Corticosteroid Randomization After Signification Head injury (CRASH)

http://www.crash.lshtm.ac.uk/Risk%20calculator/index.html

see also IMPACT prognostic calculator.

Prognostic models that were developed by the International Mission on Prognosis and Analysis of Clinical Trials in Traumatic Brain Injury (IMPACT) study group and the Corticosteroid Randomization After Signification Head injury (CRASH) collaborators are the most commonly used prognostic models for outcome after traumatic brain injury (TBI). Although they have been considered to be useful tools in clinical practice ¹⁾, a continuous process of external validity in recent cohorts of different populations is necessary.

The objective of a study was to determine the external validity and compare the IMPACT and CRASHrefitted models for prediction of outcomes after moderate or severe traumatic brain injury in a nonselected 1301-patient Spanish cohort. They studied discrimination, calibration, and overall fit as external validation measures. Excellent discrimination was indicated (area under the curve [AUC] 0.78-0.87) by the higher values in the validation than in the development sample for both models and outcomes. Calibration revealed that IMPACT models, in general, predict lower probabilities of both outcomes (mortality and disability). In contrast, CRASH-refitted models provided higher predicted probabilities than those observed. Castaño-Leon et al., can conclude that both models demonstrate an adequate performance in the representative traumatic brain Mediterranean population. Therefore, these models can be sensibly applied in the clinical practice so long as their limitations are observed during individual outcome prediction².

Han et al., used a cohort of 300 patients with severe TBI (Glasgow Coma Score [GCS] \leq 8) consecutively admitted to the National Neuroscience Institute (NNI), Singapore, between February 2006 and December 2009. The CRASH models (base and CT) predict 14 day mortality and 6 month unfavorable outcome. The IMPACT models (core, extended, and laboratory) estimate 6 month mortality and unfavorable outcome. Validation was based on measures of discrimination and calibration. Discrimination was assessed using the area under the receiving operating characteristic curve (AUC), and calibration was assessed using the Hosmer-Lemeshow (H-L) goodness-of-fit test and Cox calibration regression analysis. In the NNI database, the overall observed 14 day mortality was 47.7%, and the observed 6 month unfavorable outcome was 71.0%. The CRASH base model and all three IMPACT models gave an underestimate of the observed values in this cohort when used to predict outcome. Using the CRASH CT model, the predicted 14 day mortality of 46.6% approximated the observed outcome, whereas the predicted 6 month unfavorable outcome was an overestimate at 74.8%. Overall, both the CRASH and IMPACT models showed good discrimination, with AUCs ranging from 0.80 to 0.89, and good overall calibration. They conclude that both the CRASH and IMPACT models satisfactorily predicted outcome in the patients with severe TBI ³.

1)

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