PATTERNS OF HEAD INJURY DUE TO FALL: A RETROSPECTIVE CROSS-SECTIONAL STUDY IN MALWA REGION OF PUNJAB

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ABSTRACT

Background: Head Injury is one of the major causes of mortality among travelling population. It is one of the leading health problems all over the world which requires proper attention. The aim of the retrospective cross sectional study is to study the pattern of head injuries in fatal cases due to fall in Malwa region of Punjab.

Methods: This study was carried out in a tertiary care hospital at Faridkot from 1\textsuperscript{st} May 2018 to 30\textsuperscript{th} April 2019 and 100 cases of death due to fall were subjected to detailed post-mortem examination.

Results: It is observed that road traffic accident was the commonest cause of head injury seen in 70 (70\%) cases. This is followed by fall from height 15 (15\%) cases and assault 10 (10\%) cases. The other causes like railway accident or incidental slipping were seen in 5\% cases.

Conclusion: In our study, the most common cause of head injury overall was road traffic accidents. The victims were mostly males of the age group 31-40 years. Most of the patients of head injury were managed conservatively while few cases were operated upon.

Keywords: Head injury, Tertiary care hospital, fall, road traffic accidents.

INTRODUCTION

Head injury is one of the leading causes of mortality among accidents including road side accidents, falling from height or railway accidents etc. Not only among pedestrians or two wheelers’ riders, head injury is also common among four wheelers travelers or in some other vehicle like bus, trucks etc. Injuries due to falling from heights are the second most common unintentional accidents in the western world whilst motor vehicle collision stands first. Depending on the height of fall, the fall can be distinguished as high and low falls which varies from multistoried building to same or less-level falls like tables, chairs, ladder, stairs etc. The nature of injuries sustained due to falling from height is directly dependent on the height of the body, weight of the body, special orientation of the body at the moment of impact, the nature of the surface impacted, force by which it hit the ground and the flexibility of part of the body at contact. A unique pattern of injury is observed among the victims of fall from height which depends on the inertia of the body, movement of the body, resistance of stationary objects and the nature of surface of ground on which the person falls.\textsuperscript{1} During the fall, the falling body decelerates and the amount of kinetic energy is transferred to the point of contact on the site of impact and the ground thrusts an equal amount against the falling body itself. The energy is absorbed on the victim in the form of sustained injuries.\textsuperscript{2} Being the most eminent part of the body, head is the usual target for blunt trauma caused by road traffic accidents, fall from height and physical assault. The contents of the skull are more vulnerable to blunt trauma than other parts of body with the same or even lesser extent of application of mechanical force.\textsuperscript{1,4} Head injury is the single most common cause of mortality in vehicle accidents.\textsuperscript{3}
The most common clinical presentations in patients with head injuries are headache and vomiting followed by skull fracture and loss of consciousness. Other suggestive clinical findings of skull fractures are nose and ear bleed, mastoid ecchymosis, and CSF rhinorrhea/otorrhoea. The young male population is commonly affected by head injuries. About 69% of the population with head injuries was reported between the age group of 15-35 years.

The aim of the retrospective cross-sectional study is to study the pattern of head injury in fatal cases of fall in Malwa region of Punjab.

METHODS
This study was carried out in a tertiary care hospital in Malwa region of Punjab from 1st May 2018 to 30th April 2019 and 100 cases of death due to fall were observed. Apart from recording the nature and pattern of injuries, data regarding the nature of fall, site of primary impact, nature of floor on which they fall, height from which they fall, period of survival etc. was obtained. A detailed examination was made and data entered in a preforma. Data includes external and internal injuries, their nature, dimensions and location. Primary impact injuries were noted and photographs were taken wherever necessary. In case of treated patients, clinical data was entered.

Statistical Analysis
Data were analysed with the help of Statistical Programme for Social Sciences (SPSSTM) version 16. Various descriptive statistics like frequencies, mean, median, modes and ratio were used to compare the particular variables. Chi-square test was used to test association between gender and manner of injury. P value less than 0.05 was considered statistically significant.

RESULTS
Table 1: Distribution of cases according to cause of head injury

<table>
<thead>
<tr>
<th>Cause of Head Injury</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road traffic accident</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Fall from height</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Assault</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Others</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

From the Table 1, it is observed that road traffic accident was the commonest cause of head injury seen in 70 (70%) cases. This is followed by fall from height 15 (15%) cases and assault 10 (10%) cases. The other causes like railway accidents or incidental slipping were seen in 5% cases.

