Original Article

Demographic Study of Orthopedic Trauma among Patients Attending the Accident and Emergency Department in a Tertiary Care Hospital

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Abstract

Background: Trauma causes a major burden on the health system and economy of the country. A better understanding of the epidemiology of trauma can be of great help in planning preventive and curative strategies. **Materials and Methods:** A total of 4834 patients of trauma presenting during 1 year were included in this observational study. Demographic profile and other related criteria were noted, and data were statistically analyzed. **Results:** Male to female ratio was 5:1; most affected age group was 25–44 years in males and 45–64 years in females; 23.2% were illiterate; and professionals and students were most commonly affected. Road traffic accident (RTA), fall, and assault were the three most common causes; two wheelers were the most common accident causing vehicle. Nearly 17.7% were below poverty line and 67.6% reached hospital within 12 h. Medicolegal cases were 29.7%; only 29.3% reached hospital by ambulance and 3.72% were hemodynamically unstable. Only 3.6% received prehospital care and 16.23% were under alcohol influence. About 23.18% of RTA victims were pedestrians; city roads were the most common accident site. Head injury (25.85%) was the most common associated injury. Fractures were most common in hand (9.72%). The injury severity score (ISS) and New ISS were worse in the patients who were not using seat belt/helmet or were under influence of alcohol. The rate of death and associated injuries was also higher in this group. **Conclusion:** Trauma is a major preventable cause of mortality and morbidity mainly affecting the productive age group of the society.

Keywords: *Demography, epidemiology, injury severity score, new injury severity score, orthopedic, road traffic accident, trauma*

Introduction

Most of the developing countries including India are undergoing rapid modernization and industrialization, which has led to significant increase in the number of automobiles. This has led to rise in number of trauma cases due to road traffic accidents (RTAs), thereby making it a major health hazard.[1] Trauma due to other causes such as injuries at work place, at home, fall, assault, and gunshot injuries also contribute significantly to the overall mortality and morbidity. Previously, it was mainly a problem of the developed countries; but now, developing countries are also undergoing "epidemiology of transition" and hence facing similar challenge.[2] Trauma is the sixth leading cause of mortality and fifth leading cause of morbidity worldwide.[3] It is estimated that 1.2 million people die in RTA alone every year and about 50 million are injured.[4] As a result of ever increasing number of automobiles in developing countries, mortality and morbidity due to RTA is going to become the third most important health problem by 2020.[5,6] Due to poor documentation, the epidemiology of trauma is not well understood in India. Very few studies are available regarding the epidemiology of trauma in developing countries.[7-9] Since such a large number of trauma cases causes a major burden on the health system and economy of the country, a better understanding of the epidemiology of trauma cases in India can be very helpful in framing better preventive and curative policies.

Materials and Methods

This is an observational study carried out in the Department of Orthopedics in a tertiary level center in northern India between May 1, 2016 and April 30, 2017. A total of 4834 trauma patients presenting to the accident and emergency of our institute were included in the study. Eighty four

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days' data were collected; it was collected during 1st week of every month over a period of 1 year. All the patients of orthopedic trauma presenting on the selected days were included in the study; only those patients were excluded from the study who failed to give proper information or who did not have an accompanying family member or relative to give consent or information. All the patients were first appropriately stabilized and given necessary emergency treatment as per the standard protocol. A detailed pro forma was filled for each patient after taking written and informed consent. A detailed history was taken regarding age, sex, mode of injury whether RTA, assault, fall, machine injury, railway track accident, or gunshot injury, education status, occupational and economic status, time lapsed before reaching the hospital, whether medicolegal case or not, mode of reaching the hospital, vitals at the presentation, any prehospital care received, whether riding a vehicle or pedestrian, the accident causing vehicle, whether wearing helmet or seat belt, whether under the influence of alcohol, associated visceral injury, type of orthopedic injury and body region affected, injury severity score (ISS), new ISS (NISS), duration of hospital stay, and mortality rate were noted. The authors certify that the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000.

Statistical analysis

At the end of the study, the data were collected and analyzed using Chi-square test and Student's *t*-test. $P < 0.05$ was considered as statistically significant.

Results

There was male predominance in the total study group; 84.48% were males and 15.52% were females. Male to female ratio was 5:1. In the total study group, among males, the most commonly affected age group was 25–44 years (45.1%), and among females, the most commonly affected age group was 45–64 years (35.2%); however, overall, the most commonly affected age group was 25–44 years (42.2%).

