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Research Article

Ocular trauma: its causes and associated visual acuity among patients visiting Munawar Memorial Hospital Chakwal

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Abstract:

Objectives: To determine the causes of ocular trauma and to measure visual acuity of the traumatized cases visiting Munawar Memorial Hospital Chakwal.

Subjects & Methods: A cross-sectional descriptive study was done among 18 ocular trauma patients who visited Eye OPD of Munawar Memorial Hospital Chakwal from October – December 2021. Patients of ocular trauma were included in the study through consecutive non-probability sampling. The data was gathered from the patients by means of self-structured questionnaire regarding their demographics and types of ocular trauma to which they were subjected. Visual acuity of the patients was measured by using Snellen's eye testing chart. Data was analyzed by means of SPSS version 25.0 and Microsoft Excel 2016. Descriptive statistics were applied.

Results: Of the total 18 patients with ocular trauma, 75% were males. Mean age of the respondents in the study was 48.9 ± 11.1 years. About 44.4% of them were 51-60 years of age. Approximately 88.9 % ocular trauma was occupationally related while rest of the 11.1% cases was sports induced. About 38.9% and 16.7% of ocular trauma cases had history of organic and penetrating trauma respectively. majority (44.4%) had mildly impaired visual acuity with visual acuity score of 6/6-6/12.

Conclusion: Majority of male agricultural workers was subjected to organic ocular trauma with mild impairment of visual acuity.

Keywords: ocular trauma; visual acuity; organic trauma; Snellen's eye testing chart

Introduction

Blindness has substantially been associated with ocular trauma globally. Ocular trauma not only negatively impacts the quality of life of the patients but also drastically influence the psychological well- being of the victims [1]. In addition to blindness, retinal, lens or ocular adversities may also be caused secondary to severe ocular trauma [2].

The prevalence of ocular trauma varies worldwide [3]. According to World Health Organization (WHO), approximately 55 million people across the globe are subjected to severe ocular trauma annually [4]. About 75% of the people reporting with ocular trauma are determined to be monocularly blind [5]. Ocular trauma can be due to application of some chemical to ocular surface or due to simultaneous mechanical or chemical injuries. Occupational exposure to ultraviolet rays has also been reported among some victims [6]. Only 2% ocular injuries were identified among those who were wearing protective glasses at their workplace [7].

Some children afflicted with lens injury have been reported with post-traumatic stress disorder due to deranged mental health [8]. A similar study by Lax MB et al unveiled the fact that people subjected to ocular injury suffered with depression, anxiety and dysthymia in addition to loss of self-esteem [9]. Ocular injuries have maximally been determined in age group of 5-25 years and among 70 years old males [10]. Ocular injuries have also been identified as a serious public health issue even among inhabitants of United States with male to female ratio of 7.4:1 particularly among those who are in 40s [11]. Visual acuity is one of the salient predictors of ocular trauma that is determined by means of prescribed charts and optical instruments [12].

The present study is intended to determine the causes of ocular trauma among the patients consulting the optometrists of Munawar Memorial Hospital Chakwal and their resultant visual acuity. This study would categorically enable us to determine the influence of ocular injuries on visual acuity of the victims. Moreover, deliberating the frequency of

ocular injuries would aid the strategic planners in minimizing their propensity among general public while considering it a contemplative public health concern.

Subjects & Methods

A cross-sectional descriptive study was done among 18 ocular trauma patients who visited Eye OPD of Munawar Memorial Hospital Chakwal from October – December 2021. This study is based on thesis that was composed in partial fulfilment of BSc (Hons) Optometry & Orthoptics requirement. Ocular trauma cases were enrolled in the study through consecutive non-probability sampling. The data was gathered from the patients by using self-structured questionnaire regarding their demographics and type of ocular trauma. Visual acuity of the patients was measured by using Snellen's eye testing chart. Being portable tool, it is most commonly used for rapidly assessing the visual acuity of the patients [13]. Scores of visual acuities were given as 6/6-6/12, 6/18-6/36, 6/60-CF and HM-PL+. Data was analyzed by means of SPSS version 25.0 and Microsoft Excel 2016. Descriptive statistics were applied.

