SHORT RESEARCH ARTICLE

Kite String Injures During Makar Sankranti Festival

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DOI: 10.55489/njcm.140220232648

ABSTRACT

Introduction: Kite flying is a colourful festival; it is unfortunately associated with a significant number of incising injuries of neck and face caused by the kite string (Manja). The emergency departments report a large number of patients with such injuries during this festival.

Materials And Methods: Patients presented to the Emergency Department at Civil Hospital, Gandhinagar on 14th and 15th January with neck and face injury caused by contact with kite string were included in study. After careful assessment (primary and secondary survey) patients were classified as Superficial (Laceration limited to the skin and subcutaneous tissue) or Deep injury (breach of the platysma, and damage to muscles, thyroid gland, neurovascular or airway involvement).

Results: 20 patients were included in study. Out of which 18 were males and 2 were females. Amongst 18 males 2 were children. Two patients wearing a helmet suffered an injury to the nose. The neck zones involved in the injury, 5 cases involved zone I injury, 9 cases in zone II, 4 cases were in zone III and the remaining 2 had the nasal injury.

Conclusion: From this study we conclude that kite string injury lead to serious damage to local tissues. Using protective measures can reduce the incidence and severity of injuries.

Key words: Kite string, Makar Sankranti, slit neck, Manja

ARTICLE INFO

Financial Support: None declared
Conflict of Interest: None declared
Received: 12-12-2022, **Accepted**: 31-01-2023, **Published**: 28-02-2023
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How to cite this article:
Kakadia Y, Gajjar YK, Savsani P, Yadav C. Kite String Injures During Makar Sankranti Festival. Natl J Community Med 2023;14(2):114-117. DOI: 10.55489/njcm.140220232648

www.njcmindia.com | pISSN09763325 | eISSN22296816 | Published by Medsci Publications

INTRODUCTION

Makar Sankranti, also commonly known as Uttarayan is a seasonal festival celebrated in the month of January in India. It marks the transition of the winter season to spring season throughout the northern hemisphere.[1] In western India, especially Gujarat, it is celebrated with a huge fervor with traditional kite flying. Gandhinagar, the capital of Gujarat is famous for the International Kite Flying Festival, attracting kite flyers from several countries every year.[2] This year Uttarayan was celebrated on 14th and Vasi-Uttarayan on 15th January.

Though kite flying is a colourful and fun-filled activity, it is unfortunately associated with a significant number of incising injuries of neck and face caused by the kite string (Manja). The emergency departments report a large number of patients with such injuries during this festival. This primarily occurs due to the typical manufacturing of the kite string, which is particularly made thin and nearly razor-sharp by coating it with ground glass.[3]

This study presents our experience of kite string injuries during the festival of Uttarayan.

METHODOLOGY

All patients who presented to the Emergency Department at Civil Hospital, Gandhinagar on 14th and 15th January 2020 with neck and face injury caused by contact with kite string were included in this study. Demographic details, presenting history, nature, and site of injuries were noted. The Advanced Trauma Life Support protocol (Airway, Breathing, Circulation, Disability& Exposure) was engaged in the management of the patients. After careful assessment (primary and secondary survey) patients were classified as Superficial (Laceration limited to the skin and subcutaneous tissue) or Deep injury (breach of the platysma, and damage to muscles, thyroid gland, neurovascular or airway involvement). Superficial injuries were managed in Minor OT under local anaesthesia (2% Lignocaine and Adrenaline).

Thorough wound cleaning and closure in 2 layers, subcutaneous by absorbable and skin by non-absorbable sutures followed by sterile dressing was done. These cases were managed on OPD basis by alternate day dressings and stitch removal on the 7th day of surgical repair. Deep injuries were admitted and managed in OT for exploration and surgical repair. Xray Neck (AP & Lateral) was done for all patients. CT scan was done for patients with suspected airway or a neurovascular injury after they were hemodynamically stabilized. Prophylactic tetanus immunization and broad-spectrum antibiotic were given for all patients. Surgical and Orthopaedic opinion was taken for the cases which had any associated injury.

Roon & Christensen's classification into three zones (fig 1.) is most commonly used for the description of the site of cervical trauma. It is divided into 3 zones.[7]

Roon & Christensen's classification of neck zones		
Zone I	Sternal notch/clavicle to the cricoid cartilage	Major vascular structures of subclavian artery & vein, jugular vein, jugular vein, and common carotid artery as well as the esophagus, thyroid, and trachea
Zone II	Cricoid cartilage to the angle of mandible	common carotid artery, internal and external carotid arteries, jugular vein, larynx, hypopharynx and cranial nerves X, XI&XII
Zone III	The angle of mandible to the base of skull	Small but critical area

RESULTS

A total of 20 patients presented with incising neck and face injuries due to direct contact with kite string within a period of 2 days. These included 2 children aged 8 & 10 years with the rest belonged to the age group (15-35 years). Most patients i.e., 18 were males and two females (Table 1).

The injuries occurred when they were traveling on two-wheeler vehicles except for the children, who were injured while spectating the flying kites. Amongst the two-wheeler riders, only 5 were not wearing a helmet. None of the motorcyclists had any kind of neck protection like a scarf, neck collar or Metallic bike frames. Two patients wearing a helmet (with open visor) suffered an injury to the nose. Speaking about the neck zones involved in the injury, 5 cases involved zone I injury, 9 cases in zone II, 4 cases were in zone III and the remaining 2 had the nasal injury (Table 1).

