The incidence of children's eye injuries in Tobruk: a prospective study

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Abstract

Introduction: Ocular trauma constitutes a significant cause of acquired blindness in the pediatric population. Understanding the epidemiology of ocular trauma in children, particularly in comparison to other age groups, is vital for informing preventive measures and healthcare planning. This study aims to investigate the prevalence and characteristics of ocular trauma cases seen at the Tobruk Medical Centre in Libya over the course of one year. Methods: A retrospective study was conducted in 2019, encompassing patients of all age groups who were presented with ocular trauma in both the Ophthalmology Department and the Emergency Department of Tobruk Medical Centre. Data pertaining to age, sex distribution, duration of presentation, mode of injury, type of injury, and final visual outcomes were analyzed. Results: Among the 201 patients included in the study, 76 were children, comprising 37.8% of the total cases. Of the pediatric cases, 68.5% were male, while 31.5% were female. Notably, a significant proportion of children (77.6%) suffered ocular injuries at home, with altercations accounting for 7.8%, school-related incidents at 6.5%, and car accidents and workplace accidents contributing 5.2% and 2.6% respectively. Approximately 29% of cases required hospital admission, with 22% of patients necessitating surgical interventions. Blunt trauma was the most frequent type of ocular injury, representing 72% of cases. Penetrating trauma with intraocular foreign bodies (IOFB) accounted for 6.5% of cases. The final visual outcomes were recorded for 16 patients. Alarming results showed that 8% experienced severe vision impairment, with a visual acuity of Hand Movement or worse. Additionally, 2.6% of the trauma cases resulted in blindness with no perception of light. Sever impairment of vision is statistically significant related to cases with open rupture globe ($P < 0.001$). Conclusion: This study highlights the substantial vulnerability of children to ocular trauma and underscores the need for increased supervision and preventive measures, particularly in the home environment. Notably, open globe injuries can lead to permanent blindness. Preventive efforts should include the secure storage of sharp objects to safeguard against pediatric ocular trauma and its potentially devastating consequences.

Keywords: Ocular trauma, Open globe injuries, Closed globe injuries, Tobruk medical center-Libya.

Introduction

Eye injuries are one of the most urgent ophthalmological emergencies. The paediatric age group is more susceptible to ocular trauma, especially during playtime at home. In the United States, about thousand children get eye damage from accidents at home. Each year, about 250 thousand children get eye damage from accidents at home, at play, or in the car. (Barry 2019) There are numerous forms of eye trauma, they can be as close-globe injury with non-sharp objects, ultraviolet radiation, or chemical exposure, or as a penetrating injury with sharp objects or foreign bodies. (Sahraravand 2020) In blunt non-perforating trauma, signs include proptosis, decreased visual acuity, pain, lid ecchymosis, chemosis, mydriasis, afferent pupillary defect, increased IOP, and ophthalmoplegia. (Morris 2014) Treatment requires an immediate ophthalmologic consultation. conservative management with ice packs, pain control, bed rest, control of intraocular pressure, and systemic steroids. (Malek et. al. 2012) In open globe injuries, usually ruptures occur in areas where the sclera is thinnest (at the limbus or at the insertions of the extraocular muscles). (Sahraravand 2020) The loss of the aqueous from the anterior chamber and the vitreous or choroidal tissue through a wound are the most common signs of rupture. (Das 2020) In rupture-glob cases, management needs admission to the hospital and urgent interventions such as antibiotics, antiemetics, pain management, and urgent surgical repair of the wound. (Velibanti Nhlanhla Sukati 2012). In open-globe injuries, delaying medical attention can cause the damaged areas to worsen and result in permanent loss of vision. To achieve better therapeutic success, we need urgent surgical interventions to prevent significant morbidity and decrease the chance of blindness, which is common in these cases. (Puodžiuvienė 2018)

Methods

In a prospective study of ocular trauma, we included all new patients with eye injuries who received treatment at the Eye Department of Tobruk Medical Center in 2019. The data collection comes from direct histories of the patients or their relatives, examinations, and patient questionnaires. We record age, gender, laterality, possible previous amblyopia, detailedstatus findings at the first presentation, time at the first consultation after injury, diagnoses, andtype of management. We analyze the data, present the distributions (Excel, Microsoft Office 2019), and calculate the percentages from the reported results. The purpose of this study is to identify the patterns of ocular trauma in children, types of injuries, and visual and post- traumatic anatomical outcomes in patients presenting to our hospital.

