The Epidemiology of Trauma in Golestan Province, Northeast Iran

Soheyla Kalantari[1], Fatemeh Mehravar[2], Farhad Kord[3], Samieh Ghana[4], Seyyed Ali Aghapour[5], Rasoul Mohammadi[6], Leila Fazeli Aref[3], Ahmad Heidari[2]

1. Surgical Technology Department, Paramedical School of Golestan University of Medical Sciences, Gorgan, Iran
2. Clinical Research Development Unit (CRDU), 5 azar Hospital, Golestan University of Medical Sciences, Gorgan, Iran
3. Deputy Treatments, Golestan University of Medical Sciences, Gorgan, Iran
4. .Schools of Nursing and Midwifery, Golestan University of Medical Sciences, Gorgan, Iran
5. .Children's Hospital Taleghani, Golestan University of Medical Sciences, Gorgan, Iran
6. Shahid Beheshti University of Medical SciencesTehran, Iran

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Corresponding Author:
Fatemeh Mehravar
mehravar10261@yahoo.com

ABSTRACT

Introduction: Trauma is one of the most common health problems worldwide, resulting in many cases of physical disability every year. Considering the importance of the occurrence of trauma, this study was conducted to determine its epidemiology in trauma patients of the Trauma Center of Gorgan County, Golestan Province.

Methods: This cross-sectional population-based study was conducted on 17,941 Iranian trauma patients who attended the Trauma Center of 5 Azar Educational Hospital, Gorgan County, from the beginning of 2013 through 2014, using the census method. The patients' data were collected using a checklist designed by the Treatment Deputy of Golestan University of Medical Sciences during morning, evening, and night shifts by trained personnel. The data were analyzed with the STATA software Version 12.

Results: Most of the trauma patients were male and belonged to the age group of 21–35 years. Alley, street, and house were the most common trauma locations. Injuries, motorcycle accidents, and falls from height were the most common types of trauma. As for the outcome, most trauma patients were "treated."

Conclusion: With advances in technology, because of the increase in the number and speed of vehicles and lifestyle changes, trauma is one of the major causes of mortality and disability in the world. Knowledge of the epidemiology of trauma in the world can help lower its prevalence and incidence.

Keywords: Trauma, Epidemiology, Accident, Injury

Introduction

Trauma is the third leading cause of death worldwide [1]. In health systems, the word "trauma" is used to describe unintended injuries and a combination of disorders resulting from physical factors with diverse natural causes [2, 3]. Trauma-related injuries comprise a major health challenge worldwide [4]. In addition to mortality, trauma imposes enormous direct and indirect economic and social costs, such as the costs of treatment, loss of household income during hospitalization, decreased productivity, ceased activities, and management of organizations responsible for trauma or deceased patients [5]. According to the WHO, injury causes 5.8 million deaths per year, or over 90 percent in low- and middle-income countries. It also causes a significant amount of disability and economic losses [6].

In 2013, Haagsma estimated that 973 million people sustained injuries that warranted some type of healthcare and 4.8 million people died from injuries globally [7]. According to WHO, injuries—resulting from traffic collisions, drowning, poisoning, falls or burns and violence—from assault, self-inflicted violence or acts of war—kill more than five million people worldwide annually and cause harm to millions more. They account for 9 percent of global mortality, and are a threat to health in every country of the world. For every death, it is estimated that there are dozens of hospitalizations, hundreds of emergency department visits, and thousands of doctors' appointments. A large proportion of the people surviving their injuries suffer temporary or permanent disabilities [6].

Some studies conducted in Iran have shown that household accidents rank second after traffic accidents, which occur in one-fifth of the cases [8, 9]. Another study conducted in Iran showed that the highest and lowest exposure to accidents was in children up to four years of age and the elderly above the age of 60 respectively [10]. Accidents are a major cause of mortality and disability worldwide and, for this reason, the WHO decided to investigate accidents in high-risk areas. It is expected that the burden of injuries, diseases, and deaths will increase until 2020, and the burden of road accidents will increased markedly as compared to violence against self and others [11].

