Frequency of traumatic patients, referring (by trauma) to emergency departments of Imam Khomeini and Golestan hospitals, Ahvaz in 2016-2017

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Abstract

Background: Trauma caused by vehicle accidents, falling and quarrel are the main reasons for referral to hospital emergency rooms. Seemingly components such as age, gender, type of vehicle, and individual's education level are influential in the injury type and severity. In this study, the epidemiology of types of trauma and the factors affecting the injury type and severity were investigated.

Methods: This descriptive-analytic study was on trauma patients referred to Golestan and Imam Khomeini hospitals in Ahvaz during 2016-2017. A checklist was used to record the required information, including age, gender, type of trauma, accident location, the affected organ, injury severity and treatment outcome (death, type of disability, and so on). The results were analyzed using appropriate statistical tests.

Results: The mean age of 608 patients was 29.5 ± 15.69 years, the transferred patients to the hospital by Emergency Medical Services (EMS) were 51.2%. Trauma mechanism in 54 (8.9%), 73 (12%), and 481 (79.1%) patients included fall, quarrel, and motor vehicle crash, respectively. The most common organs damaged were limbs (56.1%) and head (37.5%), respectively. A total of 35 patients (5.8%) left the hospital with personal consent, and 11 (1.8%) died. In one, four and six patients, the trauma mechanism was falling, motorcycle riding, and car occupants, respectively. No significant difference was seen in the age, gender and trauma mechanism between the dead and the survivors.

Conclusions: The most common trauma mechanism is motor vehicle accidents. Most groups exposed to traumatic injuries are young men. More coherent measures are needed to prevent these injuries.

Keywords: trauma, Ahvaz epidemiology, emergency medical services, traumatic injuries, road traffic accidents

INTRODUCTION

Trauma is one of the most important and controversial issues in medicine, and trauma patients are among the most common cases referred to hospitals and medical centers. Currently, trauma is one of the most common causes of death in one-year-old-to 44-year-old people and the third leading cause of death at every age [1]. Damage by Road Traffic Accidents (RTA) refers to damage involving at least one motor vehicle [2]. In a fatal RTAs, death occurs instantly or within a maximum of 30 days of a crash [3]. Mortality, injuries, and disabilities due to RTA are major problems in many countries [4]. These injuries also impose a huge economic burden on the health system [5]. By 2020, RTA-related deaths are expected to obtain third and second ranks among the causes of death in high-income and low-income countries [6]. Deaths from RTA in Iran should be of particular consideration [7]. In 2007, 27, 567 people died in RTA, mostly young and children, and 27, 6762 were also suffering non-lethal injuries [8].

The trauma from vehicle accidents, falling and beatings are the main reasons for referrals to hospital emergency rooms, leading to many deaths and permanent physical disabilities. Vehicle accidents are the main cause of death and disability in most countries, including Iran. Age, gender, and type of vehicle are critical in the accidents, severity, and type of injuries, disability, and resulting mortality. The accident urban location or the country's interurban highways, due to the difference in vehicle speed when the accident, is one of the determinants of the damage's type and severity, the disability probability, and the resulting mortality. The injured person's education level can also be important in this regard. The physical injuries' type and severity in the accidents affect future disabilities and resulting mortality. Age and gender, type of vehicle (motorized or non-motorized) and the individuals' education level are important in the injury type and severity.

The preventive methods in a traumatic event will be effective when accurate information and statistics are available on the incidence and prognosis of trauma mechanisms. Epidemiologic evaluation of traumatic patients referred to the emergency department is necessary for reducing traumatic injury. Since there is no integrated system for treating patients in our country, many studies in different parts of the country are essential.

This cross-sectional study aimed to investigate the injury incidence and factors affecting the physical injuries' type and severity and the outcomes of these injuries in the affected person's future. Other causes of the trauma investigated are the quarrel and fall. Fall occurs mainly due to non-observance of safety principles and is abundantly seen in construction workers.

DATA AND METHODOLOGY

This descriptive-analytic study was on patients with traumatic diseases referred to Golestan and Imam Khomeini hospitals in Ahvaz during 2016-2017.