In the RTA group, among males, the most commonly affected age group was 25–44 years (38.8%), and among females, the most commonly affected age group was 45–64 years (42.9%) ($P < 0.05$); however, overall, the most common age group affected by RTA was 25–44 years (37%) [Table 1].

In the assault group, among males, the most commonly affected age group was 25–44 years (75.9%), and among females, the most commonly affected age group was 45–64 years (86%) ($P < 0.05$); however, overall, the most common age group affected by assault was 25–44 years (64%).

Table 1: Gender and age distribution in whole group and in various causes of trauma

Age group (years)	Whole study group			RTA			Assault			Fall		
	Male, *n* (%)	Female, *n* (%)	Total, *n* (%)	Male, *n* (%)	Female, *n* (%)	Total, *n* (%)	Male, *n* (%)	Female, *n* (%)	Total, *n* (%)	Male, *n* (%)	Female, *n* (%)	Total, *n* (%)
Below 5	87 (2.1)	1 (0.1)	88 (1.8)	84 (3.8)	1 (0.3)	85 (3.3)	0	0	0	10 (0.82)	4 (1.11)	14 (0.89)
5-14	383 (9.4)	170 (22.7)	553 (11.4)	173 (7.9)	17 (4.4)	339 (13.1)	4 (0.9)	1 (1.2)	5 (1)	205 (16.90)	31 (8.65)	236 (15.02)
15-19	419 (10.3)	88 (11.7)	507 (10.5)	189 (8.6)	85 (22)	274 (10.6)	10 (2.3)	2 (2.3)	12 (2.3)	211 (17.39)	36 (10.05)	247 (15.72)
20-24	625 (15.3)	19 (2.5)	644 (13.3)	429 (19.5)	11 (2.8)	440 (17)	6 (1.4)	4 (4.7)	10 (1.9)	107 (8.82)	25 (6.98)	132 (8.40)
25-44	1841 (45.1)	198 (26.4)	2039 (42.2)	853 (38.8)	104 (26.9)	957 (37)	331 (75.9)	3 (3.5)	334 (64)	161 (13.27)	168 (46.92)	329 (20.94)
45-64	673 (16.5)	264 (35.2)	937 (19.4)	423 (19.2)	166 (42.9)	440 (17)	82 (18.8)	74 (86)	156 (29.9)	514 (42.37)	89 (24.86)	603 (38.38)
Above 64	56 (1.4)	10 (1.3)	66 (1.4)	47 (2.1)	3 (0.8)	50 (1.9)	3 (0.7)	2 (2.3)	5 (1)	5 (0.41)	5 (1.39)	10 (0.63)
Total	4084	750	4834	2198	387	2585	436	86	522	1213	358	1571

RTA=Road traffic accidents

In the fall group, among males, the most commonly affected age group was 45–64 years (42.37%), and among females, the most commonly affected age group was 25–44 years (42.92%); however, overall, the most common age group affected by fall was 45–64 years (38.38%).

In the machine injury group, the most commonly affected age group was 25–44 years both among males (43.15%) and females (41.09%). The overall most common age group affected by machine injury was also 25–44 years (42.46%).

Age and sex distribution in the railway track accident and gunshot injury groups is shown in Table 2.

According to educational status, 36.69% were graduate, 30.43% were up to matriculate, 23.2% were illiterate, and 9.7% postgraduate. According to occupation, 32.62% were professionals, 23.7% were students, 15.8% were laborers, 11.17% were farmers, 9.6% were homemakers, and 7.1% were unemployed.

Among the modes of injury, 53.5% was RTA, 30.5% was fall, 10.8% was physical assault, 4.5% was machine injury, 0.4% was railway track injury, and 0.4% was gunshot.

Among the accident-causing vehicles, 44.9% were two wheelers, 18.35% were cars, 11.5% were trucks, 10.85% were buses, 9.8% were auto-rickshaw, 3.2% were tractors, and 1.32% were trains [Table 3].

Overall, 17.7% patients were below poverty line (BPL) whereas 82.3% were non-BPL. About 67.6% of the patients reached hospital within 12 h of injury. 29.7% of the patients in the study were registered as medicolegal cases. Only 29.3% of the patients reached the hospital by ambulance; remaining 70.7% used either hired or personal vehicle. A total of 3.72% of patients were hemodynamically unstable on reaching the hospital. Only 3.6% of the patients received prehospital care by qualified personnel. At the time of injury, 16.23% of the patients were under influence of alcohol [Table 4].

