Commentary: Open globe injury: The Indian perspective

Ocular trauma is a major cause of uniocular blindness in India, with incidence rates ranging from 4.5% to 7.5%.[1,2] It has significant financial implications and severely affects the physical and psychological well-being of the patient. Occupational eye injuries remain the most common cause of ocular injuries in the Indian rural population and are caused mainly due to agriculture-related work, carpentry, chiseling, and hammering.[1,3] The majority of patients with a history of workplace-related ocular trauma do not use any protective eye gear, which can prevent or minimize the impact of injuries.[1,3] The productive age group being more at risk with subsequent loss of work-hours poses significant financial loss to the patient and family.[1,3] Contrarily, the most common nonoccupational injuries are recreational or sports-related or due to road traffic accidents, assault, and domestic accidents.[2,4] Common objects that have been implicated are wooden sticks, *gully danda*, broomstick, knife, scissors, stones, and glass.[5] Firecracker injuries, especially during the Deepavali festival in India, are another cause of OGIs in both adults and children.[6]

A higher incidence of OGI has been noted in all age groups of Indian males except for infants and the elderly. This male preponderance can be explained by increased outdoor activities, involvement in physical violence, and rash driving. Furthermore, in India, boys generally are granted more freedom than girls in addition to preferential approach, especially with regards to treatment, rendering it an important factor for the higher prevalence of reported cases in males.[4,5]

Ocular trauma has been classified into open globe injury (OGI) (rupture, perforating injury, retained intraocular foreign body, and perforating injury) and closed globe injury (contusion and lamellar laceration).[7] Prognostic factors, which are the major determinants of final visual outcome in OGI, include presenting visual acuity, the extent of injury, type of injury, time lapse between injury and management, relative afferent pupillary defect, lenticular injury, vitreous hemorrhage, retinal detachment, and retained intra ocular foreign body.[5,8] Presenting visual acuity of > 20/800 is the most important factor for a favorable outcome.[9] However, accurate assessment of visual acuity at the initial presentation of OGI may be challenging due to pain, epiphora, periorbital edema, and other inflammatory signs. The size of the wound is another important determinant for final visual outcome. Larger the size of the wound, poorer is the prognosis. With an increase in the size of the wound, there are more chances of prolapse of intraocular structures in addition to the damage to vital ocular tissues, inflammation, and secondary infection. Moreover, larger corneal lacerations tend to have higher astigmatism in the postoperative period. Injuries involving the pupillary axis have poor final visual acuity due to central corneal opacity.[5]

Prognosis worsens with increasing severity of anterior segment involvement such as significant hyphema and uveal tissue prolapse.[5,8] However, injury to the crystalline lens as a predictor of outcome has been reported differently in various studies.[8,10] Posterior segment involvement at the time of presentation has relatively poorer outcome due to potential irreversible damage to the retina and optic nerve. Despite adequate and timely management, final visual acuity remains low in patients with retinal detachment, choroidal hemorrhage/detachment, vitreous loss, and retained intraocular foreign body.[5] In general, Zone III injuries have a relatively poorer outcome as compared to Zone I injuries.[9] Vitreous loss has been associated with poorer final VA due to vitreoretinal tractions and subsequent retinal detachment.[11]

OGIs warrant emergency referral to an eye specialist with primary application of eye shield over the injured eye. Eye pads should be avoided to prevent any undue ocular pressure.[12] Furthermore, application of eye ointments, pupillary dilatation, intraocular pressure measurement, and motility assessment should be avoided. Radiological investigations, including X-ray orbit and CT scan for localization of RIOFB, should be ordered; however, MRI scan should be avoided if an IOFB is suspected.

