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Research Article

A study to assess the pattern and determinants of road traffic injuries during a year, a tertiary care hospital-based study

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ABSTRACT

Background: Expansion in road network, motorization, and urbanization in the country has been accompanied by a rise in road accidents leading to road traffic injuries (RTIs). Today RTIs are one of the leading causes of deaths, disabilities, and hospitalizations with severe socioeconomic costs across the world.
Methods: It is a retrospective record-based study of patient attending the causality of S.G.M.H. Rewa in Madhya Pradesh, India last one year, after road traffic accident. Study area was tertiary care hospital S.G.M.H. Rewa Madhya Pradesh, India. Simple random sampling method are used among all RTA victims visit to causality of S.G.M.H. Rewa. Study period was 1 year from st January 2015 to 3st December 2015. Sample size was 325 RTA and 412 victims. Main objective of the study was to determine sociodemographic factors and their circumstances leading to RTA, outcome and seasonal variations of RTA. Study variables were demographic, human, vehicular, environmental and time factors and statistical analysis, percentages, linear and logarithmic trend and chi-square.
Results: 325 RTA was occurred in the year 2015 in which injured person were 412 who visited to causality of S.G.M.H Rewa in whom 298 (72.33%) were males and 114 (27.66%) were females, and most 49.02% of them belong to 21-40 year age. Alcohol consumption was found in 20.61% but fatality was high (76.11%) and high speed of the vehicle was the causing factor in 71.38% and case fatality was also high (73.94%) in high speed RTA. More number of RTA occurred at unfamiliar road ratio between RTA occurred at unfamiliar road and familiar road was 2.73:1 and fatality was also high in unfamiliar road accident.
Conclusions: Most of the factors responsible for RTA and its fatal consequences are preventable. A comprehensive multipronged approach can mitigate most of them.

Keywords: Road traffic accidents, Road traffic injuries, Victims, Epidemiological factors, Outcomes

INTRODUCTION

Expansion in road network, motorization, and urbanization in the country has been accompanied by a rise in road accidents leading to road traffic injuries (RTIs). Today RTIs are one of the leading causes of deaths, disabilities, and hospitalizations with severe socioeconomic costs across the world. Road traffic accidents (RTAs) is an issue of national concern, considering its magnitude and gravity and the consequent negative impacts on the economy, public health and the general welfare of the people. Road traffic injury (RTI) is major but neglected public health problem in both developing and developed countries. World Health Statistics 2008 cited in global status report on road Safety states that RTIs in 2004 were the 9th leading cause of death and at current rates by 2030 are expected to be the 5th leading cause of death, overtaking diabetes and human immunodeficiency virus infection/ acquired immunodeficiency syndrome. According to the National Crime Record Bureau (2010), the number of vehicular accidents was 430600 resulting in 133938 deaths and

470600 injuries, thereby accounting for 37.2% of all accidental deaths due to unnatural causes.[1] Road traffic crashes are a major cause of misery, disability, and death globally, with a disproportionate number occurring in developing countries.[2,3] It has been predicted that by 2020, RTIs will rank as high as third among causes of disability adjusted life years lost.[3-5]

Injuries are increasingly recognized as a global public health epidemic. Around the world, almost 16,000 people die every day from all types of injuries. 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 age groups.[6] The category of injuries worldwide is dominated by those incurred in road crashes. According to WHO data, deaths from road traffic injuries account for around 25% of all deaths from injury.[6]

India has one of the highest road accident rates in the world. There has been a steady rise in the casualties in road accidents in the country and their proportions in total deaths due to all accident have also increased considerably in the past. In India, nearly 80,000 get killed and 340,000 are injured every year in about 300,000 accidents on road network of just 22,00,000 km^2.

There is an accident every minute and death every 8 min. significant variations also arise between different states of India.[7] Injuries related to RTAs contribute significantly to the number of trauma admissions at Medical College, taking out a significant number of lives and resources.

We need to know more about the numbers and types of injuries and about the circumstances in which these injuries occur. This information will indicate just how serious the injury problem is and where, exactly, preventive measures are most urgently needed. By careful recording of the circumstances of the accident, the risk factors for serious injury could be identified, most of death occur are young age group people, because of this financial burden is increase on his dependent.

So that by keeping in mind all these fact the present study on a study on a study on pattern, severity and circumstances of injuries sustained in road traffic accidents: in S.G.M.H. Rewa Madhya Pradesh, India. Aims and objectives of the study were Age and sex distribution of injured in road traffic accidents (RTAs), circumstances leading to RTA, outcome after RTA and trends of RTA during the year.

