Observation and Epidemiology of Ocular Trauma in Children: Hospital based Study

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Abstract

Background: This study was designed to identify the causes, demographic, clinical profile & classify the patients according to the ocular trauma classification group.

Method: 60 children of age fifteen year or less, with ocular injury, who had presented to emergency services/out-patient department of the Regional Institute of Ophthalmology (RIO), IGIMS medical college & hospital, Patna (Bihar) were included. Demographic data, nature and cause of injury, duration between injury & presentation to the hospital and diagnosis were recorded. Evaluation of visual acuity, anterior segment and fundus was done.

Results: Majority of injuries occurred in children 7yrs and older (64.7%). There were 50 (83.33%) boys and 10 (16.66%) girls. 40 (66.67%) of cases presented within 24hrs of the injury while 20 (33.33%) of cases presented after more than 24 hr after trauma. Rural patients comprised 39 out of 60 (65 %) while urban were 21 out of 60 (35 %). Most of the patients n=36 (60%) belonged to average socioeconomic status fallowed by low socioeconomic status n=20 (33.33%) & high socioeconomic status n=4 (6.67%). Most of the children n=35 (58.33%) were in their primary school. The highest proportion of injuries occurred outside (eg streets, roads, playgrounds, schools) n=40 (66.67 %) followed by home n=20 (33.33%). **Conclusions:** Eye trauma in children occur most frequently outdoors. Early diagnosis, management and prevention of complications of ocular injuries can be possible by educating parents and children.

Keywords: *Ocular trauma, Paediatric, Conflict, Open globe, Closed globe.*

Introduction

Eye injuries are a major & under-recognized cause of disability & ocular morbidity that especially affects the young. The public health importance of such ocular trauma is undeniable. Injuries generate a significant & often unnecessary toll in terms of medical care, human suffering, long term disability, productivity loss, rehabilitation services and socioeconomic cost.

Studies indicate that one out of every five adults have a history of ocular trauma. In paediatric group, these rates are 12% to 38%, making ocular trauma the most avoidable cause of childhood blindness. Penetrating ocular trauma is a well-known cause of visual impairment in young adults and children leading to blindness. Cost burden due to ocular trauma is also an important issue. Severe ocular trauma may require expensive hospitalization, specialist treatment, prolonged follow-up & visual rehabilitation. The indirect, secondary economic impact of ocular trauma, due to loss of work or school days, is harder to estimate.

Approximately 1.6 million people are blind owing to ocular trauma, 2.3 million are bilaterally visually impaired & 19 million have unilateral visual loss. [1] Besides loss of vision, earnings (job opportunities) & productivity, it increases the cost to society because of increased health care spending. [2]

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Children are particularly subject to ocular trauma because of their predilection towards hazardous play, outdoor activities & relative lack of judgement. Regardless of the cause of trauma, overall management of the children eye does not differ significantly from that of adult except when amblyopia is involved, which is a possibility with any child who is injured before 6 or 7 years of age. Identifying the aetiologies of such injuries among children may help in determining most effective measures to prevent the visual loss.

Serious eye injuries in children are common and visual outcome can be devastating. [3-6] One-third of all vision loss in the first decade of life is due to trauma.[7] However nearly 90% of eye injuries can be prevented by relatively simple measures. [8,9] The purpose of this study was to analyse the demographic profile, nature / type of injury, circumstances, cause of injury, time gap between injury and presentation to the hospital of the paediatric ocular trauma during one year of study period. Patients were then classified according to the latest ocular trauma classification Birmingham Eye Trauma Terminology System (BETT) [10] and Open-Globe Injury Classification [10,11] and Ocular Trauma Score (OTS) [12,13]

Materials & Method

Study site: Emergency or out-patient department of Regional Institute of Ophthalmology (RIO), IGIMS Medical College & Hospital Patna, Bihar.

Study duration: 12 months (from August 2014 to July 2015)

Study design: This was an observational study. 60 cases of age ≤15 years and either of gender of penetrating ocular trauma were consecutively selected for this study fulfilling the inclusion and exclusion criteria.

Inclusion criteria: All the ocular trauma patients of age ≤15 years of either gender. **Exclusion criteria:**

Patients/ Parents refusing to sign the informed consent or not admitted will be excluded.

Patient not coming for regular follow-up.

Rupture of the globe with vitreous or uveal tissue prolapsed.

Following data were collected from each patient

Demographic data

Address (rural/urban): Patients residing in a place with no district hospital were categorized as rural.

Literacy status: determined on the basis of educational status as reported by patients themselves or their parents.

