Patterns of Head Injury in a Tertiary Care Military Hospital

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Abstract

Background: The incidences of head injuries are increasing in number day by day due to uncontrolled high speed motor vehicles, more movement of the public and mechanization in industry, tendency of people to violate the rules of the state as well as increasing in political violence in the country. Head injury is the most common causes of mortality following trauma. This is because of its special anatomical location of the Head in our body. This study was done to explore and evaluate patterns of Head injuries in victims reporting to emergency and casualty department in CMH Dhaka which is a tertiary care military hospital in bangladesh.

Methods: This study was a retrospective study of all patients of head injury reporting to emergency and casualty department in CMH Dhaka from july 2015 to june 2017.

Results: Most common cause of Head Injury patients reporting to emergency and casualty department in CMH Dhaka was Road Traffic Accident (50.05%). Other causes of head injury include physical assault (17.77%), fall from height (15.33%) and others. Male (66.55%) victims were common than female (33.44%). Common age group involved in more than 50 years (34.49%). In this study it was found that commonest lesion was scalp laceration (25.43%) followed by fractures to the skull (21.60%). In most cases the skull fractures were found at multiple sites. This study revealed that sub dural haemorrhage (19.86%) was commonest intracranial hemorrhage followed by extra dural hemorrhage (14.98%). Conclusion: Road traffic accident is the most common cause of head injury and males are more prone to get head injury. By establishing well organized trauma center and skilled manpower we can minimize mortality and morbidity from head injury. Evaluation of risk factors of head injury will be helpful in the policy making and taking the decision for prevention of head injury.

Keywords: Head Injury, Skull fracture, Road traffic accidents, Political violence, Fall from Height.


Introduction:

Head Injury has been defined as, “morbid state, resulting from gross or subtle structural changes in the scalp, skull, and/or the contents of the skull, produced by mechanical forces.”¹ It has also been defined as physical damage to the scalp, skull or brain produced by an external force.²

However, such force or impact, responsible for the injury, needs not to be applied directly to the head. Depending upon whether the scalp was intact or not, head injury may be termed as open or close type.³

The extent and degree of injury to the skull and its contents is not necessarily proportional to the quantum of force applied to the head. According to Munro “any type of craniocerebral injury can be caused by any kind of blow on any site of head.”⁴ Severe head injury, with or without peripheral trauma, is the commonest cause of death and/or disability up to the age of 45 years in developed countries.⁵

The incidences of head injuries are growing with increasing number of high speed motor vehicle, more movement of the public and mechanization in industry as well as increasing the political violence of the state. The injuries could be caused by a penetrating or blunt force either by direct violence or indirectly, such as a fall at the feet or buttocks. There is no clear relation to the severity of injury to skull bones and the extent of cerebral disorder.⁶

Head injury is a major public health problem in Bangladesh. Craniocerebral trauma is a huge financial and psychological burden upon the society.
In Bangladesh, the problem is increasing day by day mainly due to increased vehicular traffic and poor maintenance on the road and urbanization. To have better outcome of our patient, we evaluated the patterns of head injury in this center and accordingly, we can prepare ourselves to combat the situation.

Materials & Methods:
This study was a retrospective study from July 2016 to June 2018 of all the patients of head injury who were reported to Emergency and Casualty dept at CMH Dhaka. Data were prepared with information documented in a structural questionnaire. Patients with doubtful histories were excluded from the study (exclusion criteria). Structured questionire were used. Information included identity of the patient like name, age, sex, mode of trauma, neurological status at the time of presentation and treatment outcome. Medical ethics strictly followed throughout the study period.

Fig.-1: Blast Injury. Multiple pallets within the brain.

Fig.-1: Acute Extradural Haemtoma.
Results:

Table-I

Age-wise distribution of head injury

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of Patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>32</td>
<td>11.14</td>
</tr>
<tr>
<td>11-20</td>
<td>20</td>
<td>6.96</td>
</tr>
<tr>
<td>21-30</td>
<td>35</td>
<td>12.19</td>
</tr>
<tr>
<td>31-40</td>
<td>46</td>
<td>16.02</td>
</tr>
<tr>
<td>41-50</td>
<td>55</td>
<td>19.19</td>
</tr>
<tr>
<td>&gt;50</td>
<td>99</td>
<td>34.49</td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>100</td>
</tr>
</tbody>
</table>

In the study, age-wise distribution of head injury (Table I) shows that the peak incidence of head injury was observed in the age group (>50) years comprising 34.49% of the cases. It was also observed that 19.16% belonged to the age group 41-50 years. Thus 55% of cases comprised of age groups of 40 years & above in the study. Individuals in the age group 11-20 years were the least affected i.e. in 6.96% of total cases.

Table-II

Gender wise Distributions of Head Injury

<table>
<thead>
<tr>
<th>Patient</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>191</td>
<td>66.55</td>
</tr>
<tr>
<td>Female</td>
<td>96</td>
<td>33.44</td>
</tr>
<tr>
<td>Total</td>
<td>287</td>
<td>100</td>
</tr>
</tbody>
</table>

In the Table 2 shows gender-wise distribution of head injury. In the study 1 out of 287 cases 191 (66.55%) were males while 96 (33.44%) were females. Thus a male: female ratio of 2:1 was observed.

