

Epidemiology of Road Traffic Accidents Reported in a Rural Health Centre of a Medical College in Puducherry

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Abstract: *Background:* Road Traffic Accident (RTA) is an injury due to crashes originating from, terminating with or involving a vehicle partially or fully on a public road. The burden of RTA were increasing at an alarming rate in India due to rapid urbanisation and use of motor vehicles without personal protection. RTAs are often preventable causes of death with good health education, optimal use of safety precautions, training in basic driving skills. Understanding the pattern of RTAs will enable us to have tailor made strategies at community level and thereby prevent the losses. Thus, the study aims to understand the epidemiological pattern of RTA reported in the rural health centre of a private medical college in Puducherry. *Methods:* A record based retrospective cross - sectional study was conducted at the rural health centre of a private tertiary care hospital in Puducherry to study the characteristics, burden, and pattern of RTAs cases reported for a one - year period from 1st January 2022 to 31st Dec 2022 were reviewed. A data extraction tool was used to collect the retrospective data. The collected data were entered in Epidata application version 3.1 and analysed using SPSS Statistics version 21.0. *Result:* Majority of the victims i.e. 75.6% were men and were in the age group of 20 - 40 years. 10% of the accidents occurred on city roads. Nearly 63% of the vehicle causing accidents motorised two wheelers and 48.7% had fallen from the vehicle as a mechanism of injury. About 36 % of the victims had lower extremities followed by 29.2% upper extremities and 19.5% head injury. (Table 2) *Conclusion:* There is an increase in incidences of road traffic accidents which can lead to a rise in public health burden. Most of the accidents occur between 20 - 40 years of age which is not a dependent age group which can affect the financial status of their families. RTAs are important public health hazards and should be addressed through strengthening of emergency healthcare, stricter enforcement of traffic laws and health education.

Keywords: Epidemiology, Road Traffic Accident, Pattern of accidents, Risk factors, Traffic law

1. Introduction

A Road Traffic Accident (RTA) is an injury due to crashes originating from, terminating with or involving a vehicle partially or fully on a public road. [1] RTA are preventable causes of death. The Motor Vehicle Amendment (MVA) act was enacted on 1st September 2019, to reduce the trend of RTA and their fatalities. It is found that there is nearly a forty percent decline in the mortality in RTA victims post MVA act implementation. [2] Indian roads have become unsafe due to increasing trend of urbanisation, industrial growth, population growth and exceptional motorization rate coupled with high - speeding vehicles to the commuters. [3]

Health education regarding time management, safety precautions, training in basic driving skills particularly in young men along with behavioural and engineering action will be a better preventive strategy for RTA. [4] Non - use of safety measures helmets, seat belts, child restraints adds to morbidity and mortality from RTAs. [5] Most of the RTA can be avoided if vehicle separation on roads, improvement in road quality, change in road user behaviour both motorist and pedestrians, law enforcements and better and safer road designs are implemented effectively. [3] RTA causes economic losses to individuals, their families and to the nation. These losses come from cost of treatment, productivity loss for the victim and for the family members who need to take time off work or school to care for the injured.

The main objective of this study is to find out the epidemiological pattern of RTA reported in the rural health centre of a private medical college in Puducherry.

2. Material and Methods

A record based cross - sectional study was conducted at the Department of Community Medicine's rural health centre of a tertiary care hospital in Puducherry, India.

The study sample comprises of cases reported as road traffic accident to the rural health centre for a one - year period from 1st January 2022 to 31st Dec 2022. The investigators conducted a retrospective desk review of the cases reported with RTA. The month wise data was collected. The information regarding the basic demographic details (age, sex), the road type (national highways, state highways, city roads, approach or service road, village roads), vehicle causing accident (heavy motor vehicle, light motor vehicle, motorized two - wheeler, other means), and mechanism of injury (front or rear impact, fall from the vehicle, run over by vehicle, vehicle striking other objects) were obtained. The pattern of organ injury in the RTA victims was tabulated based on head injury, facial injury, upper extremity injury, lower extremity injury, spinal injury and more than one site of injury was also collected from the patient records.

The Microsoft excel was used as data extraction tool to collect the retrospective data and analysed using SPSS Software version 21.0 (IBM Corp., Armonk, New York). The categorical variables were expressed in frequency and percentages.

3. Results

The demographic variables of the RTA victims were studied. It was found that the majority of the victims i. e

75.6% were men and were in the age group of 20 - 40 years. However, details regarding the occupation and income level were not available.

