Indian Internet Journal of Forensic Medicine & Toxicology
Vol. 10, No. 4 October-December 2012, 100-103
DOI : 10.5958/j.0974-4487.10.4.037

Original Article

Pattern and Distribution of Fatal Injuries in Road Traffic Accidents at Udaipur

Sharma Yogesh[1]*, K Sharma Manish[2], Sharma Manisha[3]

[1]Associate Professor and Head of the Department of Forensic Medicine and Toxicology, S.P. Medical College, Bikaner, Rajasthan-334001, India
[2]Assistant Professor, Department of Forensic Medicine and Toxicology, RNT Medical College, Udaipur, Rajasthan-313001, India
[3]Senior Demonstrator, Department of Biochemistry, RNT Medical College, Udaipur, Rajasthan-313001, India

*Email: sharmayogesh958@yahoo.com

ABSTRACT

The term accident has been defined as an occurrence in a sequence of events, which usually produces unintended injury, death or property damage. Today, accidents are among the leading causes of death, in some cases the foremost cause. This study is having a lot of importance in this Udaipur region, as this area is very hilly, having most of the population as tribes, congested and important national highways, a lot of mines, marble industries, India's prime tourist locations, a lot of beautiful lakes, low education level in general population, use of two-wheelers in maximum extent by farmers and labourers in their daily routine livelihood works, hard geographical conditions, high rainy areas that makes the transportation quite difficult, faulty roads, primary and secondary referral centres with inadequate resources and manpower and most important factor that makes this area very vulnerable for fatal road traffic accidents is low awareness level regarding traffic rules, regulations and civic sense in general population.

Keywords: Laceration, Road Traffic Accidents, Regional Injuries, Fatal Injuries

INTRODUCTION

Motor vehicle surface transport commenced with Cugnot's steam tricycle in 1769. Ryan[1] conducted a study to examine the pattern of anatomical injury in victims of motor vehicle crashes who die prior to reaching hospital.

Dhillon[2] studied the pattern and distribution of injuries in fatal road traffic accidents in Shimla, Himachal Pradesh. The material comprised of 50 cases, who dead of head injury, limp injuries and combination of injuries. Out of 50 cases, maximum road traffic accidents occurred in January, February and in May and June. A total of 44% of people died in zero hour, which had no chance of receiving first aid also. The temporal bone fractures were in maximum number of cases followed by frontal bone (10%), parietal and occipital bone (8%).

Biswas studied the pattern of road traffic accidents in North-East Delhi[3]. Yadav[4] studied the correlation between intracranial hemorrhages and skull fractures. The study was conducted on 150 cases of fatal head injury brought to mortuary in Department of Forensic Medicine for medicolegal post-mortem examination, where the death was cranio-cerebral damage were included in the study. They concluded that correlation between the skull fractures and intracranial hemorrhage was found to be statistically significant.

MATERIALS AND METHODS

The study was conducted in the Department of Forensic Medicine at RNT Medical College, Udaipur. The period of the study was a full 1 year from 1 March 2008 to 28 February 2009. Cases of deaths due to vehicular/road accidents brought during this period were included in this study. During the period of study (i.e., full 1 year), 200 cases of accidents deaths were considered for this epidemiological study.

OBSERVATIONS

As shown in Table 1, out of 200 cases 150 cases (75%) were resident of rural areas, whereas 50 cases (25%) were from urban areas.

Table 1: Rural and urban distribution (*n*=200)

Place of residence	Male		Female		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
Rural	129	75.8	21	70	150	75
Urban	41	24.2	09	30	50	25
Unknown	00	00	00	00	00	00
Total	170	100	30	100	200	100

Table 2: Distribution of cases according to the place of accident (*n*=200)

Place of accident	No of cases	Percentage (%)
National highway	114	57
State highway	30	15
City road	26	13
Village road	30	15
Approach road	00	00

Out of 200 cases included in this study, 114 cases (57%) occurred on national highways.

As depicted in Table 3, motorcyclist did the common groups of victims involved in fatal accident comprise 88 cases (44%).

Table 4 gives data analysis regarding various causative factors leading to accidents. The factor of human error is found to be most significant (168 cases, 84%), in which drivers were at fault in majority of cases (54%) as against faults of others, like pedestrian, slow moving vehicles, compromising just 22.5%.