Occupation of parents

Financial status: It was based on monthly income

Cause of injury

Complete history of the nature and circumstances of the injury

Time gap between injury and presentation to the hospital

Detailed ophthalmic work up was carried out to assess the severity of injury and structural damage

Statistical Analysis: Patient related data were collected and statistical analysis was done by using Microsoft Excel Software.

Results

TABLE 1: Age Incidence

Age in years	No. of Cases	Percentage
< than 7 yrs	21	35.00 %
7 to < 12 yrs	19	31.67 %
12 to 15 yrs	20	33.33 %

Table 2 shows 50 males (boys) (83.33%) and 10 females (girls) (16.66 %) with male to female ratio of 5:1.

TABLE 2: Gender Incidence

Sex	No. of Cases	Percentage
Male	50	83.33 %
Female	10	16.66 %

Geographic distribution of the patients showed that 65% of patients were from rural area (that is 39 out of 60 cases) and 35% patients were from urban areas (that is 21 out of 60 cases). Only 6.67% (n=4) were from high income/ high socioeconomic status (Table 3).

TABLE 3: Income Status of Studied Subjects

Income Status	No. of Patients	Percentage
Low	20	33.33 %
Average	36	60.00 %
High	04	6.67 %

Table 4 shows that most of the injuries involved in primary literacy status (33 patients out of 60) in 55 % followed by under school age 09 (15.00%).

TABLE 4: Literacy Status of the Studied Subjects

Literacy Status	No. of Patients	Percentage
Under school age (<3 years of age)	09	15.00 %
Primary (class Nursery to 5th)	33	55.00 %
Middle (6th to 8th)	08	13.33 %
High (9th and 10th)	06	10.00 %
Illiterate	04	6.68 %

Table 5 showed that majority of patients, 40 out of 60 (66.67%) had injury when they were outdoors (street). In street, we have taken roads, playgrounds and schools. 33.33 % patients had injury at home

TABLE 5: Place of Injury

Place of injury	No. of Patients	Percentage
Street (Roads, playgrounds, school)	40	66.67 %
Home (House and Lawn)	20	33.33 %

The elapsed time between injury and presentation was most commonly, same day in (66.67%) patients followed by 2-7 days in 17 patients (28.33%). It was noted that in low income status group, the delay period was much longer than in high income status group (Table 6).

TABLE 6: Time of Presentation

Time	No. of Patients	Percentage
Same day	40	66.67 %
Between 2-7 days	17	28.33 %
8-30 days	02	3.33 %
> 30 days	01	1.66 %

Discussion

More than one third of eye injuries occur in paediatric age group and may cause lifelong disability due to their immature motor skill and their tendency to imitate adult behaviour without evaluating risks (Thordarson U, Ragnasson AT et al). [14]

Serious ocular trauma gives rise to structural damage or functional loss which imposes an enduring burden throughout the most productive years of life (Robert JC). [15]

In the present study boys outnumbered girls in the frequency of eye trauma by a ratio of 5:1. Our results were consistent Strahlman E et al. [16], Cascairo MA et al [17], Khatry SK et al [18] & Vasnaik A et al [19]. In general boys are granted more liberty than girls and tend to spend more time outside with their friends with less adult supervision (Ariturk N, Sahin M et al). [20]

In this study almost 65% (n=39) injuries occurred in children greater than 7 years of age. This was consistent with the studies done by Gorden Y J et al in Lesotho [21] and Niramen M et al in Finland [22].

The majority of the patients belonged to the average income status (n=36, 60%) followed by low (n =20, 33.33%) and high-income status (n=04, 6.67%). Only a small number of patients belonged to high income status in our study. This shows that there is greater level of awareness & education among the high-income group. Therefore, socioeconomic status and family negligence are important factors in eye injuries in children. Our results were consistent with the study done by Ariturk N et al [20].

In this study, most of the children were in primary school (n=33, 55.00%) because they are more often exposed to the outdoor environment and more physically active and take more risks to gain acceptance by their peers. Conflict has been recognized as a frequent cause of eye injury in the young by Rapaport et al [23].

In this study most ocular injuries (n=40, 66.67%) occurred when children were outside their home (on street, road, school, playground etc). This is consistent with the studies done by Dalia M Sebaity et al [24] and Kaimbo et al [25].

In this study playing (either playing in school, street, outdoor etc) to be the most prevalent mode of injury accounting for almost 40-50 percent of cases. In all the three age groups playing was found to be equally important and most common mode of injury. These observations were consistent with Niramen et al [22], Rapaport et al [23], Moreira et al [26].

Conclusions

Eye trauma in children occurs most frequently in outdoors but different outdoor sports are also important for the health. Early diagnosis, management and prevention of complications of ocular injuries can be possible by educating parents and children.

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