

Clinical profile and visual outcome of patients presenting with penetrating ocular trauma to a tertiary care hospital

CN Madhusudhana^{1,*}, Apoorva N², Varna V Shet³

¹Associate Professor, ^{2,3}PG Student, Dept. of Ophthalmology, MMC & RI, Mysuru, Karnataka

***Corresponding Author:**

Email: drcnms@yahoo.com

Abstract

Introduction: To identify the cause of penetrating ocular trauma; demographic, clinical profile and visual outcome of the patients presenting with penetrating ocular trauma to a tertiary care hospital.

Materials and Methods: It is a hospital based- prospective study that was conducted over a period of one year. 146 eyes of 146 patients attending outpatient in the department of ophthalmology with penetrating ocular trauma were included. Demographic data like age and gender, cause of penetrating injury, nature of work that was being carried out at the time of injury, time duration between injury and presentation to the hospital, visual acuity and diagnosis were recorded. Evaluation of anterior and posterior segment was done at time of presentation. Final visual outcome was recorded at the end of 6-8 week follow up after complete treatment.

Results: Penetrating ocular trauma was found to be more common in adults in the age group of 35-45 years and in males (71.23%). Most of them were working in agricultural field (42.46%) at the time of injury. The most common mode of injury was wooden stick. 52% of patients presented in 24-48hrs after injury, which were highest among the groups studied. Visual acuity of 6/60 or worse recorded at the time of presentation was 56.80%. After complete treatment and follow up at the end of 6-8 weeks, the best-corrected visual acuity ranging between 6/18 to 6/60 in co-relation with the time of presentation is 59.20%.

Conclusion: Most common cause of ocular morbidity in village set up are found to be in people working in agricultural field without adequate protective measures. Hence the need to explore workplace strategies to minimize ocular trauma becomes a priority. Educating the community regarding the protective measures to be undertaken at the workplace is of utmost importance. Visual outcome was found to be better in patients in whom only anterior segment was involved and who presented to the hospital within 24hrs of trauma.

Keywords: Agricultural field, Ocular morbidity, Workplace strategies, Wooden stick injury

Introduction

Ocular injury is the most important cause of monocular visual impairment and blindness which is avoidable with adequate measures.⁽¹⁾ It is estimated that almost 90% of all ocular injuries are preventable.⁽²⁾ 1.6 million people world wide are blind from eye injuries, 2.3 million are visually impaired in both the eyes and around 19 million have unilateral visual loss; however ocular trauma is the commonest cause of unilateral blindness today.⁽³⁾

Approximately more than half of all patients who present to an eye emergency department present with ocular trauma. Studies by WHO estimated that, around 55,000,000 eye injuries occurring every year causes restriction of activities, of them around 750,000 cases initially required hospitalization and 200,000 among them had open globe injuries.⁽⁴⁾ Penetrating injuries caused by sharp instruments are serious and should be treated as an emergency. The most common people who are affected are those who work outdoors especially in a rural setup. Most of the hospital and population based studies conclude that a large predominance of injuries affects males.⁽⁵⁾

Adequate eye protection when performing visually threatening activities is the most effective method to prevent ocular trauma.⁽⁶⁾ It not only causes severe visual loss but also a profound emotional trauma to

patients and their families. Treatment is time consuming and expensive but despite this there is often a grave prognosis.^(7,8)

Objectives

1. To study socio-demographic profile of population.
2. To study clinical profile and final visual outcome of population for a period of 8 weeks.

Materials and Methods

The study was conducted at MMC & RI, Mysore. It is a hospital based prospective study with data collection for a period of one-year from 1st April 2015 to 31st March 2016. A total of 146 eyes of 146 patients attending the department of ophthalmology with penetrating ocular trauma were included. Detailed history was taken and special emphasis was given to demographic data like age and sex, mode of injury, nature of work being carried out at the time of injury. Time duration between the occurrence of injury and presentation to the hospital, visual acuity on presentation and diagnosis were also recorded.

Informed consent was taken. Evaluation of anterior segment was done using slit lamp noting the size, extent and nature of injury. Fundus examination was carried out with indirect ophthalmoscope and slit lamp bio microscopy with +78D lens at the time of presentation.

Visual acuity of all the patients was recorded with the help of Snellen's chart both at the time of presentation and on the last follow-up day.

General physical examination of the patient and laboratory tests especially for general anesthesia like total leukocyte count, differential leukocyte count, hemoglobin, complete urine analysis, electro cardiogram, chest X-Ray, electrolyte balance and kidney functions were done to avoid complications. B-Scan Ultrasonography was done to patients in whom posterior segment was not visualized.

Injuries were repaired after the complete evaluation at the earliest possible time under local anesthesia for adults and general anesthesia for children depending on the patient preference and general condition. Posterior segment injuries were referred immediately for vitreo-retinal surgeon opinion and intervention if required. All the patients were followed up at 1, 3, 6 and 8 weeks. Patients who were referred for vitreo-retinal intervention were also followed up accordingly.

Statistical method: All the variables in this study were treated as categorical and expressed as frequency and percentages. Microsoft excel spread sheet was used for data entry and analysis.

