

A Comparison Of Neurometabolites Alteration Using In-Vivo Proton Magnetic Resonance Spectroscopy (1H-MRS) In mTBI Patients

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Purpose of Study

To determine the neurometabolites changes in mild traumatic brain injury (mTBI) patients using proton magnetic resonance spectroscopy (1-H MRS).

Materials and Method

Fifty subjects comprise of 28 complicated mTBI (cmTBI) patients, 7 uncomplicated mTBI (umTBI) patients and 15 controls underwent MRI scan with additional single voxel spectroscopy (SVS) sequence. The brain spectra were processed to obtain the absolute and relative neurometabolite concentrations. The neurometabolites concentrations between the three groups were compared and correlated to the Glasgow Coma Scale (GCS).

Results

The concentration of glutamine (tGlx) ($\bar{x} \pm 2(2) = 6.60$, $p = 0.037$) and relative concentration of N-acetylaspartate over creatine (tNAA/tCr) ($\bar{x} \pm 2(2) = 6.65$, $p = 0.036$) demonstrated significant differences between the groups. tGlx was seen to be elevated while tNAA/tCr was lowered moving from cmTBI to umTBI to control group. The tNAA/tCr had a mild correlation with the injury complexity ($r = 0.38$, $p = 0.01$) and GCS scores ($r = 0.54$, p

Conclusion

The changes in neurometabolite concentrations were apparent at the onset of complicated traumatic brain injury. The tGlx and tNAA/tCr ratio have potentials to serve as biomarkers reflecting injury severity, in terms of complexity and admission GCS in mTBI patients.