

A case series of candle wax burns during the Lantern Festival in Hong Kong

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Every year there was significant number of burn cases during the Lantern (Mid-Autumn) Festival in Hong Kong because children liked to play with fire on that day. They would either burn the lantern or boil the wax from candles in a pot over a fire. When the wax has melted, they poured cold water into it, causing a small explosion with water vapour and wax droplets. Children and adolescents were more common than adults to be burnt by the hot vapour, fire or hot wax. The majority sustained partial thickness burns involving the face. Such burn injuries should be preventable by education and legislation. (*Hong Kong j. emerg.med.* 2002;9:221-225)

Keywords: Burn, candle wax, Festival, Lantern, Mid-Autumn

Introduction

Mid-Autumn Festival is the 15th day of the eighth month of the lunar calendar. Chinese Legend has it that around 2170 BC, the earth was circled by 10 suns, which took turns to illuminate the earth. One day, all 10 appeared simultaneously, scorching people and crops. Hou Yi shot down nine of the 10 suns, leaving the one we see today. As a reward he was given a magic tablet of immortality. His wife Chang O stole the tablet, and then fled to the moon. Chang O was so out of breath that she spat out the tablet, which promptly transformed into a jade rabbit. The rabbit delayed Hou Yi's pursuit of Chang O, and the pair are now trapped on the surface of the moon for eternity.

Mid-Autumn Festival is an occasion for family reunion. Chinese families like to gather to celebrate. They eat moon cakes, decorate their houses with lanterns and enjoy 'watching the moon' at the Mid-Autumn Festival night. Traditional lanterns are made of bamboo frames and crepe paper, bound together with glue and are usually shaped as rabbit, fish or fruit - typical of Chinese symbols of health and prosperity. Modern lanterns are usually plastic and battery operated for safety reasons.

In Hong Kong, local children create an additional excitement by boiling wax in a metal container with a candle flame underneath. They pour cold water into the boiling wax to create a fireball comprising of steam, hot wax and fire to a height of up to 6 to 10 metres. Unfortunately, the fireball could easily injure the persons who pour the water and even the bystanders.

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Cases

During the Mid-Autumn Festival in 2001, there were five cases of candle wax burn managed in the Accident and Emergency Department of Tuen Mun Hospital (TMH AED). All of them were males, and their ages

ranged from 6 to 16 years with a mean age of 9.2 ± 3.5 (mean \pm SD). There were 4 (80%) patients under the age of 10 years. The extent of burn was all under 5% total burn surface area (TBSA). The burns predominantly involved the face (80%), with one case involving only the right foot and one involving both the face, neck, left shoulder and upper chest wall. Only one patient was admitted to the burns unit for second

degree burn over the face. All other patients were discharged and follow-up in the emergency department.

The cases managed in TMH from 1998 to 2001 is shown in Figure 1, depicting an initial fall with recent rising trend. The age, TBSA and site distribution are shown respectively in Figures 2, 3 and 4.

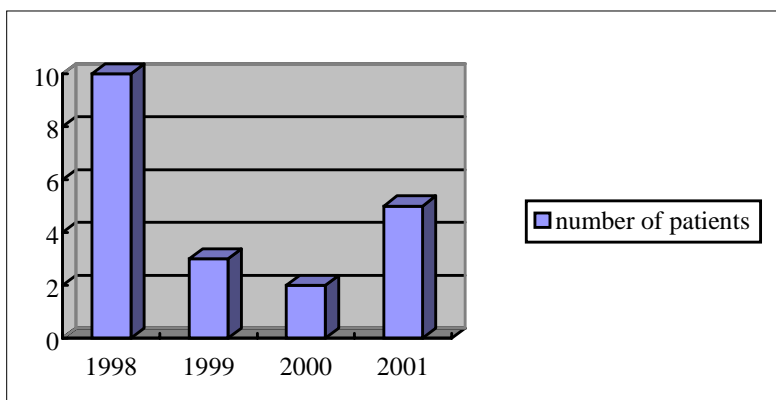


Figure 1. Number of boiling wax injury during 1998-2001 managed in TMH.

