



A Cross-sectional Study of Road Traffic Accidents at a Tertiary Care Hospital in Jaipur City, Rajasthan

Authors

Devanda Lalchand¹, Rathore MS^{2*}, Chaudhary RC³, Singh Laxman⁴, Pankaj JP⁵

^{1,4}Resident, ²Professor, ³Ex. Professor, ⁵Assistant Professor

¹⁻⁴Department of Community Medicine, Mahatma Gandhi Medical College, Jaipur

⁵Department of Community Medicine, SMS Medical College, Jaipur

*Corresponding Author

Rathore MS

Email: dr.l.c.devanda@gmail.com

Abstract

Introduction: Injuries related to road traffic accidents (RTA) contribute to significant increase of the number of trauma admissions at tertiary care centre, taking out a significant number of lives and resources. We need to distinguish to more about the numbers and types of injuries and about the situation in which these types of injuries occurred. The present study was aimed to access epidemiological correlates of road traffic accidents in a tertiary care hospital of Jaipur city.

Materials and Methods: A hospital based cross sectional study was carried out at a tertiary care teaching hospital in Jaipur, Rajasthan from 1st January 2016 to 31st December 2016. Detailed information about socio demographic profile of the victims, epidemiological data and details of the circumstances leading to accidents was collected from the victims or by his/her attendant.

Results: The present study showed male preponderance (73.67%) with maximum involvement of younger age groups (21-40 Years) among both sexes. Most of the accidents had taken place on state highways at crossing points. The most venerable road users were two wheeler, LMV and pedestrians constituted 42.67%, 14.17% and 10.67% respectively. Highest numbers of RTA were occurred during rainy season (52.17%) and during evening hours (41.83%). Drunken driving, use of mobile, talking with co-passenger and over speed were identified as common cause of accidents. Driving without helmets or seat belts were major contributing factors for severity of injury.

Conclusion: Younger age group was most commonly affected by RTA and non-use of helmets and seat belts necessities the strict enforcement of traffic rules and awareness programs in schools and colleges.

Keywords: Road traffic accidents, Injuries, Trauma, Driving.

Introduction

Road traffic accidents are one of the most common aetiology of mortality and morbidity accounting more than 1.25 million deaths per year worldwide. They also have a huge impact on

disability-adjusted life years (DALYs).^[1] The World Report on Road Traffic Injury Prevention indicates that by 2020, road traffic injuries will be a major cause of death accounting for half a million deaths and 15 million Disability Adjusted

Life Years (DALYs) were lost.^[2] According to WHO, 70% of the road traffic accidents deaths every year occur in developing countries and India accounts 10% of all these.^[3] Over 100,000 people are killed on Indian roads annually. The increasing morbidity and mortality rate, particularly in those of working age group, has devastating consequences for the economic growth of countries.^[4]

India, the latest survey of road traffic accidents shows that in year 2015 total accidents were 5,01,423 with 2.5% point increase than the total accidents 4,89,400 in year 2014. The total number of deaths also showed an increase of 4.6% from 1,39,671 in year 2014 to 1,46,133 in year 2015. This means about 1374 accidents and 400 deaths occur daily on Indian roads. Further, it can be translated into 57 road traffic accidents and loss of 17 lives in every hour in our country. The top 10 states, namely Tamil Nadu, Maharashtra, Madhya Pradesh, Karnataka, Kerala, Uttar Pradesh, Andhra Pradesh, Rajasthan, Gujarat and Telengana together accounted for 79% of all accidents in India. Rajasthan has the 8th position in a number of road traffic accidents. In 2015, the total road accidents were 24,072 in Rajasthan which was almost 5% higher than 22,969 accidents in 2012 and 10,510 persons were killed in 2015 which was 7% higher than 9528 road accident deaths in 2012.^[1,5]

The disconcert raises in mortality due to road traffic accidents over the past few years is a matter of great concern worldwide. Some of the factors that increase the risk of road accidents in India are unsafe traffic environment, lack of road infrastructure and encroachments that restrict safe areas for pedestrians, poor safety engineering measures, mixed traffic and an increasing number of motorized vehicles, rash driving behaviour and driving without a valid driving licenses.^[6]

The objective of the present study was to know the pattern of road traffic accidents, socio-demographic profile of victims and various epidemiological factors related to road traffic accidents.

Materials and Methods

It was a hospital based, cross sectional, observational study, carried out at Mahatma Gandhi Medical College & Hospital, Jaipur (Rajasthan) from 1st January 2016 to 31st December 2016. After taking approval from institutional ethics committee, all the road traffic accident victims who were reported to emergency and trauma department for seeking medical care and admitted in any department (department of orthopedics, general surgery or neurosurgery) were included in the study after taking a valid consent. RTA victims who/their relatives did not give consent and any injury on the road without involvement of a moving vehicle or injury involving a stationary vehicle were excluded from the study.

