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ORIGINAL ARTICLE

Investigation of the Frequency of Ocular Trauma among Outpatients in Gorgan (Iran): A Descriptive Cross-sectional Study

Zahra Hesari[1], Zolaykha Karamelahi[2,3], Maseeh Zabihi[4], Mahen Tatari[5], Negar Broomand[6] ✉

[1] Laboratory Sciences Research Center, Golestan University of Medical Sciences, Gorgan, Iran
[2] Clinical Research Development Unit, 5 Azar Hospital, Golestan University of Medical Sciences, Gorgan, Iran
[3] Infertility and Reproductive Health Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran
[4] Student Research Committee, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
[5] Statistical Sciences Department, Sapienza University of Rome, Rome, Italy
[6] Department of Surgery, Clinical Research Development Unit, 5 Azar Hospital, Golestan University of Medical Sciences, Gorgan, Iran

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Abstract

Introduction: Ocular traumas are among the most common ocular emergencies. These types of trumas, if not treated on time, may lead to irreversible injuries, such as vision impairment and, in some cases, blindness in people of different ages. The present study aimed to investigate the frequency of ocular trauma in patients referred to the Trauma Center of 5 Azar Hospital in Gorgan, Iran.

Methods: This descriptive cross-sectional study was conducted on 349 outpatients with ocular trauma referred to the Emergency Department of 5 Azar Hospital in Gorgan, Iran, and census sampling was used for selection. All patients were first visited by a general practitioner and an emergency medicine specialist working in the emergency screening department, and if necessary, an ophthalmology consultation was carried out. Data were collected through the hospital information system, and then the demographic information, clinical characteristics of the patients, the type of trauma, and the treatments were extracted.

Results: The frequency of penetrating and blunt trauma in outpatients was 39.8% (n=139) and 60.2% (n=210), respectively. The frequency of scleral laceration was 6%, and extraocular foreign bodies (EOFBs) was 34.1%, which 0.9% led to full-thickness corneal. A total of 4.6%, 6%, and 4.3% of the outpatients had traumatic eyelid laceration, eyelid ecchymosis, and conjunctival laceration, respectively. In addition, traumatic subconjunctival hemorrhage occurred in 8.9% of patients. The frequency of half-thickness corneal laceration and hyphema was 12% and 9.7%, in respective order.

Conclusion: Many eye injuries could be prevented by raising awareness among people who work in unsafe places and parents about hazards that threaten children at home and school. Since foreign bodies (FBs) are one of the most frequent problems associated with eye trauma and the best treatment is primarily preventive, we must reduce this complication by providing and using safe equipment and monitoring its use.

Key words: Eye Injuries, Foreign Bodies (FBs), Outpatients

Introduction

Ocular emergencies require immediate therapy, and late treatment may lead to irreversible ocular injuries (1,2).

Ocular traumas are among the most important causes of vision impairment and blindness in people of different ages. These types of traumas are also

Tel: +985632381214
Fax: +985632440488
Po Bax 97175-379
Email: jsurgery@bums.ac.ir

✉Correspondence to:
Negar Broomand, Department of Surgery, Clinical Research Development Unit, 5 Azar Hospital, Golestan University of Medical Sciences, Gorgan, Iran
Telephone Number: +989113701913
Email: negar.broomand@gmail.com

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one of the most important causes of non-congenital blindness in one eye of adults in developed countries (1-3).

Ocular traumas are divided into two groups, penetrating and blunt, depending on the cause of the trauma. Penetrating trauma is caused by sharp and penetrating objects that cause damage to the tissue; however, blunt trauma is caused by a blunt object and is accompanied by changes in the tissue shape, although in some cases, blunt trauma injuries are more extensive than penetrating trauma. The common cause of ocular traumas includes foreign bodies (FBs) that can be observed on the surface of the eye and the tissues around the eye or inside its globe. FBs are among the most common causes of blunt traumas that occur in many cases in the workplace if protective glasses and shields are not used (4).

In a group of ocular trauma, initial diagnostic and care measures play a decisive role in preventing irreversible eye injuries. Since many trauma patients are referred to the emergency room of hospitals and non-specialized clinics, a significant part of the patient's problems can be solved if the general physicians and staff are familiar with basic measures, and irreparable eye injuries can occur if there are no familiarity with trauma, ways to deal with patients, and the lack of basic patient examination facilities. Previous studies have shown that the risk of ocular trauma is high in workplaces, schools, and outdoor environments (5,6).