Results

Of the total 18 patients with ocular trauma enrolled in our study, about 12(75%) were males. Mean age of the respondents in the study was 48.9 ± 11.1 years. Most (44.4%) of our patients were 51-60 years old as depicted below in Figure 1.

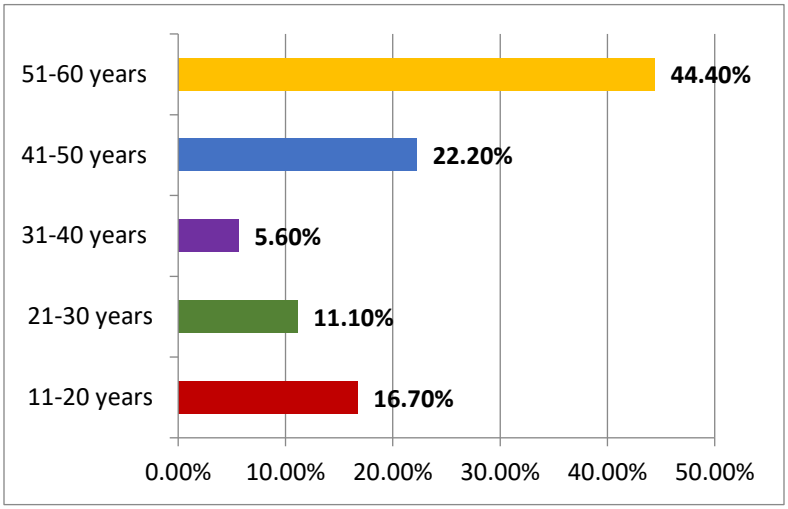


Figure 1: age distribution of ocular trauma patients (n = 18)

About 88.9 % ocular trauma among our patients were occupationally related while rest of the 11.1% cases was sports induced.

Organic trauma was the most frequent trauma among our study subjects as depicted below in Figure 2.

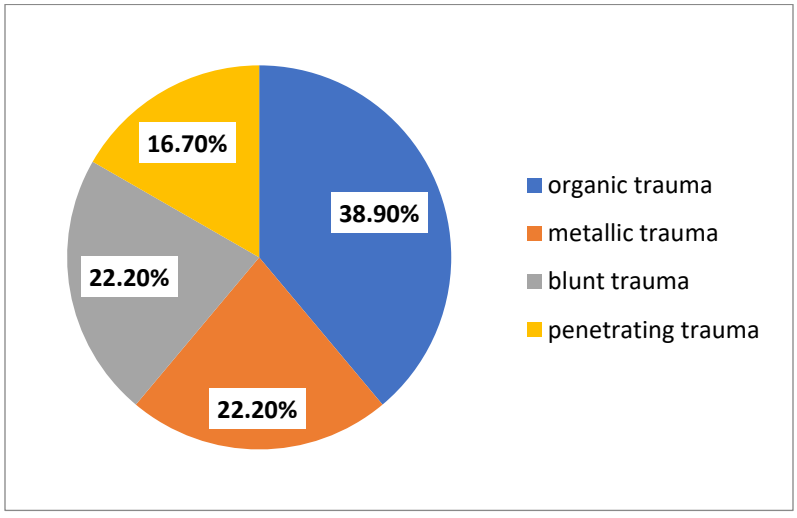
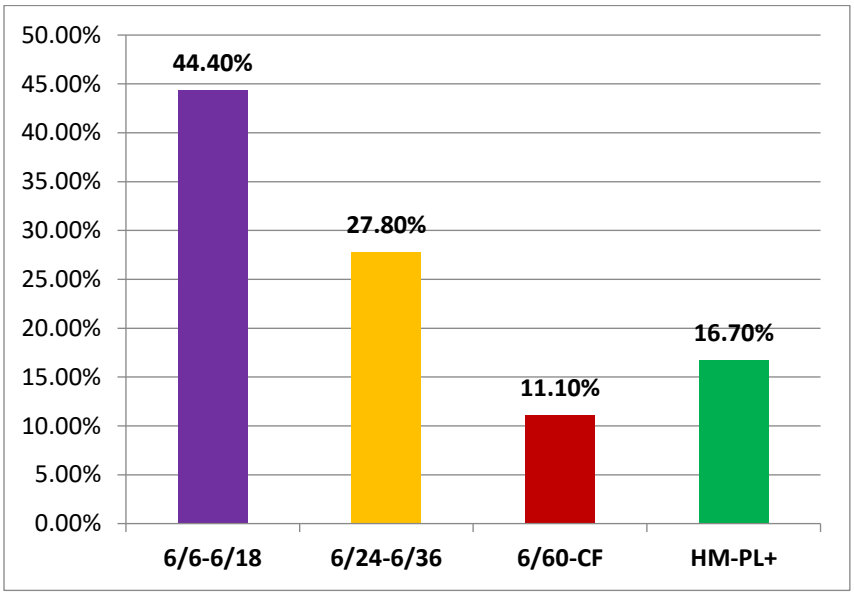