A schedule for the purpose of the recording socio demographic profile of the victims, epidemiological data, details of the circumstances leading to accidents and other relevant data had been prepared and a pilot study was done on 60 subjects to know the feasibility of schedule. After minor corrections final schedule was prepared and detailed information was collected by interviewing the victims of the accident or by his/her attendant where the condition of the victim didn't warrant the interview. The medico legal records and case sheets were referred for collecting additional information and where necessity was felt for cross checking. The data were entered into Microsoft Excel 2010 spreadsheets and analysed using percentages and proportions.

Results

In the present study, total 600 road traffic accident victims were included out of them 442 (73.67%) were male and 158 (26.33%) were female. Young age group (21-40 years) was the most commonly affected in both sexes accounting more than 70% cases. It was observed that persons had graduate or above educational qualification suffered more road traffic accidents (27.17%) among both sexes followed by illiterates. Majority of sufferers were

lower (34.67%) or middle class (28.17%) persons (Table-1).

Maximum road traffic accidents were occurred on state highways (51.83%) followed by national highways (24.67%) and city roads (16.33%). Chouraha and tiraha were found most accident prone areas where about 73% accidents were taken place. About 22% accidents were occurred on Y-typed road and sharp cuts. It was seen in present study that about 52.17% accidents were happened during rainy season when the roads were wet followed by winter (31.50%) and summer (16.33%). Majority of accidents (41.83%) were occurred during evening hours followed by morning hours (35.17%). It was also observed that in 60% of road traffic accidents driver was consumed alcohol within 1-6 hours before (Table-2).

Maximum collisions occurred sideways (46%) followed by head on (33%). 6% collisions were occurred from behind while in 15% cases the type of collision could not ascertained (Figure-1). Two wheeler drivers were found most vulnerable victims (42.67%) of road traffic accidents followed by light motor vehicle (20.50%) and

pedestrians (10.67%). Out of 256 two wheeler accidents, in 65.36% cases either driver or pillion did not wear a helmet while out of 229 LMV and HTV accidents, in 55.46% cases driver did not wear seat belts. It was also observed that overall 36.16% cases driver did not possess a valid driving license. Personal carelessness of driver was very important cause of accidents. It was observed that 31.33% drivers were used mobile phones while driving, 19.83% talked to co-passenger, 17.83% were over speed and 13.17% involved in rush driving which led to accident (Table-3).

Head/face was the most affected body part (22.67%) of road traffic accidents in this study followed by abdomen and lower back (13.83%), thorax (13%), elbow and forearm (12.17%) and ankle and feet (10.50%) (Table-4). Head injuries were most common type contributing about 22% of total injuries. Others were fractures and dislocations (17.33%), injury to blood vessels, muscles and tendons (17.17%), crush injury (12.33%), open wound (11.50%), injury to nerves and spinal cord (8.50%), injury to internal organs (8.17%) and traumatic amputation (3%) (Figure-2).

Table-1: Socio-demographic profile of road traffic accident victims

Socio-demographic factor	Male n (%)	Female n (%)	Total n (%)
Age (in years):			
< 21	31 (7.01)	7 (4.43)	38 (6.33)
21-30	187 (42.31)	85 (53.80)	272 (45.33)
31-40	130 (29.41)	33 (20.89)	163 (27.17)
41-50	35 (7.92)	12 (7.59)	47 (7.83)
51-60	28 (6.33)	12 (7.59)	40 (6.67)
>60 yrs	31 (7.01)	9 (5.70)	40 (6.67)
Total	442 (73.67)	158 (26.33)	600 (100)
Education status:			
Illiterate	94 (21.27)	38 (24.05)	132 (22.00)
Primary	79 (17.87)	34 (21.52)	113 (18.83)
Middle	62 (14.03)	18 (11.39)	80 (13.33)
Secondary/Sr. Secondary	87 (19.68)	25 (15.82)	112 (18.67)
Graduate or above	120 (27.15)	43 (27.22)	163 (27.17)
Socioeconomic Status			
Upper class	30 (6.79)	10 (6.33)	40 (6.67)
Upper Middle class	49 (11.09)	33 (20.89)	82 (13.67)
Middle class	99 (22.40)	70 (44.30)	169 (28.17)
Lower Middle class	68 (15.38)	33 (20.89)	101 (16.83)
Lower Class	196 (44.34)	12 (7.59)	208 (34.67)

