Trauma in Guilan (North of Iran): An Epidemiologic Study

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Abstract- Injuries, especially traffic accidents are so important causes of death, disability, hospital expenses, economic damages to the society which World Health Organization selected them as the main subjects for investigation and research. We have done an epidemiologic study about trauma in Guilan, a province in north of Iran. This is a descriptive study carried out on patients with traumatic injuries, admitted in Poursina Teaching Hospital, during September 2005 to July 2006. Data were collected prospectively using a data collection form including demographic information, mechanism of trauma, anatomical site of injuries, according to AIS90 and severity of head trauma according to glasgow coma scale (GCS). Data were processed by SPSS 11.5 and are shown in tables and figures. Overall 3598 patients admitted. Mean age was 31.85 ± 17.76 years with male to female ratio about 3.5:1. Most of patients were 25-44 years old (33.9%). Traffic accidents were the leading cause of injuries (73.84%) and then fall (15.7%). Motorcycle was the most common mode of transport in our patients (47.07%) after that car (24.3%). Occurrence of traffic accidents increased through evening. Forty six percent of patients transported to hospital by people or came themselves (46.42%). Head and neck were the most common injured part of body (82.4 %,) however about in 81.66% of patients were mild and then limb and pelvis (34.7%). Finally about 2.8% of them died. A trauma especially traffic accidents are an important public health issue in Guilan, we recommend conducting other studies focusing on risk factors in details, and considering injury prevention in local decision making.

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Key words: Epidemiology, injury, glasgow coma scale (GCS), Guilan

Introduction

Injuries, especially traffic accidents are a very important cause of death and disability worldwide, so much so that the WHO has decided to select this topic as a major area for discussion and further research (1). Annually 5 million people lose their lives as a result of mostly preventable injuries (i.e. 570 people per hour) (2). Traffic accidents are still a major public health threat, both in industrialized and developing countries, which leads to depletion of valuable resources, especially in terms of loss of human lives as well as man power (3). An estimated 1.2 million people are killed in motor vehicle accidents each year in addition to another 50 million injured individuals. In Iran, the incidence of people injured through unintentional means with the resultant hospitalization and death are about 425 and 42 per 100,000, respectively. Annually motor Vehicle and motor cycle accidents account for 38 deaths in 100,000 population and 237 cases of hospitalization per 100,000 of the population (5). Due to its geographical location as well as being a transit point for cars and trucks, Guilan province has one of the highest numbers of accident related injuries and deaths. In this study, we will evaluate different kinds of trauma with their related injuries.

Patients and Methods

This is a descriptive study carried out in Poursina Teaching Hospital, a major urban trauma center. We collected data of patients with traumatic injuries prospectively whom admitted in Poursina Hospital between September 2005 and July 2006.We used a data collection form consisted of:

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Age

Classified according to WHO guideline of injury 2001to 7 group: less than 5,5-14,15-19,20-24,25-44,45-64 and 65 years and older (6).

Gender

Male, female.

Mechanism of injury

Classified considering WHO guideline of injury 2001 to 7 groups: Traffic injury, fall, hit by person or object, cut, hanging, other (burn, gunshot, animal bites, drowning) and unknown (6).

Mode of transport

classified according to WHO guideline of injury 2001to10 groups: Pedestrian, bicycle, motorcycle, car, minibus/pickup, truck,bus, other (train, boat, airplane), Unknown (6).

Time of injury

According to WHO guideline of injury 2001to 6 groups: midnight up to4, 4 -8, 8-12, 12-16, 16- 20, 20 up to midnight (6).

Anatomical site of injury

Considering classification of abbreviated injury scale (AIS 90): head and neck, chest, abdomen, limb and pelvis.

Severity of head injury

Classified according to Glascow Coma Scale, Mild: 3-8, moderate: 9-12, severe: 13-15.

Mode of transport to Poursina Hospital

Emergency ambulance, people, ambulance of other centers. We processed data with SPSS 11.5, and qualitative data were analyzed using chi square and quantitative with t- test. They are presented in tables and figures. P <0.005 is considered statistically significant.

Results

Over all 3598 patients with traumatic injuries were admitted in Poursina Hospital between September 2005 and July 2006. Mean age was 31.85 ± 17.76 years. The 25-44 year old age group had the highest rate of injuries as compared to other age groups. The incidence of injuries in males was 3.5 times higher than that of females (n = 2797). Male injured 3.5 times more than women (n = 2797). Traffic accidents were the major mechanism of injury (73.84%). Table 1 shows relative frequency of different mechanisms of injuries by age groups and table 2 shows it by gender.

