Severity of Ocular Trauma Score at Presentation in Open Globe Injuries

Mashal Bano[1], Hira Wakil[2], Yousaf Jamal Mahsood[3], Muhammad Zia ud Din Khalil[4]
Khyber Girls Medical College.[1-4]

ABSTRACT

Purpose: To determine the pattern of ocular trauma and ocular trauma score in patients from general population.

Methodology: This cross-sectional study was conducted at Ophthalmology department of Hayatabad Medical Complex, Peshawar from July 2022 till April 2023. Ocular examination included best corrected visual acuity in LogMAR units, etiology of the trauma, presenting symptoms, and associated ocular complications with trauma. Raw points and Ocular Trauma Score (OTS) were calculated for each eye at the end.

Results: Total 98 eyes of 98 participants were included in this study. Mean age and presenting visual acuity of our participants were 19.01+14.5 years and 1.45+0.48 LogMAR units. Most were males 84 (85.7%) and 53 (54.1%) participants presented after 24 hours of the ocular trauma. Wood was the most common cause of ocular trauma followed by metal.

Conclusion: The patients usually present late and with bad OTS which can be the reasons for poor vision in long-term.

Keywords: Ocular trauma, Open globe injury, Endophthalmitis.

INTRODUCTION

Ocular trauma is a major public and occupational health concern for being a potentially blinding condition. Depending on the nature and extent of trauma, it can lead to visual impairment from mild visual impairment to total visual loss. A nomenclature for ocular trauma, Birmingham Eye Trauma Terminology System (BETTS), was introduced so that the classification could be standardized.[1] Other ocular trauma classification system has been under severe criticism for lack of inclusiveness of trauma related damage and its prediction about future prognostic value.[2,3,4] BETTS has been in use as a standard classification system and was further strengthened by addition of another tool or scoring system, called Ocular Trauma Score (OTS), which could predict the prognosis of ocular trauma.[5,6] Since then, OTS has been used by many researchers about its predictability and have found it quite a valid tool.[7,8]

Correspondence: Yousaf Jamal Mahsood
Khyber Girls Medical College.
Email: yousaf82@gmail.com

The pattern and outcome of ocular trauma in Pakistan is well reported in the literature but they have not studied the OTS in these settings.[9-15] There is a report of using OTS in our population but the data was about war injuries.[16] Hence, the use of OTS in general settings is lacking and needs attention. By calculating the OTS for our demographics, we will be able to predict the visual prognosis of our patients. It will be an addition to our literature that can be used as a reference for medical and legal purposes in future. Therefore, we designed this study to determine the pattern of ocular trauma and ocular trauma score in patients from general population.

METHODOLOGY

This cross-sectional study was conducted at Ophthalmology department of Hayatabad Medical Complex, Peshawar from July, 2022 till April, 2023. Only those patients of open globe injuries who were admitted as well as those aged more than 5 years and both sexes were included in this study. Patients with previous history of ocular problems that could affect the visual acuity like cataract, glaucoma, retinal disease and trauma were excluded. The study adhered to the Helsinki declaration of ethical research and ethical approval was taken from the hospital research committee prior to start of the study (Ref. No. 801/HEC/B&PSC/2022). The sample size calculated was 98, taking the proportion of ophthalmic trauma as 6.78% in admitted patients,15 confidence level of 95% and absolute precision of 5%.

After taking the informed written consent from the eligible patients or the attendants of the children, a comprehensive ocular examination was performed and recorded. A third-year resident performed all the ocular examination and a predesigned proforma was used for data collection. Ocular examination encompassed documenting best corrected visual acuity in LogMAR units, etiology of the trauma, presenting symptoms, and associated ocular complications with trauma. Raw points and Ocular Trauma Score (OTS) were calculated for each eye at the end.

IBM SPSS Statistics for Windows was used for data analyses. Mean and standard deviation were calculated for continuous data (e.g. age, visual acuity, and raw points). Frequency and percentages were calculated for the categorical data (like gender, duration of trauma, presenting symptoms, and OTS). All the data were presented in the form of table and figures.

RESULTS

A total 98 eyes of 98 participants were included in this study. Mean age and presenting visual acuity of our participants were 19.01±14.5 years and 1.45±0.48 LogMAR units. Most were males 84 (85.7%) and 53 (54.1%) participants presented after 24 hours of the ocular trauma. The baseline demographics of our study participants are given in table 1.

Table -1: Demographics of the Study Participants

Characteristics		Frequency (N=98)	Percent
Age in years (SD)	19.01 (14.5)		
Visual Acuity in LogMAR (SD)	1.45 (0.48)		
Gender	Male	84	85.7
	Female	14	14.3
Eye	Right	54	55.1
	Left	44	44.9
Duration	>24 hours	53	54.1
	6-24 hours	29	29.6
	< 6 hours	9	9.2
	Not known	7	7.1
Presenting Symptoms	Decreased vision	80	81.6
	Pain	53	54.08
	Redness	45	45.91
	Watering	29	29.51

N=frequency, SD=standard deviation

When ocular trauma score (OTS) was calculated, the mean raw points were 67.19±13.35 and most of the participants 50 (51%) received OTS of 3 as shown in table 2.