Results

Over the course of one year between (01.01.2019- 31.12.2019), there were 201 trauma patients at Tobruk Medical Center. The time interval between injury and receiving consultation in the first three hours was in 45% of patients, 51.4% of cases came to the hospital after 24 hours, and 5.5% after 3 days. The rupture can occur with severe blunt trauma at the thinnest and weakest area of the eye or because of penetration by sharp objects. The long period of time before achieving proper management leads to a worsening of the visual outcome because more normal contents of the eye are lost. The mean age was 25.12 years (range between 1 and 80 years) and the mean age of children group 14 years.

Table 1. show distribution of age group with trauma in one year in Tobruk medical center:

	Age average	total	male	female
young age	(1-18 year)	109	89	20
children	(19-50 year)	76	52	24
old age	(older than 50 yr.)	16	13	3

Of the 201 trauma victims at Tobruk Medical Center,76 (37.8%) were children. Males made up 68.5% of the pediatric patients, while females made up 31.5%. Children are most often injured at home (77.6%), then at school (6.5%), in cars (5.2), at work (2.6%), and in fights (7.8%).

Table 2. shows different types of eye injuries in relation to the site of trauma in children:

Type of trauma	at home	at school	fighting at street	workplace	car accident
blunt object (non-perforating)	37	5	3	1	3
perforating trauma	12	-	-	1	1
full down	6	-	-	-	-
chemical injury	4	-	-	-	-
Gunshot injury (perforating)	-	-	3	-	-

There were 29% of cases that needed to be admitted to the hospital, and 17 patients (22%) needed surgical interventions. The most common trauma was blunt trauma (72%). Penetrating trauma with IOFB accounted for 6.5% of cases. Both open and close injuries can lead to loss of vision through different mechanisms. The visual outcome was recorded in 61 patients; there were 6 patients' (8%) results with severe impairment of vision (vision HM or less), and blindness resulted in 2.6% of trauma cases. Severe defects in vision cases are statistically significant and related to cases of open globes with sharp objects or foreign body injuries (p value < 0.001). Lesions that cause damage to the most delicate parts of the eye, such as the optic nerve or macula, from blunt objects or traumatic sharp objects or due to the long-term loss of normal contents of the eyeball**,** can cause poor vision. Children require extra attention since they are frequently exposed to eye damage. Sharp items should be kept out of children's reach since open globe injuries have the potential to cause blindness**.**

Discussions

Eye injury in children is a common reason for an emergency in the ophthalmology department. The injuries may be due to blunt, penetrating trauma, chemical agents, or ultraviolet radiation. (Alem KD, 2019) Children's eye injuries account for 37.8% of all eye trauma at Tobruk Medical Center in one year (2019). Hospital admissions only account for around 29% of total children's eye injuries, and 22% need surgical interventions (MacEwen 1999). Closed globe injury with blunt objects at home was the commonest eye injuries in children and more common in males. Because children's vision systems are still under development, eye injury can cause significant vision impairment. As in other studies, ruptured eye injuries result in clinically as well as statistically significant poor vision (p value <0.005) (Guly 2006) (Beshay 2017). Usually, trauma patients presenting with visual acuity correspond with an increasing severity of ocular injury; children with perforating injuries or ruptures usually present with worse vision than those with a closed eye globe. In our study, there were 81% of children with eye injuries whose visual acuity (VA) was recorded at presentation; others were uncooperative. 23.7% had a VA of 6/6, and 35.5% had a VA of <6/60. (Sujit Das, Manika Rana 2020) (Sahraravand, A 2020) When a child has any type of eye trauma, they should see an ophthalmologist as soon as possible. Longstanding injuries lead to more destruction of the normal tissue of the eye. Early consultation can save the vision of children with eye injuries. (Alem et al., 2019) In the combined study, about 98% of the patients presented after 6 hours post-trauma. (Cassen JH1997) Patient education and safety measures like wearing glasses during sports are very important to decrease the risk of child trauma. It is highly recommended and important to make the public aware of the risks and causes of eye trauma because most eye injuries can be prevented.(Cassen 1997 and Morris 2013)

Conclusion

Ocular trauma in children is a common cause of emergency eye clinic visits. Most cases usually worsen before receiving a consultation, and early consultation can save vision. Ocular morbidity can still be prevented in the case of an eye injury. Thus, we require health prevention strategies.

Declaration

We declare that the clinical research paper titled '[The incidence of children’s eye injuries in Tobruk: a prospective study]' has received ethical approval from the relevant regulatory bodies and/or institutional review board, such as the Tobruk Medical Centre Ethics Committee, prior to its initiation. This statement serves as an assurance that the research study conducted for this paper adheres to the highest ethical standards,ensuring the safeguarding of human subjects and upholding the integrity of the researchprocess.

Limitations of this study

This study has two limitations; due to participant aging, we do not include occurrences where data is not accessible, and a small number of the studies in this topic.

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