With better understanding of the epidemiology of trauma, it is possible to design appropriate plans and approaches, including the use of preventive measures and organizing healthcare services, to control and prevent trauma even better. Therefore, considering the importance of accidents, this study was conducted to evaluate the prevalence and causes of accidents during 2013 and 2014.

Methods

This cross-sectional study was conducted in Golestan Province, Gorgan County, using the census method. The participants included all trauma patients (n = 17941) who were referred to 5 Azar Educational Hospital, as the trauma referral center of Gorgan County, from the beginning of 2013 through 2014. The patients with internal or neurologic diseases were excluded from the study. The data of the patients were collected using a checklist designed by the Treatment Deputy of Golestan University of Medical Sciences. The data, including age, sex, accident month, accident location, accident place, type of accident, and treatment outcome, were collected during three shifts.

This study obtained ethics approval and was approved by the Ethical Committee of Golestan University of Medical Science (Code of Ethics = 394592122713). The entire checklists were handled with confidentiality as they contained names and addresses. All emergency nurses received a two-hour training session on how to complete the questionnaire and two researchers in different shifts supervised the accuracy of data collection.

Results

A total of 17,941 trauma patients was referred to 5 Azar Educational Hospital, Gorgan County, during the study period: 8,217 patients in 2013

and 9,724 patients in 2014. During these years, most of the trauma patients were men (70.7%) and lived in urban areas (68.8%). The mean age of the participants was 23.7±10.8 years and the age groups 21–35 years (32.9%) and less than five years (27.3%) were the most frequently affected groups.

Among accident places, street (43.1%) and house (37.6%) had the highest frequency. The frequency of the accidents was the highest in winter (41.2%) as compared with other months. Injury (40.9%), motorcycle crash (27.2%), and fall from heights (15.6%) were the most frequent types of accidents. The outcome of treatment was "treated" in most patients and only 1.1% of the participants were disabled or died.

In 2013, 69.5% of the patients were men and the rest (30.5%) were women. As for the location of living, 73.3% lived in cities and 22.4% lived in rural areas, while 4.3% did not mention where they lived. The mean age of the patients was 20.7 ± 18.8 years and the age groups below five

years (30.3%) and 21–35 years (31.9%) were the most frequently affected groups. Street (35.9%), house (41.3%), and workplace (9.2%) were the most frequent accident places. The frequency of the accidents was higher in winter (32%) and autumn (29.4%). Injury (35.6%), motorcycle crash (12.2%), fall from heights (11.2%), violence (9.7%), and car accident (6.9%) were the most frequent types of accidents.

In 2014, most of the patients were men (71.4%) and the rest were women (28.6%). The mean age of the patients was 25.14±17.8 years. Street (40.9%), highway (3.9%), and workplace (7.6%) were the most frequent accident places. Motorcycle crash (21.1%), fall from heights (18.6%), violence (10.7%), and car accident (11.9%) were the most frequent types of accidents. Between type of accidents and months of the year, there was significance (p = 0.01). Figure 1 indicates the trend of frequency of accidents by months of the year in Northeast Iran.