Early intervention increases the chances of a better visual outcome. Late presentation or delay in intervention may lead to irreversible damage to ocular tissues due to prolonged inflammation and potential secondary infections.[5] Development of endophthalmitis due to late intervention significantly worsens the outcome and warrants multiple surgical interventions.[8]

The current article is an article of interest that describes the epidemiology of open globe injuries secondary to projectile impact at an urban tertiary referral center and variables associated with favorable outcomes. Poor prognostic factors as reported in the study include globe rupture, posterior segment injury, and the presence of an orbital fracture, with the velocity of impact as an additional predictor of visual outcome.[13] We believe that the retrospective design and inadequate follow-up are the main limitations of the study, indicating the need for future studies with prospective design and long follow-up to precisely define predictors of visual outcomes after a projectile eye injury.

Visual loss, psychological trauma, and financial implications to patients and their families due to OGIs are substantial, mandating an early referral, careful assessment of the extent of the injury, and subsequent appropriate management. As occupational injuries are one of the most common causes of OGIs in India, mandatory use of protective eye gear can go a long way in significantly reducing workplace-related trauma.

Bruttendu Moharana, Rituka Gupta, Bhavana Sharma

Department of Ophthalmology, All India Institute of Medical Sciences, Bhopal, Madhya Pradesh, India

Correspondence to: Prof. Bhavana Sharma, Department of Ophthalmology, All India Institute of Medical Sciences, Bhopal - 462 020, Madhya Pradesh, India.
E-mail: drbhavana_s@yahoo.co.in

References

1. Krishnaiah S, Nirmalan PK, Shamanna BR, Srinivas M, Rao GN, Thomas R. Ocular trauma in a rural population of southern India: The Andhra Pradesh Eye Disease Study. Ophthalmology 2006;113:1159-64.
2. Nirmalan PK, Katz J, Tielsch JM, Robin AL, Thulasiraj RD, Krishnadas R, *et al*. Ocular trauma in a rural south Indian population: the Aravind Comprehensive Eye Survey. Ophthalmology 2004;111:1778-81.
3. Vasu U, Vasnaik A, Battu RR, Kurian M, George S. Occupational open globe injuries. Indian J Ophthalmol 2001;49:43-7.
4. Maurya RP, Srivastav T, Singh VP, Mishra CP, Al-Mujaini A. The epidemiology of ocular trauma in Northern India: A teaching hospital study. Oman J Ophthalmol 2019;12:78-83.
5. Singh S, Sharma B, Kumar K, Dubey A, Ahirwar K. Epidemiology, clinical profile and factors, predicting final visual outcome of pediatric ocular trauma in a tertiary eye care center of Central India. Indian J Ophthalmol 2017;65:1192-7.
6. Kumar R, Puttanna M, Sriprakash KS, Sujatha Rathod BL, Prabhakaran VC. Firecracker eye injuries during Deepavali festival: A case series. Indian J Ophthalmol 2010;58:157-9.
7. Kuhn F, Morris R, Witherspoon CD, Heimann K, Jeffers JB, Treister G, *et al*. A standardized classification of ocular trauma. Ophthalmology1996;103:240-3.
8. Rao LG, Ninan A, Rao KA. Descriptive study on ocular survival, visual outcome and prognostic factors in open globe injuries. Indian J Ophthalmol 2010;58:321-3.
9. Sternberg P Jr, De Juan E, Michels RG, Auer C. Multivariate analysis of prognostic factors in penetrating ocular injuries. Am J Ophthalmol 1984;98:467-72.
10. Agrawal R, Wei HS, Teoh S. Pre-operative variables affecting final visual outcome with a critical review of ocular trauma classification for posterior open globe (zone III) injury. Indian J Ophthalmol 2013;61:541-5.
11. Agrawal R, Wei HS, Teoh S. Prognostic factors for open globe injuries andcorrelation of ocular trauma score at a tertiary referral eye care centre in Singapore. Indian J Ophthalmol 2013;61:502-6.
12. Lecuona K. Assessing and managing eye injuries. Community Eye Health. 2005;18:101-4.
13. Scanzera AC, Leiderman YI, Cortina MS, Shorter ES. Open globe injuries from projectile impact: Initial presentation and outcomes. Indian J Ophthalmol 2022;70:860-4.

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