

Improving Trends in Functional Outcomes of Severe Traumatic Brain Injury Patients Over 17 Years in a Metropolitan Trauma Centre

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Traumatic brain injury (TBI) remains a leading cause of mortality and disability despite advances in surgical and critical care. This study aims to analyze the changes of clinical features, management strategies, and outcomes of severe TBI patients admitted to our center over 17 years.

We conducted prospective observational data collection across three periods: 2007–2012 (local registry), 2015–2018 (CREACTIVE), and 2022–2024 (GEO-TBI). Patients included in the study had severe TBI (GCS <9) and were admitted within 24 hours of injury. Data included demographics, injury patterns, interventions, and outcomes at 6 months (GOSE). Outcome data were supplemented by hospital information systems and structured follow-up interviews.

A total of 721 patients were analyzed: 372 (2007–2012), 175 (2015–2018), and 174 (2022–2024). Median ages were 53, 56, and 53 years, with approximately 75% male. Injury profiles showed high incidences of extra/subdural hemorrhage (75%, 52%, 80%), parenchymal focal injuries (70%, 63%, 62%), and traumatic subdural hematomas (59%, 47%, 67%). ICP monitoring was performed in 45%, 52%, and 37%, while decompressive craniectomy was undertaken in 17%, 14%, and 11%. Median ICU stay ranged from 7–9 days. In-hospital mortality was ~48%, with 6-month mortality exceeding 50% across all cohorts.

Age-stratified analysis revealed a notable shift in the mortality threshold: initially highest in patients aged 41–50, later moving to the 51–60 and 61–70 groups. Favorable functional outcomes (GOSE 7–8) showed a modest increase across cohorts (15%, 14%, 16%).

Despite persistently high mortality, results suggest a beneficial shift in age-related survival and modest improvement in functional recovery. To uncover the causes and significance of these changes requires critical analysis. These findings highlight the need for deeper evaluation of contributory factors, including adherence to management protocols, population changes, and registry methodologies.