

The Epidemiological Profile and Pattern of Injuries Seen in Road Traffic Accidents Reported at A Tertiary Care Hospital in a Rural Area of Salem, Tamil Nadu

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Abstract

Background: Road traffic accidents are the leading cause of death in people aged 5- 29 years. In India, Tamil Nadu is the state contributing to the maximum number of RTA deaths. There is a dearth of studies exploring the epidemiological factors behind road traffic accidents and this study aims to fill that gap by studying the epidemiological patterns of RTAs in patients who underwent inpatient care in a tertiary care hospital of Salem, Tamil Nadu

Objectives:

1. To determine the age and gender of RTA victims
2. To determine the distribution of RTA victims by time of occurrence
3. To ascertain the type of vehicles, and mode of collision involved in the RTAs
4. To determine the pattern of injuries occurring in the RTA victims

Methods: A cross sectional study was conducted based on hospital records of Road Traffic Accident victims admitted for In-patient care between 1st March 2018 and 31st July 2018 at Kirupananda Variyar's Vinayaka Institute of Medical Sciences, Salem, Tamil Nadu.

Results: Most RTA victims (33.33%) were in the age group of 21- 30 years. 81.7% of victims were males. The maximum number of accidents (41.4%) took place between 1800-2200 hours. The most common vehicle involved was two-wheelers (73.1%). The most common cause of accident was fall from the two-wheeler 31.7% followed by collision of two-wheelers with Light Motor Vehicles.

The most common site of injury was the extremities (68.2%) followed by skull and maxillo-facial injuries (53.2%).

Conclusions: Greater measures need to be taken to prevent road traffic accidents in rural areas. Special attention needs to be paid to males in the age-group of 21-30 years who ride two-wheelers

Keywords: Road traffic Accidents, Injuries, Two wheelers, Motor Vehicle Safety

Introduction

The UN General Assembly officially proclaimed 2011-2020 as the Decade of Action for Road Safety. While this led to an increase in global efforts to reduce death and disability due to road traffic accidents, it did not occur at a rate fast enough to achieve SDG target 3.6, which was to reduce road traffic deaths by 50% by 2020. Globally, the number of annual road traffic deaths reached 1.36 million in 2018, and road traffic injuries are now the leading killer of people aged 5-29 years. (global status report)¹

India ranks 1st in terms of the number of Road Traffic Accident deaths among 199 countries according to the World Road Statistics 2018. The number of deaths due to road traffic accidents reported in 2018 was around 1.5 lakhs, accounting for 11% of the total number of accident-related deaths in the world. Amongst the States and UTs, Tamil Nadu had the highest number of accidents, with around 64,000.²

In spite of this being a major public health problem, there is a dearth of studies from India that addresses this topic.² National statistics of road traffic accidents in India. Journal of Orthopedics, Traumatology and Rehabilitation. 6. 1. 10.4103/0975-7341.118718.)

The objectives of this study are to ascertain the epidemiological factors of road traffic accidents and the pattern of injuries seen in non-fatal cases of Road Traffic Accidents reported to a tertiary care hospital in a rural area of Tamil Nadu.

Materials and methods

This cross-sectional study was conducted at a tertiary care hospital between August- September 2018. This hospital is located on the highway, in a rural area of Salem, Tamil Nadu.

The data for this study was obtained from hospital records. The inclusion criteria were patients involved in a road traffic accident between 1st March 2018 and 31st July 2018 and admitted as an

inpatient to the hospital. The patients who were seen only on an outpatient basis, those who had fatal injuries, and those with incomplete hospital records were excluded from the study. We also excluded patients who received treatment at another hospital before being admitted to the hospital in this study. The data from the hospital case sheets were collected using a pre-designed questionnaire. This questionnaire was designed to collect demographic information, details regarding the circumstances and nature of the accident, as well as the nature of injuries sustained by the patient. As road traffic accidents are medico-legal cases, patient histories were usually meticulously taken. However, many records did not include details such as whether the patient was wearing a seatbelt or helmet, the years of driving experience the patient had, alcohol intake by the patient, and weather conditions at the time of the accident. Therefore, such details could not be obtained, and this is one of the limitations of the study.

All cases that fulfilled the selection criteria were included resulting in a final sample size of 186.

Data was collected in Microsoft Excel and was analyzed using SPSS

Results

The total number of patients included in this study was 186. The age distribution of cases is depicted in Table 1. The patient's age ranged from 1 to 75 years with the mean age being 37 years. Most victims were in the 21-30 years age group, accounting for 62 (33.33%) patients. The majority of accident victims were males 152 (81.7%), while only 34 (18.3 %) were females.

The time distribution of the accidents is shown in Table 2. The maximum number of accidents 77 (41.4%) took place between 1800- 2200 hours. The most common mode of transport of the victim was two-wheelers (73.1%). Regarding recorded causality by type of collision, fall from two wheelers was most common (31.7%) followed by a collision between Two-wheeler with LMV (18.8%).

