



ORIGINAL ARTICLE

Incidence and Causes of Open Globe Injury in Pediatric Age Group in Salmaniya Medical Complex between 2015–2020

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Abstract

Objectives: To report the epidemiological characteristics of pediatric traumatic open globe injuries (OGI) and to discuss the outcomes of such injuries in Salmaniya medical complex in Bahrain. To provide data for OGI in pediatric age group in Bahrain.

Methods: All the hospital records of pediatric patients who were treated for open eye injuries at Salmaniya Medical complex between January 2015 to December 2020 were reviewed. Patients were divided into two groups according to their final visual acuity (FVA): Group 1, FVA better than 6/60, and Group 2, 6/60 or worse. The FVA of each group was compared to initial visual acuity (IVA), wound entry site, associated injuries, and medical treatment. Further comparison was made between school-age children (≥ 6 years old), and younger children.

Results: A total of 21 children formed the study population. The injury was more common in school-age children (67%). Most injuries occurred while playing at home, during January and July (48%). The most common objects causing OGI were sharp pieces of either glass or metallic (62%) and pencil (9.5%). About 75% of patients had a final visual acuity outcome (FVA) of better than 6/60 (Group1), 25% had 6/60 or worse.

Conclusion: Most of OGI occurred at home and during student's holidays. Objects causing OGI were sharp common household items. Emphasis on education to prevent such injuries is essential.

Keywords: Amblyopia; Bahrain; Child; Eye Injuries; Holidays.

Introduction

Ocular trauma is one of the leading causes of monocular vision disability and non-congenital unilateral blindness of children.¹ It is a leading cause of monocular blindness worldwide, especially in developing countries.²

About 35% of eye injuries in the United states are

affecting children. This approximately amounts to a total number of 840,000 eye injuries annually.³

Open globe injury (OGI) generally leads to the development of a corneal opacity which is a significant cause of visual disability.⁴ Young children are more at risk because they are prone to develop amblyopia.

Open globe injury most frequently occurs at home setting and generally as the result of the use of sharp or thrown objects.^{5,6}

Most of studies show that boys are more prone to sustain open globe injuries than girls.^{2,5,6,7} Moreover, sharp objects were the most frequent mode of injury.^{8,9}

Materials and methods

This is a retrospective study. Hospital records of 21 patients of 18 years of age and younger who were treated for open globe injury at Salmaniya Medical complex between January 2015 until the end of December 2020 were reviewed by medical records from ward database, patients' files, and the electronic records (National Health Information System (I-SEHA)). The average age of the patients was 8.5 years. Ethics approval for this study was obtained from the secondary care research committee. Patients were divided into two groups according to their final visual acuity (FVA): Group 1, FVA better than 6/60, and Group 2, FVA of 6/60 or worse. Further details about wound entry site, associated injuries and medical treatment were discussed. Further comparison was made between school-age children (≥ 6 years old), and younger children.

Data was collected and analyzed using Microsoft Excel® software.

Results

A total of 21 cases of OGI in children were collected which constituted 17% of all OGI cases of all age groups (123 cases). School age children accounted for most reported cases, 67% (14) (Figure 1). Most cases were boys, 62% (13) (Figure 2). Mainly injuries occurred while playing at home, in the months of January and July, 48 % (10) (spring and summer holiday respectively) (Figure 3). The most common objects causing OGI were caused by sharp pieces of either glass or metallic objects, 62% and pencil, 9.5% (2) (Figure 4). Distribution of cases by laterality showed slightly more cases affecting right eye, 62% (13 cases), and eight of them affected the left eye. Cornea was the most common entry site, 95% (20), 3 of those cases involved the sclera as well and one only affected the sclera. Three cases were reported to have traumatic cataract, 14 %. All

cases were taken for surgical repair on the same day of presentation without delay. About 75% (12) patients had a final visual acuity (FVA) of better than 6/60 (Group 1), 25% (4) had 6/60 or worse (Group 2), and five patients with no record of FVA.