METHODS

The study was a retrospective record-based study of patient attending the causality of S.G.M.H. Rewa in one year, after road traffic accident affiliated to Shyam Shah Medical College Rewa, Madhya Pradesh, India between the time periods of 1st January 2015 to 3st December 2015. The information about the patients admitted as cases of RTAs were ascertained from the hospital records.

Case sheets of RTAs victims from the medical records sections were read and the necessary details were sought in terms of age, sex, residence, season of accidents, place, alcohol intake, type and site of injury. The cases with incomplete details were not taken into consideration. The patients thought to be and not to be under the influence of alcohol was based on the clinical impression of the attending doctor, where possible by breath alcohol. Injury patterns were identified using case sheets and Medico Legal Certificates (MLC) of the patients who seek medical care in hospital.

By careful recording of the circumstances of the accident, the risk factors for serious injury could be identified. Descriptive statistics was used and statistical significance was tested for using the chi-square and z-test.

RESULTS

In the present study it was found that 325 RTA was occurred in the year 2015 in which injured person were 412 who visited to causality of S.G.M.H Rewa in which 298 (72.33%) were males and 114 (27.66%) were females, and total male /female ratio was 2.61:1 and it was statistically significant because $p<0.04$ and most 49.02% of RTA victims belong to 21-40 year age group.as shown in Table 1.

Table 1: Age and gender wise distribution of RTA victims.

Age-group (years)	Males	Females	Total (412)
0-20	46	18	64 (15.53%)
21-40	126	76	202 (49.02%)
41-60	98	13	111 (26.94%)
61-80	23	6	29 (7.03%)
>80	5	1	6 (1.45%)
Total=	298 (72.33%)	114 (27.66%)	412 (100%)

Chi-square=25.20, p value=<0.0001

In the present study out of 325 RTA , according to human factor responsible for RTA were that alcohol consumption was found in 20.61% but fatality was high (76.11%) and high speed of the vehicle was the causing factor in 71.38% and case fatality was also high (73.94%) in high speed RTA.

According to road condition and RTA was that RTA occurred at unfamiliar and familiar road ratio was 2.73:1, so that unfamiliar road was responsible for two-three responsible for RTA and fatality was also high in unfamiliar road. In the present study more accident were occurred at highway and these was more fatal than RTA occurred at narrow street.

Non availability of traffic police at cross road was responsible for RTA in 12.61% cases in which only 7.31% cases was have fatal outcome and poor traffic light was responsible for 26.76% RTA in which 31.39% cases have fatal outcome.

As per the vehicular condition old vehicle was responsible for 7.07% RTA in which only 8.69% was fatal and poor vehicular accessories maintenance was responsible for 12.61% RTA and in which 2.43% was fatal. According to victims condition and its outcome was that only 31.69% victims get first aid service and who was get first aid services in which fatality rate was low only 4.85%.and to get admission >1hrs after RTA rate was 19.38% and in them fatality rate was high 49.20%.

Table 2: Association of determinants of RTA with outcome of RTA.

Determinants	Yes (n=325)	Fatal Outcome of RTA
Human factor in RTA		
Alcohol consumption and RTA	67 (20.61%)	52 (77.61%)
Speed of the vehicle and RTA	232 (71.38%)	176 (75.86%)
Road condition and RTA		
Non-familiar and familiar	238/87	137/12
Narrow and wide	128/197	35/64
Traffic conditions and RTA		
Traffic police absent	41 (12.61%)	3 (7.31%)
Traffic light	86 (26.46%)	27 (31.39%)
Vehicle condition		
Age of the vehicle	23 (7.07%)	2 (8.69%)
Vehicular accessories	41 (12.61%)	1 (2.43%)
Medical facility and RTA		
First-aid after RTA	103 (31.69 %)	5 (16.12%)
Time of accident and RTA admission was >1hours	63 (19.38%)	31 (49.20%)

For both occurrence and outcome of RTA multiple factors were responsible. Factor responsible for RTA was calculated out of total, RTA and outcome of RTA was calculated out of particular factor responsible for RTA.

Monthly trend of RTA

In the present study it was observed that RTA was marginally high in the month of January then fall in number then again increasing pattern was found in May-June and again fall in number and then rising pattern was observe from September to December. As shown in Figure 1.

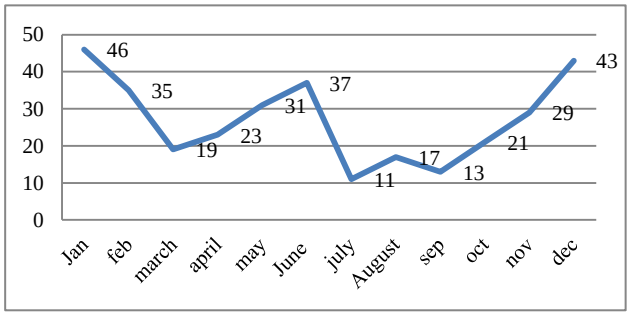

Figure 1: Monthly trend of RTA in Rewa Division.

