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Original Research

Investigation of the incidence and characteristics of head injuries: An autopsy study

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ABSTRACT:

Aim: Investigation of the incidence and characteristics of head injuries via a research conducted on autopsies. **Materials and Methods:** This study was conducted on 100 victims of both genders who died in road traffic accidents and undergoing post-mortem in department of Forensic Medicine. Ethical clearance was obtained prior to the start. Detailed personal information was recorded from relatives/accompanies of victim. All cases were thoroughly analyzed and subjected to statistical analysis. **Results:** Out of 100, males were 60 and females were 40. The pattern of skull fracture was linear vertex fracture seen in 36%, communited in 25%, depressed vertex fracture seen in 9%, basal fracture in 20% and crush fracture in 10%. The difference was significant ($P< 0.05$). The maximum deaths occurred in <24 hours (33%) followed by 24 hours – 1 week (24%), 1week- 2 weeks (18%), 2 weeks- 4 weeks (16%) and 4 weeks- 5 weeks (9%). The difference was significant ($P< 0.05$). **Conclusion:** Head injuries are most often seen in individuals who are involved in road traffic incidents.

Keywords: Road traffic incidents, head injuries, Autopsy, linear vertex fracture

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INTRODUCTION

India being one of the fastest developing nations in the world with a huge population density, the road traffic density is also increasing [1]. In India, for individuals older than four years of age, more life years are lost due to traffic accidents than cardiovascular diseases. India accounts for about 10% of road accident fatalities worldwide. Head injury has been defined as "a morbid state, resulting from gross or subtle structural changes in the scalp, skull, and/or the contents of skull, produced by mechanical forces [2]. The head being the most vulnerable part of the body is involved frequently and lead to morbidity and mortality in road traffic accidents [3, 4]. The magnitude of Road traffic accidents and fatalities in India is alarming. In 2009, itreached to 4.22 lakh road traffic accidents and 1.27 lakh road traffic fatalities [5]. The rate of incidence of head injury is higher in India because of its traffic patterns and possibly the lack of preventive measures such as helmets in motor cyclists and seatbelts in automobiles, poorly controlled traffic conditions and road conditions [6]. Depending upon whether or not the dura matter was torn, the head injury may be termed as open or closed type. The extent and degree of injury to the skull and its content is not necessarily proportional to the quantum of force applied to the head. According to Munro, any type of cranio-cerebral injury is possible with any kind of blow on any sort of head [7]. The present study was conducted to assess pattern of head injury in population.

MATERIALS AND METHODS

This study was conducted on 100 victims of both genders who died in road traffic accidents and undergoing post-mortem in department of Forensic Medicine. Ethical clearance was obtained prior to the start. Detailed personal information was recorded from relatives/accompanies of victim. All cases were thoroughly analyzed and subjected to statistical analysis. P value of <0.05 was considered as significant.

Table I: Distribution of victims

Gender	Males	Females
Number	60	40

Table I, shows that out of 100, males were 60 and females were 40.

Table II: Pattern of skull fracture

Pattern	Number	Percentage	P value
Linear vertex	36	36	0.05
Communited	25	25	
Depressed	9	9	
Basal	20	20	
Crush	10	10	

Table II, shows that pattern of skull fracture was linear vertex fracture seen in 36%, communited in 25%, depressed vertex fracture seen in 9%, basal fracture in 20% and crush fracture in 10%. The difference was significant ($P< 0.05$).

Table III: Survival period of victims

Survival period	Number	Percentage	P value
<24 hours	33	33	0.01
24 hrs- 1 week	24	24	
1 week- 2 weeks	18	18	
2 weeks- 4 weeks	16	16	
4 weeks- 5 weeks	9	9	

Table III, shows that maximum deaths occurred in <24 hours (33%) followed by 24 hours – 1 week (24%), 1week- 2 weeks (18%), 2 weeks- 4 weeks (16%) and 4 weeks- 5 weeks (9%). The difference was significant ($P< 0.05$).

DISCUSSION

WHO defined the accident as, "an unexpected, unplanned occurrence that may involve injury." Head injuries are responsible for more than one-fourth of all traumatic deaths and nearly two-third of road traffic accident. In medico- legal practice blunt head trauma are most frequently caused by traffic accident, fall from height, assault, train accident etc [8]. The present study was conducted to assess pattern of head injury in population.

In present study, out of 100, males were 60 and females were 40. Hanumantha *et al*. [9] in their study undertaken on 138 victims of road traffic accidents, died due to head injuryto find out the patterns of head injuries, their age and sex distribution and site distribution of different types of fractures. The highest incidence was seen in age group of 21-30 years and males clearly outnumbered females. In the present study, most of the incidents occurred between 1200 to 1800 hours. The maximum number of victims (40%) died while on the way to hospital. The motor-cyclists were the commonest group of victims and trucks being the commonest offending vehicles. Intracranial hemorrhages were seen in 73 cases, skull fractures were found in 66 cases and injury to brain in 38 cases.

We found that pattern of skull fracture was linear vertex fracture seen in 36%, communited in 25%, depressed vertex fracture seen in 9%, basal fracture in 20% and crush fracture in 10%. The difference was significant ($P< 0.05$). The maximum deaths occurred in <24 hours (33%) followed by 24 hours – 1 week (24%), 1week- 2 weeks (18%), 2 weeks- 4 weeks (16%) and 4 weeks- 5 weeks (9%). The difference was significant ($P< 0.05$).

Incidences are more common among the two wheelervehicles. Head was the most common site to be injured in RTAs. As motorized two wheeler vehicles constitute a largeportion of the vehicle fleet in India, the exponentially increasing number of automobile vehicles, poor adherence to traffic rules and regulations such as maintaining lane discipline, driving in zigzag patterns by public, poorly maintained and congested roads, abuse of alcohol, and lack of awareness about helmets and new generation of high speed vehicles are altogether responsible for accidents [10]. Rajesh *et al*. [11] found that 36% died within 24 hours after the accident. 33% victims survived beyond 24 hours but died within one week. The number of cases decreased with increase in survival period. Only 4% victims survived for more than 4 weeks. The victim who survived for shortestperiod of 1 hour had fracture of skull, clavicle, patella and leg bones. The victim who survived for maximum period i.e. 34 days after the accident died due septicemia (intestinal perforation).

Salgado *et al*. [12] found that twenty-five of 303 (8.3%) patients reached center within 1 h (golden hour) of trauma.A majority of patients numbering 159 (52.5%) reached center within 2–6 h after injury. Of the 303 fatal head injuries, 153 (50.5%) died within 24 h of reaching center. Ninety-five died within first 12 hours. Ninety-two of the remaining (30.4%) died 2–7 days after reaching to hospital.

CONCLUSION

Head injuries are most often seen in individuals who are involved in road traffic incidents.

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