Among RTA victims, 23.18% were pedestrians whereas 76.82% were riding a vehicle. Further, among those riding a vehicle, only 19.07% were using either seat belt or helmet.

According to the site of accident, 32.93% were on city roads, 13.81% were not specified, 11.25% on village roads, 9.62% in house, 8.93% in farm, 8.29% on highway, 7.92% at work place, and 7.2% were on other roads.

Among the associated injuries, 25.85% was head injury, 10.6% was chest injury, 7.24% was pelvic injury, 3.1% was abdominal injury, 3% was dorsolumbar (DL) spine injury, 1.84% was cervical spine injury, and 0.2% was genitourinary injury.

Among the body regions affected, 25.85% was head, 14.6% was shoulder and arm, 13.65% was leg and ankle, 11.37% was forearm and elbow, 10.34% was foot, 10.06 was chest, 9.72% was hand and wrist, 4.13% was thigh and hip, 3.1% was abdomen, 3% was DL spine, 2.79% was pelvis, and 1.84% was cervical spine.

Among fractures, 9.72% were in hand and carpals, 7.57% in radius, 6.82% in clavicle, 5.99% in tibia, 5.44% in fibula, 5.35% in ulna, 4.13% in femur, 4.05% in foot, 3.41% in humerus, 3% in DL spine, 2.79% in acetabulum, and 1.84% in cervical spine [Table 5].

Among the vehicle riders, the NISS was 16 or above in 10.7% of the patients who were not using helmet/seat belt whereas it was 16 or above in 7.5% of the patients who were using helmet/seat belt ($P > 0.05$). The ISS was 16 or above in 11.9% of the patients who were not using helmet/seat belt whereas it was 16 or above in 9.3% of the patients who were using helmet/seat belt ($P > 0.05$).

In the total study group, the NISS was 16 or above in 13.65% of the patients who were under influence of alcohol whereas it was 16 or above in 8.3% of the patients who were not under the influence of alcohol ($P < 0.05$). The ISS was 16 or above in 13.45% of the patients who were under influence of alcohol whereas it was 16 or above in 6.9% of the patients who were not under the influence of alcohol ($P < 0.05$).

Among the vehicle riders, the death percentage was 2.93% in the patients who were not using helmet/seat belt whereas it was 1.81% in the patients who were using helmet/seat belt ($P < 0.05$).

Table 2: Gender and age distribution in various causes of trauma

Age group (years)	Machine injury			Railway track injury			Gunshot injury		
	Male, *n* (%)	Female, *n* (%)	Total, *n* (%)	Male, *n* (%)	Female, *n* (%)	Total, *n* (%)	Male, *n* (%)	Female, *n* (%)	Total, *n* (%)
Below 5	2 (1.36)	1 (1.36)	3 (1.36)	0	0	0	0	0	0
5-14	9 (6.16)	5 (6.84)	14 (6.39)	0	0	0	1 (7.14)	0	1 (5.88)
15-19	24 (16.43)	13 (17.8)	37 (16.89)	1 (8.33)	1 (14.28)	2 (10.52)	2 (14.28)	0	2 (11.76)
20-24	21 (14.38)	9 (12.32)	30 (13.69)	1 (8.33)	1 (14.28)	2 (10.52)	3 (21.42)	1 (33.33)	4 (23.52)
25-44	63 (43.15)	30 (41.09)	93 (42.46)	5 (41.66)	3 (42.85)	8 (42.8)	7 (50)	1 (33.33)	8 (47.02)
45-64	19 (13.01)	14 (19.17)	33 (15.06)	2 (16.66)	1 (14.28)	3 (15.78)	1 (7.14)	1 (33.33)	2 (11.76)
Above 64	8 (5.47)	1 (1.36)	9 (4.1)	3 (25)	1 (14.28)	4 (21.05)	0	0	0
Total	146	73	219	12	7	19	14	3	17