The 200 subjects had total of 242 injuries or group of injuries believed to have been fatal or contributing to death. Head injury was dominant in all road users (50.8%) followed by thoracoabdominal in 15.3% and multiple injury in 12.8%. The combination of head and abdominal injuries were the least accounting for death (seven cases, 2.9%). The mean fatal lesion per case was 1.21.

DISCUSSION

According to a study conducted by National Transportation Planning and Research Centre, New Delhi, a person is killed or injured in every 4 min in traffic accidents in India[5].

Like other epidemic diseases, road traffic accidents involve three factors: agent, host and environment, i.e., the road use, the vehicle and the road environment. The detailed study of these factors will help in control and prevention of the accidents and reducing morbidity and mortality[6].

The most common age group involved in fatal traffic

Table 3: Type of road user killed in the road accidents (*n*=200)

Type of road user killed	Male		Female		Total	
	No. of cases	%	No. of cases	%	No. of cases	%
Pedestrians	37	21.7	16	53.3	53	2.5
Motorcyclist	88	51.8	00	00	88	44
Cyclists	05	2.94	00	0.0	5	2.5
Occupants of cars and jeeps	19	11.2	04	13.3	23	11.5
Occupants of medium vehicles	02	1.13	01	3.3	3	1.5
Heavy vehicles	13	7.6	03	10	16	8
Others	06	3.5	06	20.0	12	6
Unknown	00	00	00	00	00	00
Total	170	100	30	100	200	100

Table 4: Road accidents: causes and factors responsible (*n*=200)

Causes	No of cases	Percentage (%)
Human error		
I Fault of drivers	108	54
II Fault of pedestrians	28	14
III Fault of slow moving vehicles	17	8.5
IV Fault of passengers	15	7.5
Mechanical failure	10	5
Defective roads	06	3
Bad weather/poor visibility	16	8
Total	200	100

Table 5: Fatal injuries (*n*=200)

Fatal injury	No of cases	percentage
Head injury	123	50.8
Cervical spine injury	03	1.23
Chest injury	04	1.65
Abdominopelivic injury	13	5.37
Head and chest injury	08	3.3
Thoracoabdominal injury	37	15.3
Head and abdominal injury	07	2.9
Limb and fracture	16	6.6
Multiple injuries	31	12.8
Total fatal injuries	242	
Fatal injury per case	1.21	

accidents was 21–30 years. Males outnumbered females in ratio of 8.5:3. Two-third of all the cases was in the age group of 11–40 years in both sexes. This finding correlates with studies carried out by other workers[7].

In present study, 171 cases were married (85.5%) and 29 cases were unmarried (4.5%). The maximum number of victims were illiterate constituting 56% of all cases followed by below metric (21.5%) and 11% cases were metric but below graduate. The majority of cases were labourers and farmers accounting for 27% and 26%, respectively, of cases followed by businessmen.

Since the Udaipur population is mostly rural and tribal, three-fourth of cases were from the villages, whereas only one-fourth of cases were from the urban area (Table 1).

Out of 200 cases, 157 cases (78.5%) were of lower socio-economic status.

Two major national highways pass through the state of Rajasthan, i.e., national highway (NH) 8 and NH 76. Since NH 8 passes through Udaipur the maximum fatalities were from NH 8 accounting 57% of all cases, 15% of accidents occurred on the state highways and rest of the cases were from village and city roads (Table 2).

The maximum cases of accidents occur in the months of summer accounting for 95 cases (47.5%) followed by winters, 66 cases (33%). The least cases are seen in months of rainy season, 39 cases (19.5%).

The maximum numbers of cases in summer are due to increase movement of people due to various social events like marriages. Tribal people are having a lot of social gathering, festivals and their religious ceremonies. Moreover, in summer environment alcohol use is increased.

Motorcyclists were the commonest group of victims involved in fatal road accidents comprising 44% of total cases followed by pedestrians (26.5%) and occupants of cars and jeeps (11.5%; Table 3).

Two wheelers were the commonest offenders on road being involved in 57.5% of cases followed by cars and jeeps in 22% cases. The pedestrians and cyclists were hit by cars and jeeps in 22.6% and 20% cases, respectively.

The factor of human errors is found to be the most significant. In 84% cases, drivers were at fault in majority (54%) as against the faults of others on road, like pedestrians, cyclists, motorcyclists and passenger, comprising just 30% (Table 4).

