Brief Report

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The Frequency of Road Accident Injuries among Victims Admitted to Shahid Beheshti Hospital of Babol, Iran in 2010-2012

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ABSTRACT

BACKGROUND AND OBJECTIVE: Road accidents are one of the major causes of mortality and severe injuries, which impose substantial financial and social costs on communities. This study was conducted to investigate the epidemiology of road traffic traumas to the upper and lower extremities.

METHODS: In this cross-sectional study, victims, admitted to Shahid Beheshti Hospital of Babol, Iran, were evaluated during 2010-2012. Demographic data, accident location, day, season and time of accident, as well as admission time were investigated.

FINDINGS: In total, 1049 victims with the mean age of 32.93±16.56 years were included in this study. Overall, 830 (79.1%) and 219 (20%) victims were male and female, respectively. The majority of accidents occurred on inter-urban roads (n=830, 35%) on week days (n=839, 72.5%). The highest frequency of accidents was reported in summer (n=311, 29.6%) between 13:30 pm and 19:30 pm. The longest interval between the accident and hospital admission was 1-2 hours following the accident.

CONCLUSION: The results of this study showed that road accidents were more frequent in certain hours and seasons of the year. Therefore, recognition of local effective factors in accidents could be a proper guide for authorities to promote accurate and effective health planning

KEY WORDS: Road traffic accident, Trauma, Season.

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Introduction

Technological advances and the intensified need for quick transportation via vehicles have led to the elevated rate of road traffic accidents. Highway and road developments have also contributed to the increased occurrence of accidents (1). Road traffic accidents are among the leading causes of mortality and severe injuries in societies. In fact, these accidents impose significant social and financial costs on communities. Therefore, safety measures, reducing road traffic injuries and

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thus decreasing the associated costs are of great importance (2). Costs of road traffic accidents account for 1.3% of the loss of gross domestic product in developing countries (3). According to the reports by World Health Organization (WHO), about 1.2 million people are killed in road crashes each year, and about 50 million people suffer from the damages. Half of these victims (mostly young and male) are within the age range of 15-44 years (4). Trauma refers to a wound or shock to the body, caused by a sudden physical damage, occurring randomly or out of violence (5).

Trauma is the leading cause of death in the first four decades of life. Moreover, it is ranked the second to fourth most common cause of mortality, worldwide. Overall, accidents are regarded as the most important type of trauma (6). According to WHO reports, the incidence of road traffic accidents is the highest in Iran (7). Various factors such as weather conditions, type and conditions of the road, time of the accident, type of the vehicle and demographic characteristics influence the incidence of road accidents (2). The occurrence of road traffic accidents is quite high in Northern provinces of Iran due to their favorable climatic conditions and traffic congestion. Therefore, considering the scarcity of information about road accident traumas, this study was conducted to identify the epidemiology of victims, admitted to Shahid Beheshti Hospital of Babol, Iran. By studying the frequency of these accidents and proposing practical strategies, we can facilitate patient treatment, identify road traffic issues and raise public awareness and safety level.

Methods

This cross-sectional study was conducted on car crash victims with upper and lower extremity injuries, admitted to Shahid Beheshti Hospital of Babol during 2010-2012. Dead victims and those with traumas to the head, face, spinal cord, chest and abdomen were excluded from the study. The required information was gathered via checklists. The collected data included demographic characteristics, location of the accident (e.g., urban, rural, inter-urban, inter-rural and urban-rural linking roads), road conditions (e.g., asphalt and gravel roads), day of the accident (e.g., holidays and week days), season (i.e., spring, summer, autumn and winter), time of hospital admission (i.e., morning, afternoon and evening) and patient transfer (i.e., ambulance, private cars and others). The information was collected by trained staff, who were continuously present at the orthopedic department of the hospital by conducting interviews with the victims or their companions. For data analysis, t-test was performed, using SPSS version 20. P-value less than 0.05 was considered statistically significant

Results

In this study, 1049 victims with the mean age of 32.93±16.56 years (age range: 1-85 years) were included. The mean age of men and women was 31.36±15.46 and 38.89±19.08 years, respectively (fig 1). The demographic data of victims are presented in table 1. The majority of accidents occurred on inter-rural roads (n=367, 35%) and the lowest frequency was reported in inter-rural roads (n=28, 2.7%).

The highest frequency of accidents was reported on Thursdays (15.1%). In terms of the season of accidents, 29.6% (the highest frequency) and 14.8% (the lowest frequency) of the accidents occurred in summer and winter, respectively (table 2). In total, 533 victims were transferred to the hospital by an ambulance, whereas 387 cases were transferred via private vehicles (table 2). The highest rate of accidents was reported between 13:30 and 19:30 pm (fig 2). The majority of cases (n=318, 30.31%) were transferred to the hospital within 1-2 hours after the accident.

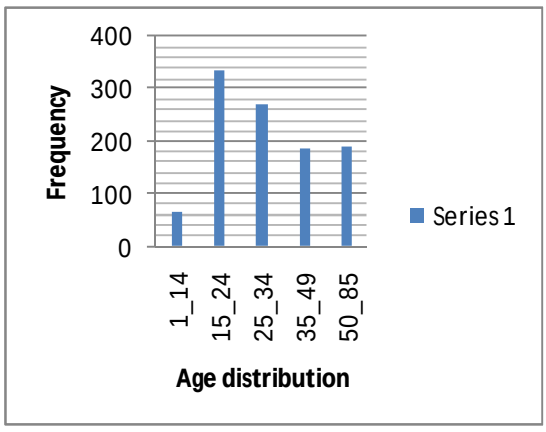

Figure 1. Age distribution of road traffic victims, admitted to Shahid Beheshti Hospital during 2010-2012

