*Original Article*

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# Retrospective Study of Traumatic Head Injuries in a Tertiary Care Hospital in Pune

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**Abstract**

***Background:*** Trauma and trauma related deaths due to head injury are a major health concerns. Yet reliable statistics are difficult to discover from routinely collected data. This study helps to measure the epidemiology, mortality and morbidity of traumatic head injury patients in a tertiary care hospital in Pune.

***Methods:*** Retrospective data of one year (1st January 2021 to 31st December 2021) was collected from Medical records department. Demographic data, severity and mode of injury, interventions done, duration of stay, morbidity and mortality were recorded.

***Results:*** Of the total 984 cases recorded, 805 were males and females were 179. Majority (More than 50%) were below 40 years of age. The most common cause of trauma was RTA (83.3%). Of all the trauma patients 100 (10.16%) were found to be under influence of alcohol. On admission 80 patients (8.13%) had poor GCS (0-3), while 812 (82.53%) on admission had good GCS (8 and above). 180 patients underwent neurosurgical intervention. Average length of hospital stay of majority patients (518) was 4 to 7 days. Total mortality was 125 (12%).

***Conclusions:*** The above study gives statistics regarding the epidemiology, morbidity and mortality of patients of traumatic head injuries in a tertiary care hospital which can be used for future references in designing management policies to prevent traumatic head injuries.

**Keywords:** Audit; Trauma; Head injury.

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## INTRODUCTION

In India, growing population simultaneously made a strong impact on increase in motor vehicle population. This increase in motorization along with expansion of the road network has brought not only rural economic development in India but also some adverse effects such as the increase in road accidents[1] Almost 1.3 million people die in road traffic accidents (RTA) every

year and 20 to 50 million people suffer non-fatal injuries, with many sustaining a disability because of their injury. According to the fourth UN global road safety week held on 8-14 May 2017, with the theme "speed management" 328,000 people dying on the roads every year, making it leading cause of death for those aged 15-49 years and cost countries 1-3% of their gross domestic product (GDP).[2,3] In road traffic accidents, the most prominent and vulnerable part of human body is head.[4] The young male population is most frequently affected by head injuries. The most commonly affected population with head injuries *i.e.* about 69% were reported in the age group of 15-35 years.[5] It is identified that the most common cause of head injury in an adult is due to fall and in children younger than 15 years is due to fall and road traffic accidents and is considered to be the most important cause of mortality.[6] The most frequent clinical presentations in patients with head injuries are headache and vomiting that were followed by skull fracture and loss of consciousness and other suggestive clinical findings of skull fractures are nose and bleeding from ear, mastoid ecchymosis, and CSF rhinorrhea/otorrhoea.[7] Head injuries are basically classified into two types depending on the involvement of dura mater. Closed head injury where the dura mater is intact and open head injury where dura mater is torn. However, based on gross anatomical involvement of structures head injuries are classified into scalp injuries, facial injuries, skull injuries, injury to meninges and injury to the brain.[8] The Glasgow coma scale (GCS) is used to assess severity of head injury by neurological assessment.[9] The GCS score between 13-15 is measured as mild head injury, 9-12 as moderate and 3-8 as severe.[10]

The aim of this study was to undertake an audit of traumatic head injuries in tertiary care hospital in pune during a 12 month period (1st January 2021 to 31st December 2021) to define the demography, mechanism of injury, length of hospital stay, morbidity and outcomes in terms of mortality.

## MATERIALS AND METHODS

The present study is carried out at BJMC and Sassoon hospital, a tertiary care centre in department of Neuro Surgery from 1st January 2021 to 31st December 2021. The present study was a hospital based retrospective observational study.

- ***Inclusion Criteria***: All admitted patients of exclusive head injury with age more than 12 years.
- ***Exclusion criteria:*** Patients brought dead to hospital, polytrauma patients admitted under other departments, patients managed through OPD.

## METHODOLOGY

- Retrospective data of 984 patients of trauma with exclusive head injury attending the hospital's emergency department over a period of one year, from 1st January 2021 to 31st December 2021, was collected from institute's Medical Records Department.
- ***The Collected data was Studied under below mentioned Variables:*** Demographic details such as age, sex, address, date of admission, and date of discharge/death; details of injury such as date of injury, mode of injury, external injuries if any, whether patient was under influence of alcohol at the time of trauma.
- Glasgow Coma Scale (GCS) score at the time of admission for assessing the severity of trauma; radiological findings; surgical intervention done (if any).
- Data obtained was compiled on a MS Office Excel Sheet (v 2010). Data was subjected to statistical analysis using Statistical package for social sciences (SPSS v 21.0, IBM). Descriptive statistics like percentage and frequency for categorical data has been depicted.

## RESULTS

**Table 1:** Age and Sex wise distribution of Patients

| Age | Male | Female | Total |
|---|---|---|---|
| <25 | 178 | 31 | 209 |
| 25-40 | 293 | 50 | 343 |
| 41-55 | 183 | 27 | 210 |
| >55 | 151 | 71 | 222 |
| Total | 805 | 179 | 984 |

Males were more than females. Majority of males were seen in the age group of 25 to 40 years while in female's majority were in the age group of >55 years followed by 25 to 40 years.

