

Original Article

Epidemiological profile of pediatric ocular trauma in a tertiary hospital of northern India

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ABSTRACT

Purpose: Ocular trauma is one of the most common causes of acquired blindness in children. It measures about 8%–14% of total childhood injuries. This study aims to determine the epidemiological profile of ocular trauma in the pediatric age group attending a tertiary hospital in northern India.

Methods: A retrospective study was conducted in our hospital between June 2014 to July 2015 and all the children aged 0–16 years presenting with ocular trauma in eye outpatient department and emergency were enrolled in the study. Various epidemiological parameters like age, sex distribution, duration of presentation, mode of injury, type of injury and final visual outcome were analyzed.

Results: Of total 357 patients, 271 (76%) were below the age of 12 years; 41.1% of children with ocular trauma belonged to age group 2–6 years. The male to female ratio was 2.9:1. Out of total patients, 242 (67.8%) presented with closed globe injury. Among the closed globe injury, the history of fall was present in about 35% of children, followed by trauma while playing with bat/ball (15.7%) and finger nail trauma (13.2%). Among open globe injury, trauma with needle, knife, glass and pen were common causes. Home was the most common place of injury (47.8%), followed by streets (17.9%) and playground (14.9%).

Conclusion: Children are vulnerable to ocular trauma and need more supervision. Sharp objects like needles, knives, household chemicals like acids should be out of reach of children.

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Introduction

Ocular trauma is one of the most common causes of acquired blindness in children.¹ There are about 1.6 million people blind due to eye injuries; in addition to this, 2.3 million are having low vision bilaterally and 19 million represent unilateral visual loss, making eye trauma the most common etiology of unilateral blindness.^{2,3} Eye injuries measure about 8%–14% of the total childhood injuries.⁴ Ocular trauma is one of the leading cause of treatable visual morbidity and blindness⁵ with children at a greater risk due to careless activities and inability in understanding the nature of dangerous objects.⁶ Ocular trauma is associated with a great

amount of emotional stress as well as frequent hospital visits and increasing economic burden.^{7,8} Ninety percent of eye trauma is preventable by taking care of minor things.⁹

The epidemiological parameter of childhood ocular trauma varies from region to region, and also varies with demographic data like age and sex. In a study conducted in US, about 25.4% of ocular injuries occurred in children and young adults up to 18 years.⁸ While in a study conducted in Pakistan, the mean age of children present with ocular trauma was 7.03 ± 3.61 years, out of which 42.9% were school-going (6–11 years old).¹⁰ In Israel, about half (47%) of the eye injuries occurred in children younger than 17 years, mainly between 6 and 12 years of age.¹¹

A large number of studies on ocular trauma have been conducted in developed countries^{12–14} but the pattern of eye injuries in developing countries is not well known.¹⁵ This study was conducted in the department of ophthalmology in a tertiary hospital institute of northern India. This study will help in estimating the

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burden of the childhood preventable blindness in this region and also identify the contributing factors responsible.

Methods

This retrospective study was conducted in a tertiary hospital of northern India. All patients with ocular trauma aged between 0 and 16 years presenting to the hospital from June 2014 to July 2015 were included in our study and evaluated for epidemiological parameters like mode of injury, age, sex distribution and type of injury. After complete examination including visual acuity at presentation, anterior segment findings, fundus examination, management given either in the form of medical or surgical intervention was noted. Visual acuity was measured using Snellen's chart or Illiterate E-chart for school-going children and using pictures or matching letters for young children. The subsequent follow-up findings were noted at 2 weeks, 1 month, 2 months and 3 months; and final best corrected visual acuity was taken at the end of 3 months. Data were reviewed using appropriate statistical tests and outcome was compared with previous studies for discussion.

Ocular injuries were classified as per World Health Organization (WHO) and Birmingham Eye Trauma Terminology System (BETTS).^{16,17} (Fig. 1).

Adnexal injuries were not included in BETTS classification. A new classification of ocular trauma was proposed in 2009 where the authors suggested that the term "ocular trauma" include structures of ocular adnexa such as the lids, orbit, lacrimal apparatus, and the conjunctival, not just the eyeball or globe.¹⁶

Results

This study included in total 357 patients presenting to the emergency and eye outpatient department with ocular trauma. Out of them, 267 (74.8%) were males and 90 (25.2%) were females. The male to female ratio was 2.9:1 (Table 1). The majority of children with ocular trauma were present in age group 2–6 years (41.2%).

