

## A Prospective Neurosurgical Registry Evaluating the Clinical Care of Traumatic Brain Injury Patients Presenting to Mulago National Referral Hospital in Uganda

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**Abstract :** Background: Traumatic Brain Injury (TBI) is disproportionally concentrated in low- and middle-income countries (LMICs), with the odds of dying from TBI in Uganda more than 4 times higher than in high income countries (HICs). The disparities in the injury incidence and outcome between LMICs and resource-rich settings have led to increased health outcomes research for TBIs and their associated risk factors in LMICs. While there have been increasing TBI studies in LMICs over the last decade, there is still a need for more robust prospective registries. In Uganda, a trauma registry implemented in 2004 at the Mulago National Referral Hospital (MNRH) showed that RTI is the major contributor (60%) of overall mortality in the casualty department. While the prior registry provides information on injury incidence and burden, it's limited in scope and doesn't follow patients longitudinally throughout their hospital stay nor does it focus specifically on TBIs. And although these retrospective analyses are helpful for benchmarking TBI outcomes, they make it hard to identify specific quality improvement initiatives. The relationship among epidemiology, patient risk factors, clinical care, and TBI outcomes are still relatively unknown at MNRH. Objective: The objectives of this study are to describe the processes of care and determine risk factors predictive of poor outcomes for TBI patients presenting to a single tertiary hospital in Uganda. Methods: Prospective data were collected for 563 TBI patients presenting to a tertiary hospital in Kampala from 1 June - 30 November 2016. Research Electronic Data Capture (REDCap) was used to systematically collect variables spanning 8 categories. Univariate and multivariate analysis were conducted to determine significant predictors of mortality. Results: 563 TBI patients were enrolled from 1 June - 30 November 2016. 102 patients (18%) received surgery, 29 patients (5.1%) intended for surgery failed to receive it, and 251 patients (45%) received non-operative management. Overall mortality was 9.6%, which ranged from 4.7% for mild and moderate TBI to 55% for severe TBI patients with GCS 3-5. Within each TBI severity category, mortality differed by management pathway. Variables predictive of mortality were TBI severity, more than one intracranial bleed, failure to receive surgery, high dependency unit admission, ventilator support outside of surgery, and hospital arrival delayed by more than 4 hours. Conclusions: The overall mortality rate of 9.6% in Uganda for TBI is high, and likely underestimates the true TBI mortality. Furthermore, the wide-ranging mortality (3-82%), high ICU fatality, and negative impact of care delays suggest shortcomings with the current triaging practices. Lack of surgical intervention when needed was highly predictive of mortality in TBI patients. Further research into the determinants of surgical interventions, quality of step-up care, and prolonged care delays are needed to better understand the complex interplay of variables that affect patient outcome. These insights guide the development of future interventions and resource allocation to improve patient outcomes.

**Keywords :** care continuum, global neurosurgery, Kampala Uganda, LMIC, Mulago, prospective registry, traumatic brain injury

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