



Original Research Article

Epidemiology and clinical characteristics of traumatic head injuries in central part of India, 2018-2019

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ABSTRACT

Introduction: Traumatic brain injuries represent 12% global burden of disease and main cause of death among 1-40 year old. Though some studies have described about traumatic brain injuries in India, very limited information is available from central part of India

Aims and objectives: To evaluate the incidence, Mode, severity, 128 Slice Computed tomography scan findings, and clinical outcome of head injuries at central part of India (Haroti area of Rajasthan and Malwa area of Madhya Pradesh).

Materials and Methods: For the study 800 patient's of Traumatic head injuries that admitted between April 2018-march 2019 in Jhalawar medical College Jhalawar Rajasthan India were included. Their medical records were reviewed and data on epidemiology, clinical characteristics, and outcomes analysed.

Results: Among 800 patient's of head injuries, median age was 28 year (range 1-90 years) Road traffic accident (60%) was most common mode of injuries followed by accidental fall from height (25%). Cerebral contusion (16%) was most common finding on 128 slice Computed tomography scan followed by acute subdural hematoma (11%) and skull bones fracture (10%). Good recovery (independent for day to day activities) was seen in 70%, mild disability was seen in 27%, severe disability in 3% and persistent vegetative state seen in 1% patient's.

Conclusion: Road traffic accident are the most common cause of traumatic head injuries in central part of India and mainly occurs in young productive age groups. At least 10% mortality or severe disability occurred in Traumatic head injury patients. Knowledge about epidemiology, etiology, clinical outcome are extremely helpful for further policy making, research and health management at national level in developing countries.

Higher incidence of Post traumatic seizures occurred in severe head injuries (12.5%) followed by Moderate (2%) and least (1%) in mild head injuries patient's.

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1. Introduction

Injuries represent 12% of global burden of disease, the third most common cause of overall mortality and main cause of death among 1-40 year old.¹ The Incidence of Traumatic Brain Injuries (TBI) is a slightly increasing and major cause of morbidity, mortality, disability and socioeconomic losses in the Indian subcontinent that result loss of productivity of work. In India every year there is an increase in the number of patients with Traumatic Brain Injuries both in urban and

rural areas. It is estimated that in our country nearly 1.5-2 million persons were injured, and 1 million die every year.² At the global level, it is estimated that the annual incidence and mortality from Acquired Brain Injury (ABIs) or Traumatic Brain Injuries (TBIs) is 200 and 20 per 1,00,000 per year, respectively.³

The number of Traumatic brain injuries has been increasing due to rapid motorization resulted increase road traffic accident, especially in last three decades.⁴ There is also day by day increasing violence, crime rates, the general absence and disregard to safety practices at working places has contributed to an alarming increase of injuries during the

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past decade. The sudden occurrence of TBIs had placed a major economic burden on individuals and families to meet costs of hospitalization and rehabilitation. The affected families had to spend resources (their own or borrowed from external source) to reach hospitals, to take care of injured person during hospital stay and after discharge.

Many studies in India and other countries have described the epidemiology of traumatic brain injuries and their clinical characteristics & outcomes of traumatic brain injury patients.

Present study was done in Jhalawar medical College and hospital aimed to describe the same things in central part of India (Haroti area of Rajasthan and Malwa area of Madhya Pradesh).

2. Materials and Methods

We conducted a retrospective study of medical records of all patients having head injuries admitted to Jhalawar Medical College and hospital Jhalawar Rajasthan, between April 2018 to March 2019. Study protocol was approved by Jhalawar medical college ethical committee.

All patient of traumatic head injuries transported in our hospital was admitted, history taken/ information collected from patient relatives or police. After clinical examination and investigation, we give treatment/ management according to hospital policy and guidelines. Computed tomography scan (128 Slice) done in every patient during admission. Most of the patients were managed by conservative treatment. Neurosurgical procedure was done on the basis of requirements.

Medical records of these patient were studied and following variables entered into Microsoft Excel sheet 7.0: Age, Sex, Glasgow comma score (GCS), Mechanism of injury, Severity of head injury, Associated other body part injuries, Length of hospital stay (days), Computed tomography scan findings, Types of management, Surgical intervention if any, and Glasgow Outcome Score

Statistical analysis of the compiled data were analyzed using SPSS version 23.0 (trial version) and presented in percentage and proportion. Proportions were analyzed using the Chi - Square test and p value less than 0.05 were considered as significant.