**Table 2:** Shows mode of Injury.

| Mode of Injury | Male | % | Female | % | Total | % |
|---|---|---|---|---|---|---|
| Accidental | 77 | 11.99 | 101 | 29.53 | 178 | 18.08 |
| Assault | 25 | 3.89 | 11 | 3.21 | 36 | 3.65 |
| RTA | 533 | 83.03 | 225 | 65.78 | 758 | 77.03 |
| Suicidal | 7 | 1.09 | 5 | 1.48 | 12 | 1.44 |
| Total | 642 | 100 | 342 | 100 | 984 | 100 |

Of the 984 cases of traumatic head injury, most common (758) were because of Road Traffic Accident, 178 Accidental (18.08%), 36 Assault (3.65%), and 12 Suicidal (1.44%).

**Table 3:** Shows Patients who were found to be under the influence of alcohol.

| Alcohol | Number | % |
|---|---|---|
| Yes | 100 | 10.16 |
| No | 884 | 89.84 |
| Total | 984 | 100 |

Amongst 984 patients, 100 patients had history of alcohol consumption at the time of injury *i.e.* 10.16%.

**Table 4:** Shows Glasgow Coma Scale (GCS) score of the patients on admission.

| GCS | Number | % |
|---|---|---|
| <3 | 80 | 8.13 |
| 3-8 | 92 | 9.34 |
| >8 | 812 | 82.53 |
| Total | 984 | 100 |

Amongst the 984 patients, GCS score above 8 contributed to the majority (82.53%), while (9.34%) patients had GCS between 3 to 8 and a GCS score below 3 was found in 8.13%.

**Table 5:** Shows Radiological findings of head Injury seen on a CT brain.

| CT Findings | Number | % |
|---|---|---|
| SAH | 148 | 15.04 |
| SDH | 142 | 14.43 |
| EDH | 135 | 13.71 |
| Small hematoma | 270 | 27.43 |
| Mixed | 289 | 29.39 |
| Total | 984 | 100 |

Majority of them (29.39%) showed minor mixed findings, followed by small hematoma (27.43%).

**Table 6:** Shows average duration of hospital stay of patients of traumatic head injury.

| Days | Number | % |
|---|---|---|
| 0-3 | 390 | 39.63 |
| 4-7 | 518 | 52.64 |
| 8-15 | 32 | 3.25 |
| 15-30 | 26 | 2.65 |
| >30 | 18 | 1.83 |
| Total | 984 | 100 |

Average hospital stay of traumatic head injury patient was 4 to 7 days (52.64%) followed by 0 to 3 days (39.63%).

**Table 7:** Shows Number of Patients having outcome as mortality.

| Sex | Mortality Present | Mortality Absent | Total |
|---|---|---|---|
| Male | 100 | 705 | 805 |
| Female | 25 | 154 | 179 |
| Total | 125 | 859 | 984 |

Amongst 984 patients 125 (12.70%) patients had mortality as an outcome of the traumatic head injury while remaining 859 (87.3%) were discharged.

## DISCUSSION

This study involves retrospectively collected data of one year of traumatic head injury patients in a tertiary care hospital in pune. In our study, Traumatic brain injury involved mainly young adults and majority of the cases (34.85%) were in age group of 25–40 years, followed by 25-40 years. In a study from central India, mean reported age of TBI cases was 32–64 years.[11] Reverdin reported that 60%–70% of incidence of TBI was among young adults.[12]

In our series, an overwhelming majority was males in all the age groups. Bharti *et al.* reported 85% incidence in males and male to female ratio of 4:1.[13]

It has been reported in literature by Indian scientists that among TBI patients majority were male.[14,15]

In our study, RTAs constituted the most common cause of TBI, This finding is comparable to studies done by Sharma *et al*, and Sindhu *et al*.[16,17] Road traffic accidents were followed by accidental falls as the second major cause of head injury in which number of females was more than males.

The importance of alcohol has to be determined in any trauma discussion. 10 percent patients were under influence of alcohol, near to study by Jha *et al* were 16 percent were positive for alcohol.[18]

Patients with GCS score of 3 and less on admission had poor prognosis and highest rate of mortality (87.5%) while patients with GCS 8 and above had excellent prognosis and least mortality (2.7%). This establishes a strong correlation between GCS and outcomes in traumatic head injuries as seen in previous studies.[19]

Amongst the total 984 patients, 81.7% patients were managed conservatively while others required neurosurgical intervention. In those patients who went neurosurgical intervention mortality rate was 38.8%, mainly because these patients had severe

head injuries with midline shifts or poor GCS on admission.

Average duration of hospital stay in our study was 4 to 7 days. Only 1% of the patients had a prolonged hospital stay of more than one month. Recovery rate in patients in our study was 88.2% while 11.8% patients succumbed to the injury.

## CONCLUSION

Since a large number of people, predominantly men in the younger age groups, are injured, killed and disabled in brain injuries, it is appropriate to focus on several preventive strategies. A national injury prevention policy with defined programmes in the areas of road safety, home safety and work safety should be formulated with clearly defined goals and objectives. A time bound action plan with short-term and long-term activities should be clearly specified in this process. The National Road Safety Policy is currently under development. The existing laws with regard to seatbelt usage by car occupants should be widely publicized and enforced by the police. It should also be ensured that all cars are fitted with seatbelts and necessary awareness among vehicle manufacturers and public should be promoted.

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