Table-2: Pattern of road traffic accidents

Study variable	Number	Percentage
Place of accident:		
National Highway	148	24.67
State Highway	311	51.83
City Road	98	16.33
Local Road	43	7.17
Accident prone sites:		
Chouraha	242	40.33
Tiraha	196	32.67
Y-type	87	14.50
Other sharp cut	45	7.50
Others road	30	5.00
Seasonal variation:		
Rainy	313	52.17
Summer	98	16.33
Winter	189	31.50
Time of accident:		
Morning(6 am-12 noon)	211	35.17
Afternoon(12 noon- 6 pm)	66	11.00
Evening(6 pm-12 midnight)	251	41.83
Night(12 midnight- 6 am)	72	12.00
Antecedent factors:		
Alcohol	363	60.50
Smoking	105	15.67
Drug abused	78	13.00
N/A	65	10.83
Personal carelessness:		
Over speed	107	17.83
Rush driving	79	13.17
Use of mobile	188	31.33
Talking to passenger	119	19.83
No fault in part of victims	107	17.83

Table-3: Mode of transport of victims

Victim's mode of transport	Number	Total
Pedestrian	64	10.67
Pedal cyclist	51	8.50
Motor cycle Riders/scooter	256	42.67
3-wheeled motor vehicle	47	7.83
LMV (Car, van, jeep)	123	20.50
Heavy Transport Vehicle	59	9.83
Total	600	100

Table-4: Body part involved in road traffic accidents

Body part involved in RTA	Number	Percentage
Head /Face	136	22.67
Neck	9	1.50
Thorax	78	13.00
Abdomen, Lower back, Lumber spine &Pelvis	83	13.83
Shoulder & Upper arm	29	4.83
Elbow & Forearm	73	12.16
Wrist & Hand	14	2.33
Hip & Thigh	54	9.00
Knee & Lower leg	61	10.17
Ankle & foot	63	10.50
Total	600	100

