

A Cross-Sectional Study: Pattern of Injuries in Non Fatal Road Traffic Accident Cases in Bagalkot City of Karnataka

Vijayamahantesh S.N.¹, Vijayanath V.²

1- Associate Professor of Forensic Medicine, S.Nijalingappa Medical College, Bagalkot, Karnataka, India.

2- Associate Professor of Forensic Medicine and Toxicology, Vinayaka Mission's Kirupananda Variyar Medical College & Hospital, Salem, Tamil Nadu, India.

Corresponding author: Vijayamahantesh S.N., S.Nijalingappa Medical College, Bagalkot, Karnataka, India.

Email: fmmahant@yahoo.com

ABSTRACT

A cross-sectional study of pattern of injuries in road traffic accidents was conducted over a period of one year involving 179 victims. Males (143) were more commonly involved than females (36) and majority of the victims (56) were in the age group of 21-30 years. Rural victims (151) outnumbered the urban (28). One third of the victims were illiterates.

36 accidents took place in an interval of 2-4PM. Two wheeler occupants (71) were commonly involved than other vehicles and collision between two wheelers and between two wheeler and four wheeler was most common mode of accident. The head and neck region showed more number of fractures and other injuries compared to other body parts and in the limbs right side limbs show more injuries than left side limbs.

INTRODUCTION

India is undergoing major economic and demographic transition coupled with increasing urbanization and motorization. Injuries on roads, at homes, and in the workplace have increased due to lack of safety-related policies and programmes. The health sector bears the maximum brunt in terms of provision of acute care, and short-term and long-term rehabilitation service¹. . The alarming increase in morbidity and mortality owing to road traffic accidents over the past few decades is a matter of great concern globally. Currently motor vehicle accidents rank ninth in order of disease burden and are projected to be ranked third in the year 2020. Worldwide, the number of people killed in road traffic crashes each year is estimated at

almost 1.2 million, while the number injured could be as high as 50 million².

Some of the factors that increase the risk of road crashes in India are unsafe traffic environment, poor road infrastructure and encroachments that restrict safe areas for pedestrians; lack of safety engineering measures; traffic mix and an increasing number of motorized vehicles; unsafe driving behavior and lack of valid or fake driving licenses.

The present study has been carried out regarding the various epidemiological, medicolegal aspects of vehicular accidents in our country making an attempt to establish various causative factors, pattern and distribution of injuries and thereby to plan successful measures against it.

Material and Methods

A cross sectional study was conducted at a tertiary care hospital of Bagalkot city over a period of 6 six months from 1st January 2011 to 30th June 2011. The study group consisted of all the road traffic accident victims reporting to hospital during this period i.e. 179 consecutive cases, both male and female, of all age groups. An RTA was defined as an accident which took place on the road, one of which had to be a moving vehicle³. Any injury on the road without involvement of a vehicle (e.g. a person slipping and falling on the road and sustaining injury) or injury involving a stationary vehicle (e.g. person getting injured while washing or loading a vehicle) were excluded from the study. The accident victims were interviewed with a pre-tested questionnaire especially designed for this purpose. The information collected comprised of demographic characteristics of victim, time of accident, type of vehicle involved, protection used, and site and type of injuries sustained.

RESULTS

Table-1: Age and sex wise distribution of RTA cases

Age	Males		Females		Total	
	No	%	No	%	No	%
1-10 yrs	09	6.29	03	08.34	12	06.71
11-20yrs	16	11.19	04	11.12	20	11.18
21-30 yrs	44	30.78	12	33.33	56	31.29
31-40 yrs	25	17.49	06	16.66	31	17.31
41-50 yrs	35	24.48	06	16.66	41	22.90
51-60 yrs	08	5.59	04	11.12	12	06.71
61-70 yrs	05	3.49	01	02.77	06	03.35
71-80 yrs	01	0.69	00	00.00	01	00.55
Total	143	100.00	36	100.00	179	100.00