Figure 2: Types of ocular trauma among patients

Visual acuity of 44.4% of traumatic cases was determined to be 6/6-6/18 as revealed below in Figure 3.



CF- Counting Fingers *HM-PL- Hand movements –Perception of Light*

Figure 3: Visual acuity of ocular trauma patients

Association of age and type of trauma among ocular trauma cases with their visual acuity is illustrated below in Table 1.

Age	Visual acuity following ocular trauma			
	6/6-6/12	6/18-6/36	6/60 –CF	HM-PL+
11-20 years	1	1	0	1
21-30 years	1	0	0	1
31-40 years	1	0	0	0
41-50 years	2	1	1	0
51-60 years	3	3	1	1
Type of trauma	**Visual acuity scored following ocular trauma**			
	6/6-6/12	**6/18-6/36**	**6/60 –CF**	**HM-PL+**
Penetrating trauma	1	0	1	1
Blunt trauma	0	2	0	2
Organic trauma	6	1	0	0
Metallic trauma	1	2	1	0
Total	**8**	**5**	**2**	**3**

- 6/6-6/12 – Normal or mild visual impairment
- 6/18-6/36 – moderate visual impairment
- 6/60-CF – poor vision with ability to count fingers
- HM-PL – able to perceive hand motion and do light perception

Table 1: Association of age groups and types of ocular trauma with visual acuity

Discussion

Mean age of the patients with ocular trauma in our study was 48.9 ± 11.1 years and majority (44.4%) of them were 51-60 years old. A similar study by Wagh V et al among ocular trauma patients of Central India to measure the degree of visual damage revealed that majority of the afflicted cases were 31-40 years of age [14]. Likewise, according to the results of a cross-sectional prospective study carried out among Nigerian patients, majority of the cases subjected to ocular trauma was 10-19 years old and mean age was determined to be 28.4 ± 18.1 years [15]. Although age of the cases subjecting to ocular trauma showed somewhat variation in association with their geographical distribution, however, commonality among all studies was predominance of male cases. The reasons for this gender preponderance should thoroughly be deliberated by qualitative studies or triangulation.

About 89% of the patients with ocular trauma in current study had history of occupational injuries while rest of the 11% patients were afflicted to ocular injuries due to sports. Most (38.9%) of our study participants were subjected to organic trauma. Equal magnitude (22.2%) of the patients was subjected to both blunt and metallic trauma. Likewise, Ethiopian research also illustrated work-related ocular injuries in greater propensity [16]. A study among adults belonging to one of the states of Nigeria disclosed approximately 28% of the ocular injures due to domestic activities followed by 21.3% of the cases resultant of occupational trauma [17]. According to another Nigerian study, ocular injuries were attributed to road traffic accidents and industrial work as well in addition to farming and hunting [18]. Apart from retrospective studies, some prospective researches have also been carried out to study the consequences of ocular trauma with respect to changes in visual acuity and blindness etc. [19]. Even in United Kingdom, children were found afflicted to ocular injuries while playing [20]. However, such studies would really turn out to be

beneficial in planning timely interventions for getting rid of grave consequences.

