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Fireworks-related Injuries during New Year celebrations in Kosovo: a comparison of the years 2008 and 2009.

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Abstract *Background:* Fireworks related injuries in children occur in Kosovo particularly during New Year celebrations.
Aim: To report the pattern of fireworks-related injuries in children up to 16 years of age treated at the Emergency Center and Plastic Surgery, University Clinical Centre of Kosovo during the 2008 and 2009 New Year celebrations.
Methods: Retrospective review of hospital records
Results: During the New Year celebrations in 2008, a total of 65 cases were admitted, 32 (49.2%) of who were children injured by fireworks. The ages of the children ranged from 5 to 16 years with a mean of 10.5years. The modal age affected was the 10 – 14 year-old group (53.6%). Boys constituted 93.8% of patients and girls 6.3%. During the 2009 New Year celebration, 17 cases were admitted with fireworks injuries, 12 (70.58%) of who were children ranging in age from 8 to 15 years (mean 11.5 years) with a modal age group of 10 – 14 years (66.7%). Boys accounted for 88.3% and girls for 16.7% of patients.
Conclusions: The frequency of fireworks injuries reduced appreciably after introduction of laws restricting sales of fireworks devices and banning their use by children.
Recommendations: It is recommended that parents play a greater role in controlling the activities of their children during festivities. The government and police should also ensure compliance with the law on the use of fireworks during the holidays.

Key words: fireworks injury, epidemiology, wounds, prevention.

Introduction

Every year, Kosovars celebrate the New Year with the use of fireworks. These devices include firecrackers, rockets, Roman candles, sparklers and aerial devices.[2,5,7-10] Fireworks produce visible or audible effect by their explosion which children find very interesting and attractive. Unfortunately, the devices may cause major injuries both to the users and bystanders. [1,3,4,6,7,9,10]

Firework devices are usually not produced in Kosovo but are imported from the Far East countries, mainly China. Importation usually began two or three months before the New Year holiday by numerous merchants, with or without permission of governmental departments. After the war in 1999, Kosovo was governed by the United Nations Interim Administration Mission in Kosovo (UNMIK). This mission gave no directives on the importation or use of fireworks. However, the brief interval in late 2007 prior to declaration of independence and a sovereign state in February 2008 provided opportunity for massive, unauthorized importation of fireworks. The devices were sold in malls and in the streets without any control of the competent authorities. Thus they could be bought by anyone, including children without supervision of parents. It was observed that towards the end of 2007, fireworks related injuries in children started to be reported at the Emergency Centre UCC, and this continued until January 2, 2008. Subsequently, the government enacted a law (Law no. 03\L-005: May 16 2008) which regulates the importation and use of fireworks devices. The law limited access to fireworks: only adults could use them from December 26 to January 1 while forbidding street sales and use by children. These measures have greatly reduced the number of firework related injuries.[11]

The aim of this report is to compare the epidemiology and pattern of fireworks related injuries between two consecutive years before and after the legislation restricting sales and use of the devices.

Methods

The records of children (≤ 16 years) treated with fireworks related injuries at the emergency ward of the

Clinical Centre of Plastic Surgery, Pristina, during New Year celebrations of 2008 and 2009 were retrieved and analyzed. Information about the types of fireworks was extracted as were the types of injury. Also, information on the age, gender, affected parts of the body and type of firework device was extracted. Statistical analysis was done using the Statistical Package for Social Sciences (SPSS) version 16.

Results

During 2008 New Year holiday celebration, a total of 65 cases of fireworks related injury, 32 (49.2%) of who were children, were reported. They were all received at the Emergency room: 24 of the children were treated as outpatients while eight cases were transferred for plastic surgery.

Table 1 shows the general characteristics of subjects in terms of gender, age and type of fireworks device during the two period under review (turns of the year 2007/2008 and 2008/2009). The number of patients seen in the first period was more than two and a half times the number seen in the second period. For both periods, boys outnumbered girls 15:1 and 5:1 respectively. The 10 – 14 year-old age group had the highest number of patients: the mean ages of subjects were 10.5 years (Range: 6 to 15 years) and 11.5 years (Range 8 to 15 years) for 2008 and 2009 celebration seasons respectively. Firecrackers were the most commonly implicated devices making up about two thirds of the total for each of the years.

Table 1: Fireworks–related injuries according to gender, age and device type

	The Turn of Year 2007/2008		The Turn of Year 2008/2009	
	Cases n=32	%	Cases n=12	%
Gender				
Male	30	93.8	10	83.3
Female	2	6.3	2	16.7
Age y				
0-4	0	0.0	0	0.0
5-9	6	18.8	3	25.0
10-14	18	56.3	8	66.7
15-19	8	25.0	1	8.3
Firework type				
Firecrackers	21	65.6	8	66.7
Rocket	5	15.6	3	25.0
Sparkler	4	12.5	1	8.3
Roman candle	1	3.1	0	0.0
Other/unknown	1	3.1	0	0.0

Table 2 shows the injury types, affected body parts and treatment disposition. Most patients had more than one kind of injury but the hands were the most often affected part of the body (84.4%) during the first time period. This was followed by the face (9.4%) and the head (6.2%) in that order. The most frequently injured parts of the hand were the volar aspect and the fingers.
Foreign objects were found in two patients, one in the cornea and another elsewhere in the head and neck region.

