



FIRE CRACKER OCULAR INJURY DURING DIWALI FESTIVAL - A PREVENTABLE OCULAR INJURY

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ABSTRACT **PURPOSE:** To study the demographic pattern and clinical profile of ocular injury due to firework during Diwali festival. **METHOD:** A total of 25 Patients coming to Ophthalmology OPD and casualty in a tertiary health centre with history of eye injury due to fire cracker during Diwali festival week were included in the study. Patient's demographic details such as age, sex, date and time of injury, residence, type of fire cracker, activity involved or onlooker and history of using protecting glasses were noted. visual acuity was taken in Snellen's fractions. Slit lamp assisted anterior segment examination, fundus examination, and intraocular pressure measurement in all eyes except open-globe injuries. B-scan, X-ray, and CT scan were done whenever necessary. Needed intervention is done whenever necessary. **RESULT:** Among 25 patients, 21 were male. The age range of patients was 5 to 52 years. Eighteen patients were less than 20 years of age. The most common type of firecracker causing ocular injuries were bombs (64%), followed by sparklers (28%) and homemade device (8%). Bottle rockets/bombs were responsible for serious ocular injuries. Sixteen patients were onlookers and 9 patients were actively involved in igniting the firecrackers. **CONCLUSION:** Ocular injuries by firecrackers are common during 'Diwali'. A majority (18/25, 72%) of patients were below 20 years of age. Absence of parental supervision, lack of knowledge about safety measures or not following them was a reason for incident. Failure to keep safe distance from firecrackers were contributory in some cases of injuries. The other major reason for firework injury is that the common practice of igniting firecrackers in the streets thus exposing passers-by to injury. The best measure is to restrict the fireworks to public open spaces (such as parks or playgrounds).

KEYWORDS : Ocular injury, fire cracker, Diwali festival, Homemade device

INTRODUCTION

Ocular trauma is that the trauma to eye and its adnexa or Ocular trauma refers to injury to eye ball and surrounding structures. Ocular trauma can be a devastating injury, causing disability for a lifetime in human.

In India, where traditionally firework form an essential part of the celebrations during Diwali festival. firecracker injuries are common during this festival, Firecracker injuries can cause serious and irreparable and irreversible damage to eye. Though fireworks-related eye injuries have been decreasing over the years, there is still a need to increase awareness in public about the dangers of fireworks. These injuries constitute an important cause of preventable blindness worldwide, and in India, such injuries are very common among children.[1-2] Few large case series on this subject exist in literature.[3-4] We report a series of firecracker injuries seen during a single week of Diwali festival to highlight the importance of firecrackers as a cause of ocular injuries in India.

AIMS AND OBJECTIVE: To study the demographic pattern and clinical profile of patients with ocular injury due to fire cracker during Diwali festival.

METHOD: This retrospective, cross sectional observational study was conducted in the eye department of a medical college. All patients with firecracker injuries who attended the emergency eye care services in eye department of medical college, during the 'Deepavali' festival week (from 04 November to 10 November 2021) were included in this study. Data were collected after written informed consent. Patient's demographic details such as age, sex, date and time of injury, time lapse between injury and hospital attendance, type of fire cracker, activity involved or onlooker and history of using protecting glasses were noted. Visual acuity was taken in Snellen's fractions. Slit lamp assisted anterior segment examination, fundus examination, and intraocular pressure measurement in all eyes except open globe injuries. B scan USG, X ray, and computed tomography scan were done whenever necessary. Needed intervention is done whenever necessary.