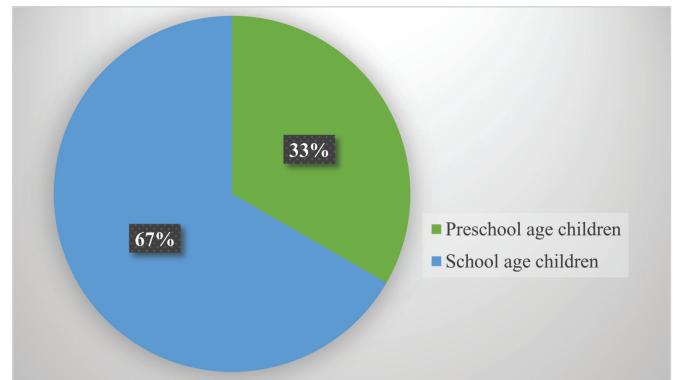


Figure 1: Age distribution of OGI cases

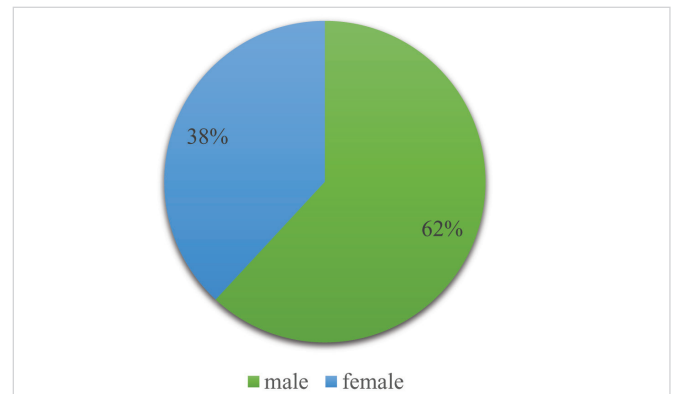


Figure 2: Number of OGI cases according to gender

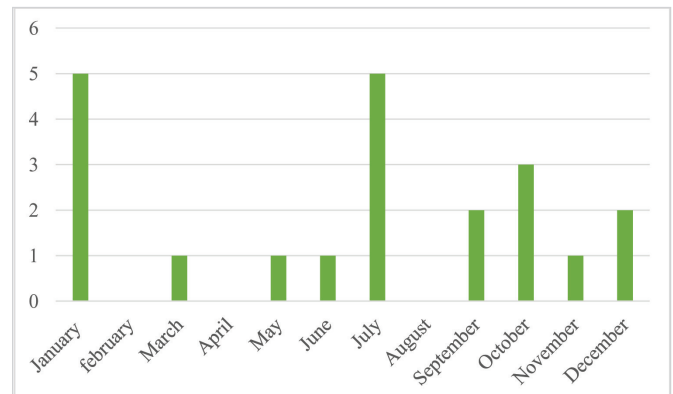


Figure 3: Number of OGI cases by month

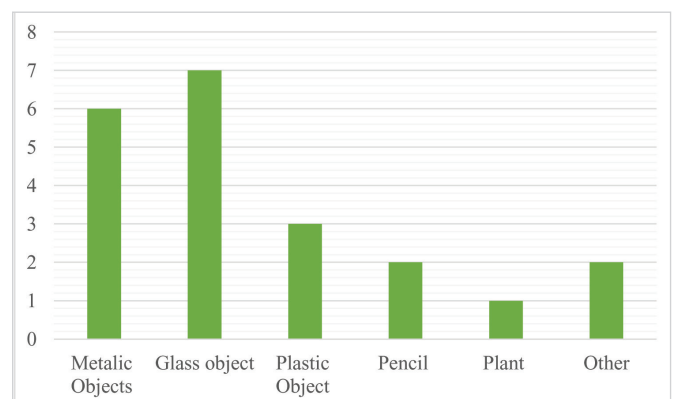


Figure 4: Number of OGI cases by objects

Discussion

Open globe injury (OGI) is defined as a full-thickness mechanical injury to the cornea and/or sclera. The two types of OGI are ruptures and lacerations. Ruptures result from blunt trauma causing a full-thickness defect at the weakest point of the eye wall. Lacerations, the result of a sharp object entering the globe, are further classified as penetrating (only an entrance wound or same entrance/exit wound) or perforating (separate entrance and exit wounds) injuries. The presence of intraocular foreign body (IOFB) is categorized under a separate category.^{2,10} All cases in this study fall under the classification of a penetrating trauma. No reported cases of any IOFB were observed in pediatric age group during the study time period.

OGI generally leads to the development of a corneal opacity which is a significant cause of blindness worldwide (4% of all causes of blindness worldwide).^{4,11,12}

Fortunately, the majority of the cases observed in this study maintained a relatively good visual outcome.

In a similar study done in 2012 at Port Harcourt teaching hospital in Rivers state, Nigeria they found that 22.2% of cases have developed traumatic cataract which is a slightly higher percentage than this study (14%).⁴

Plenty of studies showed that OGI occurs most frequently in the home setting and mostly as the result of the use of sharp tools.^{9,13} Boys sustained more OGIs than girls.^{2,5,6,7} Although the number of patients observed in this study was small, the clinical findings were concurrent with studies conducted in other geographical regions.

Similar to this study, a higher incidence of ocular trauma was noted in children above the age of 5 years, with an average age of around 8.5 years old.⁷⁻¹⁴

In one study, the authors concluded that nearly 90% of eye injuries can be prevented by relatively simple measures such as better education, appropriate use of safety eye wear, and removal of common and dangerous risk factors.⁸

Conclusion

The prevalence of open globe injury among the pediatric population in Bahrain was relatively low. Most injuries were due to household sharp objects and occurred at home during summer and spring holidays. Caregivers and children should be educated about the risks for eye injuries at home and about the use of appropriate protective eyewear during sports.

Conflicts of interest

None.

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