Four patients suffered deep tissue injury who had to be taken up in the OT for appropriate repair. In two patients the thyroid gland was exposed, they were managed with exploration and strap muscle repair with placement of negative pressure 12 FG drain (Romovac) followed by two-layer closure. In another patient, the Thyroid cartilage was exposed but the integrity of the airway was maintained. This patient was additionally investigated with a CT Neck Plain plus Contrast which ruled out airway or other neurovascular injuries, followed with exploration and three-layer closure (muscle, subcutaneous and skin) and placement of a negative pressure drain (12 FGRomovac). Postoperatively these patients had a normal voice assessment with no hematoma, emphysema or pneumomediastinum.

There was one patient with an injury to the anterior jugular vein but none with any deep great vessel injury. It was managed by ligating the vessels and two-layer closure.

The rest were superficial injuries that were managed by wound cleaning and two-layer closure followed by a sterile dressing. These patients were asked to follow-up on OPD basis for alternate day dressing and suture removal after 7 days.

The nasal injury required only simple closure. X-ray was done which ruled out a nasal bone fracture.

All the patients were given prophylactic tetanus immunization and broad-spectrum antibiotics.

Table 1: Profile of cases included in the study.

Profile	Cases (n=20) (%)
Gender	
Male	18 (90)
Female	2 (10)
Type of injuries	
Superficial	16 (80)
Deep	4 (20)
Zones Involved	
Zone 1	5 (25)
Zone 2	9 (45)
Zone 3	4 (20)
Nasal injury	2 (10)

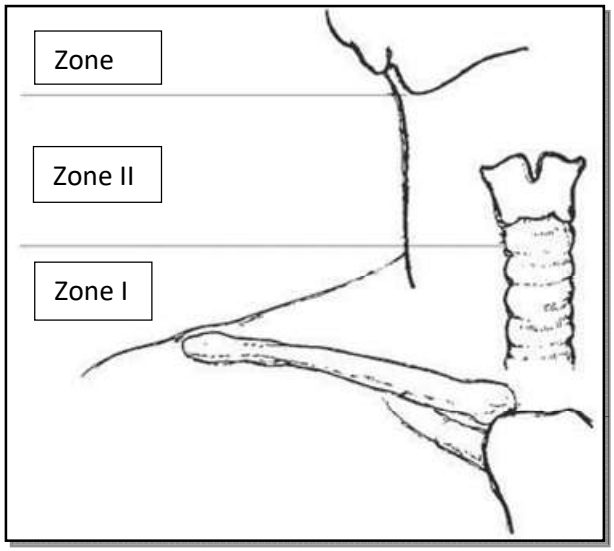

Figure 1: Roon & Christensen's classification into three zones[7]

Discussion

Kite string injuries are very common during the festival of Uttarayan. These injuries can be due to direct contact with kite string or as a fallout of kite flying. Direct contact injuries usually result in incisive or lacerative injuries to face, neck or limbs. Other injuries sustained can be due to accidental falls from height or road traffic accidents. There have been reports of accidental electrocution during kite flying (Tiwari &Sharma 1999).[4]

Most of the injuries occur when the individual is moving in an open vehicle and his or her skin comes in contact with the string. The kite string is thin and is not easily visible, thus being dangerous by virtue of its property. Nowadays special kite strings (Manja) are available which are coated with ground glass to increase its sharpness and cutting ability. They are thin, sharp and lightweight thus reducing its visibility. Multi-braiding of strings adds to tensile strength and to counter cutting action of other strings. [5,6]

The depth of the injury depends on the speed of the moving vehicle which creates increased friction with the string. A flying kite causes a much deeper wound as compared to the loose end of a falling kite. These injuries can be potentially fatal if the airway or the great vessels of the neck are involved. Also, the repair of such wounds leaves a scar which causes a cosmetic hindrance to some individuals, especially females.[5,6]

The majority of our patients were males, this could be attributed to the fact that males are involved more in outdoor activities, riding a motorcycle, kite flying etc.

Helmets can provide protection to Face and zone III of the neck. However, many of our patients wearing helmet sustained zone I and zone II neck injury. The reason for this could be slipping off the string from helmet visor towards the neck causing incisive neck injury.

None of our patients had any kind of neck protection. Protective clothing/equipment like a neck scarf, neck collar, metallic bike frame, helmets with neck extension are generally used during the festival by the local population. Metallic bike frames are usually a meter tall iron or aluminium rod, shaped like Inverted 'U' fixed near the visor of bike available locally during Makar Sankranti to protect against neck injuries (Fig 2). This offers very good cost-effective protection against invisible kite string injury. None of our patients had this installed, proving its efficacy against the threat. The kite string injury is a preventable emergency. Awareness of the incidence of kite string injuries during these festivities is very important.[8]

Figure 2: A meter tall iron or aluminium rod, shaped like Inverted 'U' near the visor of bike during Makar Sankranti to protect against neck injuries

Conclusion

From this study we conclude that the kite string injury is definitely a preventable medical emergency. Awareness among general population about such incidence of kite string injuries during these festivities is very important to prevent such incidence. As per this study use of glass-coated kite strings should be avoided and the more conventional ones should be used. Using helmets, neck scarves and metallic bike visor frames on two-wheelers can reduce the incidence and severity of injuries. The preparedness of the Emergency Department in wake of such occasions could go a long way in the effective management of such injuries.

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