ABSTRACT

Introduction: In India, Traumatic brain injuries (TBI) due to road traffic accidents (RTA) are most common. Most of deaths take place within 24 hours of injury, before reaching the tertiary hospital in most of the times. Clinical and radiological examination may not reveal full extent of injuries; Autopsy is the final opportunity to find the exact cause of death. The aim of the present study is to find the most common autopsy findings among RTA cases in head injuries and correlation of findings with time of survival.

Materials and Methods: A Proforma with parameters of study like age, sex, cause of head injury, time of accident and period of survival, type of head injury, type of skull fracture, site of fracture, intracranial haemorrhage and injuries to brain and injuries other than head injuries was designed and used for collecting study material.

Results: Male predominance of 83.3% is observed. Most of the deaths due to RTA observed in the age group of 21-50 years; accounting for 75%; 34 out of 60 (56.6%) of deaths occurred within 24 hours; 38.3% of deaths occurred within 6 hours. Highest number of deaths occurred in 3-6 hours, 20 (33.3%) out of 60 RTA deaths. Linear fractures were predominantly observed. 90%, 66.6%, 25%, 8.33% of RTA cases found with SDH, SAH, ICH and EDH respectively.

Conclusion: In India, especially in rural areas public health authorities should focus on provision of first aid, transportation, triage facilities; to focus more on increasing survival chances in golden hours.

KEYWORDS

Autopsy, Road Traffic Accidents

INTRODUCTION

Traumatic brain injury is defined by CDC as “a disruption in the normal function of the brain that can be caused by a bump, blow or jolt to the head, or penetrating head injury.” This can be due to falls, road traffic accidents, sports injuries, gunshot wounds and assaults. TBI can result as serious condition in children and older adults especially [1].

In India, Traumatic brain injuries (TBI) due to road traffic accidents (RTA) are most common [2]. Most of deaths take place within 24 hours of injury, before reaching the tertiary hospital in most of the times. Lack of First aid, longer transport time, lack of facilities in nearby hospital care settings are few of the major problems of trauma care in India [3].

The most common causes of head trauma are RTA (road traffic accidents), home, occupational accidents, falls and assaults. Inside the skull, when brain collides during injury, it may cause bruising, torn tissues, bleeding and other physical damage to brain. These injuries can result in long-term complications or death. The annual incidence of head injuries is 300 per 100000 per year in USA. Mortality rate was 25 for 100000 in North America nad 9 per 100000 in the United Kingdom [4].

Clinical and radiological examination may not reveal full extent of injuries; Autopsy is the final opportunity to find the exact cause of death. So we have taken up this study to find out epidemiology data of TBI. The aim of the present study is to find the most common autopsy findings among RTA cases in head injuries and correlation of findings with time of survival.

MATERIALS AND METHODS

Study Design: Prospective observational

Study Period: Jan 2019 to May 2019

Ethical clearance: Institutional Ethical committee approved

Consent form: Written consent took from patient attendees.

This study was conducted on deceased patients who were died due to road traffic accidents and subjected for autopsy.

A Proforma with parameters of study like age, sex, cause of head injury, time of accident and period of survival, type of head injury (skull fracture, Intracranial haemorrhage, contusion and laceration), type of skull fracture (linear, basilar, depressed, comminuted, crush, ring, suture, diastatic, counterjup, no fractures, others), site of fracture (frontal, temporal, parietal, occipital), intracranial haemorrhage (EDH, SDH, ICH, SAH) and injuries to brain and injuries other than head injuries was designed and used for collecting study material.

Statistical analysis: Descriptive analysis of qualitative variables in the form of numbers, percentages.

RESULTS

Male predominance of 83.3% is observed; 49 out of 60 TBI were males and remaining 11 deceased patients were females. Most of the deaths due to RTA observed in the age group of 21-50 years; accounting for 75%.

Table 1. Age and Sex distribution of RTA cases with TBI

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>%</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-20</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>1.6</td>
</tr>
<tr>
<td>21-30</td>
<td>16</td>
<td>14</td>
<td>2</td>
<td>20</td>
<td>6.6</td>
</tr>
<tr>
<td>31-40</td>
<td>17</td>
<td>11</td>
<td>6</td>
<td>18.3</td>
<td>5.8</td>
</tr>
<tr>
<td>41-50</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>10.0</td>
<td>2.6</td>
</tr>
<tr>
<td>51-60</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>6.6</td>
<td>1.3</td>
</tr>
<tr>
<td>&gt;60</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>6.6</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>49</td>
<td>11</td>
<td>100</td>
<td>18.3</td>
</tr>
</tbody>
</table>

34 out of 60 (56.6%) of deaths occurred within 24 hours; 38.3% of deaths occurred within 6 hours. Highest number of deaths occurred in 3-6 hours, 20 (33.3%) out of 60 RTA deaths. First 6 hours of period of survival is a crucial time, should shift deceased persons immediately to nearby hospitals.