INCLUSION CRITERIA

All patients referred to Golestan and Imam Khomeini hospitals following trauma during 2016-2017, were included.

EXCLUSION CRITERIA

Trauma patients with an injury unclear mechanism were excluded.

METHODS

This study was to investigate the frequency of traumatic patients referred to the Emergency of Golestan and Imam Khomeini hospitals in Ahvaz. In this study, a pre-designed checklist was used to collect the data, including age, gender, trauma mechanism, trauma location, damaged organ, damage severity, and treatment outcome.

DATA COLLECTION

In this study, a checklist containing the patients' demographic information (age and gender), the time of referral to the emergency department, the type of referral (referral of the patient, transfer to a hospital by followers, or by pre-hospital emergency department or dispatch from other medical centers), trauma mechanism, patient therapist's services, and the treatment outcome were used to record patient data.

STATISTICAL ANALYSIS

Data were collected and sorted and then analyzed with SPSS 22 into two sections: First, all data were analyzed using descriptive statistics. The Kolmogorov-Smirnov test was used to test the data normality. The T-test was used for testing the difference significance between the quantitative variables in a normal distribution of data, and in the non-normal distribution, the Mann-Whitney-U test was used. The relationship between qualitative variables was assessed using chi-square and Fisher's exact test. P-values less than 0.05 were considered statistically significant.

RESULTS

In this cross-sectional study, 608 trauma patients referring to Golestan and Imam Khomeini hospitals, were examined, of these 449 (73.8%) were male and 159 (26.2%) were female. The patients' mean age was 29.5 ± 15.69 years. The youngest patient was one-year-old and the oldest was 86 years old, 311 patients (51.2%) were transferred to hospital by pre-hospital Emergency Medical Services (EMS), 55 outpatients were self-referred and 221 (36.3%) were transferred to the hospital by the fellows and 21 (3.5%) from other countries were sent to the hospitals. The trauma mechanism in 54 (8.9%), 73 (12%), and 481 (79.1%) patients were fall, quarrel, and motor vehicle accidents, respectively. Among motorcycle accident victims, 140 (29.1%), 136 (28.3%), 15 (3.1%), and 190 (39.5%) were motorcyclists, pedestrians, cyclists, and car occupants, respectively. There were also 73 cases of quarrel, 44 cases with knives, 6 with weapons, 17 with a stick and 6 with fists and kicks, respectively.

Out of all participants, 228 (37.5%), 62 (10.2%), 84 (13.8%), 34 (5.6%), 42 (6.9%), and 341 (56.1%) patients suffered from head, facial, chest, and abdominal traumas, pelvic and urogenital area, and limb trauma, respectively. Among these patients, 495 (81.4%) had isolated cases of trauma in one part of the mentioned cases, but with 113 others (18.6%), there was a simultaneous trauma of two or more parts of the body.

In examining the specialized services involved in the treatment of these 608 patients, emergency services were involved in the treatment of all patients, and other services (orthopedics, neurosurgery, general surgery, ENT (Ears, Nose and Throat), maxillofacial surgery, obstetrics and gynecology, and urology) were involved in the treatment of 110 (18.1%), 50 (8.2%), 33 (5.4%), 28 (4.6%), 15 (2.5%), and two patients (0.3%), and one patient (0.2%), respectively.

The average patient stay duration in the emergency room was 37.58 ± 68.55 minutes (20 to 480 minutes), and in other emergencies, it was 106.38 ± 115.2 minutes (30 to 576 minutes). Also, 392 patients (64.4%) were discharged from the emergency department by the EMS, and 27 (4.4%) were admitted to the relevant services. In addition, 39 patients (6.4%) were transferred to the operating room, 104 (17.1%) were monitored in other emergency rooms and then discharged. Also, 35 patients (5.8%) left the hospital with personal consent and 11 (1.8%) died.

