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AN EPIDEMIOLOGICAL STUDY OF ROAD TRAFFIC ACCIDENT CASES AT A TERTIARY CARE HOSPITAL IN RURAL HARYANA.

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ABSTRACT

Background- Accidents occur not only due to ignorance but also due to carelessness, thoughtlessness and over confidence. Human, vehicular and environmental factors play role before, during and after a Road Traffic Accidents (RTA). Road traffic injuries are partially predictable and hence preventable.

Objectives- To study the pattern of road traffic accidents, socio demographic profile of road traffic injury victims seeking care at Maharishi Markandeshwar Institute of Medical Sciences And Research, Mullana and to study the antecedent factors influencing the road traffic accidents.

Material and Methods-The present cross-sectional study was carried out at Maharishi Markandeshwar Institute of Medical Sciences and Research (MMIMSR), Mullana (Ambala). All the victims who reported to MMIMSR emergency and various OPD clinics of the institute between September 2009 to February 2011 were included in the study. Various parameters like age and sex distribution, time of occurrence, protective gears worn, injuries sustained, receipt of First -Aid, alcohol consumption, category of road user, vehicles involved in RTA, types of RTA, road conditions, environmental conditions etc were studied and valid conclusions were drawn.

Results- There was a marked male preponderance (88.77 %) with maximum involvement of younger age groups. Most of the accidents had taken place in the evening hours (6 pm -12 midnight). The vulnerable road users like motorized two wheeler, LMV and pedestrians constituted 41.52%, 19.39% and 13.41% respectively. Only 158 of 545 two-wheeler users wore a helmet at the time of injury. 16.24% of drivers did not have a valid driving license. Not using indicator lights and not following speed limits were two most common factors responsible for these RTA.

Keywords: Road Traffic Accidents, Epidemiological study.

INTRODUCTION

Road Traffic accidents (RTAs) have emerged as a major global public health problem of this century and are now recognised as "veritable neglected pandemic". [1]The problem is so severe that, by 2020, it is projected that road traffic disability-adjusted life years(DALYs) lost will move from being the 9th leading cause of disability-adjusted life years lost to the 3rd leading cause in the world and will be 2nd leading cause in developing countries.[2]

The magnitude of Road traffic accidents and fatalities in India is alarming. In 2009, 4.22 lakh road traffic accidents and 1.27 lakh road traffic fatalities were reported.[3] These numbers translate into one road accident every minute and one road accident death every four minutes. However, this is an underestimate, as not all injuries are reported to the police.[3]

Human, vehicular and environmental factors play roles before, during and after a trauma event therefore accidents have to be studied in terms of an epidemiological model (agent, host and environmental factors) and analyzed in relation to time, place and person distribution. The objective of this study is to find out the pattern of road traffic accidents, socio demographic profile of road traffic accident victims and antecedent factors influencing these RTAs reported to the hospital.

MATERIALS AND METHODS

The present cross sectional study was carried out at Maharishi Markandeshwar Institute of Medical Sciences And Research (MMIMSR), Mullana (Ambala). All the victims who reported MMIMSR emergency and various OPD clinics of the institute between September 2009 to February 2011 were included in the study.

For the purpose of study, a road traffic accident was defined as any vehicular accident occurring on a public road or highway and includes vehicle accidents where the place of occurrence is unspecified. Information was collected by interviewing victim or his/her attendant using a structured interview schedule.

A detailed proforma for the purpose of recording socio-demographic profile of victims, epidemiological data, details of circumstances leading to accidents and other relevant data etc was prepared for the purpose of filling observations of the present study. The collected data was entered in Microsoft Excel. Coding of the variables was done. SPSS version 11.5 was used for analysis. Interpretation of the collected data was done by using appropriate statistical methods like percentage and proportions.

RESULTS

(A) Socio-demographic profile of the victims

A total of 1238 road traffic accident cases reported to MMIMSR during the study period. All of these cases were included in the study. Majority (79.47%) of the victims were in the age group of 15-50 years. Victims less than 15 years were grouped under category of children. 88.77% of the victims were males. Most (80.62%) of the victims were Hindus. Of the 1238 victims interviewed 925 were married accounting for 74.72% of the victims. Children were grouped under 'not applicable' for purpose of analysis. 31.02% of the victims had a primary level of education while 20.27% of the victims were illiterates. Out of total, 22.62% of the victims were unskilled labourers like manual labourers and farmers etc, while 25.53% of the victims were semi skilled, which included drivers (taxi, auto, maxi cab etc). All the female victims were housewives accounting for 6.70% of the injuries.

