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Original Research Article

Evaluation of Pattern and Distribution of Injuries among Road Traffic Accident Cases

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Abstract: ***Introduction:*** Road traffic injuries are one of the leading causes of death in the world. Among all traffic accident, road traffic accidents claim largest toll of human life and tend to be the most serious problem world over. Accidents today are among the leading cause of death. In some countries road traffic accidents are number one cause of deaths; especially in many parts of the world particularly the more highly industrialized nations. ***Objective:*** To evaluation of pattern and distribution of injuries among road traffic accident cases. ***Methods:*** Our study done at Forensic Medicine Dept. Dhaka Medical College Hospital, Dhaka, Bangladesh from July-2015 to July-2017. This study included 501 cases of road traffic accident victims of fatal road traffic accident, brought for medico-legal postmortem examination. ***Results:*** Highest number (33.13%) of fatalities occurred in the 25-44 years age group followed by the age group 15-25 years (22.95%). Male victims outnumbered female resulting in male to female ratio of 1.8:1.Pedestrians was most vulnerable accounting for 35.93% of total fatalities followed by motorized two wheelers 30.94%. Heavy Vehicles were found to be mostly involved 56.02% of cases and most accidents 83.23% occurred on highways. Majority of cases sustained multiple injuries. Largest number of injuries was recorded in head & neck 425 number, followed by lower extremities 325 number. Vehicle occupants mostly sustained thoracic injuries. In majority of cases, the site of initial impact of the responsible vehicle was frontal followed by rear and side. ***Conclusion*:** The whole data was analyzed for pattern and distribution of injuries. Males constituted a large number of the victims of the carnage. Most of the victims were either illiterate or had education only up to schools level. Four or more wheelers, heavy vehicles, were involved in maximum number of accidents. Majority of the victims sustained fracture followed by laceration, abrasion, and contusion. Moreover, the recommendations from the world report on road traffic injury prevention should be considered and promptly implemented.

Keywords: Accidents, Head Injury, leading cause of death.

INTRODUCTION

Road accidents have become a serious health hazard throughout the world by killing and crippling thousands of persons each year. Among all traffic accident, road traffic accidents claim largest toll of human life and tend to be the most serious problem world over. During 1990s road traffic accident injuries ranked ninth among the leading causes of deaths in world [1]. It is projected to become second leading cause by the year 2020 next to ischemic heart disease. About 3.5 million people die of unintentional injuries. Road traffic accidents claim 1.2 million lives [2]. The Americas bear 11% of the burden of road traffic injury mortality. Nearly three quarter of death resulting from motor vechicle crashes occur in developing country. At least 4,284 people were killed and 9,112 others injured in road traffic accidents across Bangladesh in 2017. A

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total of 3,412 people died and 8,572 others injured by this in 2016. The number of accidents increased by 15.82% and death increased by 25.56% in 2017 compared to 20162. A total of 2,123 people died and 5,558 others were injured in the first four months of this year [3]. But only this numerically shocking statistics may fail to reflect the social tragedy related to each life lost in road traffic accidents. In india over 80000 person die in traffic crashes annually, over 1.2 million injured seriously and about 3,00,000 disabled permanently [4]. The problem appears to be increasing rapidly in developing countries. The present study was conducted on 501 autopsy cases to ascertain incidence of fatal road traffic accidents and to find pattern and distribution of injuries. However, with one of the highest motorization growth rate in the world accompanied by rapid expansion in road network and urbanization over the years, our country is faced with serious impacts on road safety levels.

MATERIAL & METHODS

This study included 501 cases of fatal road traffic accidents brought to Forensic Medicine Dept. Dhaka Medical College Hospital, Dhaka, Bangladesh from July-2015 to July-2017 for medico-legal postmortem examination, details of which had been recorded. The cases were brought directly from the site of accident or who died after admission following road traffic accidents. The relevant information was collected from:

- The inquest report and other relevant papers brought by the police.
- Interviewing the police personnel accompanying the dead.
- Interviewing the relatives, neighbors, friends, or persons accompanying the deceased.
- The data thus collected was analyzed statistically.

RESULTS

In present study 501 autopsies of road traffic accident victim were conducted in the Forensic Medicine Dept. Dhaka Medical College Hospital, Dhaka, Bangladesh from July 2015 to July 2017. All the observation noted and result, are as below:

Table 1: Distribution of road traffic accident victim.