Prevalence of penetrating ocular trauma= 0.23% with a 95% CI (0.16, 0.3)

Results

In this study group, penetrating trauma is found to be most common in adults in the age group of 35-45 years 74(50.68%) and most common gender affected are males 104(71.23%). These were the people mostly working in agricultural field (Table 1 & 2) where usually the most common mode of injury will be with wooden stick 62(42.46%). Most of these patients were not protected and were ignorant about the consequences of ocular trauma. The time duration between injury and presentation to the hospital was found to be highest between 24-48 hrs (Table 3). After complete treatment, the visual outcome at the end of follow-up (8 weeks) was better in patients who presented within 24hrs of injury and who did not have posterior segment involvement. 21 patients dropped out of study since they did not come for final follow-up.

Table 1: Relation between the Age group and Gender of patients presenting with penetrating ocular trauma

Age(years)	Male	Female	Total
0-20	29	12	41 (28.08%)
21-35	13	08	21 (14.38%)
36-45	55	19	74 (50.68%)
>45	07	03	10 (6.84%)
Total	104 (71.23%)	42 (28.77%)	146

Table 2: Mode of injury occurring in Males and Females of penetrating ocular trauma cases

Mode of injury	Males	Females	Total
Wooden stick injury in agricultural field	42	20	62 (42.46%)
Road traffic accidents	15	08	23 (15.75%)
Sports/playing/recreational activities	22	09	31 (21.23%)
Domestic accidents/violence	14	04	18 (12.32%)
Others	11	01	12 (8.21%)
Total	104 (71.23%)	42 (28.77%)	146

Table 3: Comparison of time duration between injury and presentation with visual acuity recorded at the time and end of follow-up period

Time duration between injury and presentation	Visual acuity at the time of presentation	Final visual outcome at the end of 8 weeks
<24hrs	6/6-6/12	06
	6/18-6/60	13
	Worse than 6/60	25
	Total	44
24 – 48hrs	6/6-6/12	04
	6/18-6/60	24
	Worse than 6/60	37
	Total	65
> 48hrs	6/6-6/12	2
	6/18-6/60	3
	Worse than 6/60	9
	Total	14
Total	125	125

*People who were lost to follow-up were excluded from this analysis.

Discussion

For degree of freedom 8, the chi square value is 38.2 and P value is <0.005, hence the differences between and within the groups are significant. In this study people who presented within 24hrs had visual outcome in the range of 6/6-6/12 which were better than other groups and are statistically significant.

This is in comparison to a study conducted by Esmaeli *et al*⁽⁷⁾ in a retrospective analysis of 176 cases of ruptured globe, found that predictors of a good (6/18 or better) visual outcome were a presenting acuity of 6/60 or better after injury whose wound location was

anterior to the pars plana and a wound length of 10 mm or less. Thus they concluded that eyes with wounds longer than 20 mm extending posterior to the equator would lead to poor final vision and result in subsequent enucleation in the majority of cases.⁽⁷⁾

Also in a study conducted in Haryana, males (76.01%) were more frequently affected than females (23.99%) and in occupational injuries (38.26%) agricultural activities (19.9%) were most commonly involved followed by industrial accidents (12.24%) where cornea was the most affected part of eyeball (47.6%) followed by iris injury (32.64%).⁽⁹⁾

It is difficult to directly compare this study with other studies since there is significant difference in classification and method of reporting used in the study. But the final conclusion from most of the studies gives a similar outcome and makes the study significant.

Conclusion

Agricultural injury is the most common cause of ocular morbidity in rural areas. Hence, we need to prioritize the exploration of workplace strategies as an important measure to minimize ocular trauma. Educating the community about the protective measures to be undertaken at the workplace becomes a primary goal. Educating through mass media is one of the effective methods to reach out for people in remote areas. Since most of the people in villages do not have access to advanced health care, the severity of injury should be recognized by the resident medical personnel in the locality and referred immediately to the closest available tertiary centre. Therefore, local doctors/ medical personal must be trained periodically. The injuries presenting to the hospital should be investigated and treated as early as possible. While providing protection is relatively straight forward, the challenge will be in ensuring compliance with the protective mechanisms and ensure that trauma related incidents are better handled.

References

1. Editorial progress in Surgical Management of Ocular trauma. British J. Ophthalmology, 1976;60:731.
2. Thompson CG, Kumar N, Billson FA, et al. The aetiology of perforating ocular injuries in children. British J. Ophthalmology. 2002;86:920-2.
3. Negrel AD, Thylefors B. The global impact of eye injuries. Ophthalmic Epidemiol. 1998;5:143-69.
4. Desai P, Mac Ewen CJ, Baines P, Minaissian DC. Epidemiology and implications of ocular trauma admitted to hospital in Scotland. J. Epidemiology Comm. Health 1996;50:436-441.
5. MacEwen CJ. Eye injuries: a prospective survey of 5671 cases. Br J Ophthalmol. 1989;73:888-94.
6. American Academy of Ophthalmology, The 6th Annual Eye Injury Snapshot Project.
7. Esmaeli B, Elner S, Scharck A, et al. (1996) Visual outcomes and ocular survival after penetrating trauma. Ophthalmology 102:393-400.
8. de Juane J, Sternberg P, Jnr, Michaels RG(1983). Penetrating

ocular injuries, types of injuries and visual results. Ophthalmology 93:1318-22.

9. Parmar IPS, Sunandan S, Nagpal RC. Pattern of ocular injuries in Haryana. Ind J Ophthalmol 1985;33:141-144.