Considering the epidemiological differences of ocular trauma in different places and since a significant part of eye traumas are predictable and preventable, the identification of common ocular traumas in each region will lead to proper planning and formulation of appropriate strategies for preventive measures. Therefore, the present study was conducted to evaluate the epidemiology of eye trauma in patients referred to the trauma center of 5 Azar Hospital in Gorgan, Iran.

Methods

This descriptive cross-sectional study was conducted on 349 outpatients with ocular trauma referred to the Emergency Department of 5 Azar Hospital in Gorgan, Iran, and census sampling was used for selection. This work was conducted in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of Golestan University of Medical Sciences under the ethics code IR.GOUMS.REC.1399.159. All patients were first visited by a general practitioner and an emergency medicine specialist working in the emergency screen department during the years 2017 and 2018. In addition, an ophthalmology consultation was performed if needed. Some patients were treated and discharged on an outpatient basis, and if necessary, some were admitted after consultation.

Ocular trauma complaints refer to all cases that are caused by environmental factors, such as accidents at work or home, car accidents, etc., and require immediate treatment. These complaints include FBs, penetrating or blunt traumas, and fractures. A number of these patients would have been discharged to medical centers on an outpatient basis or would have been admitted to the ward if more treatments were needed, such as receiving antibiotic injections or surgery. After referring to colleagues working at the Department of Medical Statistics, the file numbers and names of outpatients who visited the hospital with ocular trauma were determined through the HIS system. Then, the demographic information, clinical characteristics of the patients, the type of trauma, and the treatments were extracted. Data analysis was then carried out using mean and standard deviation descriptive statistics and a frequency distribution table (absolute frequency-percentage) using the SPSS (version 23) software.

Results

The medical files of 349 outpatients referred to 5 Azar Hospital were investigated in the present study. The mean±SD of the patients' ages was 30.35±17.24 years, with an age range of 1-85. The participants aged 1-10 and 20-40 years in 22.2% and 40.6% of cases, respectively. Moreover, 99.4% of the studied samples were male.

The frequencies of penetrating and blunt trauma in outpatients were 39.8% and 60.2%, respectively. The frequency of Extraocular Foreign Bodies (EOFB) in patients was 34.1%, and intraocular foreign bodies (IOFB) were seen in 0.9% of patients accompanied by full-thickness corneal laceration. In addition, 6%, 4.6%, 6%, and 4.3% of all patients had scleral laceration, traumatic eyelid laceration, eyelid ecchymosis, and conjunctival laceration, respectively. It is noteworthy that traumatic subconjunctival hemorrhage occurred in 8.9% of patients. Half-thickness corneal laceration was observed in 12% of patients, hyphema occurred in 9.7% of patients, and fracture of the orbital walls was reported in only two outpatients (Table 1). Orbital fractures in our patients were observed in the lateral, medial, and floor of the orbit following falls and motorcycle accidents.

Among the total number of outpatients referred to the Emergency Department of 5 Azar Hospital, 18.3% were referred to the eye clinic, and 4% were referred

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to a professional eye care center. A total of 14.3% of outpatients underwent surgery, foreign objects were removed in 74.8% of patients, and only 10.9% of patients underwent eye examination (Table 2). We performed different types of surgery for our patients, including foreign body (FB) removal and repair of lid lacerations in the Emergency Department. Corneal laceration repair was conducted in 31 patients, scleral laceration repair in 17 cases, and repair of lacrimal canaliculus laceration in 2 patients, which was performed in the operating room.

The frequency of eye injuries in children less than 12 years old is presented in Table 3. According to this table, most eye injuries were related to eyelid hematoma (25%). The most serious injuries in children were corneal laceration, scleral laceration, globe rupture, and hyphema in 9%, 3%, 4%, and 12%, respectively. We referred four patients (3 cases with glob rupture and 1 case with IOFB) to better-equipped centers.

Table 1. Frequency of eye traumas in outpatients referred to 5 Azar Hospital

Variable		Frequency (%)
Type of trauma	Penetrating	139 (39.8)
	Blunt	210 (60.2)
Extraocular foreign body (EOFB)	Yes	119 (34.1)
	No	230 (65.9)
Intraocular foreign body (IOFB)	Yes	3 (0.9)
	No	346 (99.1)
Scleral laceration	Yes	21 (6)
	No	328 (94)
Traumatic eyelid laceration	Yes	16 (4.6)
	No	333 (95.4)
Eyelid ecchymosis	Yes	21 (6.0)
	No	328 (94.0)
Hyphema	Yes	34 (9.7)
	No	315 (90.3)
Conjunctival laceration	Yes	15 (4.3)
	No	334 (95.7)
Subconjunctival hemorrhage	Yes	31 (8.9)
	No	318 (99.1)
Partial-thickness corneal laceration	Yes	16 (5)
	No	333 (95)
Full-thickness corneal laceration	Yes	26 (7.45)
	No	323 (92.55)

