

Demographic evaluation and pattern of head injuries among road traffic accident patients- a hospital based study

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ABSTRACT

Introduction: In India, the developing economy and growing population simultaneously made a strong impact on increase in motor vehicle population. In road traffic accidents, the most prominent and vulnerable part of human body is head and head injury is the most important cause of mortality. The aim of this study was to study the demographic details and pattern of head injury in patients of road traffic accident.

Material and Methods: The present study was conducted among 61 patients of road traffic accidents. Data of the patients were recorded as per the working proforma to record the detailed description of injury, treatment given and discharge /death was recorded. Statistical tests like t-test and chi square test were used. If p value was less than 0.05, then it was taken as statistically significant.

Results: In this study maximum cases were from age group 23-32 years (32.7%) and minimum cases were from age group 73-82 years (1.6%). Males were in predominance in this study i.e. 80.3% and females were 19.6%. Out of 61 cases, 26.2% cases had Frontal bone involved, 19.6% had Occipital bone involved, 18% had Parietal bone involved, 4.9% had Temporal bone involved, 31.1% had multiple bone involved. In maximum cases multiple bones were involved.

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. It should also be ensured that all cars are fitted with seatbelts and necessary awareness among vehicle manufacturers and public should be promoted.

Keywords: Head injury; Road traffic accidents (RTA); Skull injury

INTRODUCTION

In India, the developing economy and 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).²⁻³In 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.⁵It 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.⁶The 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/otorrhea.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.⁸The Glasgow coma scale (GCS) is used to assess severity of head injury by neurological assessment.⁹The 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 study the demographic details and pattern of head injury in patients admitted in J.K. hospital.

MATERIAL AND METHODS

The present observational hospital based study was conducted among 61 patients of road traffic accident who were admitted at L.N. Medical College & Research center and associated J.K Hospital Bhopal. Study was commenced over a period of 24 months i.e. between December 2019 and November 2021. Inclusion criteria consisted of patients of Head injury admitted to the JK Hospital with age \geq 13 Years and those who gave consent for study. Exclusion criteria consisted of age \leq 13 years, patients presenting late ($>$ 1week), patients brought dead, those who lost to Follow up and those who donot give consent for study.

All patients meeting the inclusion criteria were enrolled in this study. On admission to the emergency department, all resuscitative measures were followed according to the Advanced Trauma Life Support (ATLS) guidelines. Data of the patients were recorded as per the working proforma to record the detailed description of injury, treatment given and discharge /death was recorded. No special investigation was done. We divided the patients in the score group, as per the triage pattern for the trauma patients with score 0–8 mild, 9–15 moderate, 16–25 severe, 26–49 very severe and \geq 50 lethal and score of 16 or more was considered polytrauma. The patients who were discharged or referred to a higher center for further management were also followed up to 30 days of admission and any mortality occurring was also recorded. Data were compiled and analyzed using SPSS version 22. (IBM Corporation , New York U.S). Categorical data were analyzed using percentages. Statistical tests like t test and chi square test were used. If p value was less than 0.05, then it was taken as statistically significant.

