conditions, only motor DT assessments could differentiate between groups. Auditory Stroop performance may not be a good indicator of mTBI.