

SOCIO DEMOGRAPHIC DISTRIBUTION OF ROAD TRAFFIC ACCIDENTS WITH EMPHASIS ON PATTERN OF CRANIOFACIAL INJURIES IN BANGALORE: AN AUTOPSY BASED STUDY

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Abstract

Accidents caused by motor vehicles claim the largest toll of life and tend to be most serious among all types of accidents. Road traffic accidents (RTA) continues to be a growing menace, incurring heavy loss of valuable manpower with corresponding drain of potential economic growth of the country. Present study was taken up with the aim to assess the socio demographic distribution and the pattern of head injuries occurred in road traffic accidents [RTA]. Methodology: A descriptive cross sectional autopsy study was conducted on the RTA cases. A convenient purposive sampling technique was applied to select 113 road traffic accident cases autopsied. Results: the majority of the victims were between 21 to 40 years (46.02%), males 92.0%, and Hindus 90.27%. Maximum incidents of RTA took place between 6:00 PM to 12:00 PM(37.17%), Majority of the RTA took place on weekends (54.87%) ,at cross roads (54.87%). Heavy motor vehicles were involved in majority of the cases (39.82%). Conclusions: Since then the patterns of injury from man's interaction with the motor car may have been somewhat modified by crash protection devices, such as helmets, seat belts and air bags, but injuries due to road traffic related trauma are worsening each year.

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Introduction

India has 1% of vehicles in the world; but it accounts for about 6% of the total cases of unintentional injuries.¹ Physical trauma is the leading cause of diseases and death all over world. Among all types of accidents, those caused by motor vehicles claim the largest toll of life and tend to be most serious, road traffic

accidents(RTA) continues to be growing menace incurring heavy loss of valuable man –power, along with corresponding drain of potential economic growth of country. These injuries also have a definitive causative pattern and mechanism in terms of agent (product/vehicle), host (human beings) and environmental (roads, homes, workplaces) factors along with system-related issues. This work was to determine the craniofacial injury patterns in autopsies to facilitate the awareness, by identifying, describing and quantifying trauma for use in planning and evaluation of preventive programs. The labyrinthine architecture of human facial bones provides a propensity for their collapse at impact and they may thereby act as an effective energy absorber by preventing injury to the

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brain.² Frequently, craniofacial injuries are life threatening injuries and require multidisciplinary team approach.

Aims

To assess Socio demographic distribution of road traffic accidents and the pattern of head injuries.

Methodology

A descriptive cross sectional post mortem study was conducted during the period of November 2007 to November 2009 on the RTA victims. A purposive sampling technique was

applied to select the sample of 113 cases, brought to the Forensic Medicine Department of KIMS hospital Bangalore, with an alleged history of RTA. For the purpose of the study, a RTA was defined as an accident which took place on the road between two or more objects, one of which must be any kind of a moving vehicle. Various study variables analyzed were sex, age, time of RTA, type of vehicle, position of the victim during RTA and nature of injury of road traffic accidents at autopsies. Each autopsy report was reviewed for demography, injury, and place of accident, as a means of determining the location of the crash.

Results: Following are the results

Table 1: Distribution of RTA victims based on Demographic status and sex n= 113

| Category | Male | Female | Total |
|--------------|-------------|-----------|--------------|
| Age in years | | | |
| < 20 | 16 (14.16%) | 1 (0.88%) | 17(15.04%) |
| 21–40 | 52 (46.02%) | 5 (4.42%) | 57(50.44%) |
| 41–60 | 31 (27.43%) | 3 (2.65%) | 34(30.09%) |
| = 61 | 5 (4.42%) | 0 (0.00%) | 5(4.42%) |
| Total | 104 (92.0%) | 9 (8.0%) | 113 (100.0%) |

Table 2: Showing the religion of the victims

| Religion | | | |
|----------|-----------------|-----------|--------------|
| | Male | Female | Total |
| Hindu | 102 (90.27%) | 6 (5.31%) | 108 (95.58%) |
| Muslim | 2 (1.77%) | 2 (1.77%) | 4 (3.54%) |
| Others | 0 (0.0%) | 1 (0.88%) | 1 (0.88%) |

Table-3: Showing the place of accident.

| Place of Accident | Male | Female | Total |
|-------------------|-------------|-----------|-------------|
| National High way | 6 (5.31%) | 3 (2.65%) | 9 (7.96%) |
| State High way | 22 (19.47%) | 3(2.65%) | 25 (22.12%) |
| City Main road | 15 (13.27%) | 2(1.77%) | 17 (15.04%) |
| Cross road | 61 (53.98%) | 1(0.88%) | 62 (54.87%) |

Table-4: Showing the time of accident

| Time of Accident | Male | Female | Total |
|------------------|-----------------|-----------|--------------|
| 12 am–5:59 am | 7 (6.19%) | 1 (0.88%) | 8(7.08%) |
| 6 am–11:59 am | 25 (22.12%) | 2 (1.77%) | 27(23.89%) |
| 12 pm–5:59 pm | 33 (29.20%) | 3 (2.65%) | 36(31.86%) |
| 6 pm–11:59 pm | 39 (34.51%) | 3 (2.65%) | 42(37.17%) |
| | 104 (92.04%) | 9 (7.96%) | 113 (100.0%) |