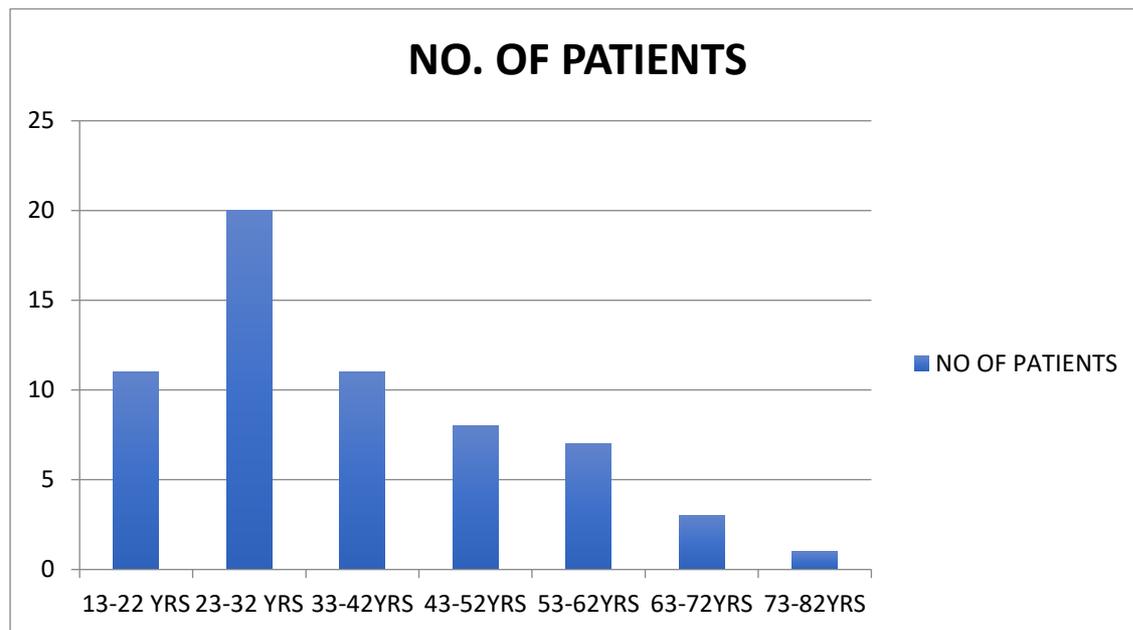
RESULTS

The present observational hospital based study was conducted at L.N. Medical College & Research center and associated J.K Hospital Bhopal. The study was conducted over a period of 24 months i.e. between December 2019 and November 2021. Total no. of cases included in the study was 61 cases.

Table 1: Age distribution among the study subjects

Age Group	No. of patients
13-22 YRS	11(18.03%)
23-32 YRS	20 (32.7%)
33-42YRS	11(18.03%)
43-52YRS	8 (13.1%)
53-62YRS	7(11.4%)
63-72YRS	3 (4.9%)
73-82YRS	1 (1.6%)
TOTAL	61

In this study maximum cases were from age group 23-32 years (32.7%) and minimum cases were from age group 73-82 years (1.6%) (table 1). Males were in predominance in this study i.e. 80.3% and females were 19.6% (table 2).



Graph1: Age distribution among the study subjects

Table 2: Gender distribution among the study subjects

Gender	No. of patients	%
Male	49	80.3
Female	12	19.6
Total	61	100

Table 3: Mechanism of injury among the study subjects

MOI	No. of patients	%
Assault	5	8.1
Fall from Height	17	27.8
Fall of Heavy Object Over Head	3	4.9
RTA	36	59
Total	61	100

Table 4: Type of trauma among the study subjects

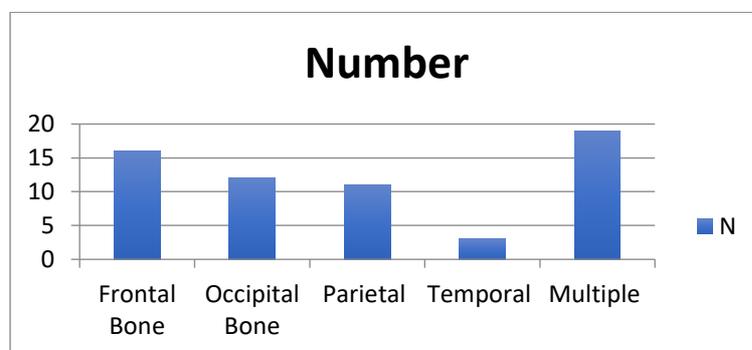
Trauma	No. of patients	%
Other associated injury	23	37.7
Scalp injuries	55	90.1
Underlying bone injury	7	11.4
No visible injury over scalp	3	4.9

Table 5: Skull bone involved among the study subjects

Trauma	No. of patients	%
Frontal Bone	16	26.2
Occipital Bone	12	19.6
Parietal	11	18.0
Temporal	3	4.9
Multiple	19	31.1
Total	61	100

Out of 61 cases, 8.1% cases were of assault, 27.8% cases were of fall from height, 4.9% cases were of fall of heavy object over head, 59% cases were of RTA (table 3). Maximum cases were of RTA and minimum cases were of fall of Heavy Object from Head. Out of 61 cases, 37.7% cases had other associated injury, 90.1% had scalp injuries, 11.4% had underlying bone injuries, 4.9% had no visible injury over scalp (table 4). Maximum injuries were scalp injuries and minimum injuries were no visible injury over scalp.

Out of 61 cases, 26.2% cases had frontal bone involved, 19.6% had occipital bone involved, 18% had Parietal bone involved, 4.9% had temporal bone involved, 31.1% had multiple bone involved (table 5, graph 2). In maximum cases multiple bones were involved.

**Graph 2: Skullbone involved among the study subjects**

DISCUSSION

The present observational hospital based study was conducted at L.N. Medical College & Research center and associated J.K Hospital Bhopal. The study period for the study was 18 months i.e. between December 2019 and November 2021. 61 patients were included in this study.

