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Original Research Article

A Hospital Based Assessment of the Various Modalities of Management and Outcome in Patients of Head Injury: An Observational Study

Kundan Kumar[1], Rahul Singh[2], Manish[3]

[1]Senior Resident, Department of General Surgery, Narayan Medical College and Hospital, Sasaram, Bihar, India

[2]Senior Resident, Department of General Surgery, Narayan Medical College and Hospital, Sasaram, Bihar, India

[3]Professor, Department of General Surgery, Narayan Medical College and Hospital, Sasaram, Bihar, India

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Corresponding Author: Dr. Kundan Kumar

Conflict of interest: Nil

Abstract:

Aim: The aim of the present study was to assess the various modalities of management and outcome in patients of head injury.

Material & Methods: The present study was conducted in the Department of General Surgery, for one year, we have studied and analysed 100 head injury patients.

Results: Out of the 100 patients who participated in the study, the Mean age was 35.5 years, majority of patients were from age group of 18-40 years (66%), followed by age group of 41-50 years (22%) and age group of 51-60 years (10%). Majority of patients who had come were of male gender (86%). Road traffic accident was the most common cause of mode of injury (74%) followed by falls 22% and assault 4%. 40 (40%) patients had severe head injury according to GCS scoring system (GCS score ≤ 8). The remaining 60 (60%) patients had moderate brain injury (GCS score 9- 12). In our study EDH and SDH were the most common findings on non-contrast brain CT scan. EDH comprised of 26% and SDH comprising of 28% of the population. SAH was the third highest finding making up 16% of the population, followed by haemorrhagic contusion (10%) and intra-parenchymal haemorrhage (8%). In 12% of the head injured population CT scan could not be done as they were not in a stable condition. 85 patients (85%) were managed conservatively with monitoring in the surgical intensive care unit without the requirement of operative intervention.

Conclusion: In this study majority of head injuries did not require surgery and could be managed conservatively, and those patients who were managed operatively with Burr Holes and Craniotomy had good outcome.

Keywords: Head Injuries, Conservative Management, Burr Holes Surgery , Craniotomy.

Introduction

Traumatic brain injury (TBI) is defined as an acute brain injury resulting from the mechanical energy applied to the head from external physical forces. It is characterized by any one of disorientation, loss of consciousness, posttraumatic amnesia, or other neurological abnormalities. [1] Head injury is the most common emergency in surgical practice. It is associated with traumatic brain injury and it is the most common cause of death in young adults. [2] Road traffic accident is the most common cause of traumatic brain injury followed by fall and assault. Road traffic accidents are responsible for about 60% of brain injuries in the world.

Other causes are falls, which account for about 25%, and other non-motor-vehicle related accidents and acts of violence which collectively account for about 15% of TBIs. [3] Traumatic brain injury is a major public health issue in India. Head injury results in injuries, death and disabilities in all age groups but more in the young working and hence productive population. [4] In India, 1 out of 6 trauma victims succumb to death, every year more than 100,000 lives are lost. [5] The principal causes of such injuries are hypoxia, hypotension, raised intra cranial pressure, reduced cerebral perfusion pressure and pyrexia.

Prevention of secondary brain injury results in improved neurological outcome in head injury.[2] Early diagnosis by clinical examination and CT-scan Brain followed by immediate treatment, if required craniotomy is most important. Delay in the treatment may result in permanent neurological

deficit resulting in long term hospitalization, nursing care, financial loss to the patient and their families. [6]

From pre-hospital to emergency department and ICU, a simultaneous assessment, monitoring, stabilization and therapeutic intervention of hypoxia and hypotension is important since a single episode of hypotension increases the risk of disability and death. The Brain Trauma Foundation developed the first TBI Guidelines in 1995 with the assistance of a group of international experts in the field. The goal was to offer the latest research on which to build protocols that would improve the survival and outcomes of TBI patients. [7] There has been some evidence that treatment in centers with neurosurgical support, especially in settings where protocol-driven neuro-intensive care units operate based on the above-referenced guidelines, is associated with better patient outcomes. [8,9]

The aim of the present study was to assess the various modalities of management and outcome in patients of head injury.

Material & Methods

The present study was conducted in the Department of General Surgery, Narayan Medical College and Hospital, Sasaram, Bihar, India for one year. In this study, we have studied and analysed 100 head injury patients.

Inclusion Criteria

- Patients of age 19-70 years, either gender, had isolated head injury with GCS 12 or less admitted to our hospital

Exclusion Criteria

- On evaluation GCS more than 12
- Patients /Close relatives declining written informed consent.

Methodology

Study was explained and written informed consents from patient's close relatives was taken. Demographic data, detailed medical history, information about operative intervention, investigations, outcome, etc obtained from patients was entered in a pre-designed case record form.

The patients were examined clinically, GCS score was assessed on admission, initial GCS assessment were made upon arrival to the casualty and 6 hours after patient had been admitted in surgical intensive care unit, once the patients were resuscitated and stabilized, then CT scan was done and findings correlated. Neurosurgeon's consultation was taken and the necessity of conservative/operative intervention was decided. In cases requiring operative intervention, mode of surgery was decided on individual patient profile. Mode of Injury, requirement of intubation, CT scan findings, management strategy whether conservative/operative, and their outcome based on the Glasgow Outcome scale was assessed during discharge and follow up.