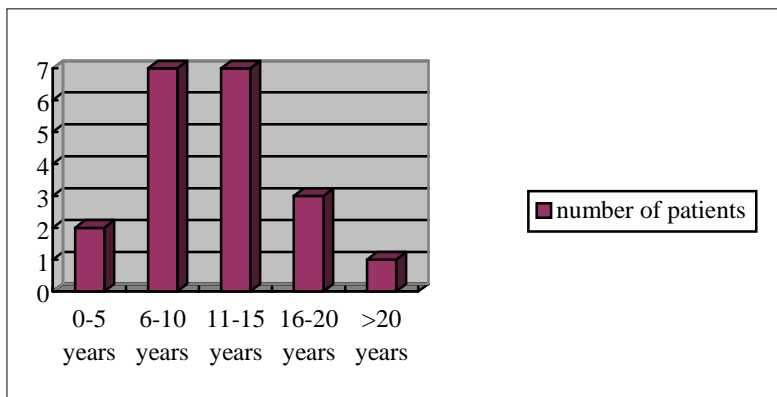


Figure 2. Age distribution in boiling wax injury patients during 1998-2001 managed in TMH.

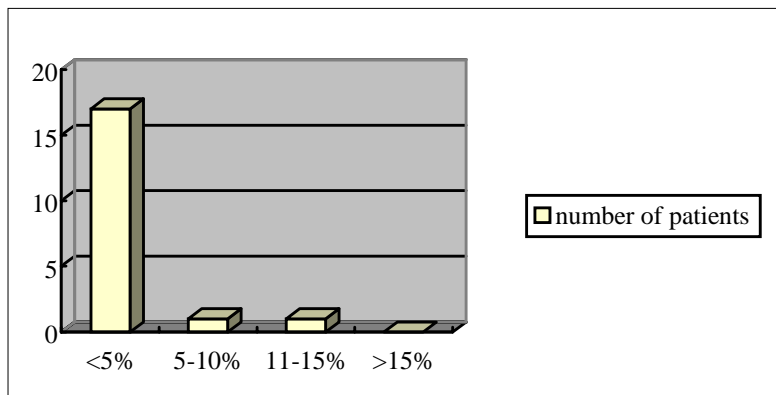


Figure 3. Total body surface burn area in boiling wax injury patients during 1998-2001 managed in TMH.

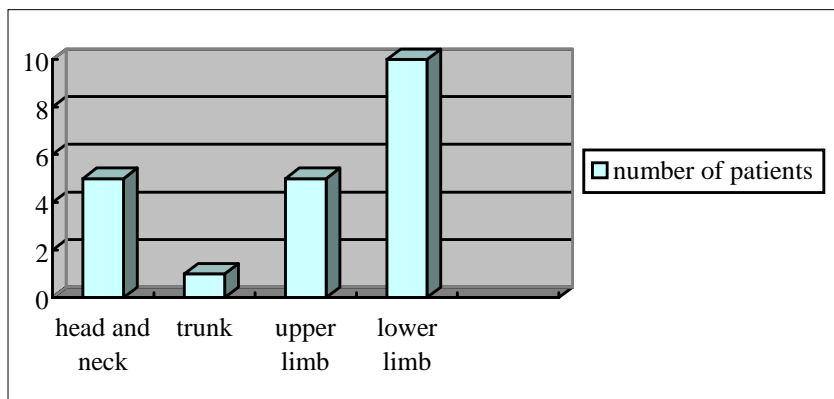


Figure 4. Sites of burn in boiling wax injury patients during 1998-2001 managed in TMH.

Figures 5 and 6 showed second degree wax burns of the faces of two children.

Figure 7 was a picture of second degree wax burns of the left wrist.

Discussion

Boiling wax is a popular and yet dangerous activity during Mid-Autumn Festival in Hong Kong and probably in other areas with Chinese population. In 2001 in Hong Kong, there were a total of 2 summons and 17,386 verbal warnings issued during the Mid-Autumn Festival.

Children usually use traditional candles for wax boiling. These candles composed mainly of paraffin and bees wax, melting between 127-156°F (52.7-68.8°C). As a result, the temperature of the boiled wax is not high and the degree of wax scald injury is less severe. However, if scented gel candles were used, the result would be different. The gel candles were mineral-oil based products which have a melting point of at least 220°F (104.4°C). The degree of tissue damage would then be significantly greater due to the higher temperature.³

In the management of these patients, most traditional candle wax burns are minor due to the low melting point and require no surgical intervention or hospitalization. Those who were severely injured were usually due to the evaporating hot vapour and flame.^{1,2}

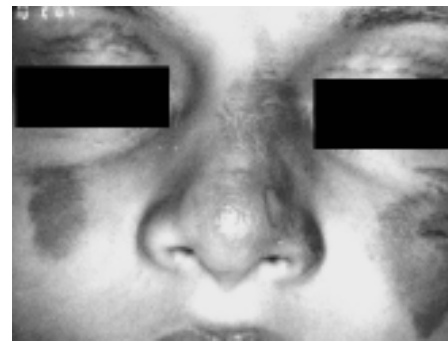


Figure 5. Second degree wax burns of the face.



