ORIGINAL ARTICLE

Pattern of Injuries in road traffic accidents in Ar'ar central hospital

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ABSTRACT

Background: In Saudi Arabia, road traffic accidents are becoming a serious health problem due to its rapid expansion of road construction and increase in the number of vehicles.
Aim: To find the pattern of injuries in road traffic accidents.
Methods: This prospective study was conducted in Ar'ar Central Hospital, Saudi Arabia from Jan to June 2018. All the patients with road traffic accidents who remained admitted for more than 24 hours were included in the study. The data was collected on a structured proforma. The information was obtained on variables such as socio-demographic profile, mechanism of injury and time at which the accident occurred. Medical records of the victims were reviewed to obtain information regarding body region injured and types of injury.
Results: Out of 124 persons, the majority of the injured were males (88%) aged between 20-40 years (53.2%). Over speeding was the most common reported cause of accident (62.1 %). There was statistically significant (p=0.016) difference between the different age groups regarding the reported time of the accidents. Limbs were the commonest site for injuries (41%), followed by Head and neck (24.2%).
Conclusion: Over speeding by young males is a critical factor in RTA. Fractures are the commonest injuries and limbs are the most frequently injured site in road traffic accidents.
MeSH words: Road traffic accidents (RTA), Pattern of injuries, Fracture, Wound

INTRODUCTION

Road traffic accident is a significant but preventable cause of morbidity and mortality which accounts for heavy economic burden on health-care system[1]. The World Health Organization (WHO) defined Road Traffic Injury (RTI) as "a fatal or non-fatal injury incurred as a result of a collision on a public road involving at least one moving vehicle "[2]. Each year road traffic accidents take the lives of 1.2 million people around the world and millions more are seriously injured.[3]

In Saudi Arabia, road traffic accidents are becoming a serious health problem due to its rapid expansion of road construction and increase in the number of vehicles. It has been reported that more than 6 million cars are there on the roads of the country.[4]This resulted in a large increase in the number of road traffic accidents with high mortality and morbidity leading to a serious health problem. Previous studies have shown that casualty and fatality rates in UAE and in other Gulf countries are much higher than in the developing countries.[5, 6] The World Health Organization's (WHO) Global Status Report on Road Safety, reports that mortality due to road traffic accidents per 100 000 population in Saudi Arab is 24.8 (> 130,000 deaths annually)[7].

The pattern of injuries varies with the speed and type of the vehicle, the position of the victim in and outside the vehicle and use of the seat belt[3]. Very few local studies are available on the pattern of injuries in road traffic accidents. This study is planned to find the pattern of injuries in road traffic accidents in patients admitted in Ar'ar Central Hospital, Ar'ar, Saudi Arabia.

METHODOLOGY

This prospective study after approval from institution review board was conducted in a period of six months from January 2018 to June, 2018 in Ar'ar central hospital of Northern region of Saudi Arabia. All road traffic accident patients who were admitted for at least 24 hours were included in the study. Patients who were treated in emergency department and were sent home on oral medications or patients who were brought dead due to RTA were excluded from the study.

Informed consent was obtained from all patients or from their attendants in case of children or unconscious adults. Data confidentiality was warranted through all steps of the research projects. Patients or their close relatives (if patients were unable to give interview) were interviewed. The data was collected on a structured proforma. The questionnaires was designed to obtain information on variables included in the study such as socio-demographic profile (age and gender), mechanism of injury, type of road users (pedestrians, drivers, passengers) and time at which the accident occurred. Additionally, medical records of the victims were reviewed to obtain information regarding body region injured and types of injury.

The data was analyzed using the Statistical Package for Social Science (SPSS) version 20. Mean ± standard deviation was calculated for age. Frequencies and percentages were calculated for gender, nature of injury and body region involved. Descriptive statistics were used and statistical significance was tested for using the chi-square test.

