

Original Article

Pattern of Injuries in Road Traffic Accident Death Cases in Western Haryana- An Autopsy Study at Maharaja Agrasen Medical College, Agroha, Hisar

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ABSTRACT

Background: Fatal road traffic accidents (RTA) are a major cause of concern all over the world. The outcome of injuries sustained in an RTA depends on various factors including but not limited to: the location of the event, type of vehicle involved, nature of the roads, the time of accident, etc. **Materials and Methods:** The present study included all the fatal Road Traffic Accident cases, which had been brought to mortuary of Maharaja Agrasen Medical College during the period 1/02/2021 to 31/01/2022 with a sample size of 81 cases. Before and during conduction of postmortem examination, data was collected by using pre-designed semi structured proforma by the investigator himself. The data thus obtained was subjected to further suitable statistical analysis. **Results:** Among 81 cases, maximum deaths occurred in age group of 21-30 years and 82.7% were males. Most of the study participants (34.6%) were doing labour work. Approximately, 40% participants were brought dead in hospital. Among total victims, 46% were drivers, 23.5% were passengers, and 30.9% were pedestrians. About 55% of all deaths occurred in occupants of two wheelers. More than 85% victims experienced injuries on head. Fracture was the most common (85.2%) type of injury followed by abrasions (82.7%), lacerations (67.9%) and contusions (50.6%). The most commonly damaged internal organ was brain (~75%). The most common cause of death (48.2%) was head injury followed by complications due to head injury (9.9%), haemorrhage and shock due to multiple injuries (24.7%) and traumatic shock due to multiple injuries (12.4%). **Conclusion:** It may be concluded that there is urgent need to address the epidemic of RTA on the roads. Road traffic deaths are to a great extent preventable.

Keywords: Road traffic accidents, Injuries, Vehicles

INTRODUCTION

The term accident has been defined “as an occurrence in the sequence of events which usually produces unintended injury, death or property damage. Among all types of accidents, those caused by motor vehicles claim the largest toll of life ^[1].

Road traffic injury (RTI) is a fatal or nonfatal injury incurred as a result of a collision on a public road involving at least one moving vehicle and pedestrians. Accident is an unexpected, unplanned occurrence, which involves injury ^[2]. Ninety one per cent of the world’s road traffic accidents occur in poor and developing

countries, even though these countries have approximately only half of the world's vehicles. Only 28 countries representing 416 million people (7% of world's population) have adequate laws that address all five behavioural risk factors for the road traffic accidents (speed, drunk driving, helmets, seat belts and child restraints). If no action is taken, road traffic accidents are predicted to result in the deaths of around 1.9 million people annually [3]. In India, the motor vehicle population is growing at a faster rate than the economic and population growth. The surge in motor vehicles coupled with expansion of the road network has also brought with it the challenge of addressing the adverse effects such as the increase in road accidents [4].

With only 1 per cent of world's vehicles, India accounts for 11 per cent of global deaths in road accidents, the highest in the world, according to a report by World Bank. The country accounts for about 4.5 lakh road crashes per annum, in which 1.5 lakh people die. India tops the world in the road crash deaths and injuries. In last decade, 13 lakh people died and another 50 lakh got injured in our country [5].

Through this study, it is intended to examine the pattern of injuries in road traffic accidents in rural settings of Hisar region of Haryana and to address various safety measures that should be taken for reducing deaths due to road traffic accidents.

MATERIAL AND METHODS

The present study was conducted in the department of Forensic Medicine at Maharaja Agrasen Medical College, Agroha, Hisar. The present study included all the fatal Road Traffic Accident cases, which had been brought to mortuary of Maharaja Agrasen Medical College during the period 1/02/2021 to 31/01/2022 with a sample size of 81 cases. Decomposed corpse of road traffic accidents fatalities and cases having alleged history of suspected foul play and cause of death other than road traffic accidents as per police papers were excluded from the study. Before and during conduction of postmortem

examination, data was collected by using pre-designed semi structured proforma by the investigator himself. The proforma comprised of relevant data on date of postmortem examination, name, age, sex, occupation, time since death, socio demographic factors, type of vehicle, pattern & distribution of injuries involving external and internal parts of the deceased's body and cause of death etc. were noted in a validated proforma designed for the study. The data thus obtained was subjected to further suitable statistical analysis.

RESULTS

The salient features of results of present study are as follows:

Maximum deaths occurred in age group of 21-30 years (30.9% cases) followed by age group of 31-40 years (22.2% cases) (Table 1).

