SHORT COMMUNICATIONS

Pattern of Craniofacial Injuries and Socio Demographic Distribution of Road Traffic Accidents in Bangalore: Autopsy Study

Hanumantha, Bayapareddy Narapureddy, Pallavi Madithati
Chennai Medical College Hospital & Research Centre, Irungalur, Trichy, Tamilnadu, India
Correspondence to: Bayapareddy Narapureddy (bayapreddy916@gmail.com)

Received Date: 28.07.2012 **Accepted Date: 15.09.2012**

DOI: 10.5455/ijmsph.2012.1.152-156

ABSTRACT

Background: 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.

Objective: Present study was taken up with the aim to assess the Socio demographic distribution of road traffic accidents and the pattern of craniofacial injuries occurred in RTA.

Materials and Methods: A Descriptive Cross sectional study was conducted on the post mortems of RTA cases. Convenient purposive sampling technique was applied to select the sample of 113 road traffic accident autopsies.

Results: Majority of the victims aged between 21 to 40 years (50.44%), most of the victims were males 104 (92.0%), and Hindus 102 (90.27%). More crashes 42 (37.17%) took place between 6:00 PM to 12:00 PM on weekends 62 (54.87%) at city cross roads 62 (54.87%). Most of the accidents occurred by heavy motor vehicle 45(39.82%). Most of the times in road traffic accidents, productive age group males (21-40 years) were injured or lost their life. More than fifty per cent of the accidents were found to occur during the weekend evenings from 6:00PM to 12:00PM.

Conclusion: Since the road traffic traumas are worsening each year, to minimise the severity of injury, man's interaction with the motor car may have been somewhat modified by crash protection devices, such as helmets, seat belts and air bags.

Key Words: Craniofacial Injury; Road Traffic Accidents; Bangalore

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) continue to be growing menace incurring heavy loss of valuable man –power, along with corresponding drain of potential economic growth of the 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 brain.[2] Frequently, craniofacial injuries are life threatening injuries and require multidisciplinary team approach.

METHODS

A Descriptive Cross sectional study conducted during the period of November 2007 to November 2009, on road traffic accident autopsies. A purposive sampling technique was applied to select the study sample of 113 cases; those brought to the Forensic Department of KIMS hospital Bangalore, for autopsy with an alleged history of RTA were included to study. 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 analysed were sex, age, time of RTA, type of vehicle (light vehicle like two wheelers, three wheelers, car, jeep etc. and heavy vehicle like truck, bus, train, tractor) and position of the victim during RTA (occupant/ driver / pedestrian), and nature of injury of roads traffic accidents autopsies. Each autopsy report was reviewed for demography, type of injury and place of accident. The information regarding the location and intersection of road was obtained from police report.

Statistical analysis: the data was analyzed by means and proportions, p value less than 0.05 ($p<0.05$) at 95% confidence interval, was considered significant, SPSS Version 12 Statistical Software was used to analyzed the data.

RESULTS

Half of the victims were aged between 21 to 40 years 57 (50.4%). Out of the all victims (113) majority belongs to Hindu religion 102 (90.27%) and most of the victims were males 104 (92.0%). male: female ratio was 11.5:1. Demography details of RTA victims have been provided in table 1. More than half of the accidents took place on weekends 62 (54.87%), Majority of crashes 42 (37.17%) were between 6:00 PM to 12:00 PM at city cross roads 62 (54.87%).

Most of the accidents occurred by Heavy Motor Vehicles (HMV) 45 (39.82%). A total of 27 (23.89%) drivers were victimized. Distribution of Road traffic accident victims based on type of vehicle used and position at the time of RTA were provided in table 2.

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 (08.0%)	113 (100.0%)
Time of Day			
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%)
Total	104 (92.04%)	9 (7.96%)	113 (100.0%)
Time of Week			
Weekday	48 (42.48%)	3 (2.65%)	51 (45.13%)
Weekend	56 (49.56%)	6 (5.31%)	62 (54.87%)
Place of Accident			
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-2: Distribution of Road Traffic Accident Victims based on Type of Vehicle Used and Position at the Time of RTA

Category	Male	Female	Total
Type of Vehicle			
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%)
Position of the Victim			
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%)
LMV Driver	7 (6.19%)	1(0.88%)	8 (7.08%)
LMV Occupants	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%)

In a total of (113) skull injuries; almost all had 108 (95.58%) scalp contusion and meningeal tear was observed in 71 (81.6%) cases. Out of all skull bone fractures; fissure fracture was seen in 63 (54.87%) and communited fracture was seen in 55 (48.67%).