RESULTS

The current study was conducted to evaluate pattern of injuries among RTA victims in Arar during the period January to June, 2018. One hundred twenty-four persons were included in the study. Their demographic data related to ages and genders are shown in table (1). The majority of the traumatized persons 109 (88%) were males aged

between 20-40 years 66 persons (53.2%). The ages of the cases ranged from 5-61 years old (M; 28.75 years ±SD; 13.1).

The time of accidents for majority of the victim was early morning (55.6 %). Most of accidents were caused through collisions (84.7%). Over speeding was the most common reported cause of accident (62.1 %). Statistically, there was statistically significant (p=0.016) difference between the different age groups regarding the reported time of the accidents as morning time was the commonest among victims blow 40 years while evening and night accidents were common among cases aged above 40 years. Data regarding time, mode, cause of the accidents and type of the car occupants in relation to cases age and genders are shown in table 2.

Regarding the site of injuries in our studied cases, limbs were the commonest site for injuries [51 cases (41%)], followed by Head and neck injuries in 30 cases (24.2%) and chest injuries [19 cases (15.3%)], while multiple sites were involved in 8 persons (6.4%) of the studies cases. There was no statistically significant difference in the site of injuries in relation to participants'' ages, genders and the mode of the accidents (Table 3).

Dislocations, fractures, internal bleeding, ruptured viscera, and wounds were reported as patterns of injuries among the enrolled cases. Fractures were the commonest injuries [62 cases (50%)] Followed by wounds and lacerations [30 cases (24.2%)] (Table 4). Patterns of injuries in the cases in relation to participants'' ages, genders and the mode of accidents are shown in table (4).Seat belt was reported to be used in only 45 cases (36.3%). There was no significant difference in sites and patterns of injuries among the victims with and without seat belt. (Table 5)

Table 1: Age groups and genders of the road traffic accidents cases

Age groups	Male	Female	Total
<20 years	31(88.6%)	4(11.4%)	35(100%)
20-40 years	58(87.9%)	8(12.1%)	66(100%)
>40 years	20(87%)	3(13%)	23(100%)
Total	109(87.9%)	15(12.1%)	124(100%)

Table 2: Age and gender in relation to the time, mode, and cause of the accident

Parameters	Gender		Age in years			Total
	Male	Female	<20	20-40	>40	
Time						
Morning	60(87%)	9(13%)	26(37.7%)	36(52.2%)	7(10.1%)	69
Evening	29(87.9%)	4(12.1%)	6(18.2%)	19(57.6%)	8(24.2%)	33
Night	20(90.9%)	2(9.1%)	3(13.6%)	11(50%)	8(36.4%)	22
	0.8847 0.2451, 2		0.0162* 12.17, 4			
Mode						
Collision	92(87.6%)	13(12.4%)	31(29.5%)	56(53.3%)	18(17.1%)	105
Rolling over	17(89.5%)	2(10.5%)	4(21.1%)	10(52.5%)	5(26.3%)	19
	0.8195 0.05204, 1		0.5654 1.140, 2			
Cause						
Signal violation	7(87.5%)	1(12.5%)	5(62.5%)	2(25%)	1(12.5%)	8
Fault of the vehicle	5(83.3%)	1(16.7%)	1(16.7%)	5(83.3%)	0	6
Over speed	66(85.7%)	11(14.3%)	24(31.2%)	40(51.9%)	13(16.9%)	77
Sleepiness	14(93.3%)	1(6.7%)	3(20%)	6(40%)	6(40%)	15
Inattention	17(94.4%)	1(5.6%)	2(11.1%)	13(72.2%)	3(16.7%)	18
	0.8077 1.606, 4		0.0802 14.06, 8			

Table 3: The sites of injuries in relation to the gender, ages, types of occupants, and accidents' modes