The median age of the study participants was 30 years and 82.7% were males. Approximately ~55% study participants were married (Table 2).

Table 1: Age-groups of participants (n= 81)

Age-groups	Total
0 to 10	6 (7.4)
11 to 20	10 (12.3)
21 to 30	25 (30.9)
31 to 40	18 (22.2)
41 to 50	6 (7.4)
51 to 60	8 (9.9)
61 to 70	3 (3.7)
>70	5 (6.2)

Table 2: Socio-demographic characteristic of victims

Age, median (IQR)	-	30 (23, 42)
Sex, n(%)	Female	14 (17.3)
	Male	67 (82.7)
Marital Status, n(%)	No	37 (45.7)
	Yes	44 (54.3)

IQR, interquartile range

The most common cause of death (48.2%) was head injury followed by complications due to head injury (9.9%), haemorrhage and shock due to multiple injuries (24.7%) and traumatic shock due to multiple injuries (12.4%). The cause of death for a person was head as well as lung injury.

DISCUSSION

In our study (Table 2); male preponderance (82.7%) was observed (M:F=4.7:1). The median age of victim was 30 years (IQR; 23-42 years). Majority of victims were in the age group of 21-30 years (30.9%) followed by 31-40 years (22.2%) (Table 1). In other studies also, in general the male predominance was seen in victims of RTA with the highest incidence in the age group of 21-30 years [6-11]. This is because the males are more exposed to outdoor activities and travel to the

workplace to earn bread and butter for the family, whereas females remain engaged in the household work. Moreover, young males are more rash and fast in driving vehicles and take more risk during driving, while females are more careful and attentive during driving.

In this study (Table 3), 39.5% participants were brought dead to the hospital. Among 49 (60.5%) hospitalized patients, 26.5% participants survived for less than or equal to six hours, 47% participants survived for more than 6 hours to three days. ~27% study participants survived for more than three days. Similar results are observed in studies of Numan *et al.* [12] and Singh *et al.* [13] So there is an urgent need for provision of first aid on the spot. The provision can be made in the form of first aid boxes in the PCR (Police control room) vans, well equipped ambulances having lifesaving equipment, provision of emergency technicians in ambulances and to institute immediate treatment to the victim without waiting for the medico-legal formalities in the hospitals.

In this study (Table 4); out of 81 cases- most of the cases i.e. 46% were drivers (either two wheeler and four wheeler) followed by 30.9% were pedestrians and 23.5% were passengers. Out of total victims of road traffic accidents, victims of two wheeler vehicles were 44 (54.3%) which were quite higher in number in this indexed study than victims of four wheeler vehicles (14.8%) and pedestrians (30.9%). Singh *et al.* [14], Dandona and Mishra [15], and Pathak *et al.* [7] reported

Table 3: Hospitalization and survival period of victims

		n(%)
Hospitalization, n(%)	Brought dead	32 (39.5)
	Hospitalized	49 (60.5)
Survival duration among hospitalized (n= 49), n(%)	≤6 hours	13 (26.5)
	>6 to ≤12 hours	5 (10.2)
	>12 to ≤24 hours	9 (18.4)
	>24 to ≤48 hours	5 (10.2)
	>48 to ≤72 hours	4 (8.2)
	>72 to ≤300 hours	7 (14.3)
	>300 to ≤420 hours	1 (2.0)
	>420 hours	5 (10.2)

Table 4: Distribution of Victims according to 'Status of a victim person'

Victim Person (n= 81)	N(%)		N(%)
Driver, n(%)	37 (45.7)	Two wheeler	32 (86.5)
		Four wheeler	5 (13.5)
Passenger, n(%)	19 (23.5)	Four wheeler	7 (36.8)
		Pillion	12 (63.2)
Pedestrian, n(%)	25 (30.9)	Hit by Four Wheeler	20 (80.0)
		Hit by Two Wheeler	5 (20.0)

the similar results. It emphasizes the great need for formulating various measures like wearing of helmets, obeying of traffic rules and stringent punishments for violation of these rules, which will help in reducing the mortality in the occupants of two wheelers.

In this study (Table 5); we found most common site of injuries was head (86.4%) followed by upper limb (61.7%) and lower limb (56.8%). 48.2% injuries involved thorax region. Our findings correlate with the study of Ambade *et al.* [16] in which the commonest region involved was the head followed by thorax. It may be due to high speed of vehicles, non-wearing of helmets & seat belts by occupants. Therefore measures should be taken to minimise the fatalities caused by RTA in the form of wearing of helmets & seat belts and implementation of strict laws by traffic police and rigorous obeying of the traffic rules.

