Section: Neurosurgery

Original Research Article

STUDY OF ANALYSIS OF OUTCOMES IN PATIENTS WITH TRAUMATIC BRAIN INJURY AT A TERTIARY CARE HOSPITAL

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Abstract

Background: The present study was conducted for evaluating outcomes in patients with traumatic brain injury. **Materials and Methods:** A total of 200 patients within the age range of 18 years to 65 years were enrolled in the present study. Patients with history of any previous head and neck trauma were excluded from the present study. Complete demographic and clinical details of all the patients were obtained. A Performa was made detailed medical and radiographic findings were recorded separately. Other variables recorded included Glasgow Coma scale and type of treatment. All the values thus obtained were then subjected to statistical analysis using SPSS software. Student t test was used for evaluation of level of significance. **Results:** Length of hospital stay was more than four days in 28.5 percent of the patients. Mortality was present in 26.5 percent of the patients. Age of more than 50 years, severe head injury as per GCS and hospital stay of more than four days was found to be significant predictors of mortality. **Conclusion:** Early evaluation of risk factors and predictors among patients with TBI helps in reducing the mortality and morbidity associated with the disease.

INTRODUCTION

Traumatic brain injury (TBI) has been one of the leading causes of morbidity, disability and mortality across all ages. Globally, more than 50 million individuals suffer from TBIs each year.[1,2] The male to female ratio is 2:1. A private study of 1084 individuals with traumatic brain injuries revealed that TBI was a high-risk factor not only for post-traumatic stress disorder (PTSD) but also for other psychiatric disorders. Statistically, the Center for Disease Control and Prevention (CDC) has estimated that annually, about 1.5 million Americans survive a traumatic brain injury (TBI). Among these, approximately 230,000 are hospitalized. In 2000, there were 10,958 TBI diagnoses. In 2015, this number jumped to 344,030. Mortality across all TBI severities is approximately 3%, yet morbidity is more difficult to estimate.[3,4] During the diagnostic process, a clinician typically assesses the severity of TBI. However, the initial assessment of TBI severity does not necessarily predict the extent of disability arising from TBI. Typical approaches to determining severity early after injury include neuroimaging, assessing the presence of an altered consciousness or loss of consciousness, assessing the presence of posttraumatic amnesia, and applying the Glasgow Coma Scale score.[5] The main contributor to secondary injury is the neuroinflammatory process principally characterized by chronic microglial stimulation, astrocytes activation, pro-inflammatory cytokines release, and oxidative stress. It was reported that it is fundamental to start the therapeutic interventions immediately following TBI, in particular within 4 h post-injury, to realize the best promising neuroprotective outcome.[6] Hence; the present study was conducted for evaluating outcomes in patients with traumatic brain injury.

MATERIALS AND METHODS

The present study was conducted for evaluating outcomes in patients with traumatic brain injury. A total of 200 patients within the age range of 18 years to 65 years were enrolled in the present study. Patients with history of any previous head and neck trauma were excluded from the present study. Complete demographic and clinical details of all the patients were obtained. A Performa was made detailed medical and radiographic findings were recorded separately. Other variables recorded included Glasgow Coma scale and type of treatment. All the values thus obtained were then subjected to statistical analysis using SPSS software.

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Student t test was used for evaluation of level of significance.

RESULTS

Mean age of the patients was 45.8 years. In 71 percent of the patients, conservative management was done. Length of hospital stay was more than four days in 28.5 percent of the patients. Mortality was present in 26.5 percent of the patients. Age of more than 50 years, severe head injury as per GCS and hospital stay of more than four days was found to be significant predictors of mortality.

Table 1: Demographic data

Variable		Number	Percentage
Mean age (years)		45.8	
Gender	Males	142	71
	Females	58	29
Cause of injury	Road traffic accident	162	81
	Fall from height	28	14
	Others	10	5
GCS on admission	Mild head injury	68	34
	Moderate head injury	82	41
	Severe head injury	50	25

Table 2: Treatment variables

Variable		Number	Percentage
Management	Conservative	142	71
	Surgical	58	29
Length of hospital stay	Less than one day	86	43
	One to four days	61	30.5
	More than four days	57	28.5
Mortality	Present	53	26.5
	Absent	147	73.5