Table-5: Distribution of RTA victims based on type vehicle involved in the accident

| Category Type of Vehicle | Male | Female | Total |
|------------------------------|-------------|-----------|-------------|
| Two wheeler | 27 (23.89%) | 2 (1.77%) | 29 (25.66%) |
| Auto rickshaw | 3 (2.65%) | 0 (0.00%) | 3 (2.65%) |
| Light motor vehicle (LMV) | 18 (15.93%) | 3 (2.65%) | 21 (18.58%) |
| Heavy motor vehicle (HMV) | 42(37.17%) | 3(2.65%) | 45(39.82%) |
| Unknown | 14 (12.39%) | 1(0.88%) | 15(13.27%) |

Table-6: Showing the Position of the victim at the time of accident

| Position of the victim | Male | Female | Total |
|------------------------|-------------|-----------|-------------|
| Rider two wheeler | 19 (16.81%) | 0 (0.00%) | 19 (16.81%) |
| Pillion rider | 8 (7.08%) | 2 (1.77%) | 10 (8.85%) |
| Occupant Auto rickshaw | 3 (2.65%) | 0 (1.77%) | 3 (2.65%) |
| Rider LMV | 7 (6.19%) | 1 (0.88%) | 8 (7.08%) |
| Occupant LMV | 11 (9.73%) | 2 (1.77%) | 13 (11.50%) |
| Occupant HMV | 42 (37.17%) | 3 (2.65%) | 45 (39.82%) |
| Pedestrian | 14 (12.39%) | 1 (0.88%) | 15 (13.27%) |

Discussion

In the present study majority of the victims were between 21 to 40 years i.e 46.02%. It is consistent with the studies conducted by Agnihotri AK³ and Chaudhary B L⁴. Males were common victims (92.0%) in our study and is consistent with the studies conducted by Agnihotri AK,³ Chaudhary B L⁴ and Khajuria B⁵ who reported ,males accounted for 80.58%, 83.20% and 85.14% respectively. Male to female ratio observed in our study is 11.5/1 while studies by Agnihotri AK³ and Neven AH⁶ reported this ratio as 4.2:1 and 5.5/1 respectively which is quite low in comparison with the current study. Our study highlights that 95% of the victims belonged to Hindu religion. It may be due to the fact that Hindu population is more in this city than other religions according to census report.⁸ It was observed in the current study that the commonest place of accident was at the road intersections [cross roads] . It is also observed by Khajuria B⁵. It is due to the fact that Bangalore is cosmopolitan city with more intra city traffic than nearby high ways. It is inconsistent with the studies by other s. It was observed that 37.17% of the RTA occurred in between 6:00 PM to 12:00 PM and 54.87% took place on weekends, as the weekend traffic is much more in the city. Kimberly MA et. Al⁸ also observed the same, but Khajuria B⁵ reported most (54.22%) RTAs

Table 7: Showing the type of vehicle and type of craniofacial injuries

| Cause of Injury | Type of Injury | | | |
|---------------------|----------------|---------------------------|----------------|------------|
| | Brain injuries | Intra Cranial Haemorrhage | Cranial Bone # | No Injury |
| Two wheeler | 16 (18.39%) | 18 (21.18%) | 19 (22.22%) | 0 (0.00%) |
| Auto rickshaw | 2 (2.30%) | 1 (1.18%) | 1 (1.59%) | 0 (0.00%) |
| Light motor vehicle | 19 (21.84%) | 17 (20.00%) | 2 (3.17%) | 2 (66.67%) |
| Heavy motor vehicle | 37 (42.53%) | 35 (41.18%) | 38 (60.32%) | 1 (33.33%) |
| Unknown | 13 (14.94%) | 14 (16.47%) | 8 (12.70%) | 0 (0.00%) |
| Total | 87 (76.09%) | 85 (75.22%) | 68 (60.17%) | 3 (02.65%) |

occurred during the daytime, between 9 AM to 8 PM.

In our study it was observed that 39.82% of the vehicles involved were Heavy motor vehicle (HMV) and least by auto rickshaws ,while in Khajuria B⁵ it was light vehicles and two wheelers were involved more in 61.05%, 42% respectively.

It was observed that occupants of the vehicles constituted the majority[62.83%] of the victims, as our study deals with intra city traffic involving city buses, and other passenger transportation vehicles. Khajuria B⁵ observed occupants of vehicles constituted 42%. Among the drivers, two wheeler drivers were more 16.81% involved in accidents. Khajuria B⁵ observed 31.1% as two wheeler drivers.

Among the craniofacial injuries observed in the current study, 60.17% cases had skull fractures, of that 48.67% were comminuted fractures and 54.87% fissure fractures with 7.08% jaw bone fracture, and 8.85% teeth dislocations. In intracranial hemorrhages [75.22%], majority were subdural (37.7%) with 9% brain laceration,. It is consistent with observations of Khajuria B⁵ Neven AH⁶ and others⁹. In another similar study by Murray GD et al. 52% of head injuries were related to Motor Vehicle Accidents.¹⁰

Conclusion

The present study highlights the demography and the pattern of injuries in R T A. More people have been killed in R T As than the world wars. The all India road data shows that 83.5% of the accidents were due to the driver's fault. Other contributory factors were: mechanical defects in vehicles, pedestrian fault, fault of the passenger, bad roads, and bad weather.¹¹ since the patterns of injury from man's interaction with the motor vehicles may be modified by crash protection devices, such as helmets, seat belts and air bags, but injuries due to road traffic related trauma are worsening each year because of scanty regard to all these. The usage of motorized vehicles is growing day by day throughout the world. It is a particular concern in developing nations like India where increasing urbanisation, overcrowding and scant regard for the 'rules of the road' are seen. It is high time that the policy makers should take a look at these types of studies and do concerned modifications in the years to come.

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