The most common body regions injured were the extremities 127 (68.2 %) followed by the skull and maxillofacial injuries 99 (53.2 %). 31.7% of patients had multiple external injuries, while 15.6% of cases had no external injuries. 56 (30.1%) of patients had head injuries. Of the various types of head injuries, 9 (4.8%) had an extradural hemorrhage, 26(14.0%) had a subdural hemorrhage, and 24 (12.9%) had a subarachnoid hemorrhage. 42 (22.6%) had head injuries classified as 'others' which included diffuse axonal injury, intracerebral hemorrhage etc.,

A detailed analysis of various external injuries on the body of victims revealed that, the most common pattern of injury was lacerations observed in 96 (51.1%), abrasions 83 (44.6%), followed

by bruises 12 (6.5%). 59 patients (31.7%) had multiple injuries. 29 patients (15.6%) had no external injury. The commonest sites of fracture were the skull and maxillofacial regions 62 (33.3%),

followed by lower limbs 37 (19.9%) and upper limb 34 (18.3%). The less common sites were spine 7 (3.8%), and pelvis 5 (2.7%).

Discussion

Most road traffic accident victims in our study belonged to the age group of 21- 30 years. A similar finding has been observed by other researchers (Pathak, Singh, Mishra)^{4,5,6}. This is probably because drivers in this age group have lesser driving experience compared to older drivers, and also because they have a tendency to take more risks

Male victims outnumbered female victims by a ratio of 4:1 in our study, with 152 male victims (81.7%) and 34 female victims (18.3%). A preponderance of male victims was also noted in other studies (Pathak, Singh)^{4,5,7}. This could be because males tend to travel more for the purposes of work

The most common type of vehicle involved was a two-wheeler. This has also been observed by other studies (Pathak, Singh)^{4,5}. This is because two-wheelers are inherently riskier than four-wheelers and also because of the lack of use of protective gear, especially helmets, by riders of two-wheelers,

The most common type of collision observed was between two-wheelers and Light Motor Vehicles. A similar finding was noted by Mishra.⁶ In a study by Singh, the most common type of collision was between two-wheelers and heavy motor vehicles, followed by two wheelers and light motor vehicles.⁵

A unique finding in our study is that the most common cause of accidents was a 'fall from two-wheeler' ie. A fall from the vehicle took place without colliding with another vehicle. This accounted for 31.7% of cases. There could be many reasons for this including slippery roads, over-speeding and loss of control of the vehicle, or the inexperience of the two-wheeler rider. Most studies dealing with road traffic accidents have not mentioned this as a cause of accidents, and this needs to be investigated further.

Most accidents, in our study, took place between 6pm to 10 pm. Other studies^{7,8,9,10} have also noted that the majority of accidents take place in the evening. This is because the evenings tend to be the time of rush hour traffic, with people returning from work. Also, there is decreased visibility due to low light conditions.

With regards to the site of injuries, the most common site of injury was skull and maxillofacial region (33.3%) followed by injuries of the lower limbs (19.6%) and upper limb(18.3%) Other

studies have reported that lower limb fractures were the most common followed by those of the upper limb and maxillofacial region.^{4,5,11}

The predominance of injuries to the skull and maxillofacial region in our study is most probably due to the lack of use of helmets by two-wheeler riders. Increased efforts, through health education and legislation, need to be made to ensure that two-wheeler riders wear helmets. The most common types of injuries were lacerations and abrasions. This was also seen in studies by Singha and Mehta SP.^{5,12}

Limitations

As this study was based on hospital records, it had some limitations. While case sheets were scrutinized for completion, there could have been errors in history taking. As mentioned earlier, we could not include data on the use of seatbelts or helmets by the victims, or alcohol consumption before the accident as this information was not always included in the patient's history. The time period considered for the study (March- July) is the monsoon period in Salem, and this could have had an impact on road and traffic conditions and the number of road traffic accidents occurring during this period.

Conclusion

Deaths due to road traffic accidents are largely preventable, and we hope that studies such as ours can play a role in influencing the policy changes required to make Indian roads safer.