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Table 1. Demographic characteristics of 1049 victims, admitted to Shahid Beheshti Hospital during 2010-2012

Demographic characteristics	N(%)
Gender	
Male	830(79.1)
Female	219(20.9)
Marital status	
Single	400(38.1)
Married	649(61.9)
Educational level	
High school diploma	510(55.9)
Diploma	165(18.1)
illiterate	159(17.4)
High school diploma	78(8.6)
Occupational status	
Housekeeper	151(17.2)
Student	142(16.2)
Construction worker	136(15.5)
Worker	130(14.8)
Farmer	87(9.9)
Employee	52(5.9)
Others	142(47.2)
Unknown	173(16.5)
Place of residence	
Rural areas	602(60)
Urban areas	420(40)

Table 2. Frequency distribution of traffic accidents, based on road type and days of the week

Characteristics	N(%)
Type of the road	
Inter-rural	367(35)
Urban	360(43.3)
Linking urban and rural areas	151(14.4)
Rural	143(13.6)
Inter-rural	28(2.7)
Road conditions	
Asphalt	882(84.1)
Gravel	167(15.9)
Days of the week	
Saturday	143(13.6)
Sunday	150(14.3)
Monday	116(11)
Tuesday	147(14)
Wednesday	125(11.9)
Thursday	158(15.1)
Friday	210(20)
Seasons of the year	
Summer	311(29.6)
Autumn	297(28.3)
Spring	286(27.3)
Winter	155(14.8)
Patient transfer	
Ambulance	533(50.8)
Private vehicle	387(36.9)
Others	129(12.3)

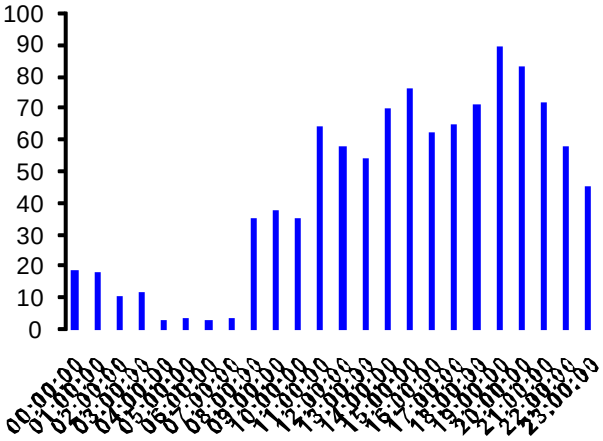

Figure 2. Frequency distribution of accident time in victims admitted to Shahid Beheshti Hospital during 2010-2012

Discussion

In the present study, the majority of victims were within the age range of 20-40 years, which is the age of active society members, who are regarded as productive human resources in a community. Road accidents cause disabilities, fatalities and financial damages to the society, and in some cases, they even lead to the loss of elites in a community (8). In our study, the male-to-female ratio was 3.7:1. This ratio ranged between 3.5 and 5 in studies conducted in our country (9, 10). In this regard, in studies by Brown et al. and Di Bartolomeo et al., this ratio was between 1.6 and 3.6 in developing countries (11, 12). Considering the differences in job responsibilities between men and women, lack of need for education or special driving skills and limitations such as cultural barriers against the use of vehicles by women, the highest rate of accidents was reported among men. In this study, individuals within the age range of 15-24 years were the main victims of road accidents. Moreover, in a study by Farooqui and colleagues in 2013, the majority of victims were in the age range of 30-39 years in India (13). A study by Cherkzi et al. in Golestan, Iran showed that the majority of victims were within the age range of 20-29 years (4), which was in line with the present findings. The need for transportation in these individuals, as the active and productive group of the society, for economic, occupational and educational reasons increases the use of vehicles and the rate of road accidents. In the present study, the majority of accidents occurred on inter-urban roads (n=367, 35%). In a study by Nazeri et al., the

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severity of injuries was higher on inter-urban roads, compared to other routes (14). Karbakhsh et al. also reached the same conclusion in Tehran, Iran (15). Heavy traffic and the need for transfer in urban regions are among the predisposing factors for this issue. In our study, most of the accidents occurred between 13 pm and 19 pm.

According to the study by Cherkzi et al., the majority of accidents occurred between 12:00 and 18:00 pm (4). Aslam et al. in Karachi also reported the highest incidence of accidents between 13:00 and 18:00 pm (16). This can be related to various factors such as drowsy driving, peak working hours, substantial transport for running errands and traffic congestion (8, 10). In the present study, the highest frequency of road accidents was reported on Thursdays, which is not a holiday in Iran; this finding was in line with the results reported in Golestan (4). This might be due to running weekly markets, which causes more traffic and travelling in the city. Therefore, traffic congestion inside and outside the city results in road traffic accidents. Based on our findings, most of the accidents happened in summer, which was in accordance with the results reported in Yazd and Golestan, Iran (4, 10). This might be due to climatic conditions, since in hot seasons, there is a tendency towards the overuse of vehicles; moreover, heavy traffic in agricultural and rural areas, traffic congestion in cities and transportation contribute to this issue. In this study, the longest interval between the accident and hospital admission was 1-2 hours.

In a study by Aslam in Karachi, the longest interval was 0-1 hour (16). Also, the most commonly used vehicle for patient transfer was ambulance (n=533, 50.8%). Therefore, it seems that facilitating victims' rapid transfer to hospitals and emergency sections is of utmost importance. Based on the evaluation of various factors such as the type and location of accidents and severity of injuries, promoting traffic culture in the society could be effective. Therefore, identification of local factors can be a proper guide for effective planning towards health promotion in the community by health authorities.

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