Among the causes of personal satisfaction, 20 cases (57.1%) were provided by EMS, 11 (31.42%) by orthopedic services, 2 (5.7%) by surgery and 2 (5.7%) by the ENT. Of the 11 patients who died, one case (9%) died before entering the emergency department, one case (9%) died within the first hour after admission to the emergency department, 6 (54.54%) died within one to six hours entering the department and three people (27.27%) died at the end of the six-hour period after entering the department. The mean age of the patients died was 23.44 ± 34.54 years and the surviving patients' mean age was 15.53 ± 29.41years. No significant difference was seen in the age between the two groups (p=0.283). In the patients died, nine (81.8%) were male. In

surviving patients, 440 (73.7%) were male, and no significant difference was seen between the two groups in gender (p=0.737). Four (36.4%) of the dead were motorcyclists and six (54.5%) were car occupants. One person (9.1%) was also traumatized after falling.

Among the survivors, 136 (22.8%), 136 (22.8%), 15 (2.5%), 184 (30.8%) were motorcyclists, pedestrians, cyclists, and car occupants, respectively. Also, 53 (8.9%) fell from a height and 73 people (12.2%) had a quarrel. In this regard, the difference between the two groups was not significant (p=0.225). In eight patients (82.8%), one organ suffered from damage and two or more organs were injured in three (27.2%) patients simultaneously. Among dead patients, 487 (81.6%) had damage to one organ and 110 (18.4%) had two or more injured organs. In this case, the difference was not significant between the two groups (p=0.437). Head, chest, abdominal, and limb injuries were seen in five (45.5%), three (27.3%), 1 (9.1%), and four (36.4%) patients, respectively. Surgical and orthopedic services were also involved in the treatment of five patients (45.5%) and neurosurgery services in the treatment of six patients (54.5%) Table 1.

DISCUSSION

Every year, more than 5000,000 people die due to an accident. In developing countries, including Iran, trauma due to accidents and other mechanisms is the first cause of death in young people and adolescents. This study's age results are a sign of this fact, and it is also the cause of the disability and economic damage in developing countries and has been underestimated. The situation is getting worse, and according to the World Health Organization's (WHO) predictions by 2020, accidents due to accidents alone will be the second cause of lost years of life around the world.

In our study, the majority of trauma patients (73.8%) were men. Also, in most previous studies from various regions, similar results were obtained and traumatic injuries were significantly more common in men than in women [9-16]. These results show that the prevalence of male gender in trauma controversy patients is more apparent.

The patients' mean age in this study was 29.5 ± 15.69 years. The youngest patient was one-year-old and the oldest was 86 years old. In line with our findings, in all previous studies, the patients' mean age was between 25 and 30 years old and the majority of patients were younger [9,12-14] This issue highlights the great importance of these injuries, given the prevalence of a healthy and active population.

The patients (2%) were transferred to the hospital by pre-hospital EMS and 3.5% by inter-hospital dispatching, but in the remaining cases, the patients had referred to the hospital or were transferred by their fellows. In Salimi et al.'s study [17], only 98 patients (40%) were transferred to the hospital by ambulance, in most cases, due to the lack of communication devices. The average transfer time from the incident time was two hours and 40 minutes, and the average stay duration in the emergency room was four hours and 14 minutes. Of course, in that study, the main difference with our study was that they only looked at dead people. However, in Salimi et al.'s study, only 135 patients (11.8%) were transferred to the hospital by emergency ambulance [14,15]. Comparison between our results with that study's findings shows that during the last decade, the EMS quality, community awareness about the use of this patient transmission system, as well as the ways of communication and access of patients to the emergency system have been improved significantly. A reason for the tendency to use the emergency system may be the full coverage of the accident committed by the patients. Azami-Aghdash et al.'s review study [15], only 31.1% and in Modaghegh et al.'s study [18], 39.5% of the patients were transmitted to the emergency department by ambulance.