Severity of Injury was classified on the basis of the Glasgow Coma Scale (GCS) at the time of admission. Traumatic Brain injury cases were graded as mild (13-15), moderate (9-12) and severe (3-8) according to GCS. To know the final outcome, Glasgow Outcome Scale was used at the time of discharge of patient. Long term outcome data was not available because so many patients lost to follow-up.

3. Results

During the study period of one year, 800 patients with Traumatic brain injuries were included in this study. The median age was 28 years (range < 1 year to 90 years). We divided the patients among three age groups : 1-15 years, 16-50 years and more than 50 years. Traumatic Brain Injury occurred majority in the age group of 16-50 years (60%) followed by 1-15 years (22%) and more than 50 age group have 18% injury. It is observed that young and productive population are affecting mostly due to intracranial injury. Male patients (65%) found to be in greater proportion as compared to female patients (35%). Table 1 .

Regarding Mode of injury, Road traffic accidents had (60%) patients found to be the most common followed by fall from height (25%) and assault (10.0%). Rests of the patients were injured due to sports related injuries in 3% and pathological / metabolic cause like CVA seizures syncope hypoglycemia seen in 2%. Table 2 .

Glasgow coma scale was used to assess the seriousness of head injury as mild, moderate and severe at the time of admission in our hospital. In our study 45% patients admitted with mild, 35% with moderate and 20% patients with severe heads injuries. Table 3 .

In our study Cerebral contusion was the most common finding 16% in Computed tomography scan followed by acute subdural hematoma in 11%, skull bones fracture in 10%, Subarachnoid hemorrhage in 9%, Extra Dural hematoma in 8% pneumocephalous in 4.5%, chronic subdural hematoma in 3%, Intracerebral hematoma in 2.5% and intraventricular hemorrhage in 1%, rest of the 40% patients not have significant findings in CT scan. Concurrent facial injuries seen in 31% and spinal injuries in 1.5% patients. Figure 1

Most of the head injuries were managed by conservative treatment. Main indication for cranial surgeries were acute subdural hematoma, extra Dural hematoma cerebral contusion with mass effect and compound depressed fracture.

In this study, out of 800 patients mortality was found in 50 patients (6.5%). In these 50 patients 26 patients (52%) had severe Head injury and 18(36%) patients moderate head injury. Six patients (12%) in mild Head injury were expired due to other associated body parts injuries. Good recovery (independent for day to day activities) was seen in 560(70%), mild disability was seen in 216(27%) and severe disability seen in 24(3%) of the patient's. Persistent vegetative status 8(1%) patients. Table 4

The Seizures is significantly associated with Severity of TBI ($p < 0.05$). The Seizures occur in 32(4%) patients during hospital stay. The Seizures is higher in severe head injuries patients 25(12.5%) followed by Moderate 7(2%) and least in Mild head injuries patients 5(1%).Table 5 .

Table 1: Distribution of Age and gender of the Patients with TBI

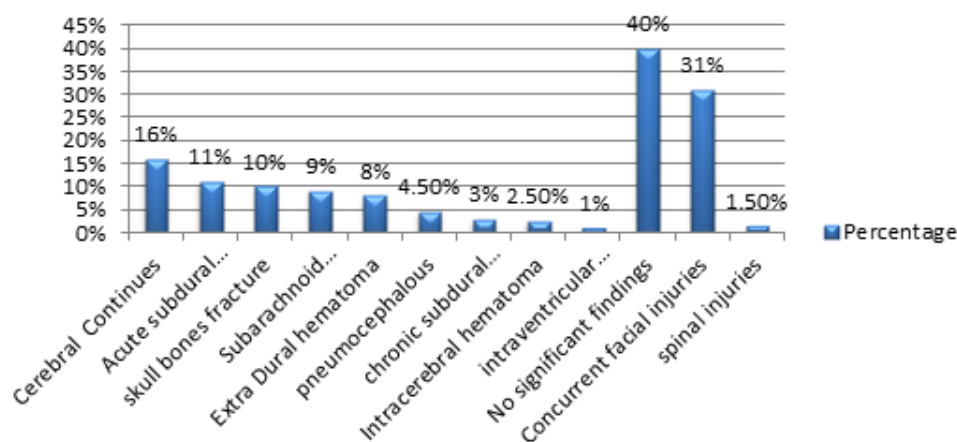
Age	Gender		Total
	Male	Female	
1-15 Years	117(66%)	59(34%)	176 (22%)
16-50 Years	303(63%)	177(37%)	480 (60%)
>50 Years	101(70%)	43(30%)	144 (18%)
Total	521 (65%)	279(35%)	800 (100%)