Table -2: Ocular Trauma Score of The Study Participants

Characteristics		Frequency (N=98)	Percent
Associated Complications	None	55	56.1
	Perforating Injury	28	28.6
	Endophthalmitis	7	7.1
	Rupture	6	6.1
	Two or more	2	2.0
OTS	1	3	3.1
	2	33	33.7
	3	50	51.0
	4	12	12.2
Raw Points (SD)	67.19 (13.35)		

N=frequency, OTS=Ocular Trauma Score, SD=standard deviation.

There was no association between time interval since injury and OTS as shown in table 3.

Table -3: Association of Time Since Injury and Ocular Trauma Score.

Duration Since Injury	OTS (%)				P-value*
	1	2	3	4	
< 6 hours	0 (0)	5 (55.6)	2 (22.2)	2 (22.2)	
6- 24 hours	2 (6.9)	11 (37.9)	14 (48.3)	2 (6.9)	0.413
> 24 hours	1 (1.9)	17 (32.1)	29 (54.7)	6 (11.3)	

OTS=Ocular Trauma Score, %=percentage

*Chi-square test was applied

Wood was the most frequent cause of ocular trauma followed by metal as shown in figure 1.

Figure -1: Etiology of Trauma in The Study Participants
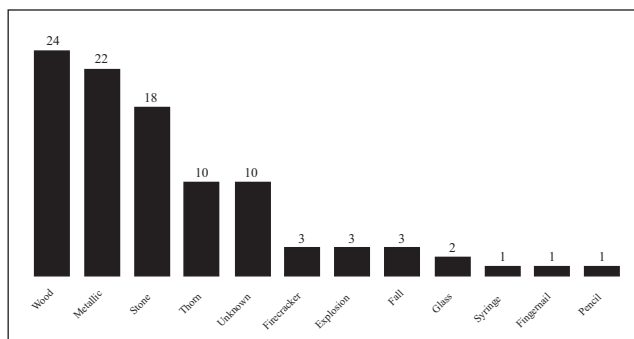
DISCUSSION

The aim of this study was to determine the pattern of ocular trauma and ocular trauma score (OTS) in patients from general population. In this study, late presentation (>24 hours), OTS of 3 and trauma with wooden objects were the main findings. Late presentation after ocular trauma can pose significant challenges in terms of diagnosis, management, and overall visual outcomes. Late presentation often leads to delayed diagnosis, making it challenging for healthcare providers to assess the extent of the ocular injury accurately. The initial symptoms of ocular trauma, such as pain, redness, blurred vision, or tearing, may diminish over time, leading patients to underestimate the severity of their condition. Untreated ocular trauma can give rise to complications such as infections, inflammation, corneal scarring, and retinal damage. Public awareness campaigns should emphasize the importance of seeking immediate medical attention after ocular trauma. Educational programs in schools, workplaces, and communities can help individuals recognize the signs of eye injuries and understand the potential consequences of delayed treatment. Promoting the use of protective eyewear in high-risk activities and industries can significantly reduce the incidence of ocular trauma.

Most of the study participants received OTS of 3. An OTS of 3 suggests a severe ocular injury. This may result from extensive damage to the ocular structures, including the cornea, lens, or retina. The score helps in determining whether the injury is likely to result in blindness, severe visual impairment, or if there is a possibility of preserving useful vision. Patients with an OTS of 3 may benefit from counseling regarding the potential visual outcomes and the need for rehabilitation services. Previous studies from Pakistan have also reported severe ocular injury on presentations. In Pakistan, as in any other country, various factors may contribute to an OTS of 3 in cases of ocular trauma. These factors can be influenced by the socio-economic, healthcare infrastructure, and cultural aspects of the region. Enhancing safety measures, promoting the use of protective equipment, and ensuring timely access to quality eye care services are essential steps in mitigating the impact of ocular trauma in any country, including Pakistan.

The main agent of ocular trauma in this study was

wood. While it's not accurate to single out one cause as the "main" cause, certain factors contribute significantly to ocular trauma in Pakistan. In Pakistan, ocular trauma can result from various causes. Occupational hazards, including workplace injuries in industries with inadequate safety measures, contribute significantly. Road traffic accidents, often due to congestion and non-compliance with traffic rules, are a common cause. Domestic accidents, sports-related injuries without proper protective gear, and violence or conflict situations also lead to ocular trauma. Limited safety education and awareness, especially in rural areas, contribute to preventable injuries. Agricultural activities, inadequate eye protection, and the use of fireworks during celebrations are additional factors. Delayed access to medical care further exacerbates the consequences of ocular trauma. Addressing these causes requires a comprehensive approach involving public awareness, safety education, and improvements in healthcare infrastructure.

The strength of this study is that real world data was collected, however it was of shorter duration. We suggest that promoting the use of protective eyewear, implementing safety regulations, and raising awareness about eye safety in woodworking environments are crucial measures.

CONCLUSION

The patients usually present late and with bad OTS which can be the reasons for poor vision in long-term.

Conflict of Interest: None to declare

Ethical Approval: The study was approved by the Institutional Review Board / Ethical Review Board No. 801-HEC-B&PSC-2022.

Author Contributions: Mashal Bano: Concept and Design of Study, Drafting Manuscript, Data Collection.

Hira Wakeel: Data Collection, Literature Review

Yousaf Jamal Mahsood: Data Collection, Literature Review.

Muhammad Zia ud Din Khalil: Data Collection &

Analysis.

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