Table-3: Details of Craniofacial Injuries Occurred in RTA

Type of Vehicle	Type of Injury				
	*Facial Bone Fracture	Brain Injuries	Intra Cranial Haemorrhage	Cranial Bone Fracture	No Injury
Two Wheeler	12(27.27%)	16(18.39%)	18 (21.18%)	19 (22.22%)	0 (0.00%)
Auto Rickshaw	1(2.27%)	2 (2.30%)	1 (1.18%)	1 (1.59%)	0 (0.00%)
Light Motor Vehicle	19(43.18%)	19 (21.84%)	17 (20.00%)	2 (3.17%)	2 (66.67%)
Heavy Motor Vehicle	10(22.72%)	37 (42.53%)	35 (41.18%)	38 (60.32%)	1 (33.33%)
Unknown	2(4.54%)	13 (14.94%)	14 (16.47%)	8 (12.70%)	0 (0.00%)
Total	44 (100%)	87 (100%)	85 (100%)	68 (100%)	3 (100%)

*Facial bone Fracture includes= Mandible, maxillary, Tooth fracture and dislocation and Nasal bones

Out of the 113 RTA victims 87 (76.9%) suffered with one or more types of brain injuries, among the brain injured victims (87) almost all had 87 (100.0%) pneumocephalus, 85 (97.7%) were had intracranial hemorrhage, 42(48.2%) had brain edema, 39 (44.8%) had brain concussion, 13 (14.9%) had brain laceration, Of the 113 victims a total of 44(38.9%) were suffered with Facial bone fractures, among the 44 facial bone fractures nasal bone fractures were commonest 21(47.7%), followed by Teeth dislocation 10 (22.2%), Jaw bone fracture were 8 (18.1%), and Maxillary fracture were only 5 (11.3%). Details of type of vehicle used and type of craniofacial injuries affected provided in table 3.

DISCUSSION

This study found that the majority of the victims aged between 21 to 40 years 50.44%. Similar Studies conducted by Agnihotri et al[3] and Chaudhary et al[4] found that 45.2% and 51.20% of craniofacial injuries occurred in 16-30 years and 20-39 years in respective age group in respective studies. In this study most of the RTA victims 92.0% were males. In other studies Agnihotri et al[3] Chaudhary et al[4] and Khajuria et al[5] the most common victimized were males 80.58%, 83.20% and 85.14% respectively confirmed our study findings. our study observed the male to female ratio was 11.5/1 but Agnihotri et al[3] and Neven et al[6] reported 4.2:1and 5.5/1 respectively in both the studies the ratio was quite low. Present study found 37.17% of the RTA took place between 6:00 PM to 12:00 PM, 54.87% on weekends. Kimberly et al also argued the same,[7] but Khajuria et al noticed 54.22% of RTAs occurred in daytime, between 9 AM to 8 PM.[5] More than half (54.87%) of the RTA occurred at city cross roads.

This study noticed that 39.82% of the RTA occurred with Heavy motor vehicle (HMV) followed by two wheeler 25.66%, Light motor vehicle (LMV) 18.58% and pedestrians 13.27%. In a study conducted by Khajuria et al contradicted our study findings, light vehicles and two wheelers were more commonly involved in RTAs 61.05%, 42% respectively and pedestrians 55.27%.[5] Present study observed that the large group of the victims (62.83%) were occupants of various vehicles. Khajuria et al argued that occupants of various vehicles were only 42%. Among the motorized vehicle drivers, two wheeler riders were more commonly (16.8%) victimized followed by LMV drivers (7.0%). Khajuria stated higher percentage than our study findings; 31.1% were two wheeler riders and 14.9% LMV drivers.[5]

Among head injuries; 54.87% were suffered with one or more skull bones fractured, 48.67% communited fractures and 54.87% fissured fracture. Khajuria et al noticed that 68.85% had skull bone fractured among the RTA victims. Neven AH also argued the same, in skull fractures, 47.84% were fissure fracture and 24.31% were depressed fractures.[6] In another study from Nepal, reported 39% of medico-legal cases, that were brought to the emergency department, 70% of them had craniofacial trauma and cause was RTA.[3] Among the facial bone fractures (44); nasal bone fractures were commonest 47.7%, followed by Jaw bone fracture 18.1%, and teeth dislocation 22.2%. In another similar study 52% of head injuries were related to Motor Vehicle Accidents. [8]

Out of all RTAs 76.9% were suffered with one or more types of brain injuries; among this almost all had pneumocephalus, and intracranial hemorrhage. Majority of the brain injured

victims (81.6%) affected with meningeal tear and brain edema (48.2%). Agnihotri et al[3] also told the same, that is soft tissue injury was the most common type of craniofacial trauma followed by facial and cranial bone fractures. Khajuria et al also noticed the similar findings; Subdural Haemorrhage 79.31%, Subarachnoid Haemorrhage 63.33%, Extradural Haemorrhage 48.85%, Intra-cranial injuries 21.26%, and Contusion 35.63% of the victims.[5] Another study conducted in India, noticed that the head was the commonest site to be injured and Subdural Haemorrhage was the commonest haemorrhage in RTA.[9] Concussion of brain tissue was highest among all types of brain tissue injury (Brain concussion 44.8% and14.9% brain laceration), but it is contradicted by another study.[9]