	Age	**Victims Cases**				**Type of Cases**		
S. No	**Group Years**	**Male**	**Female**	**No.**	**%**	**Road Users**	**No.**	**%**
1	<10	15	10	25	4.99	Pedestrian	180	35.93
2	11-14	35	20	55	10.98	Motorized	155	30.94
3	15-24	90	25	115	22.95	2-Wheeler		
4	25-44	111	55	166	33.13	Vehicle Occupants	111	22.15
5	45-64	70	30	100	19.96	Pedal Cyclists	30	5.99
6	65 & Above	29	11	40	7.98	Others Unknown	20	3.99
	Total	350	151	501	100	Total	501	100

In the present study, the age of the victims varied from 6 to 67 years. Highest number (33.13%) of fatalities occurred in 25-44 years age group followed by the age group 15-25 years (22.95%), 45-64 years(19.96%) and >65 years (7.98%), 11-20 years (10.98%), and <10 years (4.99%). Nearly three-fourth of the victims was males (69.8%) while the females constituted only (31.2%) cases.

Table 2: Showing different type of vechiles involved in fatal RTA, sites of accident in relation to road and number vechiles involved.

Vehicle	**Cases**		**Types of**	**Cases**		**Vehicle**	**Cases**	
Type	No.	%	Road	No.	%	Involved	No.	%
Heavy Vehicle			Highways	789	82.88	Single Vehicle	417	83.23
a) Truck, Oil Tanker	202	40.31						
b) Motor Bus	80	15.97						
Light, Vehicles Taxi, Car, Jeep	112	22.35	Roads	150	15.76	Double Vehicle	70	13.97
Motorized 2-wheelers	75	14.97	Lane	6	0.63	Triple Vehicle	2	0.4
Other Vehicles	28	5.59	Other Places	2	0.21			
Unknown	4	0.8	Unknown	5	0.53	Unknown	12	2.4
Total	501	100	Total	952	100	Total	501	100

Table 3: Sites of Injuries in Road Traffic Accidents.

S. No.	Site of injuries	No. of cases	%age
1.	Head & Face	425	84.83
2.	Chest	240	47.90
3.	Abdomen	180	35.93
4.	Upper limbs	270	53.89
5.	Lower limbs	325	64.87
6.	Spine injury	5	1

Table 3 show distribution of cases involved. Multiple body parts were involved in each cases. Injuries to head and face were observed in 84.83% of all injuries next common injuries were obsereved in lower limb in 64.87% victim and in upper limb in 53.89%.Injuries to chest were seen in 47.9%, to abdomen in 35.93% and spine and neck in 1%case. Total number of injuries seen in 501.

Table 4: Distribution of cases according to type of injuries.

S. No	Type of Injury	No. cases	of %age
1.	Abrasions	430	85.83
2.	Contusions	290	57.88
3.	Lacerations	375	74.85
4.	Incised wounds	10	2

Table 4 show type of injuries. All type of injuries except incised wound was common. Abrasions were the commonest seen in 85.83%, followed by laceration seen in 74.85% and contusion seen in 57.88% of all cases. Incised wound were seen in 2% cases only.

Table 5: Distribution of cases according to fatal injuries.

S. No	Fatal injuries	No. of cases	%age
1.	Head injury	301	60.08
2.	Abdominal injuries	90	17.96
3.	Thoracic Injuries	30	5.99
4.	Spinal Injuries	5	1
5.	Head & abdominal Injuries	25	4.99
6.	Head & chest injuries	10	2
7.	Multiple injuries/fracture	30	5.99
8.	Chest & abdominal injuries	10	2
	Total	501	100

Table 5 show fatal injuries. Out of 501 autopsy case, head injury was dominant in all deceased 301 cases followed by abdominal injuries 90 cases thoracic injuries 30 cases, multiple fracture 30 cases, spine and neck 5 case. The combination of head and abdominal injuries 25 cases chest and abdominal injuries 10 cases while head and chest were the least accounting for death only in 2 case. This study shows that 301 death in road traffic accident were due to head injuries alone.

