

Pattern of Paediatric Ocular Trauma in a Tertiary Eye Care Centre

Ajay A Kudva¹, Sangeetha Vijayam S Pai¹, Sudhir Hegde K¹, Rajani.K¹, Devika.P¹, Hima Jos¹

¹Department of Ophthalmology, A J Institute of Medical Sciences, Mangalore, India.

Abstract

Background: The most common cause of unioocular blindness in paediatric age group is ocular trauma. Even then, they do not receive the attention that they deserve. Eye injuries account for approximately 8–14% of total injuries in children. Next to amblyopia, ocular injuries are the main reason for preventable monocular vision loss in childhood. The etiology of trauma in children and adults is different; in children, it is more of accidental, but in adults, it is violence. **Subjects and Methods:** Patients below 17 years of age who came to our casualty and OPD during a period of 6 months from December 2014-May 2015 were enrolled in this study. We determined the initial visual acuity in all patients, examined the globe and its adnexa, performed slit lamp examination and direct ophthalmoscopic examination (if possible) and also recorded the age, sex, type of activity at the time of injury. **Results:** Majority of patients were within 6-10 years of age group. Most of the trauma occurred in schools, commonly seen in boys than girls and blunt trauma was seen more than penetrating trauma. The main presenting problems were eyelid swelling and subconjunctival hemorrhage. Overall, closed globe injuries were seen more frequently than open globe injuries. **Conclusion:** Ocular injuries lead to diminution of vision, cosmetic blemish and morbidity. The most important aspect of pediatric trauma is prevention. Education regarding masterly watchful inactivity, supervised play and road safety measures is critical. Parents, elders, teachers, caretakers, as well as the media have an important role to play in prevention of injuries in children.

Keywords: Paediatric trauma, ocular injuries.

Corresponding Author: Dr. Sangeetha Vijayam S Pai, Department of Ophthalmology, A J Institute of Medical Sciences, Mangalore, India.

Received: November 2018

Accepted: December 2018

Introduction

The most common cause of unioocular blindness in paediatric age group is ocular trauma. Even then, they are not receiving the attention that they deserve. Eye injuries account for approximately 8–14% of total injuries in children.^[1,2] Worldwide, the incidence of severe visual impairment or blindness caused by ocular trauma in children varies from 2% to 14% in different studies.^[3-7] Next to amblyopia, ocular injuries are the main reason for preventable monocular visual loss in childhood.^[8] There is an age specific pattern for ocular trauma. It is well known that infants and children less than 3 years of age sustain less injuries due to close parental supervision.^[9] However, they generally suffer handler-related injuries like from the fingernail of siblings, mother or caretaker, sewing and knitting needles, as well as scissors and knives. Injuries in older children can be accidentally by sharp edges and spikes of toys, pencils, arrows, thorns and stones and also fall during swinging or sliding in parks. This study was conducted to reveal etiology, clinical presentation and location wise classification of pediatric ocular injuries.

Subjects and Methods

Patients below 17 years of age who came to our casualty and OPD during a period of 6 months from December

2014-May 2015 were enrolled in this study (total of 36 eyes, 35 patients). We determined the initial visual acuity in all patients, examined the globe and its adnexa, performed slit lamp examination and direct ophthalmoscopic examination (if possible) and also recorded the age, sex, type of activity at the time of injury,

The definitions and classifications of ocular trauma in our study were modified from the Ocular Trauma Classification Group guidelines and Birmingham Eye Trauma Terminology system.^[10,11]

Results

We enrolled 35 patients (one with bilateral involvement, 36 eyes) in the age group below 17 years with history of ocular trauma in our OPD during the period of 6 months. Majority of trauma occurred in 6-10 years age group. There were 74.3% boys and 25.7% girls in the study. There was no significant difference in the laterality. Majority of trauma occurred in schools (51%). [Figure 1]

Presenting complaints

Eyelid swelling was seen as the most common presenting complaint followed by pain and redness of eyes. [Figure 2]

Etiology of trauma

Blunt trauma was the most common etiology found in

pediatric ocular injuries(51.4%), followed by injuries from road traffic accidents and fall from height (17.1%), chemical injury (11.4%) and injury from sharp metal objects (2.9%). [Figure 3]

Type of injury

Subconjunctival hemorrhage was found in majority of patients (29 eyes, 80%), followed by lid involvement (14 eyes, 40%), corneal injuries (12 eyes, 34.38%) and orbital fracture (3 eyes, 8.56%). [Figure 4]

