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J Neurotrauma. 2007 Feb;24(2):270-80.

Prognostic value of the Glasgow Coma Scale and pupil reactivity in traumatic brain injury assessed pre-hospital and on enrollment: an IMPACT analysis.

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Abstract

We studied the prognostic strength of the individual components of the Glasgow Coma Scale (GCS) and pupil reactivity to Glasgow Outcome Score (GOS) at 6 months post-injury. A total of 8721 moderate or severe traumatic brain injury (TBI) patient data from the IMPACT database on traumatic brain injury comprised the study cohort. The associations between motor score and pupil reactivity and 6-month GOS were analyzed by binary logistic regression and proportional odds methodology. The strength of prognostic effects were expressed as the unadjusted odds ratios presented for all individual studies as well as in meta-analysis. We found a consistent strong association between motor score and 6-month GOS across all studies (OR 1.74-7.48). The Eye and Verbal components were also strongly associated with GOS. In the pooled population, one or both un-reactive pupils and lower motor scores were significantly associated with unfavorable outcome (range 2.71-7.31). We also found a significant change in motor score from pre-hospital direct to study hospital enrollment ($p < 0.0001$) and from the first in-hospital to study enrollment scores ($p < 0.0001$). Pupil reactivity was more robust between these time points. It is recommended that the study hospital enrollment GCS and pupil reactivity be used for prognostic analysis.

PMID: 17375991 [PubMed - indexed for MEDLINE]

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