Pattern of Injuries in Road Traffic Accidents – An Autopsy Study

K H Thippeswamy[1], Ravindra Kumar C N[2] , H C Govinda Raju[3]

[1] Associate Professor, [2] Assistant Professor, [3]Professor & Head, Department of Forensic Medicine and Toxicology, East Point College of Medical Sciences & Research Centre, Bidarahalli, Bangalore

Abstract

The present study is a retrospective study conducted in the department of Forensic Medicine and Toxicology at East Point College of Medical Sciences and Research Centre, Bangalore, for a period of one year, from September 2018 to August 2019. During this period a total of 46 cases of road traffic accidents were reported amounting to 34.6% of total medico-legal autopsies conducted (133 cases).

Among 46 cases of road traffic accident majority were males 39 (84.8%) and females account to 7 cases (15.2%). Majority of the victims belonged to age group of 31 - 50 years. According to the road user category involved in the accident the maximum were pedestrians (45.7 %) followed by the two wheeler (43.5 %) and the main offending vehicle involved in the accidents were two wheeler (43.5 %). High proportion of cases showed skull fractures (87 %), 52.2 % shows chest bone fractures, followed by lower limb (32.6 %) and upper limb (21.7 %) fractures. Most of the skull fractures were associated with brain injury (82.6%) in the form of laceration or contusions of brain or brain haemorrhages, followed by thoracic injuries leading to lung lacerations or contusions (30.4%). Following the road traffic accidents, most of the victims (80.4%) died at the scene before reaching the hospital.

Keywords: *Road traffic accidents, skull fractures, thoracic injuries, safety measures.*

Introduction

The number of road traffic deaths continues to rise, reaching 1.35 million in 2016. It is the eighth leading cause of death among people of all ages worldwide. It is the leading killer among children and young adults aged between 5 to 29 years. More than half of global road traffic deaths are amongst pedestrians, cyclist and motorcyclists who are still neglected in road traffic system design in many countries. However, the rates of death relative to the size of the world's population has stabilized in recent years.[1]

India accounts for about 10 percent of road accident fatalities worldwide, 85% of all road accident deaths occurring in developing countries, and nearly half in the Asia - Pacific region. The increased rate of fatal road traffic accident worldwide has been attributed to population explosion and increased motorization.[2,3] A road traffic accident can be defined as "an event that occurs on a way or street open to public traffic; resulting in one or more persons being injured or killed where at least one moving vehicle is involved".[4]

A total of 4,64,910 road traffic accident cases were reported and among these 1,47,913 deaths were reported in India during 2017. In the same year Karnataka state reported 42,542 cases of road traffic accident.[5] RTA is the public health issue and cost a lot to individuals, families, communities and nations. The estimated cost is around 1 - 2% of a country's GNP in lower income countries.[6,7]

In any road traffic accident cases, the pattern of injury, fatal and otherwise, varies considerably depending upon whether the victim is a vehicle occupant, a motorcyclist, a pedal cyclist or a pedestrian.[8]

Material and Method

The present study is a retrospective study of medico legal autopsies of all fatal cases of Road Traffic Accident brought to Morgue, East Point College of Medical Sciences and Research Centre, in east part of Bengaluru for a period of one year from September 2018 to August 2019.

Relevant information was collected from Post mortem registers/records, Inquest papers and Post mortem reports. The relevant details were analyzed and results were presented as frequency and percentage in figures and tables.

Results and Discussion

In the present study period a total of 133 medico-legal autopsies were conducted, among them 46 cases were due to road traffic accident comprising 34.6% of total cases, followed by hanging (26.3 %). (Table 1) Among 46 cases of road traffic accident majority were males 39 (84.8%) and females account to 7 cases (15.2%). (Figure 1) Majority of the victims belonged to age group of 31 - 50 years (52.2%). (Table 2). These are similar to the studies done by Jha N[9], Azmani w[10], Aygencel G[11], Menon A[12], Montazeri A[13], Harish D[14], Bansal YS[15]. The high preponderance of males can be attributed to frequent use of vehicles by males and their high contact with the traffic. The young and middle age groups largely consisted of the working populace who travel using their own vehicles, use public transport or walk. In comparison to other age groups, the younger demographic seem more liable to meet RTA, presumably because their activities require them to travel more than the older demographics.

According to the road user category involved in the accident the maximum were pedestrians (45.7 %) followed by the two wheeler (43.5 %). (Table 3) In our study, main offending vehicle involved in the accidents were two wheeler (43.5 %). Ours being a rural part, the majority of the road users were either pedestrians or two wheeler users. The choice of manner of transportation was often influenced by the working pattern of that particular demographic area. The lack of a transport medium between rural roads to state or national highways requires commuters to either walk or use their personal vehicles to reach the nearest point of accessibility. This creates massive traffic managing issues in most parts of the city, also leads to traffic rule violations and increase in number of RTAs. An amplified number of vehicles and reduced attention of drivers and pedestrians related to the fatigue of the day; failure to follow traffic rules, associated with improper infrastructure like the absence of footpaths were the greatest cause of accidents. Other studies from different parts of the country showed pedestrians being the commonest victims.[12,16-21.]

In the present study high proportion of cases showed skull fractures (87 %), 52.2 % shows chest bone fractures, followed by lower limb (32.6 %) and upper limb (21.7 %) fractures. (Table 4). These findings are similar to the studies by Chaudhary et al[19], Kumar A[22], Kyada H C[23].