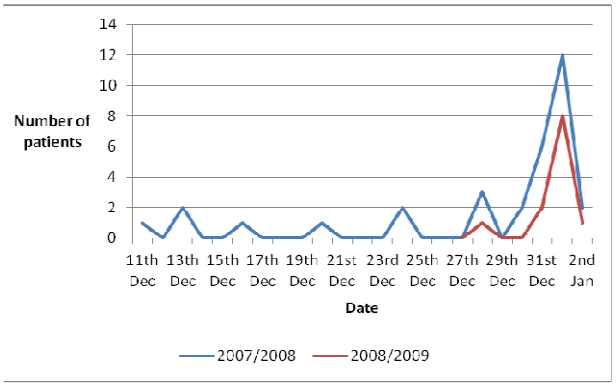
During the 2009 celebrations, lacerations and contusions were found more frequently than in the preceding year. However, the fingers, hands and head/neck remained the most common sites of injury. A total of 17 cases (including 12 children) presented with fireworks injuries. Out of 12 cases of injured children, 10 were released for further ambulatory treatment after receiving care at the emergency ward and two were transferred to our ward for plastic surgery treatment.

Table 2: Fireworks-Related Injuries According to Injury Type, Body Site Injured and Disposition

	The Turn of Year 2007/2008		The Turn of Year 2007/2008	
	Cases	%	Cases	%
Injury type				
Skin denudation	23	71.8	6	50.0
Lacerations	15	46.9	9	75.0
Contusion	8	25.0	6	66.7
Amputation of fingers	8	25.0	1	8.3
Burns	5	15.6	5	41.7
Fracture of phalanges	5	15.6	1	8.3
Body site injured				
Finger	19	59.4	4	33.3
Hand	10	31.3	3	25.0
Head/Neck	2	6.3	3	25.0
Eye	1	3.1	0	0.0
Lower extremity	0	0.0	1	8.3
Trunk	0	0.0	1	8.3
Disposition				
Outpatient treatment	24	75.0	10	83.3
Admitted/Operated	8	25.0	2	16.7
Total	32	100.0	12	100.0

The earliest reports in the first time period was on December 11, 2007 while the last patient was seen on January 2, 2008: January 1 was the day with the highest number of cases 37.5% [Figure 1]. For the 2009 celebrations, injuries were reported between December 28, 2008 and January 2, 2009. Once again, the peak day of reporting was on January 1.

Fig 1: Rate of paediatric fireworks injuries during the 2008 and 2009 New Year celebrations



Discussion

About one-half of patients (49.2%) who sustained injuries from fireworks devices were children. A comparable figure of 45% had earlier been reported from the

United States[4, 10]. This high percentage is attributable to the attractive colours and thrilling sounds which engage the curiosity and interest of children. This was further reflected in the fact that boys were many times more frequently affected than girls probably because of their intrinsically more inquisitive and adventurous nature.

The absolute numbers of children reduced by more than 60% between the two time periods. The only discernible explanation for the reduction was the introduction of laws restricting sale and access to fireworks and prohibiting their use by children. Indeed the injuries started occurring much later during the 2009 cerebrations than in 2008. The level of success is commendable but the fact that some children were injured implies that more work has to be done by the authorities to improve compliance.

Firecrackers and rockets are the devices that are mostly used and cause most of the injuries. Our findings included the potential dangers of other devices like Roman candles. These findings are consistent with those of other authors.[5,7,9,10] The fingers, palms of the hands, face, head and neck were the most commonly affected sites. These sites of injury as well as the range of injuries found in our review are similar to previous reports.[4-7,9,10] The findings are understandable considering that the lighting of the devices requires use of the hands and in addition, the twinkling effects may have aroused the curiosity of the victims and encouraged them to hold the devices close to their faces.

Fig 2: Avulsion after fireworks injury.

Fig 3: Amputated fingers after fireworks injury.

Conclusion

The legislative and administrative response to the high number of fireworks related injuries in Kosovo children during 2007 and 2008 New Year celebrations yielded positive results. The frequency of occurrence has reduced but more work is still needed to achieve further reduction and to sustain success. Parents should be encouraged to monitor and control their children during New Year celebrations. This study has shown that the if citizens strictly respect the law and government departments and police fully apply the law it will have a great influence on prevention and reduction of number of firework related injuries.

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