Table 2: Distribution of study population according to head injury

<table>
<thead>
<tr>
<th>Head Injuries</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scalp contusion</td>
<td>20</td>
</tr>
<tr>
<td>Skull vault fracture</td>
<td>15</td>
</tr>
<tr>
<td>Base of skull fracture</td>
<td>15</td>
</tr>
<tr>
<td>Brain laceration</td>
<td>10</td>
</tr>
<tr>
<td>Intracranial haemorrhage</td>
<td>30</td>
</tr>
<tr>
<td>Facial bone fracture</td>
<td>10</td>
</tr>
</tbody>
</table>

Among head injuries, 30 cases had intracranial haemorrhage and 10 cases had facial bone fractures. Laceration in brain was noticed in 10 cases. Table 2
Table 3: Distribution of cases according to type of skull fracture

<table>
<thead>
<tr>
<th>Type of skull fracture</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear (Fissured)</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Depressed</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Comminuted</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>No fracture</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

From the Table 3, it is evident that linear fracture was observed in 35 (35%) cases followed by depressed fracture in 15 (15%) and comminuted fracture in 10 (10%) cases. There were cases in which more than one type of fractures was present. There were cases in which fracture of vault was present along with fracture of base of skull.

**DISCUSSION**

The incidence of head injuries by different modes of trauma was increasing exponentially in India and other developing countries. RTA was the most common mechanism of head injury reported in previous studies.\(^9,10\) The aim of the retrospective study is to study the pattern of head injuries in fatal cases of fall in Malwa region of Punjab.

There are mainly two types of injuries observed amongst victims falling from heights: Injury Resulting from Direct Impact (Mainly Fractures) and Decelerative type of Injuries. From our study and with inferences from previous works like Goonetillike et al,\(^1\) the findings are consistent and it is found that the maximum number of fall from height cases were observed in the age group of 31-40 years (30%). The obvious reason would be that they are from the main working group. People in this age group are constantly mobile for work, education or recreational activities. Hence prone to road traffic accident, falls, assaults which are one of the major causes of head injuries.

A high incidence of head injury among males can be explained by the fact that males are the working class, they lead a more active life and keep themselves outdoor for most of the time. In accordance to road traffic accident and most of the vehicles in India are driven by males. On the contrary, females keep themselves indoors doing household activities. Regarding the distribution of cases according to the cause of head injury, out of 100 cases the cause of head injury, the most common cause was road traffic accident accounting for 70 (70%) cases followed by fall from height 15 (15%) cases and remaining number of cases were due to assault 10 (10%) and other causes in 5 (5%) cases. Similar observation was made in studies done by other authors.\(^11,12\)

With respect to distribution of cases according to the type of skull fracture in the present study it is evident that linear (fissured) fracture was observed in 35 (35%) cases followed by depressed fracture 15 (15%) and comminuted fracture in 10 (10%) cases i.e., linear fracture was the most common skull fracture encountered at autopsy examination. Our observation is in agreement with the study carried out by other authors.\(^13,14\) However our present study is in contrast with the study conducted by one author\(^15\) where comminuted fractures were found in a maximum number of cases (45.16%), followed by depressed and linear fractures (38%) in almost the same numbers of cases. Probable reason for this disparity might be due to inclusion of brought dead patients with extensive damage to head, while in present study such cases have been excluded.

In India, patterns of injury are different from other developed nations. The present policies, health schemes, and infrastructure related to health are not sufficient to meet the demands of poor and middle-class people. The segment of prevention and care of injury is a multidisciplinary area and requires coordination in different sectors of planning.

Prompt treatment of head injuries with better management plans by neurosurgeons within our limited resources will decrease the rate of morbidity and mortality related to head injuries.
CONCLUSION
In our study, the most common cause of head injury overall was road traffic accidents. The victims were mostly males of the age group 31-40 years. Most of the patients of head injury were managed conservatively while few cases were operated upon.

Despite the strict traffic rules in our country, head injury is quite common among vehicle users. More strict rules like speed limits, strict compliance of seat belt regulations, avoiding the use of mobile phones while driving is required to prevent the same. Helmet usage among two wheelers drivers as well as pillion riders must be ensured. Strict penalties for breaking the traffic laws is the need of hour to prevent accidents.

REFERENCES