Table 1. Distribution of different mechanism of injuries by age (N=3455)

Age group	Mechanism of injury							Total
	Traffic accident	Fall	Hit*	Cut	Hanging	Other	Unknown	
<5y								
N	49	41	-	-	-	2	1	93
%	(1.91)	(7.67)				(3.84)	(1.85)	(2.69)
5-14y								
N	181	51	10	3	-	13	6	264
%	(7.06)	(9.55)	(5.29)	(5.66)		(25)	(11.11)	(7.64)
15-19y								
N	443	37	26	13	1	4	7	531
%	(17.29)	(6.92)	(13.75)	(24.52)	(9.09)	(7.69)	(12.96)	(15.36)
20-24y								
N	478	46	34	7	3	12	6	586
%	(18.65)	(8.61)	(17.98)	(13.20)	(27.27)	(23.07)	(11.11)	(16.96)
25-44y								
N	873	145	86	26	6	11	23	1171
%	(34.07)	(27.15)	(45.5)	(49.05)	(54.54)	(21.15)	(42.59)	(33.89)
45-64y								
N	390	126	30	2	-	7	3	558
%	(15.22)	(23.59)	(15.87)	(3.77)		(13.46)	(5.55)	(16.15)
≥65y								
N	140	88	3	2	1	2	8	252
%	(5.46)	(16.47)	(1.58)	(3.77)	(9.09)	(3.84)	(14.81)	(7.29)
Total								
N	2562	534	189	53	11	52	54	3455
%	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)

*By person/Object 143 missing in age

Table 2. Distribution of Different mechanisms of Trauma by gender

Mechanism of injury	Gender		Total
	Male N %	Female N %	N %
Traffic accident	2098 (76.20)	559 (69.78)	2657 (73.84)
Fall	392 (14.23)	173 (21.59)	565 (15.70)
Hit*	162 (5.88)	34 (4.24)	196 (5.44)
Cut	53 (1.92)	3 (0.37)	56 (1.55)
Hanging	10 (0.36)	1 (0.12)	11 (0.30)
Other	37 (1.34)	16 (1.99)	53 (1.47)
Unknown	44 (1.59)	15 (1.87)	59 (1.63)
Total	2753 (100)	801 (100)	3598 (100)

*By person/Object

Motorcycle was the most common mode of transport in traffic accidents (47.07%). It was similar in both sexes (Table 3). Traffic accident and fall are the two major causes of injuries showed significant difference in all age groups except in patients less than 5 years old (Table 4). More men were injured, through different mechanisms, compared to women. (Table 5)

Occurrence of traffic accidents showed a progressive trend toward evening (Figure 1). Distribution of injuries was as below:

Head and neck: 82.4%, Face: 13.9%, limb&pelvic: 37.7%, Spine: 7%, Chest: 3.8%,

Abdomen: 3%.

Head injury was severe in 8.9%, moderate in9.5%, and mild in 81.66%.

Most of patients were transported to Poursina by other people (46%) then by ambulance of other centers (42%) and only 5% by emergency ambulance. 100 patients died due to severity of injuries with male to female ratio of 4.88:1.and 79% of them were traffic accidents victims, 9% of them died due to fall

Traffic accidents as the main causes injury related death were significantly more common than fall (N=79 versus N=9; $P = 0.000$).The cause of rest of injury related death was unknown (N = 12). All fall related death occurred in patients 25 years and older.

Table 3. Distribution of different modes of transport by gender

Mechanism of injury	Gender		Total
	Male N %	Female N %	N %
Pedestrian	400 (19.11)	130 (23.38)	530 (20)
Bicycle	65 (3.10)	19 (3.41)	84 (3.17)
Motorcycle	1055 (50.40)	192 (34.53)	1247 (47.07)
Car	456 (21.78)	182 (32.73)	638 (24.08)
Pick up/minibus	45 (2.15)	13 (2.33)	58 (2.18)
Bus	33 (1.57)	12 (2.15)	45 (1.69)
Other	12 (0.57)	6 (1.07)	18 (0.67)
Unknown	25 (1.19)	2 (0.35)	27 (1.01)
Total	2093 (100)	556 (100)	2649 (100)

Table 4. Difference of Traffic accidents and fall in different age groups

	Traffic accidents	Fall	Chi square	P value
<5y	49	41	0.711	0.399
5-14y	181	51	72.845	0.000
15-19y	443	37	343.408	0.000
20-24y	478	46	365.153	0.000
25-44y	873	145	520.613	0.000
45-64y	390	126	135.07	0.000
≥65y	148	88	15.254	0.000

Table 5. Difference of different mechanisms of injury in both genders

	Male	Female	Chi square	P value
Traffic accidents	2098	559	891.42	0.00
Fall	392	173	84.887	0.000
Hit	162	34	83.592	0.000
Cut	53	3	44.643	0.000
Hanging	10	1	7.364	0.007
Other	38	16	8.96	0.003