A total of 179 road traffic accidents were registered during the study period of which 143 were males and 36 were female patients. Maximum number of cases 56 (31.29%) were seen in the age group of 21-30 years for both males (44cases) as well as females (12cases)

Table-2: Domicile distribution of RTA Deaths

Domicile	Males		Females		Total	
	No	%	No	%	No	%
Rural	121	84.61	30	83.33	151	84.35
Urban	22	15.39	06	16.67	28	15.65
Total	143	100.00	36	100.00	179	100.00

In the present study out of the 179 cases most of the cases 151 (84.35%) were from rural areas as compared to urban areas which comprised of 28 cases (15.65).table 2

Table-3: distribution of RTA cases according to educational status of victims

Education	No	%
	Illiterate	60
Primary	31	17.31
Higher primary	48	26.82
Graduate	40	22.35
Total	179	100.00

Table no3 shows that among the study group 60 victims (33.52%) were illiterates followed by 48 victims with higher primary education and 40 victims (22.35%) were graduates.

TABLE-4 DISTRIBUTION CASES ACCORDING TO TIME OF ACCIDENT

TIME	NO CASES	PERCENTAGE
12-2 AM	20	11.18
2-4 AM	07	03.92
4-6 AM	00	00.00
6-8 AM	06	03.35
8-10 AM	05	02.80
10-12 PM	24	13.41
12-2 PM	14	07.82
2-4 PM	36	20.12
4-6 PM	25	13.95
6-8 PM	32	17.87
8-10 PM	04	02.23
10-12 AM	06	03.35
TOTAL	179	100.00

Table 4 shows that among all RTA cases admitted maximum number 36(20.12%) accidents took place in an interval of 2-4 PM followed by 32 cases between 6-8 PM as per the history furnished by the patients or by the individual who have brought them to the hospital.

TABLE 5-DISTRIBUTION OF RTA CASES ACCORDING TO VEHICLES THEY WERE USING

VEHICLE	NUMBER	PERCENTAGE
2 WHEELER	71	39.66
3 WHEELER	40	22.35
4 WHEELER	46	25.65
PEDESTRIAN	22	12.44
TOTAL	179	100.00

It is evident from table no 5 that majority of the victims 71 (39.66%) were found to be using 2 wheeler vehicles as compared to other vehicle users of which 38 victims were drivers and the remaining

33 were pillion riders. In these patients only 5 out of 38 drivers were using helmets and none of the pillion riders were using the helmets.

TABLE -06 DISTRIBUTION OF CASES ACCORDING TO THE VEHICLES INVOLVED IN ACCIDENTS

Vehicles involved in accidents	Number of victims
2 wheeler & 2 wheeler	26
2 wheeler & 3 wheeler	07
2 wheeler & 4 wheeler	24
2 wheeler & pedestrian	13
2 wheeler & bullock cart	04
2 wheeler alone	09
3 wheeler & 3 wheeler	01
3 wheeler & 4 wheeler	17
3 wheeler & pedestrian	00
3 wheeler alone	21
4 wheeler & 4 wheeler	26
4 wheeler & pedestrian	09
4 wheeler alone	22

Table no 6 shows that maximum accidents involved the collision between two 2 wheelers and a collision between two 4 wheelers accounting for 26 incidents each.

A detail analysis of various injuries on the body of victims reveals that abrasions, contusions and lacerations were most commonly seen on the head and neck region as compared to other regions. Next most common area to show the injuries was the right thigh region. It is seen that right limbs both upper and lower showed more injuries than left limbs.

