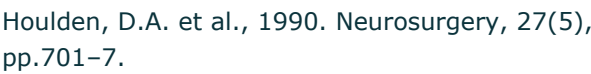


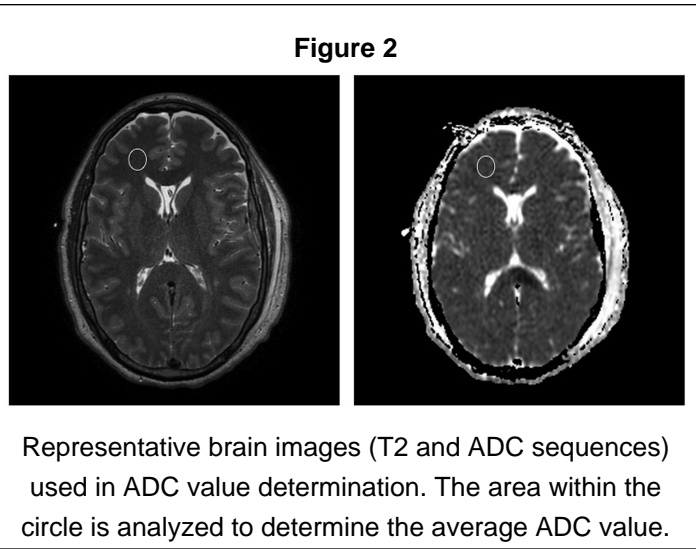
Traumatic brain injury (TBI) is a major cause of mortality and morbidity worldwide. Diffuse axonal injury is a well-recognized etiology of poor neurological outcome in patients with severe TBI, it is however difficult to diagnose. While conventional magnetic resonance imaging (MRI) sequences are poor in identifying such areas of axonal disruption, diffusion weighted imaging (DWI) detects areas where the movement of water is restricted as a result of the injury. Apparent diffusion coefficient (ADC) values obtained from DWI data may be used as a quantitative measurement of axonal injury. Currently, no conclusive data exists in the literature to enable outcome prediction based on ADC values. The objective of this study is to determine if ADC values obtained within 72 hours of the injury are predictive of patient outcome.



1. Betz, J. et al., 2012. Prognostic value of diffusion tensor imaging parameters in severe traumatic brain injury. *Journal of Neurotrauma*, 29(7), pp.1292–1305.
2. Schaefer, P.W., Grant, P.E. & Gonzalez, R.G., 2000. Diffusion-weighted MR imaging of the brain. *Radiology*, 217(2), pp.331–345.

1 day	Pure axonal injury	Decreased ADC
>4 days	Reactive gliosis	
1 week – 1 mo	Inflammation	Increased ADC

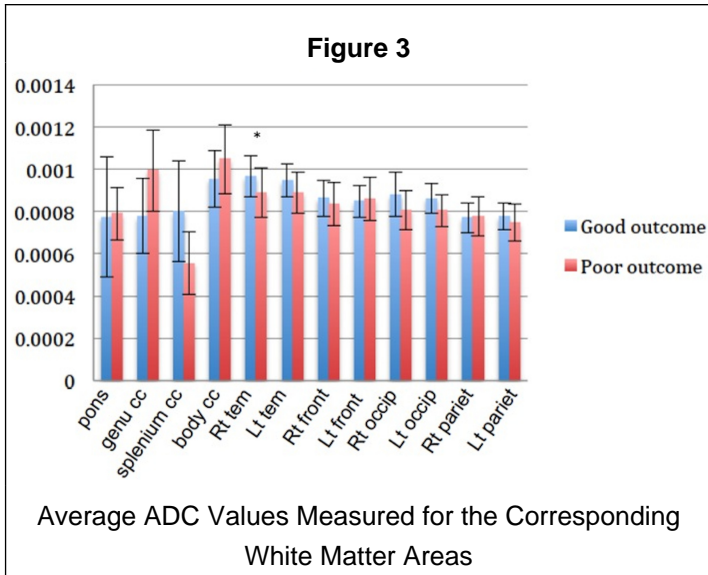
Ten patients with severe TBI were enrolled in the study, and the ADC maps were obtained from the DWI data acquired within 72 hours after the injury. The ADC values measured in a number of subcortical areas were correlated with the Glasgow Outcome Scale score and the somatosensory evoked potentials (SSEPs) for each patient.



*White matter ADC values in severe TBI patients as measured within four days of injury will be decreased in patients with poor outcomes*

The ADC values from right temporal lobe white matter were significantly different in patients with poor outcome when compared to patients with good outcome. Moreover there was a trend towards significant difference in ADC values measured within the corpus callosum.

*All patients with good outcomes had normal SSEP studies.*



White matter ADC values obtained within 72 hours of injury may correlate with the degree of axonal injury and may aid in outcome prediction in patients with severe TBI.