CRASH and **IMPACT**: Let's be optimistic for severe Traumatic Brain Injury survivors entering Rehabilitation

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Introduction

Traumatic brain injury (TBI) is a heterogeneous disease with respect to severity and prognosis which causes considerable uncertainty in what regards to expected outcome of each patient but also in terms of length of survival, quality of life and functional independence.

The IMPACT and CRASH on-line tools are used in early assessment to predict outcomes at 6 months for persons with severe traumatic brain injury (TBI) (1). We wanted to see how these tools might be applied to patients entering rehabilitation.

Materials and Methods

CRASH and IMPACT prediction data were prospectively collected from a cohort of 96 patients admitted to our rehabilitation service in Auckland, New Zealand. All of our patients received acute treatment at Auckland Hospital, so they all went through the same acute protocol. The data was recorded at Hospital admission and the first TC was made in the first 24 hours

Outcome data were collected at 6 months, using a modified version of the Glasgow Outcome Scale.

Results

We have found that applying these prediction tools to survivors of TBI entering a rehabilitation service post acute hospital care gave an unduly pessimistic assessment of outcome. For example, using the IMPACT tool, we found that the rate of poor outcomes was about 40% of that expected. By a simple reset of the parameters for these two on line tools, we found we could better utilize them to predict good rather than poor outcomes from the rehabilitation process at 6 months post injury.

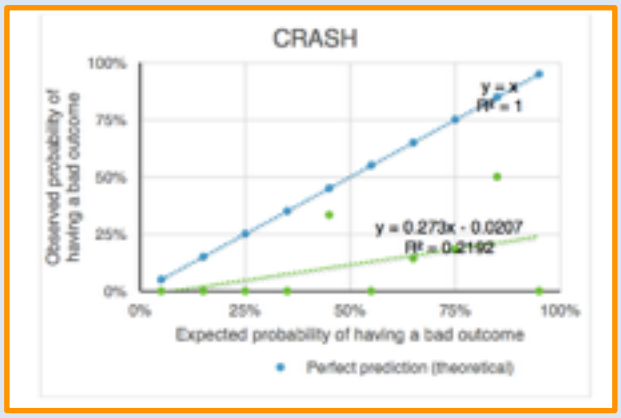

Fig 1. Graph showing the relationship between observed and predicted risk of having bad outcome with CRASH tool at 6 months post injury

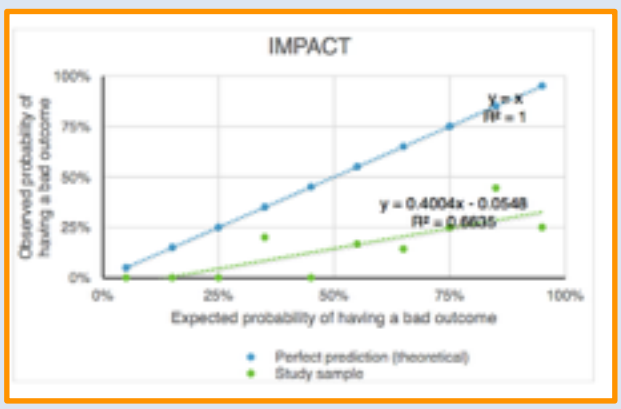

Fig 2. Graph showing the relationship between observed and predicted risk of having bad outcome with IMPACT tool at 6 months post injury

We were able to show, for instance, using the IMPACT, those with a score of 50% or less could expect a 98% chance of a good outcome.

Conclusions

We consider that this is positively framed information which would assist survivors and their families as they transition from neurosurgical to rehabilitation service. The IMPACT tool proved to be the better predictor of good outcomes.

References

Roozenbeek B, Lingsma HF, Lecky FE, Lu J, Weir J, Butcher I, et al. Prediction of outcome after moderate and severe traumatic brain injury: external validation of the International Mission on Prognosis and Analysis of Clinical Trials (IMPACT) and Corticoid Randomisation After Significant Head injury (CRASH) prognostic models. Crit Care Med. 2012;40(5):1609-17.