Table 2: Distribution of casus of head injury of the patients

Casus of Head Injury	No	Percentage
RTA	480	60%
Assault	80	10%
Fall - accidents	200	25%
Pathological / CVA	16	2%
Sports / others	24	3%

Table 3: Distribution of GCS Score of the patients with TBI

GCS Score	No	Percentage
Mild (13-15)	360	45%
Moderate (9-12)	280	35%
Severe (3-8)	160	20%
Total	800	100%

**Fig. 1:** Distribution of 128 slice computed tomography scan findings of the patients with TBI**Table 4:** Number of patients with TBI by GCS scale outcome

GCS Severity	Glasgow outcome Scale					total
	Death	Persistent Vegetative	Severe Disability	Mild Disability	Good Recoery	
Severe	26	7	20	214	2	360
Moderate	18	1	4	2	58	280
Mild	6	0	0	0	500	160
Total	50	8	24	216	560	800

Table 5: Distribution of seizers according to GCS score of the patients with TBI

GCS Score	Seizers		Total	Chi sq	P value
	Yes	No			
Mild (13-15)	4(1%)	356(99%)	360	54.771	<0.0001*
Moderate (9-12)	8 (2%)	272(98%)	280		
Severe (3-8)	20 (12.5%)	140 (87.5%)	160		
Total	32(4%)	768(96.3%)	800		

4. Discussion

In Changing and evolving trend of socio-economic factors especially in developing countries like India has made the head injuries a major epidemic as like other communicable and non-communicable disease. The need to implementation of safety protocols and the future progression of the injury burden was emphasized by WHO way back in 1990's, stating trauma will ascend the top 10 causes of disease burden from the ninth position to third by 2020 globally.⁵

In the present study it was observed that mostly young (15-50) and productive population is getting affected by Intracranial injury and majority of patients were males which is close to the IMPACT study (2007), according to which TBI case are dependent on age⁶. Study of M.K.Goyal, et al. (2010) also concluded that most affecting age group to be 21-40 years and 66% were males.⁷ Road traffic accidents (60%) was found to be major common mode of injury which is close to the similar finding i.e. 65.73% in the study of A. Pathak, et al. (2008).⁸

In the study of KU Tobi et al in 2016 Patients aged between 31 and 40 years accounted for the majority (24.2%), followed by patients between 21 and 30 years old (19.8%).⁹ The male & female ratio was 3:1 and its same reflect in our study.

The severity of brain injuries is associated with outcome at the time of discharge and other subsequent outcomes at different point of time. Low Glasgow coma score at admission was associated with poor outcome at the time of discharge. Mortality rate was 6.5% was in our Study which is close to study of Ram et al in 2014. In their study Five patients out of 18 with GCS group 3 to 8 expire, four patients out of 15 expired in GCS group 9 to 12 and 3 patients out of 27 expired from group having GCS 13 to 15, which is similar to our study.¹⁰

In traumatic head injury Posttraumatic seizures reflects the extent of brain damage and its positively correlated with the level of GCS at the time of admission.¹¹ From combined series, the risk of epilepsy ranges from 1.3 to 24%.¹² In our series, seizure occurred in (3.7%) patients during hospital stay that is similar to many other reports from India, and other parts of the world.

5. Conclusion

Head Injury is a one of the major public health issue and medical concerns to health. This is the first study of its

kind from central part of India. (Haroti area of Rajasthan and Malwa area of Madhya Pradesh) that provides the information about the epidemiology, etiology, severity, CT scan findings and outcomes of head injuries. Most of the injuries occurred due to Road traffic accidents (RTAs), more common among the economically productive age groups and predominant in males.

Outcome, mortality and posttraumatic seizures in head injuries are mostly associated with GCS at the time of admission. Knowledge about the causes, pattern, and distributions about TBI patients from this study will be helpful in policymaking, research, health management, and rehabilitation at the national level in India and other developing country.

6. Limitations

This study had also some limitations. Most of the patients are referred (because it is tertiary care center) and the time to transfer is higher so severity of patients is increased. Many patients not report after discharge and lost the follow-up.

7. Source of Funding

None.

8. Conflicts of interest

None.

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