Table 1. The prevalence of different types of accidents in 2013 and 2014

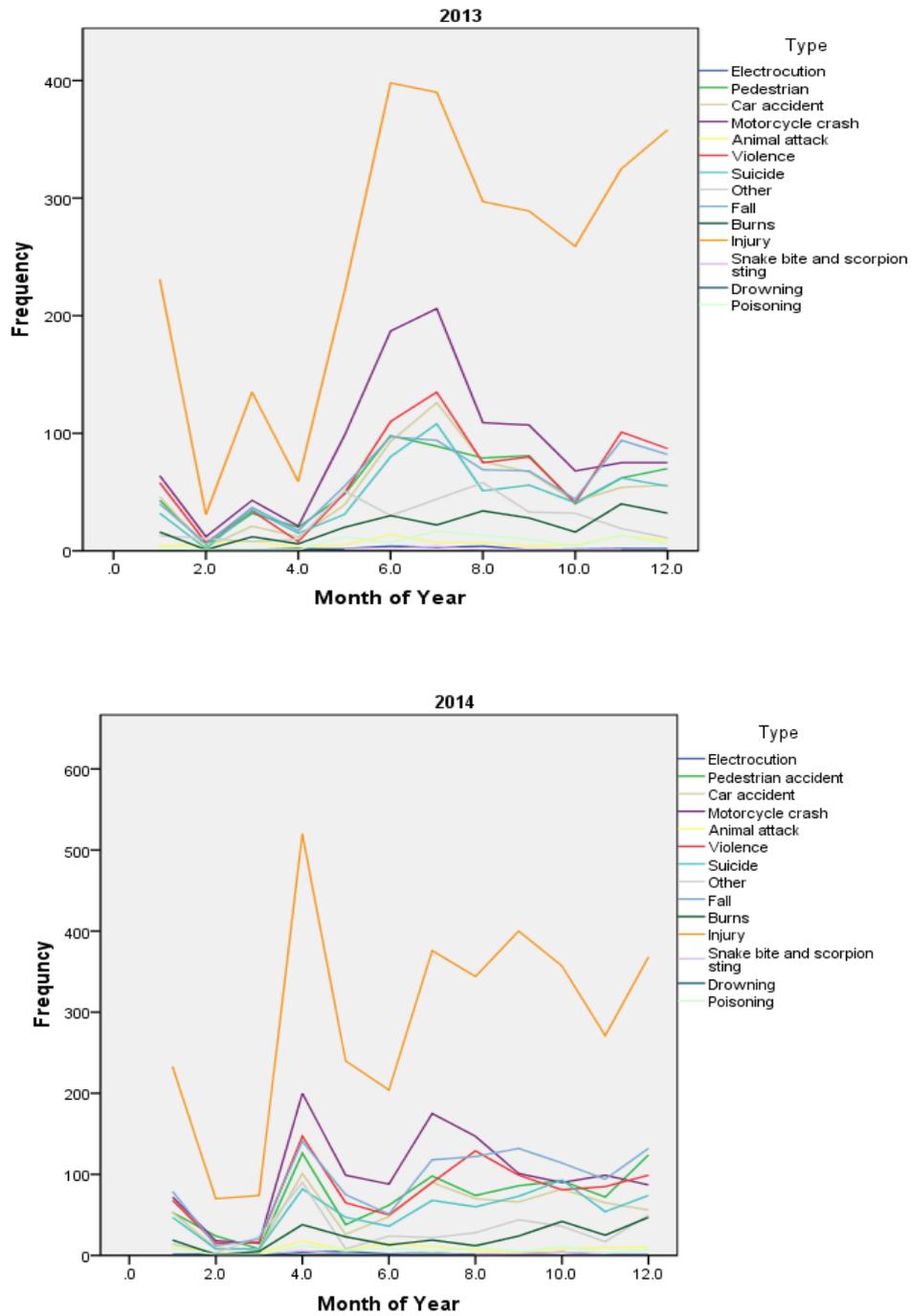| Type of accident	2013 N=9724	2014 N=8217
Electrocution	27 (0.3)	57 (0.7)
Car accident	674 (6.9)	977 (11.9)
Motorcycle crash	1191 (12.2)	1733 (21.1)
Pedestrian accident	857 (8.8)	788 (9.6)
Animal attack	105 (1.1)	131 (1.6)
Violence	944 (9.7)	879 (10.7)
Suicide	650 (6.7)	673 (8.2)
Falls	1090 (11.2)	1528 (18.6)
Burns	268 (2.8)	172 (2.1)
Injury	3457 (35.6)	871 (10.6)
Snake bite and scorpion sting	20 (0.2)	32 (0.4)
Poisoning	79 (0.8)	123 (1.5)
Other	359 (3.7)	246 (3.0)
Total	9724	8217

