

IMPACT OF PUBLIC AWARENESS ON PREVENTION OF OCULAR INJURIES DURING FESTIVALS: A CROSS-SECTIONAL REVIEW

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ABSTRACT

Objective: To see the impact of public awareness programs on prevention of ocular injuries during festivals

Methods: This Observational cross-sectional study was conducted in Ophthalmology department, DHQ Teaching Hospital, Gujranwala from 1st January 2018 to 31st December 2019 (2 years). After IRB approval and informed consent, data of patients suffering from ocular injuries only due to pellets or firecrackers at different festivals in 2018 was obtained. Proper history and examination were done and data was saved. General public education through posters and pamphlets was done regarding prevention of such injuries and data of next year (2019) was obtained, analyzed and compared with that of 2018 through SPSS v.25.

Results: Out of a total of 76 patients, 55 (72.3%) presented in 2018 and 21 (27.7%) in 2019. Majority of patients, 48 (87.2%) in 2018 and 17 (80.9%) in 2019 belonged to age groups under 20 years. Pellets caused more injuries, 34 (61.8%) and 12 (57.1%) in 2018 and 2019 respectively than firecrackers, 21 (38.2%) and 9 (42.9%) respectively. In 2018, hyphemia was most frequent clinical finding in 14 (25.5%) followed by corneal abrasions in 11 (20.0%) while the order was reversed in 7 (33.3%) and 6 (28.6%) patients respectively in 2019. In 2018, only 10 (18.2%) patients had best corrected visual acuity of counting fingers or worse at presentation while this number was 3 (14.3%) in 2019.

Conclusion: Festival injuries contribute to a significant number of preventable eye injuries. With proper educational programs and subsequent preventive measures, incidence of festival injuries can be significantly reduced.

Key Words: Festival Injuries, Awareness Programs, Ocular Trauma

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INTRODUCTION

Ocular trauma, one of the most common presentations to ophthalmic emergencies is injury or damage to the eyes.¹ These injuries can either be direct or indirect, can

occur at home, work or public places and may range from minor bruising to total globe perforations and orbital fractures leading to permanent blindness.^{2,3} Similarly modes of injuries are mostly due to chemicals and/or mechanical trauma.⁴

According to World Health Organization, annually 55 million ocular injuries occur out of which 1.6 million patients become partially or totally blind due to ocular trauma.⁵ Approximately 0.38 million people per year present to emergency departments with eye injuries in United States and children represent up to one-third of

them.^{6,7} Detailed statistics of ocular injuries in developing countries are yet to be published.

Eye injuries can cause impact on a person's life physically, mentally, socially as well as economically. While the occupational and accidental injuries are most common modes of ocular trauma, social events and festivals also contribute in a large proportion to these injuries.^{8,9} In Pakistan, a number of such religious, national and cultural festivals are celebrated, most noteworthy and prone to cause traumatic injuries include Shab-e-Barat, Eid-ul-Fitar, Eid-ul-Azha and different carnivals.¹⁰ A number of variables are liable to cause ocular injuries during such festivals like fireworks, pellets, blunt force trauma and explosions with fireworks at top of the list.¹¹

Although fireworks can be traced to as early as 7th century, their modern use is extensively limited to causes of celebrations such as those mentioned above. Owing to their colorful attraction, children (as well as elders) are fascinated towards them and likely to get injured in the process. Most likely mechanisms of injury include direct contact, flash or flame burns and damage secondary to the blast force.^{12,13} Functional and structural damage and subsequent rehabilitation depends mostly on the extent of injury.

As with any mishap, these injuries can be avoided or minimized with proper preventive measures.¹⁴ General public awareness through different educational programs in form of posters, pamphlets and attention seminars can significantly reduce incidence of these injuries and timely management in case injuries do happen, can greatly enhance functional and structural rehabilitation.¹⁵

We aim to assess the impact of general public awareness programs on prevention of ocular injuries during festivals.

METHODS

This was an observational cross-sectional study conducted at Department of Ophthalmology, DHQ Teaching Hospital, Gujranwala from 1st January 2018 to 31st December 2019. This study was approved by Ethical Review Committee of above-mentioned hospital. Informed consent was taken from all the participants. Only those patients in age range of 5 to 60 years, who presented at Ophthalmology department with injuries due to pellets and firecrackers in different festivals were included in study. Other injuries due to road traffic accidents and other sharp objects like scissors, knives etc. were excluded. 1st round of data was collected from January to December 2018 which included 55 patients. All patients underwent extensive history taking especially about nature of trauma and

instantly visual acuity (VA) was recorded. Further examination was done through slit-lamp bi-microscopy to note the nature and extent of injuries and augmented by means of radiological investigations. Pictorial recording was done wherever possible. (Figure 1) All data was saved for analysis later. Owing to a large number of such injuries, at the end of 2018, general public awareness and educational programs were launched regarding ocular injuries due to pellets and fireworks especially in children. Public was educated through different posters and pamphlets and were emphasized to practice preventive measures. (Figure 2) Similar data of similar patients was also obtained in 2019 from 1st January to 31st December. Data of both years was compared and analyzed with help of SPSS v.25 to see the impact of our educational programs on prevention of festival injuries.