Conjunctival tear was present in 10 eyes (28.5%) and lid tear in 7 eyes (21.42%). Chemical injuries were seen in 4 eyes (11.4%). Majority of patients had suffered the injury during day time and location wise most of the incidents occurred in schools (51.4%) followed by roads (17.1%), unknown (17.1%), sports (11.4%) and public places (2.9%). There were two patients with scleral tear, one with full thickness corneal tear and iris incarceration and other with retained intraocular foreign body. In our study ocular blunt trauma related injuries were seen in 51.4% (18 eyes) and among this one patient had retinal detachment and optic nerve avulsion caused due to direct trauma. Ocular adnexal injuries were caused by other sharp instruments or severe thrust by blunt object in 40% (14 eyes).

They presented with conjunctival tear in 28.5% (4 eyes), lid tear 21.42% (3 eyes). All these injuries were produced by direct trauma to eye. In total, closed globe injuries were more common than open globe injuries. [Figure 5]

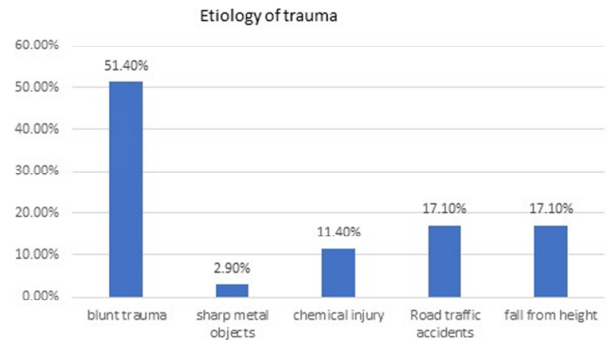


Figure 3: Bar chart showing mode of trauma

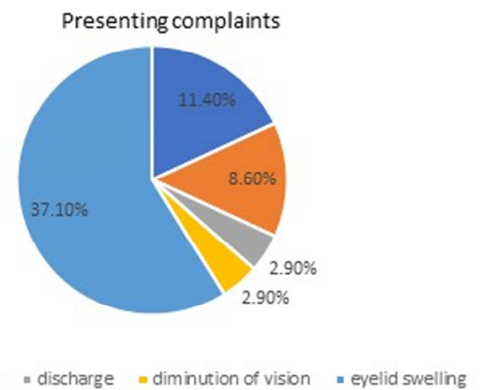


Figure 4: Graphical demonstration of clinical presentation seen in our patients

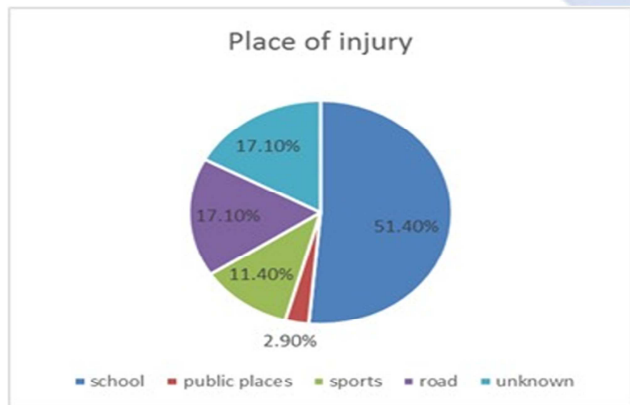


Figure 1: Graph showing places where injury occurred

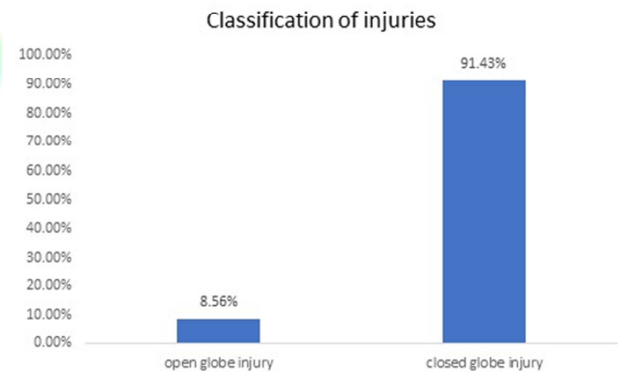


Figure 5: Overall classification of injuries that were seen in our patients

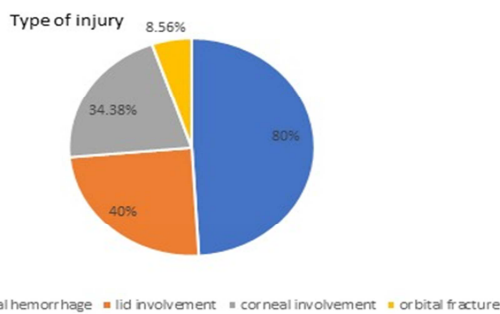


Figure 2: Graphical distribution of presenting complaints seen in our patients

Discussion

In our study, ocular trauma was fivefold more common in boys especially in 6-10 years age group, as has been noted in other studies throughout the world [12-15]. Boys were usually more susceptible to ocular damage because of the nature of their activities and presumably because of less supervision by their families. Additionally, our culture highly regards females who are quiet and move gently. This value probably reflects the decreased incidence of ocular trauma in older girls. Closed globe injury was the major

type of injury in this study, which was similar with other studies.^[3-6] The incidence of injury classified by age showed that children in less than 10 years age group were at greatest risk, which was similar to the results of Moreira et al.^[5] The type of injury and its severity are known prognostic factors of final visual outcome following trauma.^[14] Anterior closed globe injuries with hyphema, lens subluxation, cataract or glaucoma can jeopardize visual outcome. Posterior closed globe injuries, such as vitreous hemorrhage or retinal detachment, can even lead to blindness.^[16] Mechanical eye injuries are classified into closed-globe or open globe injuries. Closed globe injuries are caused by blunt force and it can result in lamellar laceration or superficial foreign body. In open-globe injuries, the cornea or sclera has a full thickness wound. This wound may be due to rupture or laceration. Sharp objects lead to penetrating injuries (single full thickness wound of the cornea or sclera), perforating injuries (two full thickness wounds of the cornea or sclera) or intraocular foreign body.

