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ROAD TRAFFIC ACCIDENTS WITH HEAD INJURY: A STUDY FROM WESTERN UTTAR PRADESH

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ABSTRACT

Background: Head is the most vulnerable part of the body to be fatally injured in road traffic accidents (RTAs).

Objective: To study the distribution and severity of road traffic accidents with head injury according to type of transport and road user.

Methods: A hospital based cross-sectional study was conducted in casualty and allied departments of JNMC, Aligarh. All admitted cases of RTA with head injury in the age-group 15-45 years from August 2010 to July 2011 were included in the study using purposive sampling.

Results: A total of 463 cases of road traffic accident with head injuries were studied. Most common transport used was two wheeler motorized vehicle (73.7%). Majority (58.1%) of road users were driving the vehicle.

Conclusion: Two wheeler motorized vehicles are at increased risk of RTA leading to head injury.

Keywords: RTA, head injury, two wheeler motorized vehicle.

INTRODUCTION

Injuries represent 12% of the global burden of disease, the third most important cause of overall mortality and the main cause of death among 1-40 year olds. Approximately a quarter of the 5.8 million deaths from injuries are the result of suicide and homicide, while RTIs account for another quarter.¹

Transportation and speeding up communications is increasingly associated with the rise in road accidents and premature deaths, as well as physical and psychological handicaps. Equally significant are the rising costs in health services and the added burden on public finances.²

Global mortality is 97/100,000 population. About 850,000 are under 45 years of age, who are the sole bread-winners for their families in most of the developing countries.³ Globally, more than half of the total accidents that occur are with drivers between the age of 15 and 44 years, and the drivers in more than 73% of cases are males.

Road-traffic accident is the most common cause of severe head injury. Head Injury is the single most common cause of mortality in vehicle accidents. Each year, an estimated 1.7 million people sustain a TBI annually in U.S. Of them: Among all age groups, motor vehicle traffic is the second leading cause of TBI (17.3%) and

resulted in the largest percentage of TBI-related deaths (31.8%).⁴

Road traffic deaths are predicted to increase by 83% in low-income and middle-income countries (if no major action is taken), and to decrease by 27% in high-income countries. The overall global increase is predicted to be 67% by 2020 if appropriate action is not taken.⁵

MATERIALS AND METHODS

The present hospital based cross-sectional study was conducted in casualty and neurosurgery ward of Department of Surgery, Jawaharlal Nehru Medical College Hospital, Aligarh Muslim University, Aligarh from August 2010 to July 2011 for a period of one year.

Study unit and study subjects: Study unit was individual and study subjects included all the patients of RTAs with head injury in age-group 15-45 years admitted to this hospital over one year.

Sampling technique: The sampling was done by Purposive sampling method.

Inclusion criteria: All patients of RTAs with head injury in age-group 15-45 years who have registered themselves in casualty and admitted to Jawaharlal Nehru Medical College Hospital.

Exclusion criteria: The patients not giving consent to be a part of study, patients who were immediately referred to higher centre, patients who were brought dead and those below 15 years and above 45 years of age.

Methodology: Clearance was acquired from Ethics Committee to conduct the present study. Interview was scheduled on Monday, Wednesday and Friday of each week starting from August 2010 and was carried out till July 2011. Every eligible patient present in ward or casualty on the scheduled day was interviewed. Information of patient admitted to casualty was taken from casualty register while that of patient admitted to ward, information was taken from ward admission register.

After screening of eligible patients they were contacted either in ward or casualty. They were told the purpose of the study and were invited to participate in the same. Informed consent was taken from patient or concerned attendants or relatives after they were assured that confidentiality would be maintained. When the condition of the patient did not permit the interview, the

parents, relatives or attendants present were interviewed. If even after detailed interviewing it was noted that the information was not relevant or incomplete then that patient was also excluded from the study. After the interview thorough clinical examination of patient was done and CT scan were looked for.

Assessment of severity of injury was done with Glasgow coma scale (GCS). Patient was assessed on first contact by the doctor on duty and was classified into mild, moderate or severe injury as per GCS score. It consists of three components i. Best eye response (E) with scores of 1 to 4, ii. Best motor response (M) with scores of 1 to 6 and iii. Best verbal response (V) with scores of 1 to 5. On computing the three components together a final score is formed with following inference- GCS (13-15) as mild injury, GCS (9-12) as moderate injury and GCS (3-8) as severe injury.

As per the schedule overall 481 eligible patients were contacted during the study period. However out of 481 patients, in 18 the information elicited was incomplete as the patient was unable to provide history of RTA. Therefore these patients were also excluded from the study leading to effective sample of 463 patients. Data was analyzed using the SPSS version 17. Significant difference was determined using Chi-square test. P-value was calculated using chi-square test and difference was accepted significant at more than 95% (p-value <0.05).

Operational definitions:

Road Traffic Accident: A collision involving at least one vehicle in motion on a public or private road that results in at least one person being injured or killed.⁶⁻⁷

Type of transport: How was the injured person travelling at the time of the injury event? e.g. pedestrian, motorized two wheeler vehicle (MTV), four wheeler and others including non-motorized vehicle like bicycle, animal-drawn or human-drawn carts and three wheeler motorized vehicle as well.

Road user: What was the role of the injured person? e.g. pedestrian, driver or passenger.