The details regarding the type of road where the accident happened, what was the mechanism of injury, what type of vehicle caused the accident were all collected from the records. The data was not available for most of the victims about the type of road where the accident occurred. However, 10% of the accidents occurred on city roads. Nearly 63% of the vehicle causing accidents motorised two wheelers and 48.7% had fallen from the vehicle as a mechanism of injury. (Table 1)

Based on the distribution of RTA cases in the year 2022, it was found that the majority of RTA cases were reported in the month of March, followed by January and December. (Figure 1). It is noted that the most cases occurred between 10 am and 12 noon. (Figure 2)

RTA can involve single site injury or multiple site injury. The various sites of injury categorised in this study are head, face, eye, chest, abdomen, spinal, upper and lower extremities. In this study it is found that nearly 36 % of them had lower extremities followed by 29.2% upper extremities and 19.5% head injury. (Table 2)

4. Discussion

A study conducted by Howley et al showed the mean age of RTA victims was 32.4 years and 87.3% were men. (6) Male pattern of RTA peaked in the third decade of their life. (7) This is similar to our study, over 58% of them were in the 20 - 40 years age group with a mean age of 33.5 years and 75.6% of them were men.

Hadaye et al in a study conducted on epidemiological factors related to RTA, two wheeler and light motor vehicles caused the majority of RTA ie.39% and 28.3% respectively. Injuries to lower extremities were involved in 47.2% of the victims. (8) In our study, nearly 63% of the vehicles causing accidents were motorised two wheelers and 36% of them had injuries to lower extremities.

The time of RTA reported was more likely in the time zone of 8 pm to midnight, followed by 4 pm to 8 pm (9) and evening to night hours (10). This is in contrast to our study findings, where most of the cases were between 10 am and 12 noon.

The findings indicate that there is an urgent need for implementation of road traffic regulations and creating awareness among the drivers as well as pillion riders

Limitation of this study is that the data is collected from cases reported in a rural health centre in a small zone. Lack of proper denominator and details regarding the follow - up of these cases and their morbidity and mortality status is not known. There wasn't any proper format to document these cases and data capture was a big challenge.

5. Conclusion

There is an increase in incidences of road traffic accidents which can lead to a rise in public health burden. Most of the accidents occur between 20 - 40 years of age which is not a dependent age group which can affect the financial status of their families. RTAs are important public health hazards and should be addressed through strengthening of emergency healthcare, stricter enforcement of traffic laws and health education.

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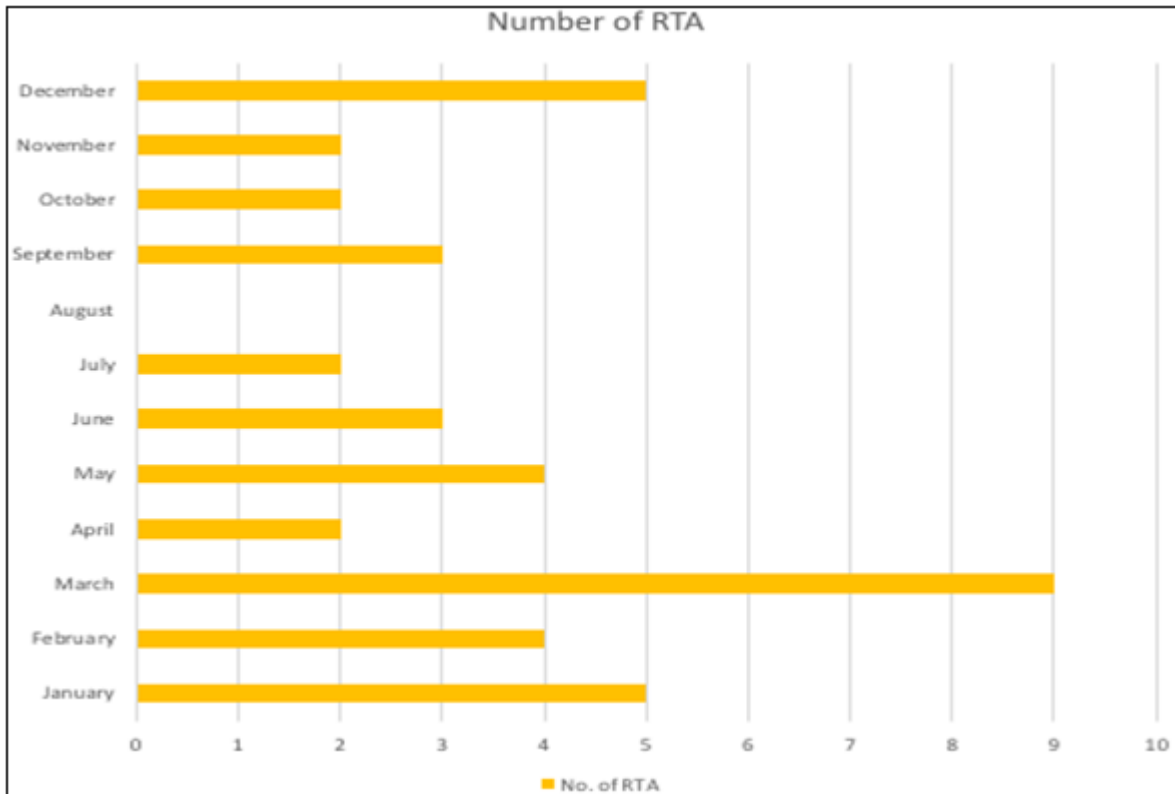