(B) Pattern of injuries

Site and severity of injury

On analysing the site of injuries it was observed that abdomen was most commonly (39.98%) involved part. (Table 1) It was noticed that among all vehicle users motorized two wheelers were most commonly affected (41.51%). The severity of injuries suffered by the victims was graded according to the "Trauma Index"[4]. According to the index, injuries are classified as mild injuries (0-7), moderate (8-18) and severe injuries (more than 18). Most (55.58%) of the injuries were mild. (Table 1)

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Table -1: Distribution of subjects according to site, Severity of injury and Type of road user.

Study Variable	Number of victims (%)
Part involved in RTA	
Upper limb	118 (9.53)
Lower limb	297 (23.99)
Abdominal	495(39.98)
Multiple	328 (26.49)
Total (%)	1238 (100)
Severity of RTA	
Mild	688 (55.58)
Moderate	389 (31.42)
Severe	161 (13)
Total (%)	1238 (100)
Vulnerable road users	
Pedestrian	166(13.41)
Cyclist	112 (9.05)
Motorized two-wheeler	514(41.51)
3 wheeler	112 (9.05)
LMV	240(19.39)
HMV	68(5.49)
Tractor	13(1.05)
Others	13(1.05)
Total	1238 (100)

Days and time of occurrence of injury:

In the present study, 670 (54.12%) accident cases were reported on week days and remaining 568 (45.88%) on weekends. Most (40.15%) of the RTA's occurred in the evening. (6pm-12midnight). (Table 2)

Table -2: Pattern of road traffic accidents:

Study variable	Number (%)
Time of Injury	
Morning(6am-12 noon)	357 (28.84)
Afternoon(12noon -6pm)	270 (21.80)
Evening(6pm-12midnight)	497 (40.15)
Night(12am -6 am)	114 (9.21)
Total	1238 (100)
Type of vehicle	
Unknown	32 (2.58)
Cycle	20 (1.62)
Motorized two-wheeler	260 (21.0)
Three wheeler	130 (10.50)
LMV (car, jeep, van)	322 (26.01)
HMV(bus/truck)	160 (12.92)
Tractor	44 (3.55)
Other vehicle	25 (2.02)
Self fall	89 (7.19)
Animal	36 (2.91)
Trees	111 (8.97)
Electric pole	09 (0.73)
Total	1238 (100)
Type of collision	
Head on	204 (16.48)
Sideways	650 (52.50)
From behind	173 (13.98)
NA	211 (17.04)
Total	1238(100)

Place, site and circumstances of injury

Out of total, 48% of the RTAs occurred outside the city whereas 32% of the injuries occurred inside the city. 20% of the RTAs took place on the outskirts of Ambala. Majority of the Accidents took place on main roads 73.8%, followed by near junctions, 14.2% and cross roads 12.0%. Majority of the victims were injured while crossing a road 875 (70.68%), 231 (18.66%) of them were injured while they were walking or riding by the side of the road (foot path). 131(10.58%) of them were injured while they were boarding or alighting a vehicle.

(C) Antecedent Factors

Consumption of alcohol

Among the victims 18.01% gave a history of having consumed alcohol within 6 hours before the RTA, whereas 81.99% of them had not consumed. Children were grouped under 'not applicable' for simplification, however, no information was collected as to the type or quantity of alcohol consumed.

Local environmental condition of the place of injury:

Majority (84.41%) of the victims responded that the road on which the RTAs took place was tarred. 12.04% of the victims reported that the road was bumpy and 3.88% of them said that the road was wet at the time of injury. Out of total , 822 (66.2%) of the victims revealed that the lighting was adequate at the time of occurrence of RTA while 27.46% and 6.22% of the victims reported absence or inadequacy of lighting at the site of injury.