Table 3: Distribution of patients in study according to different criteria

	n (%)
Educational status	
Graduate	1774 (36.69)
Up to matriculate	1471 (30.43)
Illiterate	1121 (23.2)
Postgraduate	468 (9.7)
Total	4834
Occupational status	
Professional	1577 (32.62)
Student	1146 (23.7)
Laborer	764 (15.8)
Farmer	540 (11.17)
Homemaker	464 (9.6)
Unemployed	343 (7.1)
Total	4834
Mode of injury	
RTA	2585 (53.5)
Fall	1472 (30.5)
Physical assault	522 (10.8)
Machine injury	219 (4.5)
Railway track accident	19 (0.4)
Gun shot	17 (0.4)
Total	4834
Accident-causing vehicle	
Two wheeler	1216 (44.9)
Car	497 (18.35)
Truck	311 (11.5)
Bus	294 (10.85)
Auto-rickshaw	267 (9.8)
Tractor	87 (3.2)
Train	36 (1.32)
Total	2708

RTA=Road traffic accidents

Table 4: Distribution of patients in study according to different criteria

	Yes, *n* (%)	No, *n* (%)	Total
BPL	857 (17.7)	3977 (82.3)	4834
Time lapsed >12 h	1568 (32.4)	3266 (67.6)	4834
MLC	1434 (29.7)	3400 (70.3)	4834
Reached by ambulance	1417 (29.3)	3417 (70.7)	4834
Vitals unstable	180 (3.72)	4654 (96.28)	4834
Prehospital care	175 (3.6)	4659 (96.4)	4834
Influence of alcohol	785 (16.23)	4049 (83.77)	4834

BPL=Below poverty line, MLC=Medico-legal case

In the total study group, the death percentage was 1.26% in the patients who were under the influence of alcohol whereas it was 0.95% in the patients who were not under the influence of alcohol ($P < 0.05$).

Among the vehicle riders, the percentage of associated head injury or visceral injury was 27.1% in patients using helmet/seat belt whereas it was 42.3% in patients not using helmet/seat belt ($P > 0.05$).

In the total study group, the percentage of associated head injury or visceral injury was 24.6% in patients who were not under the influence of alcohol whereas it was 31.3% in patients who were under the influence of alcohol ($P < 0.05$) [Table 6].

Discussion

Since India is a rapidly developing country and currently is one of the fastest growing economies in the world, trauma has become a major health problem. In the total study group, male to female ratio was 5:1. Male predominance was also observed in all the sub-groups with respect to mode of injury. This is comparable to other studies.[11-15] Kual *et al*. reported male to female ratio of 3:1.[16] This could be due to the fact that in our society, males are frequently involved in outdoor activities; most of the times, they are the breadwinners of the family. This also shows the behavioral and social difference in males and females in our society. Males are more exposed to the risk of trauma due to more involvement in automobile driving, labor, sports, and other activities.

Among males, the 25–44 years age group was the most commonly affected in the total study group as well as all other cases of trauma except the fall group where 45–64 years age group was the most commonly involved. Among females, the 45–64 years age group was the most commonly affected in the total study group as well as in RTA and assault; However, 25–44 years age group was the most commonly involved age group in fall, machine injury, and railway track injury. This is comparable to other studies which show that trauma most commonly affects the productive age group.[17-19] In the study by Kual *et al*., the age group most commonly affected by fatal RTAs was between 25 and 44 years.[16] According to World Health Organization, over 50% of deaths related to RTAs are among the age group 15–44 years.[10]

According to the educational status, 23.2% of the patients were illiterate and remaining were literate; this indicates that the level of education does not reduce the risk for trauma. However, lesser number of patients being postgraduates may be due to the reason that they are more often the indoor working class but this may very well be due to behavioral difference of the persons having higher education level. Professionals (32.62%), students (23.7%), and laborers (15.8%) were the most commonly affected people, indicating that those going outdoors for work or study are more exposed to risk of trauma. Chalya *et al*. in their study observed that students and businessmen were the two main groups exposed to RTA.[20]

RTA (53.5%) was the most common cause of trauma. This is comparable to other studies from India.[17,21] This shows irresponsible and erratic driving behavior while driving and at the same time emphasizes lack of law enforcement and road safety. Fall (30%) was another common cause. This is comparable to other studies from India.[17,21,22] The falls included fall from height at workplace, while sleeping