Conflict of Interest: None

References

1. WHO, Global Status report on Road Safety, Geneva, World Health Organization; 2018:1-5
2. Ministry of Road Transport and Highways, Road Accidents in India-2018 ; 46 (https://morth.nic.in/sites/default/files/Road_Accidednt.pdf)

3. Ruikar, Manisha. (2013). National statistics of road traffic accidents in India. *Journal of Orthopedics, Traumatology and Rehabilitation*. 6. 1. 10.4103/0975-7341.118718.)
4. S.M. Pathak, Maj,a,* A.K. Jindal, et al, An epidemiological study of road traffic accident cases admitted in a tertiary care hospital. *Medical Journal Armed Forces India* 70 (2014) 32-35
5. Singh R, Singh HK, Gupta SC, Kumar Y. Pattern, severity and circumstances of injuries sustained in road traffic accidents: a tertiary care hospital-based study. *Indian J Community Med*. 2014;39(1):30-34. doi:10.4103/0970-0218.126353
6. Misra P, Majumdar A, Misra MC, et al. Epidemiological Study of Patients of Road Traffic Injuries Attending Emergency Department of a Trauma Center in New Delhi. *Indian J Crit Care Med*. 2017;21(10):678-683. doi:10.4103/ijccm.IJCCM_197_17
7. Anantharaman, V., & Logaraj, M. (2015). Epidemiology of Road Traffic Accidents (RTA) Reported at a Tertiary Care Hospital in Chennai.
8. Kiran ER, Saralaya KM, Vijaya K. A prospective study on roadtraffic accidents. *J Punjab Acad Forensic Med Toxicol*.2004;4:12e16
9. Pawan BC, Meghna N, Rodrigues D, et al. Understanding somefactors associated with road traffic accidents: analysis of datafor the year 2003 available from major hospitals in Mangalore.*Indian J Prev Soc Med*. 2005;36(3):87e93
10. Jha N, Srinivasa DK, Roy G, Jagdish S. Epidemiological study of road traffic accident cases: a study from South India. *Ind JCommunity Medicine*. 2004;29(1):20e24
11. Patil SS, Kakade RV, Durgawale PM, Kakade SV. Pattern of road traffic injuries: a study from western Maharashtra.*Indian J Community Med*. 2008;33:56e57
12. Gunjan B, Ganveer, Tiwari RR. Injury pattern among non-fatal road traffic accident cases: a cross-sectional study in central India. *Ind J Med Sci*. 2005;59(1):9e12.
13. Mehta SP. An epidemiological study of road traffic accident cases admitted in Safdarjang hospital, New Delhi. *Indian J Med Res*. 1968;56(4):456e466.

Table 1. Age distribution

Age	Number	Frequency
<10 years	1	0.5%
10-20	13	7.0%
21-30	62	33.3%
31-40	35	18.8%
41-50	30	16.1%
51-60	30	16.1%
Over 60 years	15	8.1 %

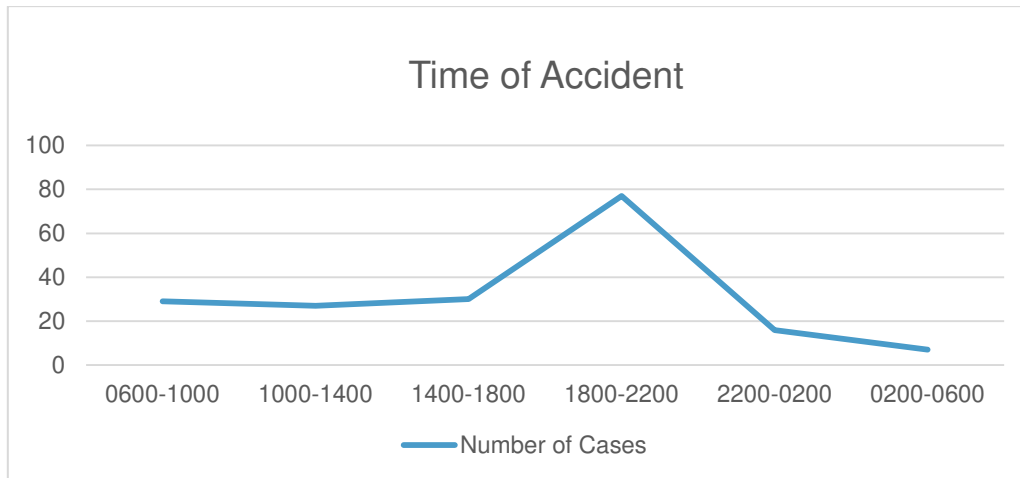


Figure 1: Time of Accident

Table 2. Mode of transport of victim

Mode of transport	Number	Percentage
Pedestrian	23	12.4
Two wheeler	136	73.1
Four wheeler/LMV	18	9.7
Heavy Motor vehicle	7	3.8
Bicycle and others	2	1.1
Total	186	100

Table 3. Nature of accident

Vehicles Involved	Number	Percentage
Two wheeler with pedestrian	17	13.6%
Car/ LMV with pedestrian	6	3.2%
HMV with Pedestrian	2	1%
Two wheeler with Two wheeler	34	18.3%
Two wheeler with Car/LMV	35	18.8%
Four Wheeler/ LMV with Four Wheeler/ LMV	8	4.3%
Two wheeler with HMV	17	19.1%
Four Wheeler LMV with HMV	2	1.1%
HMV with HMV	4	2.2%
Fall from Two wheeler	59	31.7%
Others	2	1%

*Includes collision of vehicle with bullock cart or bicycle