CONCLUSION

The usage of motor vehicles is growing worldwide. Most of the times in road traffic accidents, productive age group males (21-40 years) were injured or lost their life. More than fifty per cent of the accidents were found to occur during the weekend evenings from 6:00PM to 12:00PM. Most of the RTA deaths were due to head injuries, (Brain injury and Intra cranial hemorrhages) facial and cranial bone fractures. Since the road traffic traumas are worsening each year, to minimise the severity of injury, man's interaction with the motor car may have been somewhat modified by crash protection devices, such as helmets, seat belts and air bags.[10] Hospitals with designated trauma centers have improved outcomes when compared to hospitals without them, and if trauma victims transfer directly to a trauma center it can greatly improve the outcome of the trauma case.[11] In certain traumas, such as craniofacial trauma, it can be beneficial to have a highly trained health care provider available to maintain airway, breathing, and circulation.[12] This study may help the planners to plan better road safety measures and to make availability of better health care facilities on roads.

REFERENCES

1. Verma PK, Tewari KN. Epidemiology of Road Traffic Injuries in Delhi: Result of a Survey. Regional Health Forum WHO South-East Asia Region 2004; 8(1):8-12.
2. Lee KF, Wagner LK, Lee YE, Suh JH, Lee SR. The impact-absorbing effects of facial fractures in closed-head injuries: An analysis of 210 patients. J Neurosurg. 1987; 66: 542-47.
3. Agnihotri AK, Joshi HS, Tsmilshina N. Study of Craniofacial Trauma in a Tertiary Care Hospital, Western Nepal. Medico-Legal Update. Ind Medica. 2005;5(1): available from [cited 2012-07-22] http://www.indmedica.com/journals.php?journalid=9&issueid=67&articleid=858&action=article
4. Chaudhary B L, Singh D, Tirpude B H, Sharma R K, Meel V. Profile of Road Traffic Accident Cases in Kasturba Hospital of M.G.I.M.S., Sevagram, Wardha, Maharashtra. Ind medica. 2005;5: available from [cited 2012-07-22] . http://www.indmedica.com/journals.php?journalid=9&issueid=70&articleid=884&action=article
5. Khajuria B, sharma R, verma A. A profile of the autopsies of road traffic accident victims in Jammu. Journal of clinical and diagnostic research. 2008; 2:639-642. Available from [cited 2012-08-22] http://www.jcdr.net/articles/pdf/190/149_E%28C%29_F%28G%29_Pf%28H%29_p.pdf.
6. Neven AH, Rabab SK, Ashraf MdE, Mohamed A Pattern of craniofacial injuries in patients admitted to Tanta University Hospital--Egypt. J Forensic Leg Med. 2010; 17:26-32.
7. Kimberly M, Auman MS, Joseph AK, Michael F MA, Ballesteros MS, John E, et. al., Autopsy Study of Motorcyclist Fatalities: The Effect of the 1992 Maryland Motorcycle Helmet Use Law. Am J Public Health. 2002; 92:1352–55
8. Murray GD, Teasdale GM, Braakman R, Cohadon F, Dearden M, Iannotti F, et al. The European Brain Injury Consortium survey of head injuries. Acta Neurochir (Wien).1999; 141(3): 223-36.
9. Jha N, Srinivasa DK, Roy G, Jagdish S. Epidemiological study of road traffic accident cases: A study from South India. Indian J Community Med. 2004;29:20-4.
10. Jagnoor. Road Traffic Injury Prevention: A Public Health Challenge.CME. Indian J Community Med. 2006; 31:129-31. available from [cited 2012-08-22]

http://medind.nic.in/iaj/t06/i3/iajt06i3p129.pdf.

11. Nirula R, Maier R, Moore E, Sperry J, Gentilello L. "Scoop and run to the trauma center or stay and play at the local hospital: hospital transfer's effect on mortality". J Trauma. 2010;69 (3): 595–601.
12. Krausz AA, El-Naaj IA, Barak M. "Maxillofacial trauma patient: coping with the difficult airway". World Journal of Emergency Surgery. 2009;4: 21.

Cite this article as: Hanumantha, Narapureddy B, Madithati P. Pattern of craniofacial injuries and Socio demographic distribution of road traffic accidents in Bangalore: Autopsy study. Int J Med Sci Public Health 2012; 1:152-156.
Source of Support: Nil
Conflict of interest: None declared