Penetrating anterior segment trauma may cause lacerations of the cornea, sclera or both. Irreparable perforating injuries are usually caused by high-impact objects. All of these cases are associated with varying degrees of uveal tissue, lens and vitreous involvement. Early medical management in the form of tetanus prophylaxis and intravenous broad spectrum antibiotics is vital to prevent ocular infection.

The need for surgical repair is for the restoration of structural integrity. Self-sealing wounds carry a potential risk of endophthalmitis and panophthalmitis. The reported incidence of post-traumatic endophthalmitis is high, especially after open globe injuries (2.4–17%). Delayed diagnosis, polymicrobial infections, infections by virulent organisms and presence of intraocular foreign bodies adversely affect visual prognosis.

Posterior segment trauma may manifest as commotio retinae, choroidal rupture, posterior scleral rupture or retinal breaks. Occult scleral ruptures should always be kept in mind. Patients with traumatic retinal detachment need to be operated immediately.

Good visual acuity at presentation and early primary repair are important favourable prognostic factors affecting final visual outcome in cases with ocular trauma.^[17] Penetrating injuries generally result in poorer visual outcomes, compared to blunt injuries.^[18] Posterior segment involvement adversely affects visual results.^[19]

Eyelid injuries and facial injuries should be addressed as early as possible. Restoration of tissue anatomy is easier and results are more gratifying, if repair is done early in such cases. Floor fractures are the most common type of orbital fractures in children.^[20] Optic nerve injury, though uncommon, leads to irreversible visual loss. Chemical injury of eye is an emergency and may have devastating results if left unattended. Alkali burns are frequently more disastrous than those caused by acids, as alkalis saponify the lipids of cell membranes and produce total disruption of cells. Acids quickly precipitate tissue proteins and are therefore less penetrating. Among alkali burns, those caused by lye, fresh lime and ammonia are frequently seen.

Immediate copious irrigation of the eyes using the most readily available source of clean water can be sight-saving in chemical injuries. After first aid, early further management under the care of an ophthalmologist is essential.

Ocular injuries finally lead to diminution or loss of vision, cosmetic blemish and morbidity the most important aspect of paediatric trauma is prevention. Education regarding masterly watchful inactivity and supervised play, and road safety measures is critical. Parents, elders, teachers and caretakers, as well as the media have an important role to play in prevention of injuries in children. The irreversible nature of visual loss and immense morbidity associated with it need to be emphasized and publicized. Sensitizing people with regard to the psychosocial aspects of ocular injuries (especially the emotional aspects) is also required in our set-up. Prevention of trauma is always vital for reducing morbidity and costs associated with paediatric ocular injuries.

Conclusion

In conclusion, the most important factor which helps to reduce the incidence of paediatric ocular trauma is prevention.

