The Study on Pattern of External Injuries During Road Traffic Accidents of Helmeted and Non Helmeted Victims at Tertiary Care Centre

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ABSTRACT
Background: Motor Vehicle crashes are a remarkable reason for casualty all over throughout the world. By 2020, engine vehicle damage is predictable to wind up noticeably the third driving supporter of the international weight of illness on the globe.

Methods: The study was conducted for the period of one year and One hundred subjects were studied at Department of Forensic Medicine &Toxicology S.N. Medical College Jodhpur. Subsequent information was collected from the study: Type of Injuries (Grievous or Non grievous), Alcohol intake present or absent, Number of Abrasions/Bruises/Lacerations and Glasgow Coma Scale. Data was collected and tabulated. Statistical analysis was done. For quantitative data ‘t’ test was used and for qualitative chi-square test was used. The ‘p’ value <0.05 is considered as statistically significant.

Results: Out of total 100 patients, 55 helmeted and 35 non-helmeted individuals, 22 and 23 persons sustained grievous injuries respectively. In case of helmeted individuals, the presence and absence of alcohol intake was observed in 26 and 29 cases respectively. Out of 55 helmeted persons 54 persons sustained abrasions, 39 had bruises and 17 individuals had lacerations. The Glasgow Coma Scale (GCS) score between 3-7 and 8-15 of helmeted individuals were 20% and 80% of the individuals respectively.

Conclusions: Serious injury has been found more in non-helmeted individuals in comparison to helmeted individuals. Alcohol intake has been found more in helmeted individuals in comparison to non-helmeted individuals. The most common injury in helmeted individuals has been found to be abrasion. Lacerations have been found more in non-helmeted individuals. GCS of less than 7 was found to be in more in non-helmeted individuals in comparison to the helmeted individuals.

Keywords: Helmeted, Non-helmeted, RTA.

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INTRODUCTION
Motor vehicle crashes are a major cause of fatality all over the world. By 2020, motor vehicle injury is projected to become the third leading contributor to the global burden of disease in the world. It is well known fact that Motor cyclists are about 25 times more likely than car occupants to die in Road Traffic Accidents. Data on the incidence and types of crashes is required to guide safety policy. Knowledge of how injuries are caused and of what type they are of valuable instrument for identifying interventions and monitoring the effectiveness of intervention.¹ According to a recent survey death due to head injury is more in non-helmeted (52.5%) compared to helmeted drivers (43.8 %) whereas injury to chest and abdomen and limbs are more in helmeted. Spinal injuries were more in helmeted than in non-helmeted.² Head injury accounts for majority of death in victims of RTA. According to World Health Organization, more than 90% of deaths occur in low and middle income countries. By 2020, Road Traffic Accident injuries will rise in the 6th place as a major cause of death worldwide. Injury to the head is the commonest cause of mortality and morbidity following two wheeler crashes. Even though wearing helmet by two-wheeler riders is a statutory requirement, it has not been implemented strictly in most parts of the country. Current evidences worldwide indicate that it does reduce the mortality rate.³ It also depends how much compliant people are in wearing helmet and also to ensure they are wearing quality helmets and wearing it properly. If that is not ensured, then the desired results may not be forthcoming. The present study is aimed to compare the injury pattern in helmeted and non-helmeted victims of two-wheeler accidents.
METHODS
Study was conducted in the department of Forensic Medicine and Toxicology at S.N. Medical College, Jodhpur for the duration of one year. Victims of two-wheeler accidents admitted in casualty were studied. Any person killed immediately or dying within 30 days as a result of road traffic accident is considered as a victim of RTA. Two wheelers included motor cycles, scooters, mopeds and bicycles. All type of accidents were included in the study whether against any type of vehicles running on the road, collision with any object, surface or any animal or fall from vehicle. The study was conducted for the period of one year and one hundred subjects were studied. Following information was collected from the study:
1. Type of Injuries (Grievous or Non-grievous).
2. Alcohol intake (present or absent).
3. Number of Abrasions, bruises and lacerations.
4. Glasgow Coma Scale.

Data was collected and tabulated. Statistical analysis was done. For quantitative data ‘t’ test was used and for qualitative chi-square test was used. The ‘p’ value <0.05 is considered as statistically significant.

Table 1: Type of Injuries

<table>
<thead>
<tr>
<th>Variables</th>
<th>Helmeted Individuals (n=55)</th>
<th>Non-Helmeted Individuals (n=35)</th>
<th>Unknown Cases (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grievous Injury</td>
<td>22 (40%)</td>
<td>23 (65%)</td>
<td>4 (40%)</td>
</tr>
<tr>
<td>Non-Grievous Injury</td>
<td>33 (60%)</td>
<td>12 (35%)</td>
<td>6 (60%)</td>
</tr>
</tbody>
</table>

Table 2: Presence/Absence of Alcoholic Intake

<table>
<thead>
<tr>
<th>Intake of Alcohol</th>
<th>Helmeted Individuals (n=55)</th>
<th>Non-Helmeted Individuals (n=35)</th>
<th>Unknown Cases (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td>29 (52%)</td>
<td>24 (70%)</td>
<td>6 (60%)</td>
</tr>
<tr>
<td>Present</td>
<td>26 (48%)</td>
<td>11 (30%)</td>
<td>4 (40%)</td>
</tr>
</tbody>
</table>

Table 3: Number of Abrasions, bruises and lacerations.