Of the 18 patients with ocular trauma enrolled in our study, about 7 patients were subjected to organic trauma and 6 of them had 6/6-6/12 visual acuity. Around 5 patients had post-trauma visual acuity of 6/18-6/36 and 2 of them had blunt trauma, 2 had metallic trauma and one was exposed to organic trauma. In present study, only 3 patients were subjected to penetrating trauma while a similar study by Zungu T et al revealed affliction of majority to penetrating trauma and 63 out of 102 had normal visual acuity and 23 were found with no light perception (NPL) [21]. A prospective study done by Kyriakaki EDO et al amidst COVID-19 pandemic highlighted significant association of post ocular trauma visual acuity with psychological determinants of the victims. Although study did not reveal any statistically significant association of diminished visual acuity with clinical or demographic attributes; yet, better visual acuity seemed to have great impact on psychological condition of the sufferers. Moreover, recommendation was to have optimal collaboration between primary care physicians, ophthalmologists and mental health consultants for mitigating the likelihood of psychological effects following ocular trauma [22]. Using Imaging techniques for diagnosing type and gravity of ocular trauma with an intention to minimize the visual loss and timely management has substantially been increased worldwide in accident and emergency departments of the hospitals [23]. Magnetic Resonance Imaging (MRI) is strictly contraindicated among patients with history of ocular trauma by metallic foreign body [24]. Computerized Tomography (CT) can safely be done among all cases of ocular trauma25. Equipping the tertiary care hospitals with facilities for prompt diagnosis of ocular injuries is of paramount significance for reducing the probabilities of poor prognosis.

Conclusion & Recommendations

Ocular trauma is more commonly seem among males particularly among agricultural workers. Majority had mild impairment of visual acuity. Its frequency can substantially be reduced by using personal protective equipment and adequate guidance. Moreover, swift diagnosis by imaging modalities can prove beneficial in getting rid of grave ocular consequences.

Limitations: Small sample size due to non-cooperative attitude of the subjects.