References

1. Scribano P.V, Nance M, Reilly P, Sing, R. F , Selbst SM et al. Paediatric non powder firearm injuries: Outcomes in an urban paediatric setting. Paediatrics. 1997 Oct; 100(4) : E-5.
2. Takvam, J. A. and Midelfart, A. Survey of eye injuries in Norwegian children. Acta Ophthalmol (Copenh). 1993 Aug; 71(4):500-5.
3. MacEwen CJ, Baines PS, Desai P. Ocular sports injuries: The current picture. Br J sport med. 2000 Dec;34(6):456-8
4. Poon AS, Ng JS, Lam DS, Fan DS, Leung AT et al .Epidemiology of severe childhood eye injuries that required hospitalisation. .Hong Kong Med. J. 1998;4:371-4.
5. Moreira CA, Debert-Ribeiro M, Belfort R et al.Epidemiological study of eye injuries in Brazilian children. Arch Ophthalmol 1988;106:781-4.
6. Rapoport I, Romem M, Kinek M, Koval R, Teller J, Belkin M et al. Eye injuries in children in Israel. A nationwide collaborative study. Arch Ophthalmol. 1990 Mar;108(3):376-379.
7. LaRoche GR, McIntyre L, Schertzer RM. Epidemiology of severe eye injury in childhood. Ophthalmology 1988;95:1603-7.
8. Lithander J, Al Kindi H , Tonjum A. M. Loss of visual acuity due to eye injuries among 6292 school children in the Sultanate of Oman. Acta Ophthalmology. Scand. 1999 Dec;77 (6): 697-9.
9. Montanes C. B, Cueva, M. C, Fernandez E. G, Garcia S. C, Diez Sanchez A. L , Safa M. D et al .Eye injuries in childhood. Ann. Esp. Pediatrics, 1998; 48: 625-30.
10. Kuhn F, Morris R, Witherspoon CD, Mester V. The Birmingham Eye Trauma Terminology system (BETT), J Fr Ophthalmol. 2004 Feb;27(2):206-10.
11. Pieramici DJ, Sternberg P Jr, Aaberg TM Sr, Bridges WZ Jr, Capone A Jr, Cardillo JA, et al. A system for classifying mechanical injuries of the eye (globe). The Ocular Trauma Classification Group. Am J Ophthalmol . 1997 Jun;123(6):820-31.
12. Shoja MR, Miratashi AM. Pediatric ocular trauma. Aeta Medica Iranica 2006. 44(2):125- 130.
13. Lee CH, Su WY, Lee L, Yang ML. Pediatric ocular trauma in Taiwan. Chang Gung Med J. 2008 Jan-Feb;31(1):59-65.
14. Serrano JC, Chalela P, Arias JD. Epidemiology of childhood ocular trauma in a northeastern Colombian region. Arch Ophthalmol 2003 Oct;121(10):1439-45.

15. Ocular sports injuries: the current picture. MacEwen CJ, Baines PS, Desai P. Br J sport med. 2000 Dec;34(6):456-8
16. Yeung L, Chen TL, Kuo YH, Chao AN, Wu WC, Chen KJ et al .Severe vitreous haemorrhage associated with closed-globe injury. Graefes Arch Clin Exp Ophthalmol 2006;244:52-7.
17. Rostomian K, Thach A. B, Isfahani A, Pakkar A, Pakkar, R and Borchert M. Open globe injuries in children. J. AAPOS: Am.Assoc Pediatr Ophthalmol. Strabismus, 1998; 2: 234–238.
18. Cascairo M. A, Mazow M. L and Prager T. C. Paediatric ocular trauma. A retrospective survey. J. Paediatr. Ophthalmol. Strabismus, 1994;31: 312–317.
19. Umeh R. E and Umeh O. C. Causes and visual outcome of childhood eye injuries in Nigeria. Eye(Lond). 1997; 11(Pt 4): 489–495.
20. Bansagi Z. C and Meyer D. R. Internal orbital fractures in the paediatric age group: Characterization and management. Ophthalmology 2000 May;107(5): 829–836.

Copyright: © the author(s), publisher. Asian Journal of Medical Research is an Official Publication of “Society for Health Care & Research Development”. It is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Kudva AA, Vijayam SSP, Hegde KS, Rajani K, Devika P, Jos H. Pattern of Paediatric Ocular Trauma in a Tertiary Eye Care Centre. Asian J. Med. Res. 2018;7(4):OT08-OT11.
DOI: [dx.doi.org/10.21276/ajmr.2018.7.4.OT3](https://doi.org/10.21276/ajmr.2018.7.4.OT3)

Source of Support: Nil, **Conflict of Interest:** None declared.