Young people from 15-29 year accounted highest portion of RTA. It is a modern epidemic with rising vehicles density, high velocity technology, along with congestion of roads and traffic rules violation. India has just 1% of the total vehicles in the world but it contributes to 6% of the global Road Traffic Cases.¹¹

Clinical features of head injury are: Loss of consciousness or headache, nausea and vomiting, ear bleed, vertigo and papilloedema. Likelihood of skull fracture is directly associated with severity of injury and vault is involved three times more often than the base. Sub dural hematoma (SDH) was the most common intracranial lesion resulting from head injury. Contusions and lacerations of the brain often seen in vehicular accidents and fall from height cases. These may occur with or without external injury to the scalp and fracture of the skull.¹²

In this study maximum cases were from age group 23-32 yrs (32.7%) and minimum cases were from age group 73-82 yrs (1.6%).Bhole et al, reported that the mean age affected with a head injury was 32-64 years in a study conducted on the population of Central India.¹³Patil S et al found that the highest incidence of brain injuries was found in the age group of 21-30 years (40%) followed by 31-40 years (20%).¹⁴

The present study observed peak injury incidence at the age group of 21-40 years (51.2%).Males were in predominance in this study i.e. 80.3% and females were 19.6%.

A study conducted in Saudi Arabia described that males were more affected with head injury than females (78.4% vs. 21.6%).¹⁵Similar results of male prevalence were seen in the studies done by Bernat et al and Mamelak et al.^{16,17}The study identified the young male part of the population as a major group sustaining head injury. This corresponds to various studies on trauma or head trauma.^{18,19}Agrawal et al. suggested that this is because females, elderly people and children rather staying in the house and therefore getting less exposure to risk factors leading to injury.²⁰

Out of 61 cases, 8.1% cases were of assault, 27.8% cases were of fall from height, 4.9% cases were of fall of heavy object Over head, 59% cases were of RTA. Maximum cases were of RTA and minimum cases were of fall of Heavy Object over Head. In a study out of 1000 cases with head injuries, 900 cases were admitted in tertiary care hospital and 100 cases in a rural hospital. A greater part(48.3% and 43%) of the population admitted to both hospitals were due to RTA accidents.¹⁴This could be due to insufficient knowledge of safety traffic rules, poor quality of roads and poor street lights.²¹

A study found motor vehicles accident (RTAs) as the highest contributor to traumatic head injury in Port Harcourt metropolis.²²According to Adekanmi et al., out of 2142 cases of cranial CT scans enlisted in their study, 1318 cases were due to RTAs.²³The causes of RTA due to motor vehicles had been attributed to poor and bad road systems, inadequate motor vehicle maintenance, importation of substandard and used vehicles and tiers for both private and commercial transportation purposes. The utilization of alcohol and drugs, such as tramadol and marijuana, low levels of education, lack of eye test awareness among drivers in Nigerian have also contributed immensely to RTAs with resultant effect in traumatic head injuries.²⁴⁻²⁸

Assault was the second commonest cause of trauma head injury identified in the study with over 30% of the cases.²²This is contrary to earlier studies by Adekanmi et al²³ and Onwuchekwa et al.²⁴

Adekanmi et al²³ reported assault as the least sources of trauma with only 6.3% in Ibadan, South-Western Nigeria while Onwuchekwa et al,²³ documented 10% for assaults.

Out of 61 cases, 37.7% cases had other associated injury, 90.1% had scalp injuries, 11.4% had underlying bone injuries, 4.9% had no visible injury over scalp. Maximum injuries were scalp injuries and minimum injuries were no visible injury over scalp. The highest number of patients was having scalp lacerations (40.4%), contusion (8.8%), EDH (3.2%), SDH (4.2%) and depressed fracture (3%).²⁹

Out of 61 cases, 26.2% cases had frontal bone involved, 19.6% had occipital bone involved, 18% had Parietal bone involved, 4.9% had temporal bone involved, 31.1% had multiple bone involved. In maximum cases multiple bones were involved.

Based upon clinical investigation and autopsy, the base skull fracture alone was common (44.0%), followed by base with vault (31.0%). Vault alone was involved in 25.0% cases. In all type of victims the most common type of fracture present was linear fracture. Temporal region was the commonest (35.9%) region involved in fracture followed by parietal (29.5%) and frontal (34.6%) region.³⁰ Temporal bone was involved the most as reported in studies.^{30,31} With regard to the location of skull fracture, temporal bone was the most common bone involved in skull fracture accounting for 43 (41.75%) cases followed by parietal bone 23 (22.33%) cases, frontal bone 10 (9.71%) and occipital bone 07 (6.80%) cases.³²

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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