Figure 1. The Trend of Frequency of Accidents by Months of the Year in Northeast of Iran(2013, 2014)

Table 2. The prevalence of places of accident in 2013 and 2014

Accident place	2013 N=9724	2014 N=8217
Public places	290 (3.0)	97 (1.2)
Sports and recreational places	377 (3.9)	244 (3)
Highways	391 (4.0)	321 (3.9)
Streets	3495 (35.9)	3361 (40.9)
Workplaces	892 (9.2)	621 (7.6)
Schools and educational places	170 (1.7)	78 (0.9)
Houses	4017 (41.3)	3393 (41.3)
Others	51 (0.5)	35 (0.4)
Unspecified	41 (0.4)	28 (0.3)
Total	9724	8217

Discussion

Our study showed that the majority of trauma patients at this center (70.7%) were men. Studies conducted by Ebert, Abadi, and Ebrahimpour also reported similar findings (12–14). Kheirabadi and Bolhari found that men had more and severe accidents than women. Men also committed driving offenses two times more than women [15]. The most important reasons could be the high-risk behaviors of men and their greater presence in activities of daily life and greater use of vehicles, which expose them to trauma [16]. Therefore, it is necessary to pay more attention to safety instructions, especially for occupational safety. Moreover, these reasons can be decreased through proper education and laws. However, a study by Davis showed a similar frequency of trauma in men and women [17]; this difference could be due to the similar roles of men and women in this study.

Another finding of our study was the occurrence of accidents in urban areas and in houses, followed by streets. Urban areas were the most frequent place of accidents in studies by Davood Abadi and Mohseni as well [12, 18]. Most accidents also occurred in urban areas in a study by Rodriguez in Columbia [19]. In another study, the street was the most frequent place of accidents, and a significant relationship was found between the accident place and gender of the injured person [8, 9]; these findings are in line with our results. Moreover, in our study, the age group 21–35 years was the most frequently affected age group. The age groups 20–29 years and 15–25 years were the most frequently affected age groups in studies by Sadeghian [20] and FarzaniPour [21] respectively. This age group includes active members of the society; therefore, accidents can be prevented in this age group by determining appropriate strategies and regulations.

The frequency of accidents was higher during winter in our study while Abadi and Khatibi found that accidents were more frequent in summer [12]. Again, Fakharian reported spring as the peak season of accidents [22]. A study, titled "Epidemiology and risk of road traffic mortality in South Africa," showed the highest rate of mortality due to road accidents in December [5]. These differences can result from climatic and cultural conditions of the region; therefore, climatic conditions of the regions should be considered while devising appropriate plans and strategies.

In our study, injury (40.9%), motorcycle crash (27.2%), and fall from heights (15.6%) had the highest frequency of the accident type in order. Injury was the second cause of trauma (13.3%) in a study by Mehrdad et al. [23] and blunt force trauma to the head was the third cause in a study by Sadeghi [24]. In the study by Farzandi Pour et

al., driving traumas had the most casualties and were the most common cause of accidents [21]. Therefore, to prevent and control traumas and decrease the associated mortality rate, a deeper look into the field of trauma is required to develop plans that are more effective.

Conclusion

In general, the increasing number of studies on trauma in recent years shows that trauma is recognized as a cause of increased mortality and morbidity in the age of technology due to the increased speed of vehicles and the nature and conditions of modern life. Therefore, it is suggested that extensive interventional programs be developed with the cooperation of medical universities, traffic police, and other related organizations to decrease the mortality and morbidity of accidents. Moreover, extensive epidemiologic studies should be conducted in Iran as well as different provinces, and their results used to make systematic plans.

Conflict of Interest

The authors declare that they have no competing interests.

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