In all the admitted cases a total of 194 fractures were found in different bones of the body of which 35 fractures(18.04%) were noticed in the skull. Next common bone to involved was tibia which was

**TABLE-7 DISTRIBUTION OF INJURIES ON
DIFFERENT PARTS OF BODY**

Injuries/body part	Abrasion	Contusion	Laceration
Head and neck	54	21	81
Right arm	25	05	02
Right forearm	05	00	02
Right hand	14	02	12
Left arm	08	03	00
Left forearm	11	01	01
Left hand	12	05	09
Right thigh	24	09	17
Right leg	15	00	15
Right foot	16	06	12
Left thigh	21	05	07
Left leg	08	02	03
Left foot	04	04	07
Chest	14	06	01
Abdomen	02	02	02

**TABLE 08- DISTRIBUTION OF FRACTURES
SUSTAINED IN RTA CASES**

BONES	NUMBER	PERCENTAGE
SKULL	35	18.04
RT SCAPULA	2	01.03
LT SCAPULA	1	00.55
RT CLAVICLE	6	03.09
LT CLAVICLE	4	02.06
RT HUMERUS	3	01.54
LT HUMERUS	0	00.00
RT RADIUS	6	03.09
LT RADIUS	3	01.54
RT ULNA	8	04.12
LT ULNA	1	00.55
RT HAND BONES	18	09.27
LT HAND BONES	2	01.03
RT HIP	2	01.03
LT HIP	0	00.00
RT FEMUR	14	07.21
LT FEMUR	12	06.18
RT PATELLA	2	01.03
LT PATELLA	2	01.03
RT TIBIA	13	06.70
LT TIBIA	15	07.73
RT FIBULA	12	06.18
LT FIBULA	11	05.70
RT FOOT BONES	17	08.77
LEFT FOOT BONES	5	02.58
TOTAL	194	100.00

fractured in 28 cases (13rt+15lt).

A further analysis of these fractures indicates that right limb bones (103 out of 159 limb fractures) were more commonly fractured as compared to the left limb bones(56 out of 159 limb fractures)

**TABLE 09- DISLOCATIONS SUSTAINED IN RTA
CASES**

JOINT	No	PERCENTAGE
LT AC JOINT	3	17.65
LT ELBOW	1	05.88
RT ELBOW	1	05.88
RT WRIST	3	17.65
LT HIP	3	17.65
LT ANLKE	1	05.88
RT ANKLE	2	11.76
LT FOOT	3	17.65
TOTAL	17	100.00

In the 179 admitted cases 17 dislocation of bones were noticed of which 11 (64.70%) were found on left half of the body as compared to the 6(35.30%) on right side

DISCUSSION

In the present study out of 179 road traffic accident cases 143 were males and 36 were female patients showing a significant male preponderance. Maximum number of cases 56 (31.29%) were seen in the age group of 21-30 years for both males (44cases) as well as females (12cases) These findings with regards to sex and age wise distribution are similar to the studies conducted by Lisa Sarangi⁴, Soori H⁵ Akhilesh Pathak⁶ Nilambar jha⁷, Harnam singh.⁸ and Gunjan B⁹.

In the present study 151 (84.35%) cases were from rural areas as compared to urban areas which

comprised of 28 cases (15.65). this is in contrast to the study of Soori H⁵ in which victims were distributed almost equally from urban and rural areas.

Out of the 179 cases 60(33.52) were illiterates, followed by 48 cases with higher secondary education and 40 were graduates. It is observed that more people with lower levels of education were involved in RTAs.. However, this relationship between education and RTA may not be causal. This coincides with studies of Nilambar Jha^{3&7} conducted at Nepal and south India where maximum victims were illiterates. This is in contrast to study of Lisa Sarangi⁴ in which maximum cases were graduates and to study of Abdulbari¹⁰ B where most victims were having higher secondary education.

Though the accidents took place at all times a day, peak time for accidents was different. Maximum number 36(20.12%) accidents took place in an interval of 2-4 PM followed by 32 cases between 6-8 PM. In our study in an interval between 6AM TO 6 PM total of 110 accidents took place and in between 6PM and 6AM only 69 cases were registered .This could be explained by the fact these are the time durations where maximum traffic can be seen. This is same as that found in the study of Akhilesh P⁶ and Nilambar J⁷ and is in contrast to the study of Gunjan B⁹ where almost equal cases were found in day and time of day.