<table>
<thead>
<tr>
<th>Nature of Injuries</th>
<th>Helmeted Individuals (n=55)</th>
<th>Non-Helmeted Individuals (n=35)</th>
<th>Unknown Cases (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrasions</td>
<td>54 (98%)</td>
<td>33 (95%)</td>
<td>10 (98%)</td>
</tr>
<tr>
<td>Bruises</td>
<td>39 (70%)</td>
<td>23 (65%)</td>
<td>6 (55%)</td>
</tr>
<tr>
<td>Lacerations</td>
<td>17 (30%)</td>
<td>30 (85%)</td>
<td>8 (82%)</td>
</tr>
</tbody>
</table>

Table 4: Glasgow Coma Scale Score.

<table>
<thead>
<tr>
<th>Glasgow Coma Scale Score</th>
<th>Helmeted Individuals (n=55)</th>
<th>Non-Helmeted Individuals (n=35)</th>
<th>Unknown Cases (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-7</td>
<td>11 (20%)</td>
<td>16 (45%)</td>
<td>6 (60%)</td>
</tr>
<tr>
<td>8-15</td>
<td>44 (80%)</td>
<td>19 (55%)</td>
<td>4 (40%)</td>
</tr>
</tbody>
</table>

RESULTS
N=100 cases of victims of two-wheeler accidents were studied. Out of these 110 individuals, 55 were helmeted, 35 were non-helmeted and the status of rest of the individuals i.e. 100 was unknown. 38.18% of helmeted individuals and 65.91% of non-helmeted individuals had grievous injury [Table 1]. 47.27% of helmeted individuals and 27.27% of non-helmeted individuals had smell of alcohol [Table 2]. Most common injury in helmeted as well as in non-helmeted individuals is abrasion. 29.09% of helmeted and 86.37% of non-helmeted individuals had lacerations [Table 3]. 20% of helmeted and 45.46% of non-helmeted individuals had GCS below 7 [Table 4].

DISCUSSION
Injuries to two-wheeler riders compose a significant proportion of severe traffic accident injuries. In the present study pattern of head injury in the victims of fatal two wheeler accidents are observed and analysed regarding the use of helmet. Majority of the vehicles involved were motorbikes (65%). The age group of the victim was 20-29 years. Injuries to the scalp were present in 82% of cases of helmet wearers and 99.7% in non-helmeted victims. Abrasion was more than any other injury followed by contusion in helmeted whereas laceration was common in non-helmeted victims. Similar findings were obtained by Gupta S et al. They found that scalp contusions and lacerations were present slightly less in helmeted victims when compared with non-helmeted group. Helmets afford protection to scalp injuries. Non-helmeted riders suffered more facial lacerations, 29.5% as compared to helmeted victims (16.4%). Facial bone fracture is also more in helmeted group. Helmet seems to have afforded no protection against traumatic brain injury. The incidence of cervical spinal injury doesn’t show marked difference whereas thoracic and lumbar spine injury was higher in helmeted group. Cause of death was head injury in 53.4% of non-helmeted cases where as...
in helmeted it was only 44.3% confirming the protection given by
helmet in TBI.\textsuperscript{10,11} Data on the incidence and types of road traffic
accidents as well as detailed understanding of the circumstances
that leads to accidents is required to guide safety policy.
Knowledge how injuries are caused and what type they are, will
be valuable instrument for identifying interventions and monitoring
the effectiveness of interventions. This study was done to analyse
the injury patterns in helmeted and non-helmeted victims of fatal
two wheeler accidents.

\textbf{CONCLUSION}

Grievous injury has been found more in non-helmeted individuals
in comparison to helmeted individuals. Intake of alcohol has been
found more in helmeted individuals in comparison to non-
helmeted individuals. The most common injury in helmeted
individuals has been found to be abrasion. Lacerations have been
found more in non-helmeted individuals. GCS of less than 7 was
found to be in more in non-helmeted individuals in comparison to
the helmeted individuals.

\textbf{REFERENCES}

1. Goyal M. The correlation of CT scan and operative findings in
125-32.
2. Gosh P K. Epidemiological study of victims of vehicular
3. Singh H. Pattern and distribution of injuries in fatal Road Traffic
4. Srivastav AK and Gupta RK. A study of fatal road accidents in
5. Biswas G: Pattern of Road Traffic Accidents in North-East
6. Kiran E R. Road safety at cross roads. J Indian Acad Forensic
8. Singh YN, Bairagi KK & Das KC. An epidemiological study of
road traffic accident victims in medicolegal autopsies. J Indian
9. Reddy KSN. The Essentials of Forensic Medicine and
pp.213- 233.
11. Nath N C. Road Traffic Accident -The Present Scenario and

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