Table 5: Distribution of patients in study according to different criteria

Site of accident	*n* (%)
City road	1592 (32.93)
Not specified	668 (13.81)
Village road	544 (11.25)
House	465 (9.62)
Farm	432 (8.93)
Highway	401 (8.29)
Workplace	383 (7.92)
Other roads	349 (7.2)
Total	4834
Associated injury	
Head injury	1250 (25.85)
Chest injury	512 (10.6)
Pelvic injury	350 (7.24)
Abdominal injury	150 (3.10)
Dorsolumbar spine injury	145 (3)
Cervical spine injury	89 (1.84)
Genitourinary injury	10 (0.2)
None	2328 (48.15)
Total	4834
Body region affected	
Head	1250 (25.85)
Shoulder and arm	707 (14.6)
Leg and ankle	660 (13.65)
Forearm and elbow	550 (11.37)
Foot	500 (10.34)
Chest	512 (10.06)
Hand and wrist	470 (9.72)
Thigh and hip	200 (4.13)
Abdomen	150 (3.1)
Dorsolumbar spine	145 (3)
Pelvis	135 (2.79)
Cervical spine	86 (1.84)
Exact diagnosis (fractures)	
Hand and carpals	470 (9.72)
Radius	375 (7.57)
Clavicle	330 (6.82)
Tibia	290 (5.99)
Fibula	263 (5.44)
Ulna	259 (5.35)
Femur	200 (4.13)
Foot	196 (4.05)
Humerus	165 (3.41)
Dorsolumbar spine	145 (3)
Acetabulum	135 (2.79)
Cervical spine	89 (1.84)

on roof in rural areas, fall from stairs or bed, and fall on floor. This emphasizes the need of safe working conditions for labor and industrial workers and need of building safer houses with proper boundary walls of roof.

Physical assault (11%) was also a major cause. Huda *et al*. reported assault in 5.4% of the cases.[22] In another study, Ghani *et al*. reported assault in 3% of cases.[23] The higher incidence of assault may be due to behavioral difference in this region compared to others.

Occupational injuries were 4.5%. Some other studies have reported occupational injuries from 3.7% to 10.5%.[21-23] This emphasizes the need of providing safe environment for people working on machines at their workplace.

Railway track accidents were 0.4% of cases. Rastogi *et al*. reported railway track accidents in 0.8% of cases.[17] Although this is a small proportion, it is very important because it most often causes fatal or complex injuries.

Gunshot injuries were 0.4% of cases. Rastogi *et al*. reported gunshot injuries in 1.3% of cases.[17] Huda *et al*. reported gunshot in 2.08% of cases.[22] Again, these can be associated with vessel injury along with fractures and hence can lead to serious disability and mortality.

Two wheelers (44.9%) were the most common accident-causing vehicle followed by cars (16.2%), trucks (11.2%), buses (10.85%), auto-rickshaw (9.8%), and tractors (3.2%); remaining were by trains and other vehicles. This is comparable to other studies.[17,21] Ruikar observed that 23.2% of the victims of RTA were two wheeler riders.[24] Madhu *et al*. observed that two wheelers were involved in 41.3% of accidents.[25] The easier affordability and handling of two wheelers has led to a huge increase in number of these vehicles on the roads but people hardly wear helmets; this along with the fact that other body parts are also unprotected on two wheelers makes these vehicles one of the major reason for RTA-associated injuries.

Patients BPL were 17.7% whereas remaining 82.3% were non-BPL. This BPL group needs health care to be provided at low cost, and appropriate allotment of budget by government is required for treatment of BPL patients. Only 67.6% of the patients reached hospital within 12 h. Dutta *et al*. observed that 33% of the patients reached hospital within 1 h of injury.[26] Medicolegal cases were 29.7% which indicates trauma causes a huge burden not only on the health system but also on the judicial system of the country. This again is a new observation. Only 29.3% of the total patients reached the hospital by ambulance whereas remaining reached either by personal or hired vehicles. Dutta *et al*. in a study observed that only 8.3% of the patients reached the hospital by ambulance and another 3% by police vehicle.[26] There is a need to improve the ambulance facility significantly. On reaching the hospital, 3.72% of the patients were hemodynamically unstable. Only 3.6% of the patients received prehospital care by a qualified personnel. There is very strong need for the government to provide adequate qualified healthcare providers at periphery. Overall, 16.23% of total were under the influence of alcohol at the time of injury. Rastogi *et al*. reported 10.65% patients having alcohol in their blood.[17]

Among RTA victims, 76.4% of the patients were riding a vehicle at the time of injury and remaining 23.6% were

Table 6: Injury severity score and new injury severity score scores in different category of patients