RESULTS

Distribution of type of transport with gender has been shown in table-1. Maximum number of patients 341 (73.7 %) were using MTVs including largely motorcycle. With regard to gender males

were 278 (60.0 %) and females 63 (13.6 %) showing increased risk of RTA with head injury in two wheelers. Two wheelers were followed by pedestrians 76 (16.4 %) which formed the second largest group with males been 61 (13.2 %) and females 15 (3.2 %). Four wheelers motorized vehicles including car, jeep, heavy vehicles and others including three wheelers were least in number 46 (9.9 %).

Table 1: Distribution of type of transport with gender

Type of transport	Male (%)	Female (%)	Total (%)
Pedestrian	61 (13.2)	15 (3.2)	76 (16.4)
2 wheeler motorized vehicle	278 (60.0)	63 (13.6)	341 (73.7)
4 wheeler motorized vehicle + others	37 (8.0)	9 (1.9)	46 (9.9)
Total	376 (81.2)	87 (18.8)	463 (100)

Table 2: Distribution of type of road user with gender

Type of transport	Male (%)	Female (%)	Total (%)
Pedestrian	61 (13.2)	15 (3.2)	76 (16.4)
Driver/operator	254 (54.9)	15 (3.2)	269 (58.1)
Passenger	61 (13.2)	57 (12.3)	118 (25.5)

Table 3: Severity of head injury with type of transport

Type of road user	Glasgow coma scale			Total (%)	X ² (df), P-value
	Mild (%)	Moderate (%)	Severe (%)		
Pedestrian	56 (73.7)	12 (15.8)	8 (10.5)	76 (100)	1.623 (4),
2 wheeler motorized vehicle	256 (75.5)	59 (17.4)	24 (7.1)	339 (100)	0.805
4 wheeler motorized vehicle + others	33 (71.7)	8 (17.4)	5 (10.9)	46 (100)	
Total (n=461)	345	79	37	461	

Table 4: Severity of head injury with type of road user

Type of road user	Glasgow coma scale			Total (%)	X ² (df), P-value
	Mild (%)	Moderate (%)	Severe (%)		
Pedestrian	56 (73.7)	12 (15.8)	8 (10.5)	76 (100.0)	1.906 (4), 0.753
Driver/operator	203 (76)	43 (16.1)	21 (7.9)	267 (100.0)	
Passenger	86 (72.9)	24 (20.3)	8 (6.8)	118 (100.0)	
Total (n=461)	345	79	37	461	

Severity of injury was studied with different type of transport as shown in table-3. More proportion of severe injuries was observed in four wheelers (10.9%) and pedestrians (10.5%) as compared to two wheelers (7.1%) who were involved in majority of accidents. However this difference was not significant (p-value=0.805).

Similarly with regard to different road user mild injuries were almost uniformly distributed

Table-2 shows distribution of type of road user with gender. Maximum 269 (58.1 %) of patients were either driver or operator of vehicles which largely consisted of male drivers 254 (54.9 %) as compared to female 15 (3.2%) who were very few overall. Out of total 269 drivers 262 (97.4 %) were driving two wheelers and only 7 (2.6 %) were driving four wheelers. Passengers formed the next largest road user category comprising 118 (25.5 %) with almost equal share between males 61 (13.2 %) and females 57 (12.3 %). However out of total passengers 79 (66.9 %) were riding two wheelers and remaining 39 (33.1 %) were either riding four wheelers or other vehicles. Least common group comprised of pedestrians involving 76 (16.4 %) of total RTA patients most of whom were males (13.2 %) and only few were females (3.2 %).

In the present study out of total 463 patients GCS could not be assessed in two patients because of overwhelming effect of alcohol thereby GCS was considered in 461 patients only. Out the remaining 461, 345 (74.8%) were classified as mild, 79 (17.2%) as moderate and 37 (8.0%) as severely injured.

among different users (Table-4). However more of moderate injuries were observed in passengers (20.3%) and more of severe injuries among pedestrians (10.5%) as compared to any other group. However difference noted above was not significant (p-value=0.753).

DISCUSSION

In the present study a total of 463 patients of RTA with head injury were studied. With regard to type of transport increase preponderance in two wheelers (56.3%) was also reported by Suryanarayana et al (2010)⁸ in Bangalore study followed by pedestrians (18.5 %). Agnihotri and Joshi (2006)⁹ found 37.33% patients were using motorcycle followed by pedestrians with 33.8 %.

With regard to type of road user the findings of study are in corroboration with Suryanarayana et al (2010)⁸ where they noted 43.8% of patients were two-wheeler riders, 12.5% two-wheeler pillion and 18.5% were pedestrians. Further Fitzharris et al (2009)¹⁰ noted MTV users were 48.4%, pedestrians 26%. Out of the 378 MTV users recruited to the study with, 66.7% were riders. Patil et al (2008)⁷ noted among the drivers of different types of vehicles, majority (61.2%) were motorized two-wheeler drivers and bicyclists (20.1%) and the pedestrians were 47 (13.4%).

In the present study findings of severity of injury were in corroboration with Agnihotri and Joshi (2006)⁹ where most (57%) patients had mild injury and the rest (43%) suffered from grievous injury. Similarly Jha et al (2004)¹¹ found mild injuries as commonest of three with 51.2% whereas 48.1% had moderate and 0.7% had severe injuries. Malhotra et al (2005)¹² also noted that severity of injuries was greater among pedestrians.

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