DISCUSSION

Road traffic accidents (RTAs) are increasing with rapid pace and presently these are one of the leading causes of death in developing countries. Vander sluis *et al*., has reported that traffic is the most important cause of severe injuries and three quarters of severely injured cases who died during hospitalization are victims of traffic accidents [5]. In the present study, a total of 501 cases of fatal road traffic accidents (RTA) have been studied in respect to distribution, nature and type of injuries. The actual time of occurrence of the accident has not been recorded in most of the fatal RTA's hence no comment on the time of occurrence of accident in the present study. A majority of fatal RTA have sustained multiple injuries. EKe N *et al*., have also reported occurrence of multiple injuries in 93.5% of the victims [6]. The commonest injuries were observed on head and face in 84.83 percent, lower limbs 65 percent upper limbs 53.89 percent, chest 47.90 percent followed by 35.93 percent on abdomen and only one percent having spinal injuries. Chandra et al observed injuries on head & face in 77.99 percent. Tripude *et al*., observed 67.5 percent injuries were on head and face and 47.5 percent injuries were on chest, 26.25 percent injuries were on abdomen [7]. Singh H *et al*., observed injuries on Head and face 77.6 percent, chest 44 percent, abdomen 31.8 percent, upper limbs 35.6percent, lower limbs 44.2 percent, spine 12.9 percent which are almost similar with present studies [8]. Menon A *et al*., showed 88.88 percent skull fractures as cause of deaths occurring in fatal accidents [6]. Arvind K *et al*., observed injuries on head and face as 68.79 percent, chest 26.9 percent and abdomen 47.31 percent [9]. Multiple injuries and multiple body parts were found involved in all the cases in the present

study. The injuries sustained were abrasions, contusions, lacerations, incised wounds, fractures and injuries involving internal organ. All types of injuries were common in road accidents victims. Abrasions, lacerations and contusions were more common. Abrasions were seen in 86 percent cases followed by lacerations in 75 percent cases and contusions in 58 percent cases. The injuries were as a result of heavy blunt forces seen in hit and run cases, crush injuries due to impact of the vehicle and rough surface of roads. Singh H et al observed that fracture dislocation and lacerations were seen in 89.1 percent and 88.8percent cases respectively followed by abrasions 84.4percent. Dos Santos AM *et al*., showed that 69.3percent of victims suffered lacerations, 51.4 percent got fractures, and 20.7 percent suffered from head trauma. Abrasions constituted largest percentage (86 percent) of all injuries amongst motor bikes as victim was dragged on the road in the roadside accidents. There were total of 289 injuries in 100 cases (injuries per case being 2.9). Head injuries were the dominant cause of death among all road users' cases (57 percent), followed by abdominal injuries 19 percent cases, thoracic injuries 7percent cases and multiple fractures were seen in 6 percent cases. Least accounting for death 1 percent of cases was seen in spinal injuries. The present study is in concurrence with Chandra *et al*., who observed 49.46 percent of cases died of head injuries, 22.52 percent of abdominal injuries, and 28 percent of multiple injuries. Singh H *et al*., observed 50.4 percent of cases died due to head injury followed by 19.3 percent of multiple injuries, 5.3 percent of abdominal injuries and 4.2 percent of chest injuries [4]. Chaudhary *et al*., observed 56.25 percent of cases died of head injuries [5]. Arvind K *et al*., observed that 31.51 percent of cases died of head injuries and 37.21 percent had head injury along with chest injury or abdominal injuries [9]. The traffic police department has a crucial role to play in identifying and holding accountable reckless driving, speeding and unstable or overloaded vehicles [10]. The maintenance, repair and expansion of roads coupled with setting up dividers on national highways, cautioning signals for hazardous locations, disseminating information on driving and road safety to masses through media and exemplary punishment for violating traffic laws are some of the main areas that need to be worked on rigorously by the government.

CONCLUSION

The whole data was analyzed for pattern and distribution of injuries. Males constituted a large number of the victims of the carnage. Most of the victims were either illiterate or had education only up to schools level. Four or more wheelers, heavy vehicles, were involved in maximum number of accidents. Majority of the victims sustained fracture followed by laceration, abrasion, and contusion. Primary impact injuries and secondary injuries were noted mostly in lower extremities, whereas secondary impact injuries in head and neck. More than one-fourth of the deaths were due to involvement of pelvis and extremities injuries. It may be concluded that there is urgent need to address the epidemic carnage on the roads. Road traffic deaths are to a great extent preventable. Moreover, the recommendations from the world report on road traffic injury prevention should be considered and promptly implemented.

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