Out of the 357 patients, 242 (67.8%) presented with closed globe injury and 115 (32.2%) with open globe injury. Among closed globe injury, adnexal injury was commonest, followed by sub conjunctival hemorrhage and then corneal abrasion. Among open globe

Table 1
Age and sex distribution of pediatric ocular trauma.

Age group (Year)	Male	Female	Total (%)
0–1	3	0	3 (0.84)
2–6	105	42	147 (41.18)
7–12	90	31	121 (33.89)
13–16	69	17	86 (24.09)
Total (%)	267 (74.79)	90 (25.21)	357 (100)

injury, corneal perforation with or without uveal tissue prolapse was the commonest followed by traumatic cataract (Table 2). The final visual acuity, at the end of 3rd month, was improved in a large portion of patients but 12.3% of patients ended up with mono ocular blindness (Table 2).

Among the closed globe injury, the history of fall was present in about 35% of children, followed by trauma while playing with bat/ball (15.7%) and followed by finger nail trauma (13.2%). Among open globe injury, trauma with needle, knife, glass and pen were common causes (Fig. 2). Home was the most common place of injury (47.8%), followed by streets (17.9%) and playground (14.9%) (Fig. 3).

Discussion

Ocular injury is very common, more so in the under privileged and developing countries. Ocular trauma constitutes 5% of all cases admitted in developed countries and about 12.9% in developing under privileged and developing countries.¹⁸ In our study, it was found that the most common age group involved was 2–6 years as supported by other studies.¹⁹ The prevalence of childhood ocular trauma being lower in age group <2 years has been explained by greater parental care and children being less exposed to outer world.²⁰ Male to female ratio in terms of ocular trauma in our study was found to be 2.9:1. Various studies also showed higher incidence of eye injuries in males.^{4,6,21} The commonest location for ocular trauma was home, which is consistent with various studies.^{4,21,22} The commonest etiological agents causing open globe injuries included needle, knife, glass and arrow in our study which correlate with previous studies.²⁰ Forty-four patients (12.3%) had mono ocular blindness at the end of our study while 57.7% attained good

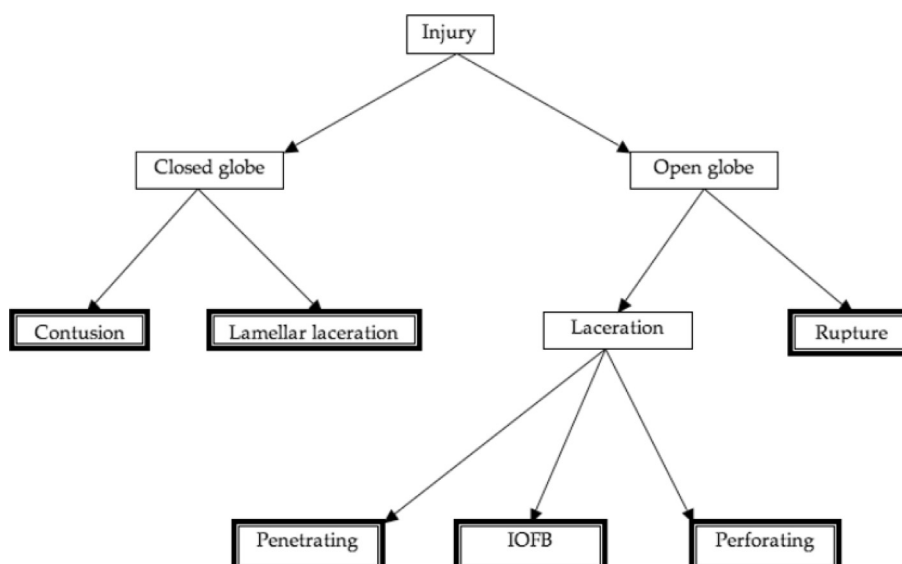
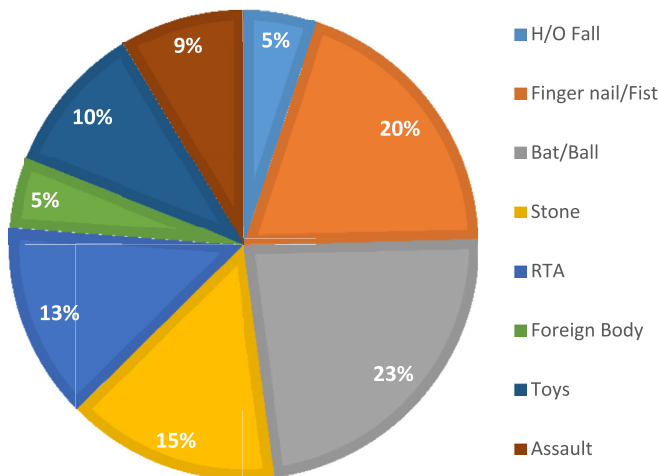