Aetiology of head injury

Distributions of different modes involved in head injury are shown in Table 3. Majority of victims of head injury were commonly due to road traffic accident 145 (50.05%) cases followed by assault 51 (17.77%) cases. Fall from height 44 (15.33%) and occupational head injury 26 (9.05%) cases, whereas other like gunshot etc comprised of 13 (7.31%) cases. This study shows suffering from head injury to male victims were commonly due to road traffic accident 102 (53.40%) cases followed by assault 34 (17.80%) cases. Fall from height and occupational head injury were 44 & 26 cases (23.03% & 13.60%) respectively. Female victims of head injury were also commonly due to RTA 43 (44.79%) cases followed by assault 17 (17.70%) cases, occupational head injury and others were 7 & 8 cases (7.29% & 8.33%) respectively.

Fig.-1: Aetiology of head injury

Fig.-2: Pattern of head injury

Table-III

Gender wise Distributions of Head Injury

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In the Table 3, it is showed that in head injury commonest lesion was scalp laceration i.e. 73 cases (25.43%), followed by fractures of skull 62 cases (21.60%). SDH 57 cases (19.86%) was commonest intracranial hemorrhage followed by EDH 43 cases (14.98%).

Fig.-3: Pattern of skull fracture

Fig.-4: Pattern of skull fracture

Fig.-5: Pattern of skull fracture

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As per study table 5 Pattern of skull fracture: shows skull fracture in head injury most commonly involvement of multiple bones 28 case (45.16%), individually temporal bone was involved 13 cases (20.96%) followed by frontal bone 9 cases(14.51%)

In this study table 6 showed that survival of head injury victim was 91.63% (263 case) while 8.36% (24 cases) expired.

Fig.-6: Outcome of head injury patients

Discussions:
With exploding population, increasing number of automobile vehicles, encroachment of roads, tendency of violating traffic rules and traffic systems have greatly contributed rapid increase in head injury. Head injury is also common in assault and fall from height.

Road traffic accident is the most common mode of head injury in the adult age group. The overall increase in vehicular traffic is responsible for automobile accidents as the most common mode of fatal injury. In road traffic accidents, head injury is the common cause of mortality followed by thoraco-abdominal and the musculo-skeletal injuries in that order. In our study, we have similar finding road traffic accident is the most common cause of head injury followed by assault. This is in accordance with the study done by Chen CL et al which showed 70% road traffic accident, 15.3% fall from height and assault 8.7% and the result of Kremer C et al also match with this study.

In this study male & Female victims ratio of head injury was(2:1), which was in accordance with other workers.\textsuperscript{5,11-14,15} who have reported the range from 1.7: 1 to 8: 1. In our study male were predominant in head injury which matches well with the reporting of other studies of similar nature.\textsuperscript{16-18,19,22} This gender bias was due to males worked outdoors and therefore, they are more commonly exposed to road traffic accidents, assault and occupational injuries.

In our study the maximum number of victims (39.49%) are age group of more than 50 years followed by (19.16%) the age group of 41 to 50 years which does not match to the results reported by other workers as Jamebaseer M Farooqui et.al, they found the highest numbers of deaths (39.79%) were in the 20-39 years age group in head injury victims. However, Akang et al\textsuperscript{24} and Lai et al,\textsuperscript{25} observed that the peak age of such victims is in the fourth decade, with the mean at 33 years. Tripude et al\textsuperscript{26} also pointed that commonest age group is 21-30 (39%) and next common is 31-40 (18%). The reason of different result may be most of our patients lead a disciplined life within cantonment, they highly abide by rules of traffic, and they do not involved in politics during service life. In our study many of the head injury patients were retired soldiers, we found victims of head injury are more aged than other studies.

Scalp laceration observed in 25.43% cases, Skull fractures, observed in 21.60% of the victims. In this study the commonest type of injury is laceration and hematoma. Study conducted in Delhi by Tyagi et al\textsuperscript{31} reported scalp injuries to be present in 76%, while Gupta et al\textsuperscript{32} reported 89% of scalp laceration. These findings match with our study.

Cases of head injury with fractures of the skull tend to have more complications and are often fatal than those without fracture.\textsuperscript{7,8} Bony fractures in this study are temporal (20.96%), frontal (14.51%), parietal (12.90%) and occipital (6.90%). Higest number of cases, i.e. 28 cases (45.16%) the fractures were found at multiple sites. Akang et al\textsuperscript{24} in their study reported: frontal (12%), temporal (9%) and parietal (9%). Chandra et al\textsuperscript{12} reported: temporal (59%), occipital (58%), parietal (50%) and frontal (49%). Both series, however, have reported the skull fractures at multiple sites as the most common.

The commonest intracranial hemorrhage is subdural hemorrhage (19.86) in our study, followed by extradural haemorrhage which is in conformation to the observations made by Akang et al\textsuperscript{24} The findings differ with the observations of Chandra et al\textsuperscript{12} who
have reported subarachnoid haemorrhage as the commonest.

Most of our head injured patients having good outcome, survive 91.6% and expired 8.36%. This study matches with the study Gupta et al who have reported survival rate 90%.

**Conclusion:**

Head injury may lead to fatal outcome. For our safety it is to be given priority for safe traffic system and standard hospital care. Head injury demands good pre-hospital care, good transport facilities like Heli evacuation, prompt ambulance service and provision of efficient and well organized neurosurgery center as well as well trained and efficient manpower. Evaluation of risk factors will helpful in the policy making and taking decisions for prevention of head injury at national or international level.

**References:**

28. Indian Internet Journal of Forensic Medicine & Toxicology. 2005; 3(1).