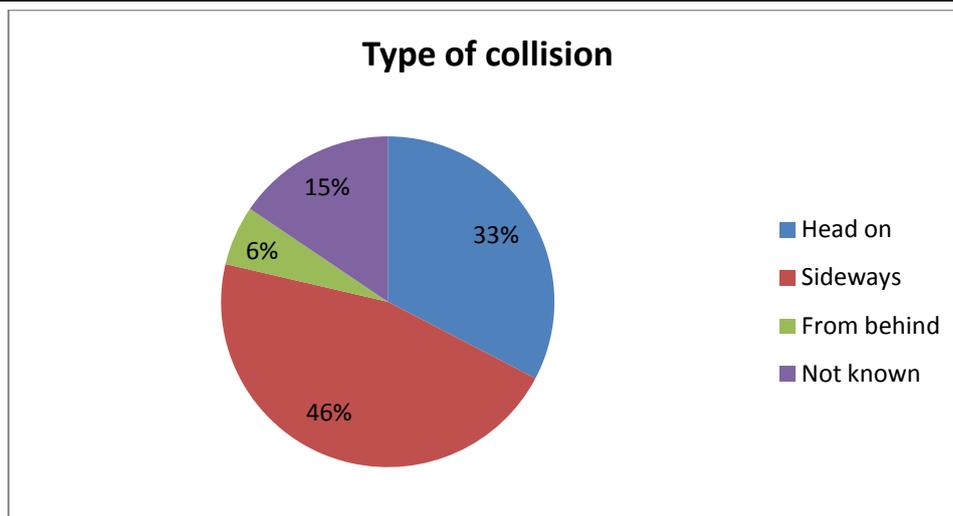


Figure-1: Showing the type of collision

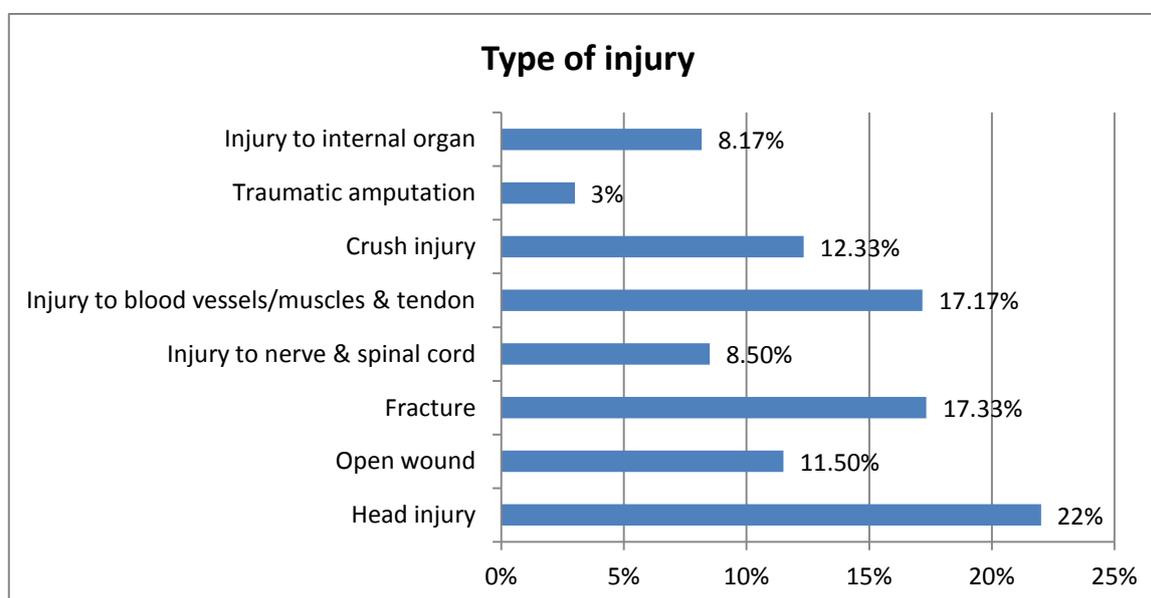


Figure-2: Type of injury among road traffic victims

Discussion

In the present study male victims were 3 times more than of female which was consistent with previous study by Sathiyasekaran et al^[7], who reported 80% of patients involved in road traffic accidents were males. The male predominance of road traffic accidents the rationale for the high prevalence of RTAs in males (3 times more than females) reveal their higher activity levels and contribution in high-risk activities such as driving/riding, negligence, over-speeding and drunken driving without wearing any protective gears. It is may be due to greater male exposure on the streets.^[7-9] Age group (21-40 years) was the

most commonly affected in both sexes accounting more than 70% cases. Similar results were observed in past studies conducted in various parts of India by Mishra et al^[10], Khare et al^[11], Patilet al^[12], Gudadinni^[13] and Sharma et al^[14] where they found the age groups ranging from 15-40 years were most common sufferers of RTA.

It was surprisingly observed that highest numbers of victims were had a graduate or above degree of qualification (27.16%), followed by illiterate (22%), secondary (18.66%), primary (18.83%) and middle level education (13.33%). The higher numbers of accidents among highly educated group was due to negligence while among illiterates or

less literates it was due to deprivation of road traffic awareness. Majority of victims belonged to lower or middle social class while a study by Kumar and Srinivasan^[15] it was upper middle class.

Present study showed that the majority of accident seen in state highway followed by national highway, city roads and local roads. Chouraha and tiraha were found most accident prone areas. The risky road condition had been promoted due to the increasing number of automobiles along with the population explosion for which infrastructures of road were usually not prepared to manage the heavy load of traffic.^[16] As shown by this study majority of collision in the accident was sideways followed by head on, from behind and collision from unknown side. Hastiness, improper lighting condition, absence of signboards and distant visibility due to poor engineering of roads were the common contributing factors for this.

Most of RTAs were occurred in rainy season and clouding conditions which was similar as observed by Mishra et al^[10] and Pathak et al^[17] in their studies. Majority of the accident was seen evening and morning hours when people are more active and mobile. Similar results were observed by Khare et al^[12], Pathak et al^[17] and Khan and Hussain.^[18] Driving during midnight is more risky than day time, which can be assigned to fatigue and/or alcohol consumption.^[19]

In present study revealed that majority of driver (63.83%) were having driving license and only 36.16% did not have driving license. The reason may be the casual attitude of the drivers towards obtaining the driving license with no fear of checking by traffic police. Drivers who use mobiles during driving have four times more risk of becoming a victim of RTAs when compared to those who do not use such type of devices.^[20]

Most vulnerable group in RTA was motorcycle/scooter driver (42.67%) followed by light motor vehicle (20.50%), pedestrian (10.67%), heavy motor vehicle (9.83 %), pedal cyclist (8.5%) and 3-wheeled motor vehicle (7.83%). Similar results were observed by Khare et al^[11] and Patil et al^[12]

while contrary results were seen by Jha et al^[8] where pedestrian were most commonly suffered by RTA. These findings suggested that unavailability of footpath, inappropriate road markings, signals and inadequacy of maintenance of roads were significant factors of road traffic accidents.^[16] Head and face were most commonly affected body part followed by abdomen and lower back. This was similar as observed previously by Jha et al^[8] but another study by Pathak et al^[17] showed that lower limb injuries were more common.

Conclusion

The study highlights the need of necessity of implementation of helmet wearing for motorcyclist and use of seat belts for four wheeler drivers. The prevalence of road traffic accidents can be decreased by increasing the awareness among the family, drivers and community. Government should take steps for efficient transport system and implementation of traffic rules and regulations strictly by police and transport authority.

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