ADVANCED MRI APPLICATIONS FOR MILD TRAUMATIC BRAIN INJURY

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Objective: To correlate clinical neurological symptoms with mTBI biomarkers during the acute and subacute period following mTBI.

Background: Subjective assessment remains the standard of care for patients with mTBI.

Methods: 86 patients enrolled in the study within 72 hours or 8(±2) days of head injury for the first encounter (E1). Two or three subsequent visits followed: 8(±2) days for E2, 22(±7) days for E3, and 90(±7) days for E4. Chi-square and linear mixed models were used to assess changes across encounters.

Results: Most prevalent symptoms at E1 were “Headache” (92.5%), “Don’t feel right” (84.6%), and “Feeling slowed down” (82.5%). 26.1% of patients continued to experience headaches at E4. On average, patients reported 18.5, 19.2, 12.7, and 5.4 symptoms between each respective encounter. Significant decrease was found between E1 (p=0.017) and E4 (p0.001), suggesting possible symptom resolution three months after injury.

Neurological measures tested immediate recall and delayed concentration. There was a significant increase in word recall between E1 to E3 and E1 to E4 (p=0.002 for both). Only five digit recall demonstrated significant change between encounters (p=0.043). When comparing performance on three digit recall with symptomology, patients who incorrectly recalled three digits had prolonged symptoms. By E4 incorrect responders had almost six times as many symptoms (p=0.015).

Conclusion: We can potentially identify clinical symptoms which support the natural history of TBI in patients. Advanced imaging techniques may bolster current treatment of TBI and allow objective diagnosis. Further study is necessary to determine better treatment pathways in caring for these injuries.