Site of injuries/ Variables	Abdomen	Chest	Head & neck	Limbs	Vertebrae	Multiple	Totals
Gender							
Male	7(87.5%)	17(89.5%)	28(93.3%)	42(82.4%)	8(100%)	7(87.5%)	109(87.9%)
Female	1(12.5%)	2(10.5%)	2(6.7%)	9(17.6%)	0	1(12.5%)	15(12.1%)
Age (Years)							
<20	2(25%)	7(36.8%)	11(36.7%)	10(19.6%)	2(25%)	3(37.5%)	35(28.2%)
20-40	6(75%)	7(36.8%)	15(50%)	31(60.8%)	4(50%)	3(37.5%)	66(53.2%)
>40	0	5(26.3%)	4(13.3%)	10(19.6%)	2(25%)	2(25%)	23(18.5%)
Type of occupants							
Passengers	3(37.5%)	11(57.9%)	13(43.3%)	29(56.9%)	7(87.5%)	4(50%)	67(54%)
Drivers	5(62.5%)	8(42.1%)	17(56.7%)	22(43.1%)	1(12.5%)	4(50%)	57(46%)
Accident mode							
Collision	8(100%)	16(84.2%)	22(73.3%)	46(90.2%)	7(87.5%)	6(75%)	105(84.7%)
Rolling over	0	3(15.8%)	8(26.7%)	5(9.6%)	1(12.5%)	2(25%)	19(15.3%)
Total	8(100%)	19(100%)	30(100%)	51(100%)	8(100%)	8(100%)	124(100%)

Table 4: Types of injuries in relation to gender, age, types of occupants, and accidents' modes

Types of injuries/Variables	Dislocation	Fractures	Internal Bleeding	Ruptured Viscus	Wounds & Lacerations	Totals
Gender						
Male	5(100%)	53(85.5%)	19(86.4%)	4(80%)	28(93.3%)	109(87.9%)
Female	0	9(14.5%)	3(13.6%)	1(20%)	2(6.7%)	15(12.1%)
Age (Years)						
<20	1(20%)	16(25.8%)	7(31.8%)	0	11(36.7%)	35)28.2%)
20-40	4(80%)	28(45.2%)	13(59.1%)	5(100%)	16(53.3%)	66(53.2%)
>40	0	18(29%)	2(9.1%)	0	3(10%)	23(18.5%)
Passengers	4(80%)	23(37.1%)	13(59.1%)	2(40%)	15(50%)	57(46%)
Drivers	1(20%)	39(62.9%)	9(40.9%)	3(60%)	15(50%)	67(54%)
Collision	5(100%)	52(83.9%)	17(77.3%)	5(100%)	26(86.7%)	105(84.7%)
Rolling over	0	10(16.1%)	5(22.7%)	0	4(13.3%)	19(15.3%)
Total	5(100%)	62(100%)	22(100%)	5(100%)	30(100%)	124(100%)

Table 5: Types and sites of injuries in relation to the use of seat belt

Parameters	With seat belt	Without seat belt	Total
Site of injuries			
Abdomen	2(25%)	6(75%)	8
Chest	8(42.1%)	11(57.9%)	19
Head & Neck	9(30%)	21(70%)	30
Limbs	18(35.3%)	33(64.7%)	51
Vertebrae	3(37.5%)	5(62.5%)	8
Multiple	5(62.5%)	3(37.5%)	8
Totals	45(36.3%)	79(63.7%)	124
Type of injuries			
Dislocation	1(20%)	4(80%)	5
Fractures	19(30.6%)	43(69.4%)	62
Internal Bleeding	7(31.8%)	15(68.2%)	22
Ruptured Viscus	1(20%)	4(80%)	5
Wounds and Lacerations	17(56.7%)	13(43.3%)	30
Total	45(36.3%)	79(63.7%)	124

DISCUSSION

Road traffic accident is the leading cause of admission in hospitals worldwide. Saudi Arabia is a part of the" Group of twenty" with major economies. Roads are important for transportation within and in between cities. More than 6 million cars are found on the roads of KSA for this purpose[9]. 20% of hospital beds are occupied by RTA patients according to Ministry of Health record[10].