Figure 1: Different Injuries Encountered and Included in Study



Figure 2: Public Awareness Banner pasted at Hospital Outdoor



RESULTS

Total 76 patients were included in this two years study out which 55 (72.3%) presented in 2018 and 21 (27.7%) in 2019. (Table 1) Patients in 2018 ranged from 5 years to 60 years while in 2019 from 5 years to 40 years. In 2018, majority of patients, 48 (87.2%) belonged to age

groups of up to 20 years and in 2019, patients under age of 20 years were 17 (80.9%).

Table 1: Frequency Distribution of Study Population

Total No. of Patients	2018	2019	Total
Number	55	21	76
Percentage (%)	72.3	27.7	100.0

In 2018, pellet gun injury was found as cause of injury in 34 (61.8%) and firecrackers in 21 (38.2%) while in 2019, stats of pellet gun injury were in 12 (57.1%) and firecracker in 9 (42.9%). (Table 2)

HypHEMA was most common clinical finding in 14 (25.5%) patients in 2018, followed by corneal abrasions in 11 (20.0%) and corneal tears in 6 (10.9%) patients while corneal abrasions were most frequently seen in 7

(33.3%) patients in 2019, followed by hypHEMA in 6 (28.6%) and corneal tears in 4 (19.1%) patients. (**Figure 3**) In 2018, only 10 (18.2%) patients had best corrected visual acuity (BCVA) of counting fingers (CF) or worse at presentation while this number was only 2 (3.6%) after treatment. In 2019, only 3 (14.3%) patients had BCVA of counting fingers or worse at presentation while no patient had BCVA at counting fingers or worse after treatment (Table 3)

Table 2: Frequency Distribution of Cause of Trauma

Cause of Injury	2018	2019
Pellet Gun Injuries	34 (61.8%)	12 (57.1%)
Firecracker Injuries	21 (38.2%)	9 (42.9%)
Total	55 (100.0%)	21 (100.0%)