DISCUSSION

The present study was conducted at the tertiary level S.G.M.H hospital affiliated by Shyam Shah Medical College Rewa Madhya Pradesh, India. According to the findings of the study was discussed that 325 RTA was occurred in the year 2015 in which injured person were 412 who visited to causality of S.G.M.H Rewa.in whom 298 (72.33%) were males and 114 (27.66%) were females, distribution of RTA between males and females was highly significant because $p<0.0001$ it was less than 0.04 and most 42.09% of RTA victims of them belong to 21-40 year age group.

According to various factor responsible for RTA found that the, according to human factor responsible for RTA were that alcohol consumption was found in 20.61% but fatality was high (76.11%) and high speed of the vehicle was the causing factor in 71.38% and case fatality was also high (73.94%) in high speed RTA. According to road condition and RTA was that RTA occurred at unfamiliar and familiar road ratio was 2.73:1, so that unfamiliar road was responsible for two-three responsible for RTA and fatality was also high in unfamiliar road.

In the present study more accident were occurred at highway and these was more fatal than RTA occurred at Narrow Street. Non availability of traffic police at cross road was responsible for RTA in 12.61% cases in which only 7.31% cases was have fatal outcome and poor traffic light was responsible for 26.76% RTA in which 31.39%

cases have fatal outcome .As per the vehicular condition old vehicle was responsible for 7.07% RTA in which only 8.69% was fatal and poor vehicular accessories maintenance was responsible for 12.61% RTA and in which 2.43% was fatal. According to victims condition and its outcome was that only 31.69% victims get first aid service and who was get first aid services in which fatality rate was low only 4.85% and to get admission >1 hours after RTA rate was 19.38% and in them fatality rate was high 49.20%.

RTAs are increased in the winter season as the drivers have poor adaptability to light in foggy environment. The month of "December" may be regarded as the "month of festival" (picnic, new-year celebration, game competition etc.) during which period the vehicles are driven with alcohol intoxication and transport volumes are increased rapidly, similarly in summer due to marriage season and vacations of school was increase the outing.

Similarly a study was conducted by Singh R, et al was found that out of total 347 victims, 258 (74.35%) were males, while only 89 (25.65%) were female subjects.[8] Highest numbers of victims were in 20-30 years age group, accounting for 141 (40.63%) patients and various factors were attributed to the causation of these injuries as that maximum number of accidents took place during winter season (35.16%) and on national highway (69.50%). A total of 10 (3.88%) injured patients were intoxicated with alcohol at the time of accidents, all males.

Similar finding was observed in the study conducted by Mishra B et al Among 360 RTA victims, most cases 138 (38.33%) were in the age group of 15-30Years.[9]

A high percentage of both fatal 30 cases out of total 66 (45.45%) and non-fatal 108 out of total 294 (36.73%) cases were observed from the same age group. Out of 69 drivers sustaining RTA in the present study, 32 (46.37%) were found to have some evidence of alcohol consumption, 'Alcohol - the killer on road' is a well-documented fact and out of the 32 with these evidence 27 (84.37%) succumbed to their injury.[10-13]

The $\chi 2$ value for this was found to be 30.25 ($P<0.001$). It was observed that 180 (50%) cases were due to high speeding vehicles, Narrow and defective roads were responsible for 39 (26.53%) of non-collision accidents whereas collision types occurred mostly in wide roads i.e. 132 (61.97%), Only 18 (5%) cases of RTA requiring hospital visit occurred in the presence of effective traffic light Out of the total 246 vehicles involved, 162 (65.85%) were old and 84 (34.14%) were new. Out of 42 fatal accidents caused by motor vehicles, 33 (78.57%) were due to old ones. Old vehicles were also responsible for majority of non-fatal accidents. But contrast to the present study that About 306 (85%) of RTA occurred in familiar roads to that of 51 (14.17%) in non-familiar ones.

Similarly a study conducted by Bhuyan PG et al found that RTAs affected mainly the people of productive age group which were predominantly male.[14] Accident rate was maximum in twilight and winter season demanding high morbidity and mortality. Wanget al also observed a similar seasonal trend that accidents were increased in winter month.[15]

CONCLUSION

Study concluded that RTA was more common in young age group a multifactorial problem and its outcome was also depends on multiple factors, so to prevent this increasing epidemic of RTA we need to work on multiple factors at personal level and need some strong legislation application. And to increase awareness especially among young age group people about traffic rules.

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