Original Article

Clinical Characteristics and Visual Outcomes of Ocular Trauma in Rural Southeast Iran

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Abstract

Purpose: To classify ocular trauma in a rural region of southeast Iran, evaluate its impact on vision, and assess post-treatment visual outcomes.
Patients and Methods: The study was a hospital-based, prospective, observational study conducted over a one-year period including patients presenting with ocular trauma from rural areas of Sistan and Baluchestan province located in southeastern Iran. A total of 50 patients with ocular trauma were included. A detailed ocular history was obtained, followed by a comprehensive ophthalmic examination for each patient. Follow-up visits were scheduled one week after discharge, and subsequently at four weeks eight weeks and twelve weeks.
Results: Ocular injuries were more commonly seen in adults who were engaged in agricultural work. Males were more frequently affected (74 %). Closed-globe injuries (72 %) were more common than open-globe injuries (28 %). In both open- and closed-globe injuries, the most common object causing injury was a wooden stick. At presentation, only 29.2 % of patients had a visual acuity better than 1/10. However, after completing treatment and at the 3-month follow-up, 71.3 % had a best-corrected visual acuity better than 1/10.
Conclusion: Ocular trauma remains a major public health concern in rural areas, particularly among adult males involved in agricultural activities. Closed-globe injuries were more common than open-globe injuries, with wooden sticks identified as the primary cause of trauma. Further multi-center studies across multiple rural hospitals in Iran could provide a broader epidemiological picture of ocular trauma and its impact in these areas.

Keywords: Clinical; Profile; Outcome; Ocular; Injuries; Rural; Iran.

Article Notes: Received: Feb. 07, 2024; Received in revised form: Mar. 16, 2024; Accepted: Apr 02, 2024; Available Online: July 12, 2024.

How to cite this article: Jamalzehi M. Clinical Characteristics and Visual Outcomes of Ocular Trauma in Rural Southeast Iran. Journal of Ophthalmic and Optometric Sciences . 2024;8(3):1-6.

Introduction

An injury is damage to a person or a tissue/organ caused by the transfer of mechanical, thermal, chemical, electrical, or radiant energy [1]. The eyeball is a relatively well-protected structure in the body [2]. It is shielded from direct injury by the eyelids, eyelashes, and the protective margins of the orbit [1,3]. Physiologically, the eye is further safeguarded by the blink reflex, head-turning reflex, and lacrimation, which occurs in response to the intrusion of irritants [4,5]. Despite these protective mechanisms, ocular injuries are relatively common [1]. Such injuries can be classified as open-globe or closed-globe injuries [6]. The effects of ocular trauma are often more severe than injuries to other parts of the body due to the delicate nature of ocular tissues, potentially leading to permanent blindness [7].

Ocular trauma is a major cause of visual impairment and morbidity worldwide [8]. In Iran, the prevalence of visual impairment is significantly higher in rural areas compared to urban regions [9,10]. Ocular injuries are more common in rural areas due to high illiteracy rates and poor socioeconomic conditions [1,11]. Also limited awareness of protective measures, such as goggles and safety shields, contributes to the high incidence of ocular injuries in these communities [12]. The nature of injuries also differs, as most cases in rural areas are related to agricultural work and animal handling [13].

The aim of this study is to identify the types of ocular injuries in a rural area of southeast Iran, assess the extent of damage caused by these injuries, and evaluate visual outcomes following treatment.

Patients and Methods

The study was a hospital-based, prospective, observational study conducted over a one-year period including patients presenting with ocular trauma from rural areas of Sistan and Baluchestan province located in southeastern Iran. Informed consent was obtained from all study participants, and institutional ethics committee approval was secured before the study commenced. Patients with a history of previous ocular trauma were excluded from the present study. A total of 50 patients with ocular trauma were studied. A comprehensive history was obtained, followed by a detailed ocular examination for each patient. Patients requiring hospitalization were admitted and received appropriate treatment, while others were managed on an outpatient basis. Follow-up visits were scheduled one week after discharge, and subsequently at four weeks eight weeks and twelve weeks. During follow-up, visual acuity was recorded. When necessary, refractive testing was performed, and corrective glasses were prescribed.