Fig. 1. Birmingham Eye Trauma Terminology System classification of ocular injuries.

Table 2
Type of injury and final visual outcome (at the end of 3rd month).

Type of injury	Final visual outcome				Total (%)
	Non-cooperative/Not documented	<3/60-pl	<6/18–3/60	6/18–6/6	
Closed globe injury (n = 242)					
Adnexal	34	–	–	57	91 (25.5)
Sub conjunctival hemorrhage	2	–	–	87	89 (24.9)
Corneal abrasion	9	–	–	53	62 (17.3)
Open globe injury (n = 115)					
Corneal perforation with/without uveal tissue prolapse	10	27	29	–	66 (18.5)
Traumatic cataract	04	13	19	05	41 (11.5)
Intraocular foreign body	–	4	–	4	8 (2.3)
Total (%)	59 (18.5)	44 (12.3)	48 (13.4)	206 (57.7)	357 (100)

Closed globe injuries



Open globe injuries

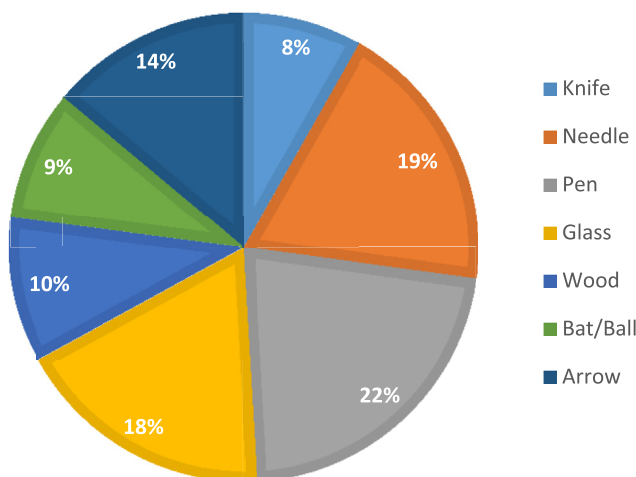


Fig. 2. Pie Chart showing mode of injury among closed and open globe injuries.

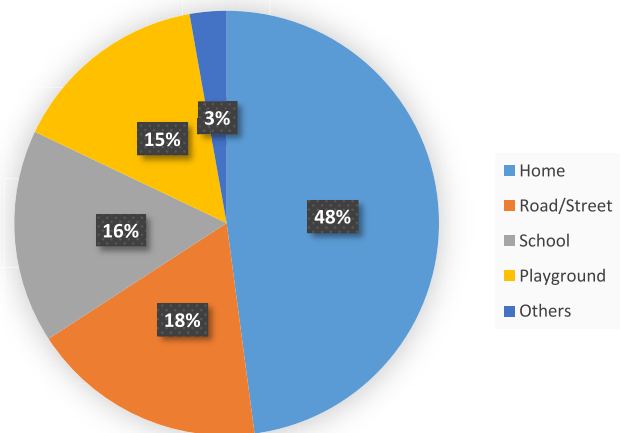


Fig. 3. Pie chart showing distribution of ocular injuries according to the place of occurrence.

modes of eye injuries, using safety measures like goggles and helmets while driving, and supervising the objects to be played with. Sharp objects like needles, knives, household chemicals like acids should be out of reach of children. In case of mishap, it is mandatory to seek medical attention at the earliest.

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visual outcome. In a study conducted by Narang et al²³, ambulatory vision was attained in 52.8% of children.

Thus at the end of the study it was concluded that children need more supervision at home and family should be made aware of the

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