



Study of Various Management Techniques and Outcomes in Patients with Head Injuries

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ABSTRACT

Background: The frequency of traumatic brain injury has increased dramatically as a result of fast modernisation, transportation advancements, and an increase in violence.

Aims & objectives: The goal of this study was to look into various care options and outcomes in patients who had suffered a brain injury at a tertiary hospital.

Material and Methods: The current investigation was a prospective, descriptive, and observational study conducted in patients aged 19 to 70 years old, both genders, who had an isolated head injury with a GCS of 12 or less and were admitted to our hospital.

Results: The average age of the 240 patients who took part in the study was 36.6 years, with the majority of patients falling into the 18-40 year age group (66%), followed by the 41-50 year age group (20%), and the 51-60 year age group (10%). (12 percent). The majority of the patients (90 percent) were men, with a male to female ratio of 9:1. The most common mode of injury was a road traffic accident (74 percent). EDH and SDH were the most common results on non-contrast brain CT scans in our study. EDH accounts for 27% of the population, whereas SDH accounts for 26%, resulting in a population of 53%. SAH was the third most common diagnosis, accounting for 18% of the population, followed by haemorrhagic contusion (11%), and intra-parenchymal haemorrhage (1%). (7 percent). Without requiring operative intervention, 198 patients (82%) were handled conservatively in the surgical intensive care unit with monitoring. Only 42 patients (18%) required surgical intervention, which comprised Craniotomy (14 patients) and Burr Hole (14 patients) (28 patients).

Conclusion: The majority of head injuries in this study did not require surgery and could be treated conservatively, while those who were treated operatively with Burr Holes and Craniotomy had a positive outcome.

Keywords: head injuries, conservative management, Burr Holes surgery, Craniotomy

INTRODUCTION

The frequency of traumatic brain injury has increased dramatically as a result of fast modernisation, transportation advancements, and an increase in

violence¹. The delay in admitting the patient to the hospital, the delayed discovery of intracranial pathology, and the neglect of the related injuries contributing to secondary brain damage account for a large portion of the mortality and morbidity in traumatic brain injury

patients. In India, traumatic brain injury is a major public health concern². Head injuries cause injuries, mortality, and impairments in people of all ages, although they are more common among the youthful, working, and hence productive population. In India, one out of every six trauma sufferers dies, resulting in the loss of over 100,000 lives each year³. Fifty percent of people who die from a traumatic brain injury do so within the first two hours. In India, ninety-five percent of trauma patients do not receive the care they need during the "Golden Hour" after an accident⁴. Healthcare providers and academics are interested in identifying characteristics in the acute stage of a head injury that could provide insight into patient outcomes.

Aims & objectives: The goal of this study was to look into various care options and outcomes in patients who had suffered a brain injury at a tertiary hospital.

MATERIAL AND METHODS

The current study was a two-year prospective, descriptive, and observational tertiary hospital-based study that was conducted in our Institute's department of general surgery. The study was authorised by the ethics committee of the university.

Criteria for inclusion: Patients with isolated head injuries with GCS 12 or less were admitted to our hospital between the ages of 19 and 70, regardless of gender.

Exclusion criteria: GCS of higher than 12 on evaluation; patients/close relatives who refuse to sign a written informed permission form.

The study was explained, and signed informed consent was obtained from the patient's close family. Patients'

demographic information, complete medical histories, information on operative intervention, investigations, and outcomes, among other things, were recorded into a pre-designed case record form. The patients were clinically checked, and their GCS scores were assessed on admission, as well as 6 hours after they were brought to the surgical intensive care unit. Once the patients were resuscitated and stabilised, a CT scan was performed, and the results were compared. The need for conservative/ operative intervention was determined after consulting with a neurosurgeon. In cases when surgery was required, the type of surgery was determined based on the patient's particular characteristics. During discharge and follow-up, the severity of the injury, the need for intubation, CT scan findings, therapeutic plan (conservative or surgical), and their outcome on the Glasgow Outcome Scale were all evaluated. Data was collected and compiled using Microsoft Excel, and descriptive statistics were used to analyse it.

RESULTS

In this study, we looked at and analysed 240 patients who had had a head injury. All of the traumatic brain injury patients were admitted to the surgical critical care unit after undergoing resuscitation and a CT scan of the brain. The average age of the 240 patients who took part in the study was 36.6 years, with the majority of patients falling into the 18-40 year age group (66%), followed by the 41-50 year age group (20%), and the 51-60 year age group (10%). (12 percent). The majority of the patients (90 percent) were men, with a male to female ratio of 9:1.

TABLE 1: Age and gender in relation to head injury

Characteristic	Number of patients	Percentage
Age group (years)		
18-20	10	8%
21-30	68	28%
31-40	72	30%
41-50	48	20%
51-60	28	12%
61-70	4	2%
Gender		
Male	216	90%
Female	24	10%

The most common mode of injury was a road traffic accident (74 percent). The most prevalent cause of head injury in men was a car collision (81%) followed by a fall (14%), and assault (14%). (5 percent). The most prevalent cause of head injury in the female population (92 percent) was a fall, followed by a road traffic accident (8 percent).

Table 2: Mode of injury.

Mode of injury	Male (n=216)	Female (n=24)	Total number of patients	Percentage
RTA	176 (81 %)	2 (8 %)	178 (74%)	74%
Falls	30 (14 %)	22 (92 %)	52 (22%)	22%
Assault	10 (5 %)	0	10 (4%)	

According to the GCS grading system, 47 (39 percent) of the patients suffered a severe head injury (GCS score 8). The remaining 73 patients (61%) had moderate brain injuries (GCS score 9- 12).