Results

The present study showed the highest incidence of ocular injuries in the first decade of life (30 %). Also it was observed that ocular injuries are more common in males compared to females (Table 1). Closed-globe injuries (72 %) were more frequent than open-globe injuries (28%) (Table 2).

Table 3 shows that agricultural work-related ocular injuries formed the commonest mode of injury followed closely by injury while playing.

Amongst the objects causing ocular injury, the main culprits were wooden sticks and sugarcane leaves. Also injury due to an accidental splash in the eye and blunt trauma by stone were common. Injury due to thorn, bull horn, metal rod were also seen (Table 4)

Table 5 shows the distribution of visual acuity

Table 1: Age and sex distribution of patients entering the study

Age in years	Males	Females	Total	Percent
0-10	7	5	15	30
11-20	9	2	12	24
21-30	7	1	6	12
31-40	4	1	6	12
> 40	8	2	11	22
Total	37 (74 %)	13 (26 %)	50	100

Table 2: Type of injury among patients entering the study

Type	Number of patients	Percent
Open globe	14	28
Closed globe	36	72
Total	50	100

Table 3: Mode of Injury among patients entering the study

Mode of injury	Number of of patients	Percent
Agricultural work	24	48
Play	19	38
Domestic work	6	12
Traffic accident	1	2
Total	50	100

of ocular injury patients at presentation and their best corrected visual acuity (BCVA) at 3 months follow-up after treatment. At presentation 30 % of patients had visual acuity better than 1/10. At 3 months follow-up after treatment, 74 % of patients had visual acuity better than 1/10. One patient had just light perception (LP) and 2 patients had no light perception (NLP).

Table 4: Objects causing ocular injury among patients entering the study

Object	Open globe injury	Close globe injury	Total
Wooden stick	3	9	12
Leaves	1	7	8
Building material	0	5	5
Tree branch	1	4	5
Stone	2	3	5
Thorn	0	2	2
Animals	2	0	2
Finger nails	0	2	2
Metal rod/ wire	3	2	5
Marbles	2	1	32
Sharp particles glass/metal)	2	1	2
Total	14	36	50

Table 5: Extent of visual loss at presentation and 3 months follow-up

Visual Acuity	Number of cases at presentation	Percent	Number of cases at 3 months follow-up	Percent
Better than 1/10	15	30	37	74
1/10-5/100	20	40	8	16
5/100-14/1000	12	24	2	4
LP	1	2	1	2
NLP	2	4	2	4
Total	50	100	50	100

LP: Light perception; NLP: No Light Perception

Discussion

In our study, there was a male predominance (74 %) among patients with eye injuries. This male predominance is likely due to the greater exposure of males to outdoor work, making them more prone to injuries [1,14].

Both eyes were equally involved, with the right eye affected in 48% of cases and the left eye in 52 %. At presentation, 30 % of patients had visual acuity better than 1/10.

In the present study closed-globe injuries (72 %) were more frequent than open-globe injuries (28 %), consistent with findings from previous studies.[1,15]. Also similar to other studies the most common circumstance (48 %) in which injuries occurred among adults was agricultural work [1,15]. The incidence of agricultural ocular injuries was higher in our study than in most other studies we reviewed, likely because our study was conducted in a rural area where farming is the primary occupation [1,15]. In the pediatric age group, most ocular injuries were sustained during play, which was similar to other studies from rural areas [16,17]. Traditional games, such as marbles, contributed to ocular trauma in two pediatric cases.

The majority of patients 90 % presented with only anterior segment involvement. One patient had isolated posterior segment involvement, while 10 % had both anterior and posterior segment involvement.

This study was limited by a relatively small sample size and a short follow-up period. We recommend conducting studies with larger sample sizes and longer follow-up periods in rural areas of Iran to better understand the prevalence and causes of ocular injuries.

Conclusion

Ocular trauma remains a major public health concern in rural areas, particularly among adult males involved in agricultural activities. Closed-globe injuries were more common than open-globe injuries, with wooden sticks identified as the primary cause of trauma. Further multi-center studies across multiple rural hospitals in Iran could provide a broader epidemiological picture of ocular trauma and its impact in these areas.

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Footnotes and Financial Disclosures

Conflict of interest:

The authors have no conflict of interest with the subject matter of the present manuscript.