The trauma mechanism in 8.9%, 12%, and 79.1% of the patients were falling, quarrel, and motor vehicle accidents, respectively. Among those who had motor vehicle accidents, 29.1%, 28.3%, 3.1%, and 39.5% were motorcyclists, pedestrians, bicyclists, and vehicle occupants. Also, out of 73 cases of quarrel recorded, 44, six, 17, and six cases were with knives, weapons, sticks, and fists and kicks, respectively. In most previous studies, the most common trauma mechanism was the accident with vehicles and then falling. For example, in Mobaleghi et

Table 1. Comparison between the dead and survived patients' traumatic characteristics

Variable	Type	Patients died (n=11)	Patients survived (n=597)	p-value
Age (years)		34.54 ± 23.44	29.41 ± 15.53	0.283*
Gender	Man	9 (81.8%)	2 (18.2%)	0.737**
	Female	440 (73.7%)	157 (16.3%)	
Trauma mechanism	Motorcyclist	4 (36.4%)	136 (22.8%)	**0.225
	Pedestrian	-	136 (22.8%)	
	Bicyclist	-	15 (2.5%)	
	Car occupant	6 (53.5%)	184 (30.8%)	
	Fall from height	1 (9.1%)	53 (8.9%)	
	Quarrel	-	73 (12.2%)	
Extent of damage	An organ	8 (82.8%)	487 (81.6%)	**0.437
	Several organs	3 (17.2%)	110 (18.4%)	
Damaged organ	Head	5 (45.5%)	223 (37.4%)	Chi-square error
	Face	-	62 (10.4%)	
	Chest	3 (27.3%)	81 (13.5%)	
	Abdomen	1 (9.1%)	33 (5.5%)	
	Pelvic and Urogenital	-	42 (7%)	
	Limbs	4 (36.4%)	337 (56.4%)	
Specialized services involved in patient treatment	Emergency Medicine	11 (100%)	597 (100%)	Chi-square error
	Orthopedic	5 (45.5%)	105 (17.6%)	
	Neurosurgery	6 (54.5%)	45 (7.5%)	
	General surgery	5 (45.5%)	27 (4.5%)	
	ENT	-	28 (4.7%)	
	Maxillofacial surgery	-	15 (2.5%)	
	Obstetrics and Gynecology	-	2 (0.3%)	
	Urology	-	1 (0.2%)	

* Independent Samples t-test was used to compare the two groups
** Chi-square test was used to compare the two groups

al.'s study [9], the trauma mechanism in 1956 (48.7%), 1901 (47.3%) and 159 (4%) people were motor vehicle accidents, falling, and quarrels, respectively. In Cheraghian et al.'s study [13], the trauma mechanism in 3946 (4.6%), 6592 (7.6%), and 29086 (33.9%) people were falling, quarrel, and motor vehicle accidents, including 5383 (6.2%) pedestrian accidents, 10323 (12%) car crash, and 13381 (15.7%) motorcyclists, respectively, and the rest included other types of trauma. However, the classification of trauma mechanisms in that study was different from our study, but still, the most common mechanism of trauma was the accident of motor vehicles. In Salimi et al.'s study [14] the most common mechanism of trauma in 671 (59%) was accidents, of which 241 (36%), 237 (35.3%), 177 (26.4%), and 16 people (2.4%) were pedestrians, motorcyclists, drivers or car occupants, and bicyclists, respectively. Also, 242 cases of falling (21%), 140 cases of Injury with non-penetrating objects (12.3%) and 54 cases of injury with cuts (4.7%) were reported. Also in Azami et al.'s review study [15], the most common mechanism injury was the car accident (50.1%) and then, falling (22.3%). Also, the accident mechanism in 45%, 26.3%, 25.3%, and 3.4% of was motorcycles, pedestrians, car occupants, and others, respectively. In Beigzadeh et al.'s study [16], the most common trauma mechanisms were motor vehicle accidents (49.7%), quarrel (16.9%), falling (15.1%), and occupational accidents (11.6%).

Also in the investigation of cases of quarrel, in Arhami et al.'s study of the 499 patients studied, 283 cases (56.7%) were referred to the emergency department due to penetrating trauma and 240 cases (48.1%) required surgical intervention [12]. Finally, 398 (79.8%) were discharged after complete recovery, 81 cases (16.2%) left the emergency with their personal consent, and 4 (0.8%) died. Based on that study's findings, the trauma prevalence due to conflict and violence in Tehran was about 16 cases per 1000 visits to the trauma unit of the Center.