OBSERVATION AND RESULT

TABLE 1. AGE, GENDER AND RESIDENCE PROFILE OF PATIENTS:

AGE	GENDER		RESIDENCE	
	MALE	FEMALE	RURAL	URBAN
< 20 years	18			
20-40 years	5	21	4	9
>40 years	2			16

TABLE 2. TYPE OF FIRE CRACKER:

TYPE	ACTIVITY	
	Activity involved	Onlooker
Bottle bomb/bomb	16	
Sparklers	7	15
Homemade device	2	10

TABLE 3: INITIAL VISUAL ACUITY OF THE PATIENTS ATTENDING OCULAR EMERGENCY DEPARTMENT; CF - COUNTING FINGER, HM - HAND MOVEMENT, PL - PERCEPTION OF LIGHT

VISION	NUMBER OF PATIENTS	PERCENTAGE
6/6 - 6/9	6	24
6/18	9	36
6/36	5	20
6/60 - CF/HM	4	16
No PL	1	4

TABLE 4. CLINICAL MANIFESTATION OF FIRE CRACKER INJURY:

CLINICAL MANIFESTATION	NUMBER OF CASES	PERCENTAGE
Lid and conjunctival burn	6	24
Lid laceration	3	12
Corneal abrasion (close globe injury)	9	36
Conjunctiva and Corneal foreign body	8	32
Hyphema	3	12
Iridodialysis	1	4
Traumatic cataract	4	16
Vitreous haemorrhage	1	4
Open globe injury	2	8

DISCUSSION

In the present study, among total of 25 patients, it was observed that 21 (84%) male and 4 (16%) were female patients. The mean age of the patients was 14.45 years, The age range of patient was 5 to 52 years. A majority (18/25, 72%) of patients were below 20 years of age. Sixteen (64%) patients were from urban area and 9 (36%) patients were from rural area. [Table 1] Majority of the patients belonged to urban area. Urban area and high socioeconomic status are associated with more availability of firecracker thus involved in more firework during Diwali festival hence more incidence of firecracker injury.

Bombs were the most common types of fireworks causing injury, affecting 16 (64%) patients, followed by sparklers 7 (28%) patients and homemade device 2 (8%) patients. Fifteen (60%) patients actively involved in ignition of firecracker. Injuries to onlookers are also very common (10/25, 40%) [Table 2]

Six patients who were given first aid and were not admitted had 6/6 to 6/9 vision. These patients had either lid burn/laceration or had one or two corneal foreign bodies, which were removed. Fourteen patients had vision between 6/18 to 6/36 and 4 patients had less than 6/60. The causes of diminished vision were corneal abrasion/ oedema/ laceration, multiple corneal foreign body, Traumatic cataract, vitreous haemorrhage, and macular oedema. One (2.3%) patient lost his eye completely due to ruptured globe.

Corneal abrasions (closed globe injuries) and multiple foreign bodies involving lids, conjunctiva and cornea were the most common presentations. The clinical presentations included corneal abrasions (closed globe injuries) (9, 36% patients), multiple conjunctival and corneal foreign bodies (8, 32% patients), hyphema (3, 12% patients), lid and conjunctival burns (6, 24% patients), vitreous haemorrhage (1, 4% patients). Open globe injury was observed in 2 (8 %) patients, out of which one (4%) had badly ruptured globe. This eye was enucleated. USG scan (A+B scan) revealed vitreous haemorrhage in 1(4 %) patient. None of the patients had retinal detachment or optic nerve injury. Lacerations of lid in 3(12%) and iridodialysis was seen in 1 (4%) patient. Sparkles produced only conjunctival or corneal burn or corneal abrasions (closed globe injury), while rockets, cone fountain bombs and bombs caused lid laceration, open globe injury, iridodialysis, vitreous haemorrhage and multiple corneal foreign bodies, all of which led to poor visual outcome.

CONCLUSION

Firework related Ocular injuries are common during 'Diwali festival'. A majority (18/25, 72%) of patients were below 20 years of age. Absence of parental supervision, lack of knowledge about safety measures or not following them was a reason for incident. Failure to maintain safe distance from firecrackers was contributory factor in some cases of injuries. The other major cause of injury is the common practice of igniting firecrackers in the streets thus exposing the passers-by to injury. The most effective measure to reduce firework related injury may be to restrict the fireworks to public open spaces (such as road, parks or playgrounds). Regulating the quality of firecrackers and promoting safe use via schools and media will also have a positive impact.

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Conflict of Interest: None

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