Statistical Analysis

Data was collected and compiled using Microsoft Excel, analysed using descriptive statistics.

Results

Table 1: Age and gender in relation to head injury

Gender	**N%**
Male	86 (86)
Female	14 (14)
Age in years	
18-20	10 (10)
21-30	26 (26)
31-40	30 (30)
41-50	22 (22)
51-60	10 (10)
61-70	2 (2)

Out of the 100 patients who participated in the study, the Mean age was 35.5 years, majority of patients were from age group of 18-40 years (66%), followed by age group of 41-50 years (22%) and age group of 51- 60 years (10%). Majority of patients who had come were of male gender (86%).

Table 2: Mode of injury

Mode of injury	**N%**
RTA	74 (74)
Falls	22 (22)
Assault	4 (4)

Road traffic accident was the most common cause of mode of injury (74%) followed by falls 22% and assault 4%.

Table 3: Severity of head injury based on Glasgow coma scale

Severity of head injury	N%
Moderate (GCS-9-12)	60 (60)
Severe (GCS 8 AND LESS)	30 (30)

40 (40%) patients had severe head injury according to GCS scoring system (GCS score ≤ 8). The remaining 60 (60%) patients had moderate brain injury (GCS score 9- 12).

Table 4: Intracranial findings on CT scan

Intracranial findings on CT scan	N%
EDH	26 (26)
SDH	28 (28)
SAH	16 (16)
HC	10 (10)
IPH	8 (8)
CT NOT DONE	12 (12)

In our study EDH and SDH were the most common findings on non-contrast brain CT scan. EDH comprised of 26% and SDH comprising of 28% of the population. SAH was the third highest finding making up 16% of the population, followed by haemorrhagic contusion (10%) and intra-parenchymal haemorrhage (8%). In 12% of the head injured population CT scan could not be done as they were not in a stable condition.

Table 5: Mode of management

Mode of management	N%
Conservative	85 (85)
Operative	15 (15)

85 patients (85%) were managed conservatively with monitoring in the surgical intensive care unit without the requirement of operative intervention.

Discussion

With rapid modernization, advances made in transportation, and the upsurge of violence, the incidence of traumatic brain injury has increased many folds. Much of the mortality and morbidity in traumatic brain injury patients is due to delay in admission of the patient to a hospital, delayed detection of intracranial pathology and neglect of the associated injuries contributing to secondary brain damage. [10] Traumatic brain injury is a major public health issue in India. Head injury results in injuries, death and disabilities in all age groups but more in the young working and hence productive population. [11] In India, 1 out of 6 trauma victims succumb to death, every year more than 100,000 lives are lost. Fifty percent of those who die from traumatic brain injury do so within the first two hours of injury. Ninety five percent of trauma patients in India do not receive the required care during the "Golden Hour" period after an injury is sustained. [12]

Out of the 100 patients who participated in the study, the Mean age was 35.5 years, majority of patients were from age group of 18-40 years (66%), followed by age group of 41-50 years (22%) and age group of 51- 60 years (10%). Majority of patients who had come were of male gender (86%). Similar observations have also been made by Tandon et al [13] who reported the mean age of 25.87 years in a series of 681 patients, whereas the mean age of the patients studied by Turazzi; et al [14] was 34 years. According to the global burden of disease study, India had highest rates of intracranial injury from road traffic accidents. [15] The Second leading cause of traumatic brain injury related outcomes in India was falls. Injuries are the seventh leading cause of mortality in India and 78% of these deaths are due to road traffic accident alone. Gururaj G et al [12] noted that road traffic injuries are the leading cause (60%) of traumatic brain injuries. Followed by falls (20% to 25%) and violence (10%). Similar findings were noted in present study. Road traffic accident was the most common cause of mode of injury (74%) followed by falls 22% and assault 4%. 40 (40%) patients had severe head injury according to GCS scoring system (GCS score ≤ 8). The remaining 60 (60%) patients had moderate brain injury (GCS score 9-12).

In our study EDH and SDH were the most common findings on non-contrast brain CT scan. EDH comprised of 26% and SDH comprising of 28% of the population. SAH was the third highest finding making up 16% of the population, followed by haemorrhagic contusion (10%) and intra-parenchymal haemorrhage (8%). Zaitun Zakaria et al [16] described three cases of EDH and their management, focusing on operative and non-operative treatment. They also reviewed, at that time, the available literature from the past three decades as well as the guidelines for management of EDH. They concluded that EDH can be managed non-operatively provided the GCS remains the same with symptomatic improvement.

A study done by Moussa et al [17] found that 50 patients of EDH were managed successfully by conservative approach without the need of surgery. In 12% of the head injured population CT scan could not be done as they were not in a stable condition. 85 patients (85%) were managed conservatively with monitoring in the surgical intensive care unit without the requirement of operative intervention. Many factors in head injury patients have been assessed and analysed, however, now is the time to expand our use of clinical knowledge beyond the Glasgow Coma scale, and create new scoring systems that take other variables like pupillary reactivity into account for establishing prognosis of head injury patients.

Conclusion

In this study majority of head injuries did not require surgery and could be managed conservatively, and those patients who were managed operatively with Burr Holes and Craniotomy had good outcome. If conservative approach to head injury management can be shown as a suitable alternative to surgical intervention, it will offer a mode of treatment that has fewer potential complications and risks than the traditional surgical route.

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