Table 2. Frequency of services provided to outpatients referred to 5 Azar Hospital

Variable		Frequency (%)
Patient transport	Referral to the clinic	64 (13.8)
	Referral to a specialized center	14 (4.11)
	Emergency treatment	271 (77.7)
Type of treatment received	Surgical treatment (in the Operating room)	50 (14.3)
	Foreign body removal and Lid repair in the Emergency Ward and Clinical Setting	261 (74.8)
	Eye examination	38 (10.9)

Table 3. Frequency of eye injuries in pediatric group (0-12 years old)

Types of Eye Injury	Frequency	Percentage
Lid hematoma	20	25
Lid erosion/Lid laceration	4	5
Bullet in the Eyelid	2	3
Subconjunctival hemorrhage	13	16
Conjunctival erosion/Conjunctival laceration	7	9
Extraocular foreign body (EOFB)	9	11
Intraocular foreign body (IOFB)	1	1
Corneal erosion	2	2
Corneal laceration (full/partial thickness)	7	9
Scleral laceration	2	3
Hyphema	10	12
Globe rupture	3	4

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Discussion

The purpose of the present study was to conduct an epidemiological investigation of ocular trauma in outpatients referred to the Emergency Department of 5 Azar Hospital in Gorgan (Iran) during 2017-2018.

The study population included 349 patients; 99.4% were male. In a study of the prevalence of ocular traumas in the native North China populations, Zhou J et al. investigated 6,830 patients who were over 30 years of age for ocular traumas. They found that ocular trauma was more common in men (7).

In a prospective study, Soliman MM et al. conducted an epidemiological evaluation of serious eye trauma involving 153 eyes of 147 patients. In their study, 80% of the patients were men, and it was reported that 80.4% of the patients had open globe trauma and required surgery. This finding is not consistent with the present study, as the study population included cases referred to the hospital with serious issues (8).

Another variable studied was age, with the mean±SD of the patients' ages being 30.35±17.24 years and an age range of 1-85. In the study by Farajieskooie et al., the mean age was also reported to be 30 years. Furthermore, 65% of the participants in this study were men (2), which is consistent with the present study. This finding can be due to the type of social activity of men and their employment in high-risk environments.

In a one-year study conducted by Samoila Ovidiu et al., the mean age of patients referred to the eye emergency was reported to be 39.54 years. In this study, conjunctivitis and corneal FBs were identified as the most common causes of referrals to the emergency eye clinic, accounting for 50% of the cases (9).

In another study, which was conducted by Ozkurt ZG et al. (2014) on patients with corneal FBs, the mean age of the patients was 32 years (10), which is consistent with the present study and indicates the high frequency of eye traumas in people aged 30-40 years who are very active socially.

In a study to evaluate the pattern of eye injuries and surgical procedures in an eye teaching clinic, Islam MS et al. reported that these injuries occurred among patients aged 18 years or younger most frequently (11), which is not consistent with our study.

In another study on 73.933 patients in 2006 by Fea A et al., the results indicated that the most common eye problems included conjunctival and corneal abrasions and corneal FBs, and the use of protective types of equipment has been emphasized to prevent this type of trauma (12).

In a similar study, Sahu SK et al. the range of the patients' ages was 24-45 years, and the majority was male (81.6%) (13). In a study in Nepal by Kinderan YV et al. (14) and another study by Basnet A et al. (15), blunt trauma was more frequent than open globe injury, and males were more prone to trauma the same as present study.

Our study found the most frequent eye injury in children (less than 12 years) was eyelid hematoma, and the most serious injuries were corneal and scleral laceration and globe rupture, whereas in another study, that was conducted by Kaçer EÖ et al. the most frequent injuries as closed globe injury was hyphema (16).

Out of the 349 outpatients studied in our study, only 14.3% (n=50) underwent surgical treatment, 74.8% (n=261) underwent outpatient FB removal, and 10.9% (n=38) underwent specialized examination in the eye clinic.

Conclusions

The results of the present study indicate a high frequency of eye trauma in the 20-40-year male age group, that is, in the period when people have the most social activity. The IOFB is the most frequent job-related eye complication caused when eye protective equipment is not used at work. The incidence rate of this complication can be reduced by using safety equipment, providing appropriate training, and monitoring their use. The second most commonly affected age group includes children who suffer complications due to a lack of awareness of dangerous conditions and poor self-care ability.

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Conflict of Interest

The authors declare that there is no conflict of interest in the present study.

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