Figure 6. Second degree wax burns of the face.

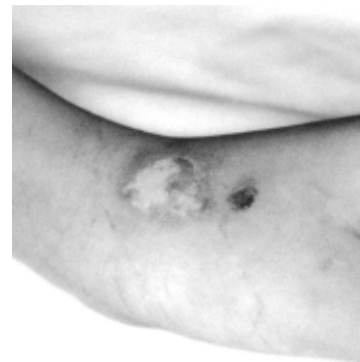


Figure 7. Second degree wax burns of the left wrist.

Chan¹ reported 57 patients admitted with wax burn to the Burn Unit of Prince of Wales Hospital of Hong Kong from 1986 to 1996. The Hospital served the northeast part of Hong Kong. Ying² of the same Hospital conducted another study revealing a total of 50 patients of burn injuries as a result of playing with fire, including fireworks, wax flame and scald from 1993 to 1999. Majority of the patients were male of young age. Extent of burns was around 10% of total surface burn area. Exposed areas of the body, especially the upper limbs were involved. There were a significant number of face & neck burns that would cause subsequent cosmetic and functional problem. Inhalation injury was relatively rare as the activity usually took place outdoor.^{1,2}

In the management priority in an emergency department, we should first ensure adequate ventilation especially in unconscious patients or those with inhalation injury. The next priority is to control any external haemorrhage due to accompanying wounds. It is essential to provide adequate intravenous fluid in the case of extensive burns (3-4 ml/kg body weight/% burn/in the first 24 hours in adults). Other priority should include prevention of hypothermia and provision of adequate analgesia by either oral or parental analgesic.⁴ Since most wax boiling occurred in open area, major burn with inhalation injury was not common.

It is important for us not only to prevent candle wax burns in Mid-Autumn Festival but also other burn-related injuries. Burns and scalds are classified as less severe in terms of mortality and hospital admission rates. But children with burns stay longer in hospitals compared to those with any other injury, and their suffering, severe disfigurement for life and continuous emotional stress disorders demand special attention.⁵

On the other hand, the cost associated with burn management is also immense. According to the Division of Injury Control, the annual costs for burned children in the United States amount to US\$3.6 billion per year.⁶

Active measures to prevent burn injuries could include education which to alter behaviour or lifestyle changes.

Passive measures could include publicity, environmental change/product design and legislation.^{7,8} Before implementing any prevention campaigns, knowledge of the prevalent etiological patterns of burn injuries in the specific community must be well studied. For example, in Hong Kong, candle wax burn injuries are common during the Mid-Autumn Festival and fireworks burn injuries are common during the Lunar New Year.

Education on burn prevention has been shown to be effective in schools, particularly in junior schools where the children are less than 12 years old.^{7,9} A study showed that with multilevel classroom activities which included visual information, safety-skill training and risk-control activities, there were significant improvements in children's injury-control knowledge and attitudes. A downward trend in overall admission rates to their regional medical center was also noted.⁵ Besides, we can also provide educational program for pregnant ladies or new mothers, and this can be incorporated into their ante-natal and post-natal classes. They can then provide continuous education to their children.

Publicity plays an important and effective role in burn injury prevention. During festivals, the government can utilize the media to raise awareness on accident prevention, report the number of cases afterwards and use photographs to impress the public on the severity and consequences of burn injuries.

A safe environment is a prerequisite in burn prevention. Installation of smoke detectors and automatic sprinklers are some of the examples. Besides, product safety is also important. Product modification and redesign, so that it is user-friendly with protective measures can minimize the risk of burn injuries.

Legislation by banning dangerous activities should be the most effective way of reducing burn injuries. The best example outside the burn field was the use of seat belt whilst driving a car and the use of crash helmets whilst driving a motorbike. It is an offence to boil wax in Hong Kong since 2000. The maximum penalty is a fine of HK\$2000 and an imprisonment for 14 days upon conviction. Every year during the

Mid-Autumn Festival, police will verbally warn the people who boil wax and then carry out prosecution if they refuse to stop.

In conclusion, many of the burn injuries can be prevented. It is common to have different types of burn injuries in different Chinese festivals, such as candle wax burn during Mid-Autumn Festival and fireworks burn during Lunar New Year. It is important for the communities and government to carry out appropriate preventive measures so as to enjoy a joyful festival instead of a tragedy.

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