	Not wearing helmet/seat belt (total=1638), *n* (%)	Wearing helmet/seat belt (total=386), *n* (%)	Under influence of alcohol (total=785), *n* (%)	Not under influence of alcohol (total=4049), *n* (%)
NISS				
0-5	950 (58)	231 (59.9)	487 (62.14)	2720 (67.2)
6-10	278 (17)	80 (20.6)	94 (11.9)	648 (16)
11-15	234 (14.3)	46 (12)	96 (12.31)	344 (8.5)
16-20	156 (9.5)	26 (6.7)	97 (12.35)	304 (7.5)
21-25	20 (1.2)	3 (0.8)	11 (1.3)	33 (0.8)
ISS				
0	372 (22.7)	85 (21.9)	189 (24)	1182 (29.2)
4	760 (46.4)	172 (44.5)	377 (48.1)	2190 (54.1)
9	311 (19)	94 (24.3)	113 (14.45)	396 (9.8)
16	177 (10.8)	33 (8.7)	97 (12.35)	252 (6.2)
25	18 (1.1)	2 (0.6)	9 (1.1)	29 (0.7)
Associated injury	693 (42.3)	105 (27.1)	246 (31.3)	996 (24.6)
Deaths	48 (2.93)	7 (1.81)	61 (7.77)	46 (1.13)

NISS=New injury severity score, ISS=Injury severity score

pedestrians. This is comparable to some other studies.[27] This highlights that road safety is not only important for the people riding vehicles but it is also important to provide separate safe zones and corridors for the pedestrians who are commonly knocked down by erratic drivers. Rastogi *et al*. reported 9.6% of the injuries were among pedestrians.[17]

Among vehicle riders, only 19.7% of the patients riding vehicle were using helmet/seat belt. Dutta observed that 20.6% of the patients were wearing helmets at the time of injury.[26] Studies have established protective role of helmets in two wheeler riders.[28,29] Although enough laws exist for control and punishment in road traffic rule offenders, this is a clear evidence that there is a serious need of strict implementation of these rules.

City roads (32.93%) were the most common site of accidents followed by village roads (11.25%), house (9.62%), farm (8.93%), highway (8.29%), and workplace (7.92%). Ruikar observed that 53.5% of the accidents occurred in rural areas whereas 46.5% occurred in urban areas.[24] This may be due to the fact that city roads are overcrowded by vehicles whereas village roads have relatively less number of vehicles and the highways are improving in terms of safety.

Head injury (25.85%), chest injury (10.6%), pelvic injury (7.24%), and abdominal injury (3.1%) were the common associated injuries. Rastogi *et al*. reported head injury (57.2%), abdominal injury (31%), chest injury (24.2%), and pelvic injury (7%).[17] ShivaPrakash *et al*. reported head injury (18.31%), abdominal injury (3.02%), chest injury (1.99%), and pelvic injury (0.96%).[21]

Affected body regions were head (25.85%), shoulder and arm (14.6%), leg and ankle (13.65%), forearm and elbow (11.37%), foot (10.34%), chest (10.06%), hand and wrist (9.72%), thigh and hip (4.13%), abdomen (3.1%), DL spine (3%), pelvis (2.79%), and cervical spine (1.84%). Rastogi *et al*. in their study reported upper limb injuries in 29.7% cases and lower limb injuries in 28.2% cases.[17] ShivaPrakash *et al*. reported lower limb injuries in 56.51% of cases and upper limb injuries in 29.87% of cases.[21]

Fractures were most common in hand and carpals (9.72%) followed by radius (7.57%), clavicle (6.82%), tibia (5.99%), fibula (5.44%), ulna (5.35%), femur (4.13%), foot (4.05%), humerus (3.41%), DL spine (3%), acetabulum (2.79%), and cervical spine (1.84%).

Most of the patients (86.36%) were discharged from the hospital within 7 days whereas 107 (2.2%) deaths were reported in the hospital. The ISS and NISS are very good predictor of survival and mortality in trauma patients. We observed that both ISS and NISS were worse in the group of patients who were not using helmet/seat belt or who were under the influence of alcohol at the time of injury. Similarly, the rate of associated injuries and death was also higher in these patients.

Conclusion

Trauma is a major preventable cause of mortality and morbidity, mainly affecting the productive age group of the society. But a large proportion of trauma can be prevented if appropriate measures are enforced at individual and state levels.

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Conflicts of interest

There are no conflicts of interest.

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