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Fireworks-Related Injuries in Iran: A Survey Following the 2014 New Year's Festival in Tabriz

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Abstract

Background: Iranian people celebrate the last Wednesday eve of the year as Chaharshanbe Suri and use explosives and firecrackers as part of this festival.
Objectives: This study concerned fireworks injuries related to the Chaharshanbe Suri festival in Tabriz, a provincial capital in East Azerbaijan, Iran, to evaluate the epidemiology and provide data to prevent and manage these accidents.
Patients and Methods: This study was comprised of patients who were treated at the emergency department of Tabriz Sina hospital with burn injuries related to fireworks. The patients' demographics, time of the accidents, locations of the burns, and the type of explosive were recorded. Descriptive statistics were used to analyze the data.
Results: Forty-nine patients were seen in the emergency department. The mean age was 17.16 ± 9.1, ranged from 3 to 36. Forty patients were male (81.6%) and 9 were female (18.4%). Twenty-one patients had second degree burns (47.7%), 10 patients had first degree burns (22.7%), 9 patients had third degree burns (20.5%), and 4 patients had first and second degree burns (9.1%).
Conclusions: The study shows that walking in the streets or driving with open windows can be dangerous in Iran during Charshanbe suri.

Keywords: Fireworks, Burn, Emergency

1. Background

Fireworks have visible and audible effects and are used around the world to celebrate popular events. In the United Kingdom, these devices are used around Halloween (October 30) (1). In India, the festival of light (Diwali) is celebrated with fireworks (2). In the United States, people celebrate the Fourth of July with fireworks (3, 4). The Iranian New Year (Nowrouz) starts on March 21. According to the Persian calendar, the eve before the last Wednesday of the year is celebrated as the fire festival, Chaharshanbe Suri, which means Wednesday light. Its origin dates back to 1700 BC and the festival ushers in the New Year and spring. The celebration usually begins in the evening and people make bonfires and jump over them until early morning to keep the sun alive (5). Today people also use explosives and firecrackers to celebrate this holiday.

2. Objectives

This study concerned fireworks injuries related to the Chaharshanbe Suri festival in Tabriz, a provincial capital of East Azerbaijan, Iran, to evaluate the epidemiology and provide data that can be used to prevent and manage these accidents.

3. Patients and Methods

This descriptive cross-sectional study was comprised of all patients who were treated at the emergency department of Tabriz Sina hospital from February 1 to March 30, 2014 for burn injuries related to fireworks. A researcher used a checklist to record each patient's age, gender, job, time of accident, burn area, and the type of explosive. Data concerning the patient's admission status was gathered from medical records. Descriptive statistics were used and frequency distributions were calculated for variables and mean ± SD and the percentage were reported for results.

4. Results

During the period from February 1 to March 30, 2014, 49 patients were treated for fireworks injuries at the emergency department of Tabriz Sina hospital. All the accidents occurred from March 3 - 21, with 79.6% of the patients (39

people) referring to the emergency department on March 28, the last Wednesday eve.

The mean age of the patients was 17.16 ± 9.1 and ranged from 3 to 36. Forty patients were male (81.6%) and 9 were female (18.4%).

Twenty-six patients were students (53.06%), 2 were soldiers (4.1%), 7 were self-employed (14.28%), and 14 were unemployed (28.57%).

Thirty-five patients were injured by firecrackers (72.9%) and 13 were burned from fires (27.1%). One patient did not give information about the type of explosive.

Of the 36 people who were injured while fire jumping or playing with fireworks (73.5%), 6 were hurt while preparing the rockets or the fire (12.2%), 3 were bystanders (6.1%), and 4 were injured accidentally while passing on the roads or a firecracker was thrown into the car window (8.2%).

Twenty-two people were injured at home (44.9%), 24 were injured on streets or in alleys (49%), and 3 were burned at parks or special places (6.1%).

Forty-five people were from urban areas (91.8%) and 4 were from rural areas (8.2%).

Twenty-four patients had hand injuries (49%), 6 had an injury to the face (12.2%), 4 (8%) had injuries to the lower extremities (3 with a foot injury and 1 with a calf injury), 3 had a trunk injury (6.1%), 1 had burns on his neck (2%), and 4 had both hand and facial injuries (8%). The number of persons who had both hand and foot injuries was equal to those with hand and trunk injuries. Five patients had whole-body burns (10.2%).

Twenty-one patients had second degree burns (47.7%), 10 had first degree burns (22.7%), 9 had third degree burns (20.5%), and 4 had first and second degree burns (9.1%). The burns of 5 patients were not categorized.

Of the 49 patients, 1 had a bone fracture (2%), 18 were admitted to the hospital (36.7%), and 31 (63.3%) were discharged from the emergency department.

Figure 1. Patient With Burns on Both Hands

5. Discussion

Although fireworks are used globally to celebrate festivals, they present a public health hazard. According to a report by See and Lo (6), 1,703 fireworks-related injuries occurred in the United States from 1980 - 1989. Clarke and Langley reported 237 fireworks-related injuries in New Zealand between 1979 and 1992 (7). In the 2007 study conducted by Saadat et al. (8), there were 45 cases of fireworks-related injuries in Tehran, Iran. These findings show that the incidence of this type of injury in our study is similar to the study conducted in Tehran, Iran's capital city, and it is significant when compared to other countries. Incidence of fireworks-related injuries in our study (49 cases) is greater than a similar study that we conducted two years ago (29 cases) (9). Most of the injured patients were men (81.6%), which is similar to our previous findings (82.8%)9 and the findings of Chen et al. (61%) (10). In most of the reports from various countries, fireworks-related injuries were caused by only explosives (2, 11-15), but in our study 27.1% of the patients were injured while jumping over the fire or setting up bonfires. Since the government has set aside special areas in parks to play with explosives, only 6.1% had an accident in a park; most of the people were injured in their homes, streets, or alleys. It may be that people are not aware of these special places because of a lack of information. Our results show that most of the injuries occurred in urban areas (91.8%) because villagers have a lower tendency to use explosives. In the studies conducted in China and Victoria, United States, the most common injury sites were the hand, neck, and face, which replicates our findings (10, 15). Most of the patients were injured while playing with or making explosives, whereas 6.1% were bystanders. Interestingly, 8.2% of the accidents occurred as people were passing through streets or were in their cars. It shows that even walking in the streets or driving with open windows can be dangerous in in Iran on Charshanbe suri!

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