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Reference: Borgialli D, Mahajan P, Kuppermann N, et al. Performance of the Pediatric Glasgow Coma Scale Score in the Evaluation of Children With Blunt Head Trauma. *Academic Emergency Medicine* [serial online]. August 2016;23(8):878-884. Available from: CINAHL Plus with Full Text, Ipswich, MA. Accessed September 28, 2016.

Questions: Is the pediatric GCS score comparable to the standard GCS score for identifying children with traumatic brain injuries (TBI) on CT and clinically important traumatic brain injuries. (ciTBI)?

Introduction: The Glasgow Coma Scale (GCS) score is a widely used tool to assess the level of consciousness and severity of altered mental status in patients with traumatic brain injuries. Preverbal children require a modified GCS score to account for different stages of verbal, motor and cognitive development. There have been limited studies on the accuracy of pediatric GCS in identifying TBI in non-verbal aged children.

Methods: Secondary analysis of a multi-center prospective observational cohort study of blunt head trauma in children. It was conducted at 25 pediatric EDs in patients younger than 18 with nontrivial blunt head trauma. The pediatric (<2 yrs old) and standard (≥2 yrs old) GCS scores given to patients in the ED prior to CT scan were compared against TBI on CT and ciTBI. TBI on CT was defined as intracranial blood, pneumocephalus, cerebral edema, diastase of skull or skull fracture depressed by the width of the skull. ciTBI was defined as death from TBI, requiring neurosurgical procedure, intubation for more than 24 hours or hospitalization for greater than two nights related to the head injury.

Results: 42,041 patients were enrolled and 10,499 were less than two years old. Of those less than two, 9.4% had TBIs on CT and 1.4% had ciTBIs. Patients greater than two had 6.5% with TBI and 1.8% with ciTBIs. Using a receiver operating characteristic curve for the accuracy of the GCS on TBI on CT and ciTBI, the study found similar results compared to standard in identifying ciTBI (0.77 vs 0.81) and slightly less accurate identification in TBI on CT (0.61 vs 0.70).

Discussion: This study highlighted the importance of validating prediction tools in large studies compared to small single-site studies. The initial study at one center had shown both similar and better performance of the pediatric GCS vs standard GCS in identifying TBI on CT and ciTBIs, respectively. When applied to a more generalized population, the results weren't as promising in predicting TBI on CT, but did confirm that the pediatric GCS could be used to identify children with clinically important traumatic brain injury.

Limitations: One limitation of the study is that only 36% of the population underwent CT and therefore could have missed some children with positive findings on CT. Another limitation in this study was that it removed one point from the max verbal score in a patient who was crying or irritable. This makes the verbal component of the GCS score in pediatrics less reflective of changes in mental status and modifiable by outside factors including analgesics, stressful environment and parents present with the child.