Our study shows that majority of the injured were male (88%). This gender difference is not surprising in Saudi Arabia due to driving laws where the drivers are only males so they are most vulnerable to RTA's. Similar higher incidence of traffic accidents among males has been found worldwide by many other researchers[11, 12] .

The ages of the cases ranged from 5-61 years old (M; 28.75 years ±SD; 13.1). Individuals in the age group of 20-40 years were the most effected [66 persons (53.2%)]. Similar results were reported in Jazan (Saudi Arabia) where the most common age group was 18-30 years.[13] this prevalence of accidents among the youth can be attributed to the lack of entertainment facilities in this area. They are using motor vehicles as an activity of leisure with illegal manners and inadequate training. Likewise, in a study in Iran the average age of the injured was 24.7 years and 33.8% were in the range of 20-29 years[14]. Similar results were revealed in the previous studies conducted at other places.[15, 16]As a result, maximum involvement of economically active members of the society can result in economic burden to both family and the country.

The time of accidents for majority of the victim was early morning [69 cases (55.6 %)]. Statistically, there was significant (p=0.016) difference between the different age groups regarding the reported time of the accidents as morning time was the commonest among victims blow 40 years while evening and night accidents were common among cases aged above 40 years. 30–39 year age group had the highest frequency of daytime crashes in UK as well.[17] A study in Nepal also showed similar results with 50% of the accidents were in the morning (6.00 am - 12.00 pm) time followed by 31.2% in between 12pm to 6pm[18].

Seatbelt is important factor in reduction of casualities and severity of injuries in road traffic accidents. Our study found that Seat belt was used in only 45 cases (36.3%). Similarly Amit[19] found that none of the victims were wearing seatbelt. This may be result of lack in knowledge, proper driving training or weakness of law enforcement agencies. In the USA, front seatbelt use was 75% in 2002. This attitude can be changed through mass education and awareness campaigns in educational institutions and public places and through media. Rate of seatbelt usage in Korea increased from 23% in 2000 to 98 % in 2001 following a national compaign[20].

Our study concluded over speeding as the major cause of RTA's, accounting for 62%. Other causes include lack of attention, sleepiness and vehicle fault. Ghaffar et al. [21] have reviewed RTA's in Saudi Arabia and have shown similar results in which around 50% of reported cases were due to excess speed and was the major cause of RTA's.

Regarding the site of injuries in our studied cases, limbs were the commonest site for injuries (41%), followed by Head and neck injuries (24.2%) and chest injuries (15.3%), while multiple sites were involved in 6.4% of the cases. In studies conducted in other regions of Saudi Arabia like Najran and Qassim, the most frequently injured body regions were head and neck, followed by upper and lower extremities, which is not consistent with our results[22,23] however the results are consistent with other international studies. A study in Iran reported limbs (57%) as the most commonly effected site followed by head and neck (26%).[24] Another study by Shamim in Karachi, Pakistan shows limbs (44.7%) are the most commonly injured site followed by head and neck(27.8%)[25].

Fractures, dislocations, internal bleeding, ruptured viscera, and wounds were reported as types of injuries among the enrolled cases. Fractures were the commonest injuries (50%) followed by wounds and lacerations (24.2%). Similar results were obtained by Dinesh Rao in his study conducted in Pune, India.[26] However the Ethopian study reported lower limb as the major site and lacerations were the most frequent type of injury[27].

CONCLUSION

Road traffic accident is still a major cause of mortality and morbidity in KSA. Young males are most commonly affected and over speeding is a critical factor in RTA. Fractures are the commonest injuries and limbs are the most frequently injured site in road traffic accidents.

Recommendations:

1. To control over speeding, apart from installation of cameras at fixed points, police should monitor speed on unexpected points as well.
2. Heavy fines should be implemented on those who do not wear seat belt and over speed.
3. Road safety should be included in curriculum of schools.
4. Training should be provided to health care professionals to tackle and treat fractures.

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Conflict of interest: None

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