Utility of anatomic mri and specific neurological assessments in mild tbi

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Objective: This study investigated the utility of specific assessments and findings on high resolution anatomic MRI to evaluate Mild Traumatic Brain Injury (mTBI). Background: 3-word recall is commonly employed in patients with mTBI to assess memory function (Folstein et al., 1975). This test is usually normal and is probably inadequate for assessing these patients. 5-word recall, BESS, and Digits Backward are incorporated into the SCAT 2 (McCrory et al., 2009), but research has not demonstrated their effectiveness as longitudinal assessments (McCrea et al., 2013). The extent of incidental MRI findings in mTBI patients also remains unclear. Methods: 86 patients (15-50 years old), enrolled in the study either within 72 hours or 6-10 days of head injury, were followed over 3 months. Patients completed a maximum of 4 encounters which included a clinical exam, neurological assessments, and a multi-modal MRI at each visit. Chi-square and linear mixed models were used to longitudinally assess clinical symptoms found in the SCAT2. Results:
Three longitudinal neurological assessments provided statistically significant results. The success rate of three trials of 5-Word recall increased from 14.1 correct out of 15 at Encounter 1 (E1) to 14.9 at Encounter 4 (E4) (p0.001). Only the Single-Leg test of the Modified BESS was significant, dropping from an average of 4.1 errors at E1 to 1.8 at E4 (p0.001). Subjects demonstrated a significant increase in successful 5-Digit Backward Recall (57.5% at E1 to 71.7% at E4; p=0.043) Anatomic MRI also provided interesting data; 20 of the 81 subjects imaged had stable white matter changes across encounters (24.7%) and 23 had incidental findings (28.4%).Conclusion: Neurologists may consider 5-Digits Backward, Single-Leg Balance, and 5-Word Recall tests over traditional 3-Word Recall, Gait/Romberg, and full BESS testing when assessing progression of mTBI patients over multiple visits. Incidental findings and white matter changes may be more prevalent in patients with mTBI compared to the normal population (Katzman et al., 1999, Hopkins et al., 2006).