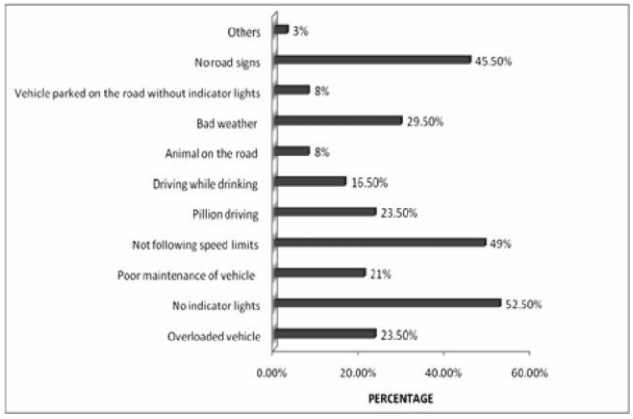
Presence of driving licence and use of helmets and seat belts:

Out of total, 16.24% of drivers did not have a valid driving license. Among the 545 two-wheeler users (riders and pillion) only 158 (28.99%) of them wore a helmet when they were injured whereas 387 (71.01%) of them did not wear a helmet. 693 (55.98%) of them were other road users. Between the 492 HMV and LMV users only 66 (13.42%) of them used seat belt. Rest of them did not use a seat belt.

Cause of event:

Not using indicator lights, not following speed limits, no proper road signs were most common causes responsible for road traffic accidents.(Fig 1)

Figure-1: Bar diagram showing causes responsible for these road traffic accidents



Post-Injury Factors

Transportation used for reaching Medical Centre

Only 4.12% of the victims mentioned that there was medical aid available at the site of injury (within 500 meters from the site of injury). The victims were brought to the hospital by auto 390(31.50%) of the instances, followed by private vehicle 314 (25.36%). The police used their vehicles to bring 220 (17.77%) of the victims to the hospital. 103 (8.32%) of the victims were transported using a taxi, whereas 61(4.93%) victims reached the hospital by bus/minibus. Ambulances brought the victims to the hospital 150 (12.12%) of the instances.

Discussion:

The present study revealed that, majority of the RTA victims were in the age group of 15 to 50 years (79.47%). Tendency of this age group to show scarce attention to traffic rules & regulations and non use of safety devices like helmets, seatbelts, restraints etc can be a possible explanation for the same. In a hospital based study by Ganveer GB majority of the victims were in the age group 18-37 years.[5] This shows that the people of the most active and productive age group are involved in RTAs, which adds a serious economic loss to the community. Similar observations were also made by Balogun JA.[6]

Not surprisingly our study shows that overwhelming majority of the victims (88.77%) were males. This is due to greater exposure of males

on streets. According to a study done by Nilamber J et al in JIPMER 83% (603) were males.[7]

Regarding educational level of victims this study confirms the results concluded by others.[8] Above observation indicates that lack of road traffic senses resulting either from illiteracy or poor literacy may have been a significant contributory factor to the causation of road traffic accidents.

It was found in this study that majority of the victims 41.52 %(514) were two wheeler occupants. Occupants of Heavy motor vehicles accounted for 9.8% of the victims. Cyclists accounted for 5.8% of the victims. According to the community based study done by others.[9] Majority of the victims were Two-wheeler users 46.3% (315) and pedestrians 24.9%(169), followed by cycle users (14.1%). Olukoga A observed that, 61% of the victims were pedestrians.[10] These findings show that pedestrians, cyclists and two wheeler users are the most vulnerable road users and need to take extra precautions.

Regarding time of occurrence of injury, findings of our study mimics the findings presented by a report (2009) prepared by Transport Research Wing (TRW), Ministry of Road Transport & Highways, Government Of India, New Delhi.[3]

In the present study, the higher number of reported accident cases occurred on week days (Monday-Fridays) 54.12%, when compared to weekends (Saturdays and Sundays) 45.88%. Others studies have observed more accident cases on weekends.[11,12] In another study from Delhi, the highest number of RTAs were observed on Mondays and Wednesdays.[13]

It was observed in this study that the maximum numbers of injuries were seen in the abdomen and the least in the upper limb. This is in contrast to the study by Biswas G [14]who cited that the maximum (56.4%) injuries were found on head and neck, followed by thorax (54.5%) and abdomen (44.5%). External injuries were found more than 905% cases. Other studies[15,16] also showed a high incidence of head injuries in their series on RTAs. These studies contradict the observations on this aspect of the study.

It was seen that not following speed limits and not using indicator lights were two main causes in more than half of the total RTIs. Since one accident had one or many predisposing factors so these factors are more than the actual cases. Clarke DD[17] found high speed vehicle predisposing factor in 65% of accidents.

Conclusion

Present study showed that RTAs were more common in the younger age groups. Good numbers of drivers were found without valid driving license. The study highlights the need of compulsory implementation of helmet wearing for motorcyclist and necessitates the need for taking urgent steps for establishing ambulance services and provision of pre-hospital care & trauma services. Strict legislation should be adopted in dealing with rash, negligent driving and driving under the influence of alcohol.

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