In the study it was observed that majority of victims 71 (39.66%) were occupants of two wheelers as compared to other vehicles. This is same as other studies of Lisa Sarangi⁴ and Akhilesh P⁶ where as it is in contrast to the study of Harnam⁸ in which pedestrians were the most common and to the study of Gunjan B⁹ in which light motor vehicles were the commonest.

Maximum accidents involved the collision between two 2wheelers and between 2 four wheelers 26

victims each closely followed by collision between two wheeler and 4 wheeler vehicles. (Table 6)

Distribution of injuries sustained on different areas of the body was recorded and it shows that injuries (fractures also) were more common in the head and neck region as compared to any other part of the body. (Table 7 and 8). This finding is in contrast to the study of Harnam Singh⁸ and to the study of Gunjun B⁹ and to the study of Zaka U khan¹⁰ and others in which extremities were more commonly involved. The study also indicates that injuries (fractures also) were more common in right limbs than left limbs in both upper and lower extremity. But dislocation of joints (table 9) was more common in the left side than on the right. No such study was found in the literature for comparison.

CONCLUSIONS

This study shows that in our set up certain age group and sex are more likely to be involved in road traffic accidents than others. It also brings out a fact that people using two wheelers were more commonly involved in accidents compared to others. The distribution of the fractures and other injuries in head and neck region is in compliance with non usage of helmets by two wheelers. So it is recommended that use of helmet should be made compulsory to all people using two wheelers both driver as well as pillion riders and education of the mass regarding road safety measures should be undertaken periodically and at school level also. More and more studies on this aspect should be taken up in near future, so that a strong data base can be created.

References

1. World Health Organization, Regional Office for South-East Asia, New Delhi. *Injury prevention and control in South-East Asia Region*. 2002.

2. World Health Organization. *World report on road traffic injury prevention*. Geneva: WHO; 2004. p.3-29.
3. Jha N, Road traffic accident cases at BPKIHS, Dharan, Nepal. One year in retrospect. *Journal of Nepal Medical Association* 1997; 35: 241-244
4. Lisa Sarangi, L. Parhi, R.K. Parida, P.Panda. A study on epidemiological factors associated with road traffic accidents presenting to the casualty of a private hospital in Bhubaneswar. *Journal of Community Medicine*, July-Dec, 2009, Vol. .5(2): 1-6
5. Soori H, Akbari ME, Ainy E, Zali AR, Naghavi M, Shiva N. Epidemiological pattern of non-fatal Injuries in Iran. *Pak J Med Sci* 2010;26(1):206-211
6. Akhilesh Pathak, N.L. Desania & Rajesh Verma. Profile of Road Traffic Accidents & Head Injury in Jaipur (Rajasthan) *J Indian Acad Forensic Med*, 30(1):6-9
7. Jha Nilambar, D.K. Srinivasa, Gautam Roy, S. Jagdish. Epidemiological study of road traffic accident cases: A study from south India . *Indian Journal of Community Medicine Vol. XXIX, No.1, Jan.-Mar., 2004:20-24*
8. Harnam Singh, Dhatarwal S.K Pattern and distribution of injuries in fatal road traffic accidents in Rohtak (Haryana). *Journal of Indian Academy of Forensic Medicine*, 2004; 26(1):20-23
9. Gunjan B. Ganveer, Rajnarayan R. Tiwari Injury pattern among nonfatal road traffic accident cases: A cross-sectional study in central India. *Indian J Med Sci Vol. 59 No.1, January 2005: 9-12*
10. Khan ZU, Al-Asiri KA, Iqbal J. Injury patterns from road traffic accidents. *Pak J Med Sci* 2010; 26(2):394-397.