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Prognosticating traumatic brain injury (TBI) - How does admission to neurosurgical units affect outcome?

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Introduction: Both CRASH and IMPACT models have been developed in recent years to prognosticate traumatic brain injury (TBI). However, there is no clear evidence as to how acceptance for neurosurgical intervention to tertiary centres affects outcome compared to other centres. There is also predictive uncertainty with regards to if acceptance affects the ability of CRASH and IMPACT to prognosticate TBI.

Methods: Patients referred to a tertiary neuroscience centre from December 2014-January 2016 with a suspected TBI were retrospectively examined. For each model, the predicted survival and overall outcome were compared to the actual outcome on admission and at six months post injury, stratified by patient age and acceptance for neurosurgical intervention.

Results: The results indicated that 161 patients met the initial criteria; mean age 65 years (SD=21). Both CRASH and IMPACT correctly predicted six-month mortality rates and functional outcomes in most patients (range 61.7-82.4%), with better predictive performance for patients not accepted to the centre (range 84-98%). There was also no significant difference in the initial survival of elderly patients if accepted (78% [95% CI 50.6-104] vs. 81% [95% CI 67.8-94.8] but were lower for those not accepted (24% [95% CI 4.2-43.7] vs. 76% [95% CI 63.5-88.5], p=0.027).

Discussion: The lesser ability of CRASH and IMPACT models to predict outcomes when accepted suggests that acceptance to specialist centres may be able to improve outcome. Patients >65 years also had good survival rates on admission and at six months if accepted. This suggests more optimistic treatment and acceptance of appropriate patients should be considered.