

# Socio-demographic profile of head injury victims due to fatal road traffic accidents in Mangalore

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## Abstract

**Background:** Road traffic accidents are important causes of mortality and morbidity due to increasing number of vehicles, the risk taking behavior among general population and changes in lifestyle. **Aim:** To study the socio-epidemiological profile head injury victims due to fatal road traffic accidents in Mangalore. **Material and Methods:** Out of the 346 cases of RTA autopsied from Mangalore jurisdiction, 286 cases (82.65%) were found to have sustained fatal head injuries. The data required for the study was collected and analyzed retrospectively from all cases. A proforma was prepared accordingly to collect the data based on the deceased's particulars. **Results:** The highest incidences of 56 cases were noticed among the age group of 20-29 years. 247 cases (86.4%) were that of males. The highest incidence of 57 cases (19.9%) were noticed on Saturdays and during 12 Noon-6PM (39.5%). Pedestrian deaths 105 cases (36.7%) were more and on highways. Evidence of helmets used were recorded in only 8.92% cases. Alcohol was recorded in 6 (2.1%) cases. **Conclusion:** Proper education of road users especially regarding speed driving, helmet use, alcohol and other drug abuses may help to control human errors involved in fatal head injuries due to road traffic accidents.

**Key Word:** Head injury, fatal road traffic accidents, epidemiological factors, safety measures

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## INTRODUCTION

Death due to road traffic accident is one of the most common forms of unnatural death and its history is as old as the invention of the wheel itself. Road traffic accidents were ranked ninth among the leading causes of death in the world during 1990s. If the same trend continues, it is estimated that the road traffic accidents will become the second leading cause of death by the year 2020.<sup>1</sup> Road traffic injuries are one of the top three causes of death among individuals aged between 5 and 44 years and more people die in road accidents in India than anywhere else in the World.<sup>2</sup> Road traffic accidents are important causes

of mortality and morbidity due to increasing number of vehicles, the risk taking behavior among general population and changes in lifestyle. The exponentially increasing number of automobile vehicles, poor adherence to traffic rules and regulations such as maintaining lane discipline, driving in zigzag patterns by public, poorly maintained and congested roads, abuse of alcohol, narcotic substances, lack of awareness about traffic rules and new generation of high speed vehicles are altogether responsible for accidents. Epidemiological data on road traffic accidents in this part of India have been reported but there is no proper correlation with head injury. The present study was conducted to study the socio-epidemiological profile head injury victims due to fatal road traffic accidents in Mangalore.

## MATERIAL AND METHODS

All cases of road traffic accidents involving fatal head injuries which underwent autopsy at Tertiary Care Hospital in Mangalore over a period of five years were included in the study.

### Inclusion criteria

- All cases of fatal head injuries due to road traffic accidents.

**Exclusion criteria**

- All other fatal head injury other than road traffic accidents.

This was a record based retrospective study. The data required for the study was collected and analyzed retrospectively from all cases subjected to autopsy at two major tertiary care hospitals, situated in Mangalore. A proforma was prepared accordingly to collect the data based on the deceased’s particulars, with complete external and internal examination in retrospective studies of those involved in fatal head injury cases due to road traffic accidents. Recorded details include name, age, sex, address, information furnished by the police in the inquest papers, postmortem reports, investigation reports if any and cause of death. All the data obtained was kept anonymous to protect the identity of the deceased and also for confidential medico legal information.

**RESULTS**

The present study included all cases of fatal head injuries due to road traffic accidents in Mangalore jurisdiction. Out of the 346 cases of RTA autopsied from Mangalore jurisdiction, 286 cases (82.65%) were found to have sustained fatal head injuries. Age of incidence among the individuals was broadly grouped into ten years range and the highest incidences of 56 cases were noticed among the age group of 20-29 years and 50-59 years respectively, as depicted in table 1. On considering sex profile among deaths due to road traffic accidents, 247 cases (86.4%) were that of males and 39 cases (13.6%) of females out of total 286 cases.

**Table 1:**

Patient characteristics	No. of cases	%
<b>Age (years)</b>		
1-9 years	14	4.9%
10-19 years	18	6.3%
20-29 years	56	19.6%
30-39 years	47	16.4%
40-49 years	52	18.2%
50-59 years	56	19.6%
60-69 years	29	10.1%
≥70 years	14	4.9%
<b>Sex</b>		
Male	247	86.4%
Female	39	13.6%
<b>Types of victims</b>		
Two wheeler rider	101	35.3%
Pillion rider	62	21.7%
Pedestrian	105	36.7%
Three wheeler rider	07	2.4%
Four wheeler rider	11	3.9%

The days of occurrence among deaths due to road traffic accidents, the highest incidence of 57 cases (19.9%) were noticed on Saturdays and lowest incidence of 29 cases (10.1%) each were noticed on Tuesday and Wednesdays.

The time was divided into 4 periods of 6 Hours interval. In this aspect of study most of the road traffic accidents had occurred during 12 Noon – 6PM (39.5%) followed by 6PM – 12 Midnight (37.8%), 6AM – 12 Noon (17.8%) and 12 Midnight – 6AM (4.9%) respectively. On further analysis of victim profile, pedestrian deaths formed the larger chunk of the pie, accounting for 105 cases (36.7%). 101 cases (35.3%) were of two wheeler drivers, followed by pillion riders in 62 cases (21.7%), four wheeler occupants in 11 cases (3.9%) and three wheeler occupants in 7 cases (2.4%). Incidence of road traffic accidents was more in highways and main roads as compared to rural roads. The highest incidences of 111 cases (38.8) were noticed in Highways and the lowest incidences of 58 cases (20.3) were noticed in rural areas.