In our study most of the skull fractures were associated with brain injury (82.6%) in the form of laceration or contusions of brain or brain haemorrhages, followed by thoracic injuries leading to lung lacerations or contusions (30.4%). (Table 5). A high occurrence of brain injury was due to the fact that majority of two wheeler users were not using helmets while light motor vehicle users were travelling without safety measures like seat belts causing dash-board or wind screen injury and in the pedestrian it can be explained due to the fact that after primary impact, it was produced by vehicle to being run over in most instances. Head injury was the most common cause of death which has also been documented by other researchers.[12,13,19,21,23,24.]

Following the road traffic accidents, most of the victims (80.4%) died at the scene before reaching the hospital. While (8.7%) of them died within 24 hours after the accident, 6.5% survived for a period of 2-6 days, 4.4% cases survived for a period of 7-10 days. (Table 6). These findings are similar to the studies by Menon A [12], Montazeri A [13].

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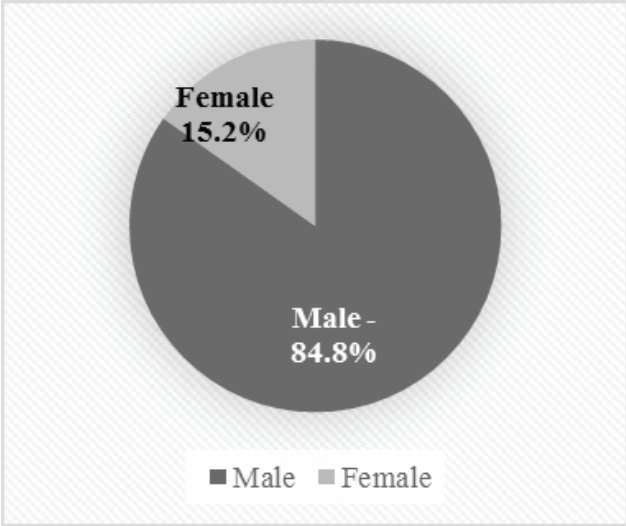

Figure 1 – Sex wise distribution of cases

Table 1: Profile of Medico-legal autopsies conducted during the study Period		
Type of Case	**Number**	**Percentage**
RTA	46	34.6
Hanging	35	26.3
Natural Death	19	14.3
Poisoning	17	12.8
Electrocution	6	4.5
Drowning	4	3.0
Fall from Height	3	2.2
Assault	2	1.5
Snake bite	1	0.8
Total	133	100

Table 2: Age and Gender wise distribution of cases of RTA				
Age Group (in Yrs)	**Male**	**Female**	**Total**	
			No	**%**
0-10	0	1	1	2.2
11-20	6	0	6	13.0
21-30	7	1	8	17.4
31-40	12	0	12	26.1
41-50	11	1	12	26.1
51-60	1	3	4	8.7
61-70	2	1	3	6.5
Total	39	7	46	100

Table 3: Road User Category of cases of RTA		
Road User Category	**No. Cases**	**%**
Two wheeler	21	45.7
Pedestrian	20	43.5
Light Motor Vehicle	2	4.3
Heavy Motor Vehicle	1	2.2
Three wheeler	2	4.3
Total	46	100

Table 4: Distribution of cases of RTA on Fracture of Bones

Type of Bone Fractured	Motorcycle Rider	Pillion Rider	Pedestrians	Vehicle Drivers	Front/Rear Seat Occupants	Total	
						No	%
Skull	14	1	20	1	4	40	87.0
Facial Bones	2	1	2	1	0	6	13.0
Vertebrae	2	1	3	0	0	6	13.0
Chest Bones	9	3	10	1	1	24	52.2
Upper Limb	5	0	4	1	0	10	21.7
Lower Limb	5	1	8	0	1	15	32.6
Pelvis	2	1	1	0	0	4	8.7

Table 5: Distribution of cases of RTA on Tissue / Visceral Injuries

Tissue / Viscera	Motorcycle Rider	Pillion Rider	Pedestrians	Vehicle Drivers	Front/Rear Seat Occupants	Total	
						No	%
Brain	12	1	20	1	4	38	82.6
Spinal Cord	2	0	1	0	0	3	6.5
Lungs	5	2	6	0	1	14	30.4
Heart	1	0	1	0	0	2	4.4
Liver	2	1	3	0	1	7	15.2
Spleen	2	1	2	0	0	5	10.9
Kidney	0	0	3	0	0	3	6.5

Table 6: Distribution of cases of RTA on Time of Survival of Victims

Survival Period	Cases	
	No	%
Died on Scene	37	80.4
< 24 Hrs	4	8.7
2 – 6 Days	3	6.5
7 – 10 Days	2	4.4
Total	46	100

Conclusion and Recommendations

This study showed that road traffic accidents contribute to majority of deaths, more common in the younger age groups and male sex. Majority of victims were pedestrians and main offending vehicle involved in the accidents were two wheelers. Higher incidence of skull fractures was observed along with associated brain injuries.

Road traffic accidents are an evolving problem in our country as the number of vehicles are increasing day by day. Stringent laws regarding speed limit, use of safety belts and helmets and other traffic violations together with better quality roads, provision for pedestrian walking and crossing and roadside illumination will go a long way in preventing much of such tragedies. A multi-disciplinary approach consisting of public education, a proper pre-hospital trauma care system and definitive trauma care facilities coupled with rehabilitation is required to be put in place if any impact is foreseen on this ever growing epidemic on the roads.

Conflict of Interest: Nil

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Ethical Clearance: Taken from the Institutional Ethical Committee.

Refernces

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