Table 3: Predictors of mortality

Predictors of mortality	95 % CI	p-value
Age of more than 50 years		0.012*
Male gender		0.095
Severe head injury as per GCS		0.000*
Surgical management		0.147
Hospital stay of more than four days		0.029*

*Significant

DISCUSSION

Traumatic brain injury (TBI) presents in various forms ranging from mild alterations of consciousness to an unrelenting comatose state and death. In the most severe form of TBI, the entirety of the brain is affected by a diffuse type of injury and swelling. Treatment modalities vary extensively based on the severity of the injury and range from daily cognitive therapy sessions to radical surgery such as bilateral decompressive craniectomies. Guidelines have been set forth regarding the optimal management of TBI, but they must be taken in context of the situation and cannot be used in every individual circumstance. The 2 leading causes of TBI overall are falls and motor vehicle accidents. As a result of an overall increased number of TBIs, but lower rate of related deaths, we have a growing population of individuals living with significant disabilities directly related to their TBI.[7-9]

Hence; the present study was conducted for evaluating outcomes in patients with traumatic brain injury.

Mean age of the patients was 45.8 years. In 71 percent of the patients, conservative management was done. Length of hospital stay was more than four days in 28.5 percent of the patients. Mortality was present in 26.5 percent of the patients. Age of more than 50 years, severe head injury as per GCS and hospital stay of more than four days was found to be significant predictors of mortality. G/Michael, S et al assessed the outcome and associated factors of traumatic brain injury among adult patients. Road traffic injury was the most frequent cause of traumatic brain injuries among adult patients, accounting for 181 (37.5%), followed by assault, accounting for 117 (24.2%) which affects adult age groups. One-third of the participants had a moderate Glasgow coma scale of 174(36%). Only 128(26.8%) patients arrived within one hour. One hundred sixty, 160 (33.1%) of patients had a mild traumatic brain injury, whereas, 149(36%) of patients had a severe traumatic brain injury. Regarding computerized tomography scans findings, the hematoma was the most common (n = 163, 33.7%). Ninety-one, 91(18.8%) of participants had cerebrospinal fluid otorrhea, and, 92(19%) were diagnosed with a positive battle sign.

The overall prevalence of unfavorable outcomes after traumatic brain injury was found to be 35.2%. Having additional Injury, hypoxia, time to hospital presentation after 24 h, severe Glasgow Coma Scale, moderate Glasgow Coma Scale, tachypnea, bradypnea, and cerebrospinal fluid Othorrhea, were

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factors associated with unfavorable outcomes. The overall unfavorable outcome was experienced by about four out of every 10 victims of traumatic brain injury.[10]

Javeed, F et al used the Rotterdam score, which is based on a CT scan, to assess the outcomes of traumatic brain injury patients. There were 270 male patients (84.6%) and 49 female patients (15.4%). The mean age was 37.4 ± 15.4 years and road traffic accidents were observed in 275 people (86.2%). Severe traumatic brain injury (TBI) was seen in 123 patients (38.6%). The most common Rotterdam score was 2 in 86 (27.0%) patients, while it was score 3 in 72 (22.6%), score 4 in 59 (18.5%), score 5 in 41 (12.9%), score 1 in 31 (9.7%) and score 6 in 29 (9.1%). The mortality rate was 33.5% in our patients and good recovery was seen in 150 (47.0%) patients. The Rotterdam score is a useful tool to evaluate and predict outcomes in head trauma patients.[11]

Elahi C, et al determined if patients with traumatic brain injury (TBI) in low- and middle-income countries who receive surgery have better outcomes than patients with TBI who do not receive surgery, and whether this differs with severity of injury. Of the final 2502 patients, 609 (24%) received surgery and 1893 (76%) did not receive surgery. There were significantly fewer road traffic injuries and more violent causes of injury in those receiving surgery. Those receiving surgery were also more likely to receive care in the ICU, to have a poor outcome, to have a moderate or severe TBI, and to stay in the hospital longer. The hazard ratio for patients with TBI who underwent operation versus those who did not was 0.17 in patients with moderate TBI; 0.2 for those with mild TBI, and 0.47 for those with severe TBI. Those who received surgery for their TBI had a lower hazard for poor outcome than those who did not.[12]

CONCLUSION

Early evaluation of risk factors and predictors among patients with TBI helps in reducing the mortality and morbidity associated with the disease.

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