**Table 2: Socio-demographic characteristics**

Socio-demographic characteristics	No. of cases	%
<b>Day of occurrence</b>		
Sunday	49	17.2
Monday	41	14.3
Tuesday	29	10.1
Wednesday	29	10.1
Thursday	36	12.6
Friday	45	15.8
Saturday	57	19.9
<b>Time of accident</b>		
12 am	14	4.9
6 am	51	17.8
12 pm	113	39.5
6 pm	108	37.8
<b>Place of incidence</b>		
Highway	111	38.8
Main road	117	40.9
Rural road	58	20.3

Among the total 101 cases of two wheelers involved in road traffic accidents, the evidence of Helmets used were recorded in 9 (8.92%) cases while 92 (91.1%) did not use it. It was also noted that, none of the deceased pillion riders wore protective head gears. The evidence of alcohol was recorded in 6 cases (2.1%) out of 286 cases and was not detected in remaining 280 cases (97.9%) of road traffic accidents; however, this has to be interpreted with caution, owing to certain limitations like lack of reliable source of information which could have reduce the data available for the same.

**Table 3: Human factors**

Human factors	No. of cases	Percentage
<b>Safety measures</b>		
Helmet used	09	9%
Helmet not used	92	91%
<b>Alcohol consumption</b>		
Consumed	06	2.1%
Not consumed	280	97.9%

## DISCUSSION

Road traffic injuries are one of the top three causes of death among individuals aged between 5 and 44 years and more people die in road accidents in India than anywhere else in the World.<sup>2</sup> Head is the most common site to be injured in road traffic accidents. This study was done for a period of five years in Mangalore Jurisdiction of Karnataka, to draw a victim profile of fatal head injuries due to road traffic accidents. In the present study male predominance 247 cases (86.4%) was seen and the age of incidence being common in 20 to 29 years and 50 to 59 years with 56 cases (19.6%) respectively. The similar results were drawn in the study conducted in Budapest, Hungary, where it was concluded that the males outnumbered females and the principal age group involved in fatal road traffic accidents was 20 to 29 years and 50 to 59 years with cases of 16.4% respectively.<sup>3</sup> In our study, peak timing of incidence of road traffic accidents was 12PM to 6PM followed by 6PM to 12AM which is probably due to heavy and unequal distribution of the traffic at those hours on the road. These data were similar to the studies done in Mangalore and Manipal, Karnataka wherein it was concluded that most of the road traffic accidents being common during afternoon hours (12PM to 6PM) followed by evening hours (6PM to 12AM).<sup>4,5</sup> In this study, maximum fatalities of Road traffic accidents were due to head injuries which occurred on the main roads in 117 cases (40.9%) followed by highways in 111 cases (38.8%), compared to rural roads in 58 cases (20.3%). These data were similar to the study done in Guwahati, Assam where it was reported that the frequencies of road traffic accidents were more common in urban areas (43.42%) and less in rural areas (16.98%).<sup>6</sup> In the present study, pedestrian involvement was seen in 105 cases (36.7%), followed by two wheeler rider in 101 cases (35.3%) and pillion rider in 62 cases (21.7%). The four wheeler occupant and three wheeler occupant were 11 cases and 7 cases respectively. The similar results were drawn in the study done in Chandigarh wherein pedestrian's involvement (42%) was more as compared to the two wheeler motorcyclist's involvement (25%).<sup>7</sup> Helmet wearing was infrequent among Motorcyclists in the present study, 92 (91%) Riders, among 101 riders were not wearing a helmet at the time of accident. None of the pillion riders were wearing helmet at the time of accident. Failure to wear a helmet resulted in a significant higher incidence of head injury and death among motorcyclists which includes both riders and pillion riders. Similar results were seen in the study done in Dharan, Nepal, wherein minimal use of helmet was the main cause of fatal head injury in two-wheeler occupants.<sup>8</sup> In this study, it was seen that out of 101 riders the evidence of alcohol was recorded in 6 cases (2.1%).

This was in contrast with a study from United States where 26% of deaths due to road traffic crashes were attributed to alcohol use.<sup>9</sup> However, this has to be interpreted with caution, owing to certain limitations like lack of reliable source of information and viscera not collected and send to RFSL which could have reduced the data available for the same.

## CONCLUSION

The following preventive aspects if followed may help to control human errors involved in fatal head injuries due to road traffic accidents:

- Strict enforcement of traffic rules and regulations and awarding severe punishment for the offenders.
- Measures to be taken by the concerned authorities to control traffic jam at peak hours in city limits by allowing use of alternative avenues.
- Zebra crossing for pedestrians with fluorescent lights and sign boards.
- Speed breakers should be laid according to the specifications with zebra lines and fluorescent lights, periodically properly maintained and repainted.
- Proper education of road users especially regarding speed driving, helmet use, alcohol and other drug abuses and driving and number of seat occupants.
- Making it compulsory for both the riders and pillion riders to wear crash helmets.

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