In our study (Table 6), fractures were seen in 85.2% cases. Abrasions and lacerations were seen in 82.7%

Table 5: Distribution of Victims according to ‘Injuries by Anatomical Region’

	N(%)
Head	70 (86.4)
Neck	9 (11.1)
Face	41 (50.6)
Chest	39 (48.2)
Abdomen	26 (32.1)
Upper Limb	50 (61.7)
Lower Limb	46 (56.8)

Table 6: Distribution of Victims according to ‘Pattern-of-Injuries’

	N(%)
Abrasion	67 (82.7)
Contusion	41 (50.6)
Laceration	55 (67.9)
Fracture	69 (85.2)
Others	10 (12.4)

cases and 67.9% cases respectively. Similar results are observed by Mandal and Yadav [17]. The probable reason for above findings can be attributed to the over speeding of the vehicles causing much blunt force for the impact. Role may also be played by the nutritional deficiencies like calcium, phosphorous and vitamin D deficiency etc. in the population which makes the bones weaker thereby leading to more number of fractures in RTA.

In our study (Table 7); most common organ involved was brain (haemorrhage) followed by lungs. This might be due most of victims were the cases of head injuries. Splenic injuries were seen in 6 cases; and liver injuries were in 13 cases. Similar results are observed by Jakhar *et al.* [18] and Ambade *et al.* [16].

In the present study (Table 8), the most common cause of death (48.2%) was head injury followed by haemorrhage and shock due to multiple injuries (24.7%) and traumatic shock due to multiple injuries (12.4).

Table 7: Distribution of Victims according to ‘Internal Organ Damage’

	Type of injury	N(%)
Brain (n= 61)	Haemorrhage	56 (91.8)
	Contusion	20 (32.8)
	Laceration	5 (8.2)
Right Lung (n= 13)	Contusion	6 (46.2)
	Laceration	8 (61.5)
Left Lung (n= 17)	Contusion	7 (41.2)
	Laceration	11 (64.7)
Heart (n= 2)	Contusion	1 (50.0)
	Laceration	1 (50.0)
Liver (n= 13)	Laceration	13 (100)
Spleen (n= 6)	Laceration	6 (100)
Right Kidney (n= 1)	Contusion	1 (100)
Neck structures (n= 1)	Contusion	1 (100)
Pleural Cavity (n= 26)	Haemorrhage	26 (100)
Peritoneum (n= 18)	Haemorrhage	18 (100)

Table 8: Distribution of Victims according to ‘Cause-of-Death’

	N(%)
Head Injury	39 (48.2)
Complications of head injury	8 (9.9)
Head and Lung injury	1 (1.2)
Lung injury	2 (2.5)
Haemorrhage and shock due to multiple injuries	20 (24.7)
- Internal	16 (80%)
- External	4 (20%)
Traumatic shock due to multiple injuries	10 (12.4)
TCI	1 (1.2)

Similar results are observed by Sharma *et al.* [10] and Farooqui *et al.* [19].

CONCLUSION

It may be concluded that there is urgent need to address the epidemic of RTA on the roads. Road traffic deaths are to a great extent preventable. Traffic safety education should be given in schools so that the people mature as responsible drivers/road users in future. Wearing of helmet and seat belts should be made mandatory. Using of cell phone and other distractions while driving should be avoided. The state should have zero tolerance policy for violation of traffic rules and drunken driving. It is recommended that separate department like Traffic Medicine under the ambit of road traffic authority must be established. Educating public by radio, TV channels, newspapers, posters and pamphlets and safety statements should be delivered by the celebrities and ministers for the sake of life of the people of the state. The head injuries are the main injuries which lead to death, so the public awareness should be enhanced regarding the safety measures of travelling. The government should bring awareness to the public that the first hour after accident is very important. If anybody finds an accidental case on the road, he must bring them to hospital immediately. The helpers and carrying people are the saviours of the

life. The roads should be properly maintained with florescent illumination for night riders. Efficient crash reporting and monitoring system with well-equipped police control room should be established to co-operate immediate rescue measures. Drivers need to be trained by an authorized center for proper maintenance of vehicle, safe driving and first aid. Organized team work is required by people in many disciplines such as education, engineers, medical practitioners, psychologists and enforcement officers for effective prevention of road accidents and to minimize the fatalities.

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