Figure 3: Comparison of Nature of Trauma in 2018 and 2019

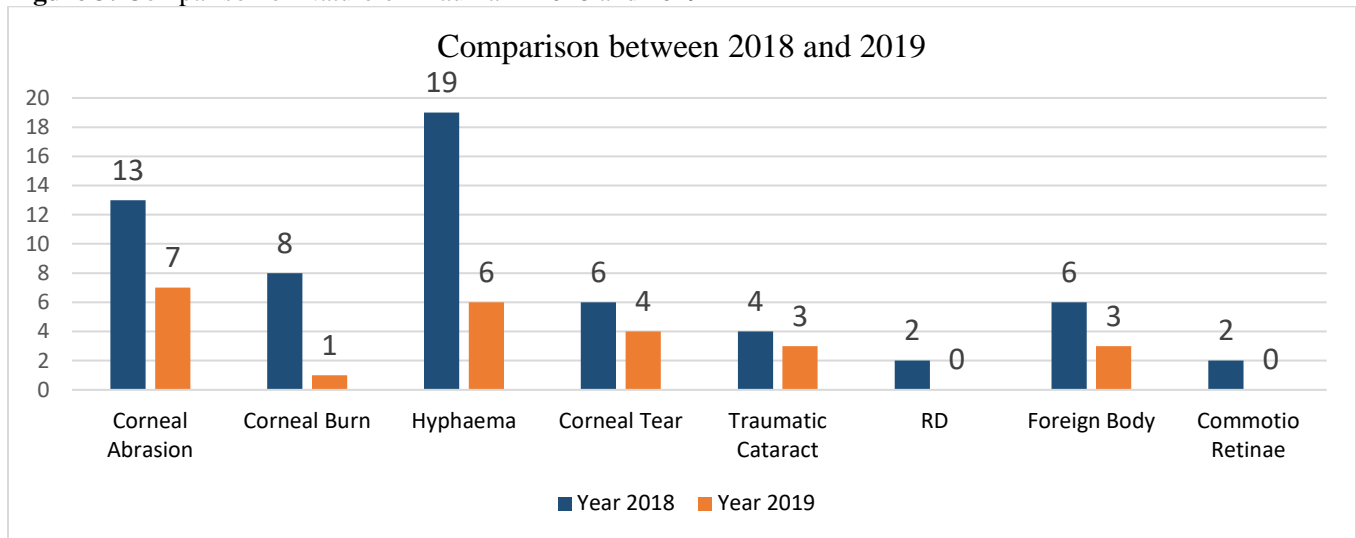


Table 3: Comparison of Patients' BCVA Pre and Post Operatively

Best Corrected Visual Acuity (BCVA)	2018		2019	
	Before Treatment	After Treatment	Before Treatment	After Treatment
Perception of Light	4 (7.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Hand Movements	3 (5.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Counting Fingers	3 (5.5%)	2 (3.6%)	3 (14.3%)	0 (0.0%)
6/60 to 6/36	11 (20%)	6 (7.2%)	6 (28.6%)	5 (23.8%)
6/24 to 6/6	34 (61.8%)	47 (85.5%)	12 (57.1%)	16 (76.2%)
Total	55 (100.0%)		21 (100.0%)	

DISCUSSION

Eye trauma is cause of permanent blindness (mostly unilateral) in at least half a million people worldwide annually.¹⁶ Mechanisms like coup, countercoup and ocular compression seem to be the main culprits in causing traumatic ocular injuries.¹⁷ Ocular traumas can lead to a wide range of injuries ranging from mild

eyelids abrasions to globe perforations. In this study, we focus only on injuries caused by pellets and firecrackers during different festivals.

Aim of our study was to see the impact of different awareness and educational programs on prevention of incidence of such injuries. In our study population, age range was from 5 to 60 years but majority of injuries

occurred in patients younger than 20 years of age as was the case in another study.¹⁸ Most were unilateral injuries and there was male predominance. Reason for that is in Pakistan, males are more likely to engage outdoor festival ceremonies than females. Huda et al and Fangyu et al both reported male predominance at 84.7% and 87.0% in their studies too.^{19,20} Most common source of injury in our study was pellet gun injury followed by firecrackers while Huda et al mentioned bangers (35.3%), rockets in bottle (28.0%) and then firecrackers (27.3%) in decreasing frequency.

Hyphema was most common clinical finding in our study in 2018 and in 2019, it was corneal abrasions. Kong et al reported hyphema and vitreous hemorrhage (41.5% each) as most frequent findings in his study followed by corneoscleral tears and optic nerve contusion (33.1% each) and then traumatic cataract (28.8%) at third.²¹

At presentation, best corrected visual acuity of counting fingers or worse in 2018 was in 10 (18.2%) patients which reduced to 2 (3.6%) after treatment. BCVA in 2019 of counting fingers or worse was in 3 (14.3%) people whereas no patient had counting fingers or worse vision postoperatively. These good visual outcomes were comparable to Huda et al who had 74 (47.7%) eyes with good visual outcome (20/40 or better).

All these statistics of our study show significant difference in 2018 and 2019 variables. Reason for that was introduction of general public awareness and educational program at the end of 2018, which was launched in form of posters and pamphlets distributed to patients and attendants visiting ophthalmology outdoor. Educational campaigns to reduce ocular injuries at festivals have been previously reported on literature and their effectiveness explained.²²⁻²⁴

Our future plans to further reduce incidence of such festival injuries include to further extend these awareness programs inside as well as outside the hospital. This includes conducting walks and seminars, educational programs at the level of Chamber of Commerce and Industry, Gujranwala about the hazards and safety measures and demand to government to have complete ban on toy guns especially those liable to cause traumatic injuries.

This study provides a proof of how educational and awareness programs can remarkably reduce incidence and rate of traumatic ocular injuries occurring at festivals. However, there are a number of limitations to this study. First of all, only pellet and firecrackers injuries were included in this study whereas festival celebrations are likely to cause ophthalmic injuries in a number of different ways. Secondly, male to female ratio was not identified but initial data analysis showed

strong male predominance. Gujranwala is a large division with a number of primary eye care setups. Although a great number of patients directly approach DHQ Teaching Hospital Gujranwala (a tertiary care referral), a significant number of patients with significant findings did not reach us. A vast multi-center study would've been a better choice for this purpose. And lastly, no management/ operative procedures were explained in this study.

CONCLUSION

Festival injuries contribute to a significant number of preventable eye injuries. With proper preventive measures, incidence of such injuries can be greatly reduced. For that purpose, different public educational and awareness programs play a remarkable role. Government should encourage such programs in order to hamper the rate of such injuries.

CONFLICT OF INTERESTS:

Authors declared no conflict of interests.

FUNDING:

No funding was acquired for this study.

ETHICAL APPROVAL:

The study was approved by the Institutional Review Board/ Ethical Review Committee of Gujranwala Medical College/ DHQ Teaching Hospital, Gujranwala. Vide reference No. Admin. 384/GMC

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AUTHOR'S CONTRIBUTIONS

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ZH: Manuscript writing, Statistical analysis, correspondence

IQM, AJ: Supervision, Manuscript review

AH: Manuscript review, Data collection

HARW: Manuscript review, Analysis