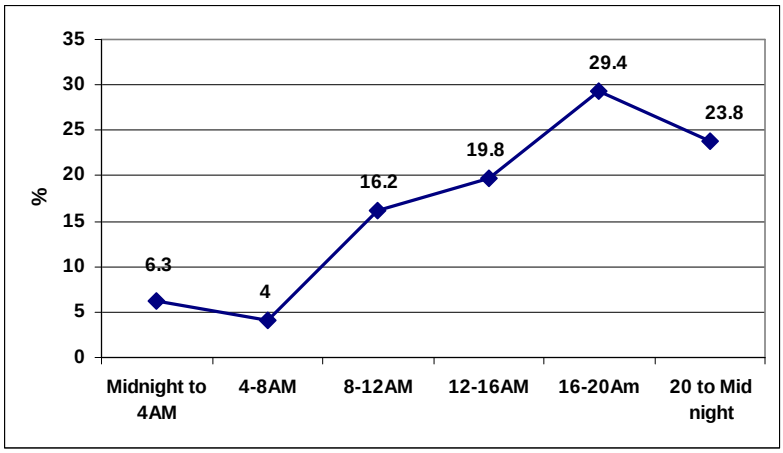

Figure 1. Time of occurrence of injury

Table 6. Injury related death by gender

	Male	Female	Chi square	P value
Traffic accident	65	14	32.924	0.00
Fall	7	2	2.778	0.096
Unknown	11	1	8.333	0.004
Total	83	17	43.560	0.000

Table 7. Major traffic accident related death by gender

	Male	Female	Chi square	P value
Pedestrian	17	8	3.240	0.072
Motorcycle	30	1	27.129	0.000
Car	11	4	4	0.046

Discussion

Injuries and specially traffic accidents are important as causes of death, disability, hospital expenses, and economic damages to the society (1). We found men 3.5 times more prone to traumatic injuries than women. This pattern was same for all mechanisms of injuries which was similar to other studies (3, 7, 8). The great proportion of men could be due to more involvement in out home activities which oppose them to risky behaviors.

In our study, 25-44 years old patients were the most group injured in different types of trauma and a significant number of them were victims of traffic accidents. A study showed in India youth and middle aged (15-55y) were the main injured group, then olds (60y) in traffic accidents (8) In Saudi Arabia 71% of traffic victims were 18-49 years olds (9). A study in one state in USA revealed that 25-44 years old as the most injured group (8). These figure show that most of the injured people are active, working class of societies.

We found out that injuries were 3.5 times more common in men compared to women. This finding was similar in other studies (3, 6, 7). This finding could be attributed to the fact that men are more likely to be driving a car or be a passenger in a car rather than women. Patients in the 25-44 year-old age range were the most commonly injured group of people.

We found traffic accidents the leading cause of injury and most common mode of transport was motorcycle. In Asia motorized two and three wheelers will make up the anticipate growth in numbers of motor vehicle accidents (10).In India injury due to motorcycle was the second one after bicycle (7). In Kenya Matatus- a local transport vehicle – was the main cause, however majority of patients were pedestrian (11). Several studies indi-

cated that pedestrians are most vulnerable and pay a heavy toll for exposure to road traffic accidents (12, 13). Road traffic injuries in WHO region of Europe are a major public health problem and kill about 127000 million every year (14). In developed countries road traffic death rates have decreased since 1960s because of successful intervention but it increased in developing countries during same period. For example though high economic growth had transcended into high accident rate in Malaysia recently witnessed a change in the trend toward increasing (15).

In our patients, occurrence of traffic accidents had a progressive trend toward evening, similar to another studying Delhi (7).

We also found traffic accident as the major cause of death and motorcycle as the main mode of transport in our patients while female victims of traffic injury were mainly pedestrian and in male most common mode of transport was motorcycle. In Malaysia 50% or more of road death in cities involve pedestrians while 60% of fatal road accidents involved motorcycles (15). In a study on epidemiology of traffic related death in Tehran, like our findings, women were pedestrian and men who died were motorcyclist (17)

We found fall as the second cause of injuries in all ages, however in children less than five it didn't show significant difference with traffic accidents but it seems that fall is an important problem in young and middle aged too. In a study in USA fall related hospitalization was more common in children and elderly (8).Although most of the studies about fall focused on it in the above age groups (17), but in young and middle aged who are the economically active groups , more attention should be paid to this entity.

In our study hit by objector person in our study was the 4th cause of injury .In Africa homicide is number one cause especially in young (25-34y) (19). It is somehow is similar to another study in USA which showed great proportion of young in assault and is also 3rd cause of injury related death after traffic accidents and suicide (8). In our patients suicide by hanging was 4th mechanism of injury. Suicide by all mechanism was the second cause of injury related death in one state of USA (8) and 3rd in Africa. (17) Less number of suicide numbers in our patients is because of this reason that most of patients who attempt to suicide with poison are referred to another center.

We found head and neck the most injured anatomical injury site of body in our patients which was similar to other study (7).

The majority of our patients transferred from the scene of the injury by people and a few number of them by emergency ambulance. In another study in Tehran transportation of the patients injured due to traffic accidents and fall in 14.4% and 4.5% was by emergency ambulance while most f them transported by people (5). In conclusion, trauma and specially traffic accidents are main public health issue in this region which can be prevented by effective interventions. We recommend conducting other studies focusing on risk factors in detail about every cause of injury, and considering injury prevention in local decision making; because although some intervention from developed countries can be applied in developing countries; should be applicable to the particular situation of them regarding to more complexity limitation.

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