Iris E. Hunt
L2
LSU Health Sciences Center, New Orleans, LA

Anthony M. DiGiorgio, DO, MHA and John P. Hunt III, MD, MPH
LSUHSC Department of Neurosurgery and Department of Trauma Surgery

"The timing of Glasgow Coma Score documentation in a trauma database: implications for patient care, research, and performance metrics"

Objectives: It is possible that the timing of collection of certain elements may improve or detract from the accuracy of models trying to explain clinical severity of injury or disease.The Glasgow Coma Scale (GCS) is intended as an objective, reliable measure of a trauma patient's mental status. This study looks to determine the contribution of the timing of the GCS to the performance of a commonly used risk-adjustment tool for trauma patients.

Methods: The Trauma Registry records of consecutive admitted patients with blunt trauma during a 4-year period (2013-2017) was further parsed to include only patients with a traumatic brain injury, excluding penetrating trauma and patients discharged from the emergency department. The GCS documented during the trauma resuscitation (GCS-1)and during the initial neurosurgery consult (GCS-2) were collected. The ΔGCS was calculated as the difference of GCS-2 and GCS-1. Probability of survival (POS) was calculated using the Trauma Injury Severity Score (TRISS) method. This was done once using GCS-1 (POS-1) and again using GCS-2 (POS-2). Other variables from the trauma registry that were analyzed included age, gender, race, injury intent, injury severity score (ISS), toxic substance screen results, discharge location, mortality, primary payor and hospital length of stay (LOS).

Results: GCS-1 significantly differed from GCS-2 (6.69 vs 7.84, ± 2.553, p<.001), as the GCS-1 group average was influenced by many patients with GCS of 3. There was no ΔGCS in 180 patients. The cohort with a decrease in GCS (70 patients) showed a significant difference between the mean GCS-1 and GCS-2 (9.46 ± 3.317, 7.36 ± 3.266, p<.001). The cohort with an increase in GCS (204 patients) showed a significant difference between the mean GCS-1 and GCS-2 (5.39 ± 3.113, 8.69 ± 3.067, p<.001). There were 330 (72.69%) patients with severe TBI (GCS ≤ 8) as noted by GCS-1 and 288 (63.44%) patients with severe TBI as noted by GCS-2.

There was a statistically significant difference (p<0.001) in the means of POS-1 (74.7% ± 26.6%) and POS-2 (79.3% ± 24.4%). The actual observed survival rate for the cohort was 71.0% (325/458). When compared to the observed value, the predicted POS-1 was significantly greater (71.0% vs 74.7% ± 26.6%, p=.004), and when compared with POS-2 there was an increasingly significant difference in means (71.0% vs 79.3% ± 24.4%, p<.0001)

Conclusions: GCS-1 recorded on patient emergency department arrival differed significantly from GCS-2 recorded by the neurosurgery team at later times. GCS-1 was more closely correlated with patient survival.