

# A Prospective Study on the Pattern and Outcome of Penetrating Eye Injuries in a Tertiary Care Hospital

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## ABSTRACT

**Introduction:** Ocular trauma is one of the major cause of loss of vision. Present study was done to determine the pattern, aetiological factor and visual outcome for penetrating eye injuries in a tertiary care hospital.

**Materials and Methods:** This is a prospective study of 52 patients who presented with penetrating eye injuries over a period of nine months. Detailed history regarding trauma, nature and agent of injury were recorded. All the patients underwent a comprehensive ocular examination including visual acuity, slit lamp examination and detailed posterior segment evaluation. B-scan and necessary radiological investigations were done wherever required.

**Results:** Our study group consisted of 52 patients including 40 (76.9%) males and 12 (23.1%) females with an age range between six years and 70 years. Penetrating eye injuries were common in the age group of 16-45 years(63.5%). All the patients had unilateral injury. Right eye was involved in 27(51.9%) and left in 25(48.1%) of the patients. Stick was the most common agent of injury(34.6%). Overall visual outcome at the end of three months showed 15.4% attained a visual acuity of 6/12 or better whereas 53.7% of them had visual acuities poorer than 6/60.

**Conclusion:** Penetrating eye injuries occurs most frequently in the economically productive age group. Prevention and early intervention are very important in the management of penetrating ocular trauma. Public awareness on ocular trauma and its prevention through eye care programmes and media are of utmost importance.

**Key Words:** Penetrating eye injuries, stick, visual outcome

factor, occupation, visual outcome and sequelae of penetrating ocular trauma.

## MATERIALS AND METHODS

This is a prospective study of 52 patients who presented with penetrating eye injury to the Department of Ophthalmology from March 2012 to October 2012. The study was registered with the institutional review board and approved by the ethical committee. Consent was taken from all patients who were enrolled in the study. A detailed history was taken regarding age, gender, the eye injured and the agent causing injury. Examination was done to detect initial visual acuity, the integrity of eyeball, site of injury, anterior chamber depth, presence of iris prolapse, hyphema, cataract, afferent pupillary defect, vitreous hemorrhage, retinal detachment and intraocular foreign body. Zone 1 injuries were confined to cornea, zone 2 involved sclera up to 5mm from corneoscleral rim and zone 3 involved sclera behind zone 2.<sup>5</sup> Ultrasound B-scan and the necessary investigations to rule out intraocular foreign body was done. The patients were started on broad spectrum antibiotics. Further treatment was done based on whether the wound was self-sealing or not. In self-sealing wound with normal anterior chamber without any uveal prolapse, medical management was done, except for pediatric patients, where the wound was sutured. In cases of leaking wounds, primary repair was done under general anesthesia. Patients were reviewed at one week, one month and three months. The data were entered for statistical analysis.

## RESULTS

The study group comprised of 52 patients. Of them, 40(76.9%) were males and 12(23.1%) were females with M:F of 3.3:1. The age of the patients ranged from 6 years to 70 years with a mean of 31 years. Majority of the patients were in the age

## INTRODUCTION

Ocular trauma is one of the important causes of preventable morbidity and a major cause of unilateral visual loss in developing countries.<sup>1,2</sup> The morbidity is proportional to the severity of trauma. Since ocular injuries affect mostly the young productive population, it causes a major socioeconomic loss. However, if certain precautions are taken, this loss can be prevented. Targeting the nature and cause of injuries by education and legislation are the primary goals of prevention.

The pattern and etiology of injuries vary between population. The pattern of ocular trauma can be influenced by environmental and socioeconomic changes. The burden of blindness in India is higher in the rural population.<sup>3</sup> This is due to the fact that this section of people with less literacy, poor socioeconomic status whose main occupation is agriculture have less access to eye care than the urban population.<sup>4</sup> This study focuses on the pattern, aetiological

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group of 16-45 years accounting for 63.5%, followed by patients less than 15 years(19.2%) [Table 1].

All patients had unilateral injury. Right eye was involved in 27 patients(51.9%) and left eye was involved in 25 patients(48.1%). There was no significant preponderance. The most common agent of injury was stick (34.6%), followed by thorn(19.2%) [Table 2].