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References

1. Hauschild VD, Schuh-Renner A, Lee T, Richardson MD, Hauret K, Jones BH (2019). Using causal energy categories to report the distribution of injuries in an active population: An approach used by the U.S. *Army. J Sci Med Sport.* Sep;22(9): 997-1003.
2. Wang JD, Xu L, Wang YX, You QS, Zhang JS, et.al (2012). Prevalence and incidence of ocular trauma in North China: the Beijing Eye Study. *Acta Ophthalmol* Feb; 90(1): e61-7.
3. Bian X, Xu S, Song Y, Wang Y, Zhao B, et al (2020). Global, national and regional prevalence, and associated factors of ocular trauma: A protocol for systematic review and meta-analysis. Medicine (Baltimore) 2020 Aug 28; 99(35): e21870.
4. Negrel A D, Thylefors B (1998). The global impact of eye injuries. *Ophthalmic Epidemiol 1998;* **5(3)**: 143–169..
5. Vats S, Murthy GVS, Chan dra M, Gupta SK, VashistP, et.al (2008). Epidemiological study of ocular trauma inan urban slum population in Delhi, India. *Indian J Ophthalmol* 2008; 56: 313-316.
6. Desai NM, Shah SU (2023). Lateral Orbital Canthotomy. 2023 Jul 25. In: StatPearls [Internet]. Treasure Island (FL): *StatPearls Publishing*; 2024 Jan.
7. May DR, Kuhn FP, Morris RE, Witherspoon CD, Danis RP, Matthews GP, et al (2000). The epidemiology of serious eye injuries from the United States Eye Injury Registry. *Graefes Arch Clin Exp Ophthalmol* 2000 Feb; 238(2): 153-157.
8. Karaman S, Ozkan B, Gok M, Karakaya I, Kara O, Altintas O, et al (2017). Effect of eye trauma on mental health and quality of life in children and adolescents. *Int Ophthalmol* ; 37: 539–544.
9. Lax MB, Klein R (2008). More than meets the eye: Social, economic, and emotional impacts of work-related injury and illness. *New Solut.* ; 18:343–360.
10. Patel D (2015). Eye Injuries: Improving our practice. *Community Eye Heal* 2015; 28(91):41–3..
11. May DR, Kuhn FP, Morris RE, Witherspoon CD, Danis RP, et al (2000). The epidemiology of serious eye injuries from the United States eye injury registry. *Clinical Investigation* Feb; 238(2): 153-157.
12. Shah M, Shah S, Khandekar R (2008). Ocular injuries and visual status before and after Their management in the tribal areas of Western India-A historical cohort study Grafes Arch *Clin Exp Ophthalmol* ; 246:191–197.
13. Azzam D, Ronquillo Y (2023)**.** Snellen Chart. 1st May 2023.
14. Wagh V, Tidake P (2022). Clinical Study and Profile of Ocular Trauma: Findings from a Rural Hospital in Central India. *Cureus 2022* Jul 16; 14(7): e26915.
15. Jac-Okereke CC, Jac-Okereke CA, Ezegwui IR, Umeh RE (2021). Current pattern of ocular trauma as seen in tertiary institutions in south-eastern Nigeria. *BMC Ophthalmol* ; 21: 4.
16. Alemayehu WT, Shahin S (2014). Epidemiology of ocular injuries in Addis Ababa Ethiopia. *J Ophthalmol East Cent South Africa*. 2014;18(1).
17. Ezinne NE, Mashige KP, Onainwa AP (2018). Ocular injuries among adults in Owerri Municipal, Imo State, Nigeria. *ARC J Ophthalmol 2018*; 3(1): 4-9.
18. Kyari F (2015). Challenges of agriculture-related eye injuries in Nigeria. *Community Eye Heal J* 2015; 28(91): 52.
19. Okpala NE, Umeh RE, Onwasigwe EN (2015). Eye injuries among primary school children in Enugu, Nigeria: Rural vs Urban. *Ophthalmol Eye Dis*;7: 13-19.
20. Sii F, Barry RJ, Abbott J, Blanch RJ, Macewen CJ, Shah P(2018). The UK paediatric ocular trauma study 2 (POTS2): Demographics and mechanisms of injuries. *Clin Ophthalmol* 2018; 12: 105–111.
21. Zungu T, Mdala S, Manda C, Twabi HS, Kayange P (2021). Characteristics and visual outcome of ocular trauma patients at Queen Elizabeth Central Hospital in Malawi. *PLoS ONE* 2021; 16(3): e0246155.
22. Kyriakaki EDO, Detorakis ET, Bertsias AK, Markakis G, Tsakalis NG, et al (2023). Ocular trauma, visual acuity related to time of referral and psychosocial determinants, during COVID-19 pandemic: A prospective study. *Exp Ther Med*. Feb 8;25(3):130.
23. Zafar S, Sebestyen K, Qureshi Z, Schein O, Johnson P, et al. National Trends in Imaging Rates for Eye-Related Emergency Department Visits in the United States. *Am J Ophthalmol*. 2020 Mar; 211:114-122.
24. Wang D, Rizzuti A (2023). Eye trauma imaging. *StatPearls*. 26 June 2023.
25. Allon G, Beiran I, Seider N, Blumenthal EZ (2016). The role of computed tomography in the immediate workup of open globe injury. *Eur J Ophthalmol* Aug 04; 26(5): 503-504.