Out of these participants, 37.5%, 10.2%, 13.8%, 5.6%, 6.9%, and 56.1% were traumatized in the head, face, chest, abdomen, pelvic region, and urogenital area, and other organs, respectively. In Mobaleghi et al.'s study [9], as in our study, the most common trauma site was in the limbs (61.2%), followed by head and neck (23.2%), thorax (5.9%), vertebrae (4.8%), and abdomen (4.4%), respectively. In Azami et al.'s study [15], the most common injury site was head and neck (47.3%), then, limbs and pelvis (41.8%), face (19.3%), abdomen (12.5%), chest (10.5%) and vertebrae (6.5%). In Modaghegh et al.'s study [18], the most common anatomical sites injured were the lower limbs (45.5%) and head and neck (42.5%). Considering the high prevalence of traumatic head injury among traumatic and preventable injuries, in many cases, including using the helmet in motorcyclist, providing knowledge and culture-building in this regard, along with the application of effective rules, can greatly prevent such damage, which is a very dangerous and life-threatening threat.

In our study, 35 patients (5.8%) left the hospital with personal consent, acceptable in comparison with similar studies, especially given that the study was conducted in the emergency department. In Barati and Sedaghat's study of 5-month first-rate discharge with personal satisfaction, the results were from 1.8% to 32.8%. In a study of patients admitted to the psychiatric ward, 3% of the patients had left their incomplete phase of hospitalization and were discharged with personal satisfaction, while this rate in the emergency department was 20% [19]. In studies, mortality and readmission rates were higher during the two weeks after discharge with personal satisfaction than those who had been discharged on time, and 96% of those who had been admitted had a similar complaint to the previous visit. According to various studies, mortality and re-admission are more frequent within 30 days after discharge with personal satisfaction than those who are being discharged on time [20].

Vahdat et al. also showed that the most important reasons for discharging with the patients' personal satisfaction included dissatisfaction with EMS (27%) and dissatisfaction with facilities and equipment (33%), and physicians' suggestions (12%) [21]. In another study, the most reason for leaving the hospital with personal responsibility was the

health system problems of the wards [22]. Nezamzade showed that the most reason for patients' dissatisfaction and the leaving with personal desire was dissatisfaction with medical and nursing services, being a teaching hospital, and dissatisfaction with medical equipment and facilities [23].

The mortality rate in our study was 1.8%. No significant difference was seen in the age, gender, and trauma mechanism between the dead and the survivors. In Mobaleghi et al.'s study [9], the death frequency in trauma patients was 0.5%, and the trauma mechanism did not have a significant relationship with the death risk. However, this finding in both studies may be due to a small sample size of patients who died. In Salimi et al.'s study [17], trauma-related deaths in six university hospitals, the mortality rate was 3.1%, of which 208 were men and the average age of the dead was 40.7 ± 23.5 years. The most common causes of death were traffic accidents with 174 cases (71%) and then falling with 41 cases (16.8%). Also, the most common causes of death were a head injury with 169 (69%) and abdominal damage with 19 cases (7.8%). In Monsef et al.'s study [10], like our study, the most common cause of death (58.1%) was due to head injury. The death percentages reported in the studies conducted by Cheraghian et al. [13], Salimi et al. [14] and Modaghegh et al. [18] were 0.65%, 8.4%, and 6.1%, respectively which were, in most cases, resulted from an accident of motor vehicles. Also, in Modaghegh et al.'s study, like our study, the most common cause of death (87.7%) was head and neck injuries, often due to motor vehicle crash or fall.

CONCLUSION

The most common mechanism of trauma and the most common cause of death are motor vehicle accidents. The most exposed group of traumatic lesions are young men, given that young men are the most active part of the economy in any society, the high prevalence of traumatic injuries and serious complications as well as social and individual consequences, it can also be very detrimental to any society economy. Considering the high degree of traumatic injury prevented, it is expected that more coherent action and careful planning will be made for culture-building practices; it will establish robust and principled laws to improve the person's safety in the use of vehicles and work environments.

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The authors declare that they have no conflict of interests.

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