Figure 1: Number of RTA cases per month in the year 2022. N=41

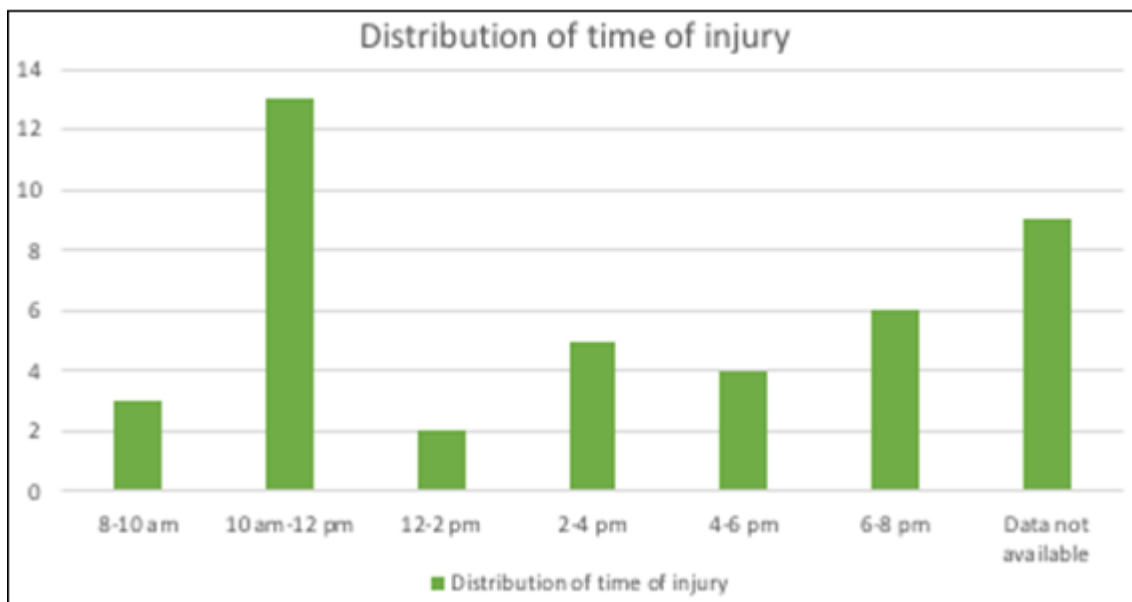


Figure 2: Bar plot showing distribution of time of injury

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Table 1: The demographic variables of RTA victims N= 41

Variables	Class (n)	Frequency (%)
Age (Years)		
<20	6	14.60%
20 - 40	24	58.50%
41 - 60	8	19.50%
>61	3	7.30%
Sex		
Male	31	75.60%
Female	11	26.80%
Road Type		
National highways	1	2.40%
State highways	2	4.80%
City roads	4	9.75%
Approach/ Service roads	2	4.80%
Village roads	1	2.40%
Data not available	31	75.60%
Vehicle causing accident		
Heavy motor vehicle	3	7.30%
Light motor vehicle	2	4.80%
Motorized two - wheeler	26	63.40%
Others	1	2.40%
Data not known	9	21.90%
Mechanism of Injury	5	12.10%
Front or rear impact	20	48.70%
Fall from the vehicle	0	0%
Run over by vehicle	5	12.10%
Vehicle striking other objects	1	2.40%
Others	10	24.30%
Data not available		

Table 2: Pattern of organ injury in the RTA victims

Region of injury	Class (n)	Frequency (%)
Head injury	8	19.50%
Facial injury	1	2.40%
Upper Extremity injury	12	29.20%
Lower Extremity injury	15	36.50%
Spinal injury	1	2.40%
More than one site of injury	4	9.75%