Multiple body parts were involved in a single case. There were total of 630 injuries found in 200 cases (injury per case being 3.15). The commonest injuries were observed to head in 154 (77%) cases and to chest in 147 (73.5%) cases. Injuries to the abdomen were seen in 78 (39%) cases and to neck in 22 (11%) cases. Two hundred subjects had a total of 242 injuries or group of injuries believed to have been fatal or contributing to death. The fatal injury per case being 1.21

Table 6: Cause of death

Authors	Cause of death					
	Head injury (%)	Multiple injuries (%)	Chest injury (%)	Abdominal injury (%)	Head and chest injuries (%)	Head and abdominal injuries (%)
Sevitt (1968)[8]	24	22	25	8.2	10.8	10
Sevitt (1973)[9]	58	27	16	7	—	—
Chandra *et al*. (1979)[10]	49.46	28	—	22.52	—	—
Lau *et al*. (1998)[11]	39.6	49.1	—	—	—	—
Present study	46.5	53	—	—	—	—

Serious brain injury was dominant among all road users (50.8%) followed by multiple injuries (12.8%) and thoracoabdominal injuries (15.3%). The combination of head and abdominal injuries were the least accounting for death in 2.9% of cases (Table 5).

The incidence of fatal lesions varied in different road users. Head injury was commonest in pedestrians, cyclists and motorcyclists. Similar findings were noted by other workers like Sevitt[8,9], Chandra[10] and Ghosh[12] (Table 6).

CONCLUSION

Many road traffic accidents are caused by alcohol consumption by drivers. Strict penalty, rules and regulations for prevention of alcohol consumption by drivers should be imposed. Trauma centre should be created on NH 76 and NH 8 to decrease the mortality and morbidity in road traffic accident victims. On national highways, there should be public telephone booths with toll-free numbers so that information about accident can be given to nearest trauma centre and police station. Frequent teaching programmes should be planned for school going children about traffic rules and regulations. Establishment of trauma intensive care unit in all tertiary medical college hospitals should be compulsory. Speed limit is an important factor to decrease the road traffic accident.

As a whole, a multidimensional approach should be implanted to control the fatal road traffic accidents by increasing the awareness of general people by educating them regarding traffic rules and regulations, the maximum consumption of government resources, with the help of non-government organisations, proper human resources training, proper planning by government machinery and medical advancement to decrease the mortality and morbidity in road traffic accidents. So that an important and active group of society can be saved by this life-threatening disastrous events.

REFERENCES

1. Ryan M, Stella J, Chiu H and Ragg M. Injury patterns and preventability in prehospital motor vehicle crash fatalities in Victoria. Emerg Med 2004; 16(4): 274-279.
2. Dhillon Sangeet and Sekhon HS. Pattern and distribution of injuries in fatal road traffic accidents in Shimla (Himachal Pradesh). Medicolegal Update 2007; 7(4): 115-118.
3. Biswas G, Verma SK, Sharma JJ and Aggarwal NK. Pattern of road traffic accidents in northeast Delhi. J Forensic Med Toxicol 2003; 20(1): 27-32.
4. Yadav A, Kohli A and Aggarwal NK. Study of correlation between intracranial hemorrhages and skull fractures. J Forens Med Toxicol 2008; 25(2): 42-45.
5. Tirpude BH, Naik RS, Anjankar AJ and Khajuria BK. A study of the pattern of craniocerebral injuries in road traffic accidents. J Indian Acad Forensic Med 1998; 20(1): 9-12.
6. Norman LG. Road traffic accidents epidemiology, control and prevention. World Health Organization, Geneva, 1962; pp. 7-18.
7. McCarrol JR, Braunstein PW, Cooper W, et al. Fatal pedestrian automotive accidents. JAMA 1962; 180(2):127-30.
8. Sevitt S. Death after road traffic accidents. Med Sci Law 1968; 8: 271-87.
9. Sevitt S. Fatal road accidents in Birmingham: times to death and their causes. Injury 1973; 4: 281-7.
10. Chandra J, Dogra TD and Dikshit PC. Pattern of cranio-intracranial injuries in fatal vehicular accidents in Delhi. Med Sci Law 1979; 19(3): 186-94.
11. Lau G, Seow E and Lim S. A review of pedestrian fatalities in Singapore from 1990 to 1994. Ann Acad Med Singapore 1998; 27(6): 830-7.
12. Ghosh PK. Postmortem study of pattern of injury involving pedestrian victims. J Foren Med Toxicol 1991; 8(3-4): 1-8.