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

Severity of head injury	Number of patients (n=240)	Percentage
Moderate (GCS-9-12)	146	61%
Severe (GCS 8 AND LESS)	94	39%

EDH and SDH were the most common results on non-contrast brain CT scans in our study. EDH accounts for 27% of the population, whereas SDH accounts for 26%, resulting in a population of 53%. SAH was the third most common diagnosis, accounting for 18% of the population, followed by haemorrhagic contusion (11%), and intra-parenchymal haemorrhage (1%). (7 percent). Because they were not in a stable condition, CT scans could not be performed on 11% of the head wounded

population. We discovered that EDH had the lowest mortality, with none of the patients diagnosed with EDH on CT scan imaging dying in our study, whereas SDH had the highest mortality, with 26 patients out of 88 dying from SDH, SAH, and Intra-parenchymal haemorrhage each accounting for 14 deaths, and Haemorrhagic contusion accounting for only 6 deaths out of 88. All of the patients who did not have a CT scan died as a result of their serious head injuries.

Table 4: Intracranial findings on CT scan.

CT SCAN FINDINGS	NO OF PATIENTS	PERCENTAGE
EDH	64	27%
SDH	62	26%
SAH	44	18%
HC	26	11%
IPH	18	7%
CT NOT DONE	26	11%

Without requiring operative intervention, 198 patients (82%) were handled conservatively in the surgical intensive care unit with monitoring. Only 42 patients (18%) required surgical intervention, which comprised Craniotomy (14 patients) and Burr Hole (14 patients) (28 patients).

Table 5: Mode of management

Mode Of Management	Number Of Patients	Percentage
Conservative	198	82%
Operative	42	18%

There were 138 patients who had a favourable outcome, such as a good recovery and moderate disability, and 102 patients who had an unfavourable outcome, such as severe disability and death during therapy. 126 (58%) of the 216 males in the study had a satisfactory recovery/moderate disability, whereas 90 (42%) had a severe disability/died. The female group, on the other hand, had 12 (50%) favourable outcomes and 12 (50%) unfavourable outcomes.

Table 6: Gender in relation to outcome

Sex	Good recovery/ Moderate disability	Severely disabled/Died	Total
Male	126	90	216
Female	12	12	24
Total	138 (57%)	102 (43%)	220

DISCUSSION

Early detection of the potential for traumatic brain injury in any trauma victim and minimising of subsequent insults, such as hypoxic-ischemic injury" The goal of traumatic brain injury therapy is to prevent this secondary insult⁵. Patients must be treated according to Advanced Trauma Life Support (ATLS) procedures in all multi-trauma cases, because systemic injuries kill patients considerably faster than CNS injuries. According to Haroon S. et al., 79.2 percent of instances occurred in the first four decades of life, with the age range of 21 to 30 years having the highest number of patients (25.3 percent). Tandon et al. made similar observations in a series of 681 individuals, reporting a mean age of 25.87 years, but the mean age of the patients evaluated by Turazzi et al. was 34 years⁶. The current study found similar results. The male to female ratio was nine to one. Several Indian authors, including Sambasivan M (15:1), Bharti P (5.6:1), and Haroon S, reported comparable findings (3.5:1). India had the greatest rates of cerebral injury from road traffic accidents, according to the global burden of disease research⁷. Falls were the second greatest cause of traumatic brain injury-related deaths in India. In India, injuries are the sixth greatest cause of death, with road traffic accidents accounting for 78 percent of all deaths. According to Gururaj G. et al., road traffic accidents are the primary cause of traumatic brain injuries (60 percent). Then there are the falls (20% to 25%) and the violence (10 percent). The current study found similar results⁸. The majority of head injuries in this study did not require surgery and were managed conservatively, with 198 (82 percent) of 240 patients being managed conservatively. The reasons for this were that in 26 patients with severe head injuries, CT scans could not be performed, close relatives of a few patients did not give consent for surgery due to the high risk nature of the operation, and thus they were managed conservatively despite surgical indications, and the rest of the patients were managed conservatively despite surgical indications. As a result, they were treated with caution. 28 patients had burr holes and 14 individuals had craniotomies out of the 42 patients who were

operated on. Only four of the 28 burr hole patients died, leaving 24 with a positive prognosis. Only two people died after 12 of the 14 craniotomies were successful. We discovered that EDH produced the best results. Our findings are consistent with those of Croce M. et al., who found that 70% of 83 patients with GCS scores of 11-15 who had subdural hematomas less than 1 cm in breadth were successfully handled non-operatively, with just 6% requiring surgery⁹. Patel NY et al. observed that only about 10% of 462 patients with head injuries and CT-imaged cerebral hematomas who were managed non-operatively developed clinically and subsequently required surgery. Zaitun Zakaria et al. reviewed three cases of EDH and how they were treated, concentrating on both surgical and non-surgical options¹⁰⁻¹². They also analysed the available literature from the previous three decades, as well as EDH management guidelines at the time. They came to the conclusion that EDH can be managed non-operatively as long as the GCS remains stable and the symptoms improve. Moussa et al. discovered that 50 EDH patients were successfully treated with a conservative approach without the need for surgery in a study¹³. Many characteristics in brain injury patients have been measured and analysed; however, now is the time to broaden our use of clinical knowledge beyond the Glasgow Coma scale and develop new scoring systems that consider other variables such as pupillary reactivity when determining prognosis.

CONCLUSION

The majority of head injuries in this study did not require surgery and could be treated conservatively, while those who were treated operatively with Burr Holes and Craniotomy had a positive outcome. If a conservative strategy to head injury care can be demonstrated to be a viable alternative to surgical intervention, it will provide a therapeutic option with less risks and problems than the usual surgical path.

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