Fig 1. Number of Deaths occurred in relation to time of survival
Male predominance of 83.3% is observed; 49 out of 60 TBI were males in the present study. 21-30 years (28.3%), 41-50 years (26.6%), 31-40 years (20%) in the present study. 20% were females with a male to female ratio of 1:0.25. The most common age group involved was 21-40 years (32%) followed by 61-80 years (28%) and 41-60 years (18%).

In this study, 34 out of 60 (56.6%) of deaths occurred within 24 hours; 38.3% of deaths occurred within 6 hours. Highest number of deaths occurred in 3-6 hours, 20 (33.3%) out of 60 RTA deaths.

Pfeifer R et al [9] documented death rate in relation to time; 45% of the individuals died within one hour. The second peak occurred within 1–4 h of trauma in about 34% of patients. The third peak occurred after 1 week of trauma in 20% of victims.

In this study, 34 out of 60 (56.6%) of deaths occurred within 24 hours; 38.3% of deaths occurred within 6 hours. Highest number of deaths occurred in 3-6 hours, 20 (33.3%) out of 60 RTA deaths.

Most commonly injured skull bone is temporal bone (53.3%), 33.3%, 28.3%, 21.6% of RTA cases were presented with parietal bone, frontal bone and occipital bone fractures respectively.

Among intra cranial haemorrhages, SDH (90%) is dominating feature observed followed by SAH (66.6%). 90%, 66.6%, 25%, 8.33% of RTA cases found with SDH, SAH, ICH and EDH respectively.

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Sachin Chourasia et al [7] documented 12% succumbed to spot death and 34% died between 16-24 hours (34%), 39 (78%) patients were found to be having skull fracture majority of which involved vault alone (48.72%) while in 18 (46.15%) patients the fracture involved both vault and the base of skull. Contusion was present in 28 (56%) patients. Most common type of intracranial hemorrhage was found to subarachnoid hemorrhage which was found in 41 (82%) patients followed by subdural and intra-cerebral hemorrhages which were seen in 38 (76.4%) and 22 (44%) patients respectively.

Joseph Alexis R et al [8] stated that 50.5% of deaths occurred within 24 hours. Most common autopsy finding was SAH (81.3%). Others were subdural hemorrhage (SDH) (75%), skull fractures (67.4%), cerebral contusion (40.8%), and IVH (11.8%). EDH has highest diagnostic value i.e., 98.35% and SAH had least diagnostic accuracy value (45.72). Sub dural hemorrhage (SDH) had highest sensitivity (57.02%). EDH had higher specificity (100%). Significant SDH, SAH, and brain contusions were not detected during antemortem evaluation. Pathak A et al [10] did a study on autopsy findings of head trauma cases in Gujarat reported 91.67% of cases had skull fractures, 92.5% intracranial haemorrhages. Among intracranial haemorrhages, 83% were SDH, 28% were SAH and 17% had IBI.

Kazuhiko Kibayashi [12] reported 80% were males and 20% were females with a male to female ratio of 1:0.25. The most common age group involved was 21-40 years (32%) followed by 61-80 years (28%) and 41-60 years (18%).

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Sachin Chourasia et al [7] did an autopsy study on blunt force trauma cases, revealed 80% were males and 20% were females with a male to female ratio of 1:0.25. The most common age group involved was 21-40 years (32%) followed by 61-80 years (28%) and 41-60 years (18%).

Joseph Alexis R et al [8] did a study on 303 fatal head injury patients observed majority were males and age group between 21 and 40 years.

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accidents were the commonest categories of death, while in the non-traumatic deaths cerebro-vascular accidents were the commonest category. Subarachnoid hemorrhages were the commonest intracranial lesions.

CONCLUSION

Majority of TBI victims of RTA survived less than 24 hours. Even though, diagnostic accuracy value is not high to detect extent of injuries, (haemorrhages), proper clinical examination, radiological expertise imaging may help to decrease mortality. Immediate resuscitation, early transportation to health care facility and strict adherence to traffic rules reduces mortality. In India, especially in rural areas public health authorities should focus on provision of first aid, transportation, triage facilities; to focus more on increasing survival chances in golden hours.

REFERENCES