80.7% of the injuries were in zone 1. Hyphema was present in 13.4% of the patients. Intraocular foreign body(IOFB) was present in 3.8% of the patients. 3.8% of the patients developed endophthalmitis.82.6% of the patients required surgical repair and 17.3% of them required only medical management as they were self-sealing. Initial visual acuity ranged between perception of light(PL) and 1/60 in 42.3% of the patients. At the end of three months, 15.4% had visual acuity of 6/12 or better whereas 53.7% had visual acuity poorer than 6/60. 13.4% of the patients had no PL at the end of three months. This was due to endophthalmitis and phthisis bulbi. Corneal scarring was the most common sequelae accounting for 50% [Table 3].

## DISCUSSION

Ocular injury is an established cause of preventable visual loss in young individuals.<sup>6,7</sup> In this study, there was higher incidence of penetrating ocular injuries among males compared to females. The male to female ratio is 3.3:1 which is consistent with many other studies.<sup>4,8-13</sup> This male preponderance is thought to be related to their higher occupational exposure and high risk adventurous and aggressive behavior.

In our study, the commonest age group affected was 16-45 years followed by children less than 15 years. Most of the pre-

vious studies report a higher incidence of penetrating injuries in patients less than 40 years.<sup>8-12</sup> Stick was the most common agent of injury in our study. 30.7% of the patients were indulged in agriculture. There is a wide variation among various studies which is attributed to socioeconomic status, lifestyle and prime occupation of people of that region.<sup>7,8,11,12,14</sup>

The distribution of wound localization is comparable to other studies.<sup>8,13,15</sup> 80.7% of the injuries involved zone 1. This may be related to the fact that cornea is the most exposed part of the eyeball. However, Qadri and his coworkers reported 63.04% of the injuries posterior to cornea since most of their patients had turmoil related injuries. Self-sealing corneal injuries showed a favourable prognosis in terms of visual outcome whereas corneoscleral and scleral injuries showed a poor visual outcome.

The presence of IOFB was accounted to 3.8% in our study which is much less frequent than reported by Soylu et al (20.1%) and Cillino et al (16.8%).<sup>8,16</sup> This may be attributed to the fact that most of the injuries in our group were caused by stick and were of low velocity. Endophthalmitis was reported in 3.8% of the patients in our study group. The frequency is much lower when compared to previous studies which is reflected by the higher rate of injuries confined to zone 1.<sup>8,9</sup>

At presentation, majority of the patients had visual acuity ranging from perception of light and 1/60. 15.4% of the patients in our group had a final visual acuity of 6/12 or better whereas 53.7% had poorer than 6/60 at the end of three months. Our outcomes are similar to the previous studies of penetrating eye injuries.<sup>11,13,17</sup> These results reflect the severity and the morbidity caused by penetrating eye injuries.

The limitations of the study are small sample size, short term follow-up and the time of presentation following trauma was not noted. However, we believe that being a tertiary care hospital, this is a representative sample of penetrating eye injuries in our region.

## CONCLUSION

Ocular trauma is one of the important causes of preventable blindness among young individuals. Prevention and early intervention being the major goal in the management of penetrating eye injuries, greater attention should be directed towards the agent and circumstances causing injury. Education of the public is the foremost step to be taken in prevention. Protective eye wears should be worn when there is a risk for ocular trauma. Adequate supervision of children should be stressed upon the parents and teachers. Playing using sharp tools and toys should be discouraged. Eye care programmes in India need to consider ocular trauma along with other chronic diseases of the eye.

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Age	Frequency (%)
<15 years	10(19.2)
16-45 years	34(65.3)
>45 years	8(15.3)

**Table-1:** Shows age distribution of the patients

Agent	Frequency(%)
Stick	18 (34.6)
Thorn	10 (19.2)
Metallic object	8 (15.3)
Stone	7 (13.4)
Pencil	3 (5.7)
Glass	2 (3.8)
Others	4 (7.6)

**Table-2:** Shows the various agents involved in the causation of injury

Final visual acuity	Frequency (%)
≥ 6/12	8 (15.4)
6/18-6/36	17 (32.6)
6/60-2/60	9 (17.3)
1/60-PL	12 (23.0)
No PL	7 (13.4)

**Table-3:** Shows the final visual outcome at the end of three months

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