Pattern and Final Visual Outcome in Paediatric Ocular Trauma in Central India

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ABSTRACT

BACKGROUND

Paediatric ocular trauma is one of the most common causes of preventable visual morbidity in children. One third vision loss occurs in the first decade of life, which is crucial stage for visual development. We wanted to evaluate the final visual outcome of paediatric ocular trauma and determine the various aetiological factors contributing to ocular trauma.

METHODS

Prospective data regarding age, sex, visual acuity, etiological factors of 100 children who visited the emergency in the department of ophthalmology was collected. Children below 18 years of age were included. Children who could not cooperate or lost to follow-up were excluded from the study. Chi square test was done. P values were considered statistically significant at 0.01% level.

RESULTS

Of the 100 cases, closed globe injury accounted for 69% and the sex ratio was 3.2:1. 48 children had visual acuity > 6/12, 18 had visual acuity 6/18 – 6/36, and 3 children had no perception of light (NOPL).

CONCLUSIONS

Paediatric ocular trauma is a major cause of the non-congenital unilateral blindness. Such injuries cannot always be prevented, but by identifying the underlying aetiological factor of serious injuries, it may be possible to determine the most effective method of reducing the incidence of visually challenging trauma. Although prognosis is mainly dependent on the extent of injury, choice of appropriate management can favourably affect the visual outcome.

KEY WORDS

Paediatric Ocular Trauma, Visual Acuity, Closed Globe Injuries, Open Globe Injuries, Final Visual Outcome

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BACKGROUND

It is estimated that there are up to 2, 80,000 hospital admission due to ocular trauma in children less than 15 years of age each year.¹ Of the total childhood injuries ocular trauma accounts for about 8–14%² which is also the leading cause of treatable visual morbidity and preventable monocular blindness. The ensuing visual disability has significant, socioeconomic and psychological impact on the children, family and to the society.³ Which warrants accurate estimate of the prevalence and the aetiological factors contributing to the ocular trauma and will be helpful in preventing as well as better management and cure of the patients. There are very limited epidemiological studies in India, or none in central India. This study will help in estimating the contributing factors responsible for preventable blindness in children.

Prevention of severe and blinding ocular injuries by better educational efforts, parental supervision during sporting activities, domestic safety measures and early medical intervention are important decisive factors in decreasing the morbidity and incidence of ocular injuries. In view of various complexities involved this study would provide an efficient multi-dimensional approach towards the management of paediatric ocular trauma.

We wanted to evaluate the final visual outcome of paediatric ocular trauma and determine the various types of aetiological factors contributing to ocular trauma.

METHODS

After obtaining approval from the institutional ethics committee, a prospective study was done among children who reported with ocular trauma to the department of ophthalmology. 100 children with ocular trauma who were less than 18 y of age were included in this study. Uncooperative children and who could not attend the follow up were excluded. Classification of Pieramici et al was adapted in this study. Clinical assessment of every patient was done by obtaining Visual acuity, age, sex, duration from time of injury to reporting in the hospital, place of injury, aetiology of injury and local examination. Ocular examination best corrected Pre-treatment visual acuity with Snellen chart or multiple picture test in verbal children, whereas in preverbal children. Estimation of visual acuity was done by fixing and following the light or by hundred and thousand sweet tests.

In all cases anterior segment was examined by oblique illumination with torch light using binocular loupe and slit lamp. Fundus examination with direct and indirect ophthalmoscope was done for evidence of intra ocular foreign body, vitreous haemorrhage and opacities, oedema or detachment of retina and condition of optic disc. Fundus examination was not possible in patients with massive hyphaema and massive vitreous haemorrhage.

In some cases, ultra-sonography and x-ray of the orbit was done to rule out intra ocular foreign body (IOFB) or orbital fracture. Depending on the type of injury patients were either managed by conservative or surgical methods. 57 patients were managed conservatively, and 43 patients required

surgical intervention. Conservative treatment was given in cases of closed globe injury which included lid oedema, ecchymosis, conjunctival congestion / chemosis, subconjunctival haemorrhage, corneal abrasion / partial thickness tear, traumatic uveitis, hyphaema <½ of anterior chamber, traumatic mydriasis, Iridodialysis (<2 hrs. meridian asymptomatic), vitreous haemorrhage, Berlin's oedema and retinal haemorrhage.

Surgery was required for lid tear, conjunctival tear, foreign body, corneal tear with or without Iris / vitreous prolapses, traumatic cataract, subluxation or dislocation of lens and endophthalmitis. All the patients were followed up at intervals of 1, 2, 4 weeks and 3, 6 months. In every follow up visual acuity, anterior and posterior segment examination was done. Tonometry if required in certain patients was also done.

Statistical Analysis

Chi square test was used and P value at 0.01% level was considered to be statistically significant.

RESULTS

In this study higher incidence of ocular trauma was seen in the 5-14 years age group which accounted for 66% of the total cases. The sex ratio between male and female child was 3.2:1 (table-1). The most common aetiological factor was injury by wooden stick (14.5%), however interpersonal fights, injury due to iron nails and thick rope were least common (2.9%) of total cases (table-2). Closed globe injury was the most common type of injury reported in this study accounting for 69% and burns accounting for 8% of the total injuries (table - 3).

Age Group (Yrs.)	Male		Female		Ratio
	Number	Percentage	Number	Percentage	
0 – 5	13	17.1%	04	16.7%	3.3:1
5 – 14	50	65.8%	16	66.6%	3.1:1
14 – 18	13	17.1%	04	16.7%	3.3:1
Total	76		24		3.2:1

Table 1. Demographic Profile of Patients

Etiological Factors (n=69)		Number	Percentage
Wooden stick		10	14.5%
Cricket Ball		09	13.0%
Gulli danda		09	13.0%
Fall		08	11.6%
Stone/Gravel		08	11.6%
Toys		05	7.2%
Tree Twig		05	7.2%
Fist		04	5.8%
Iron Nail		02	2.9%
Slap		02	2.9%
Thick rope		02	2.9%
Unknown		05	7.2%
Total		69	100.0%

Table 2. Etiological Factors

Of the 100 patients 48 had visual acuity (pre-treatment) > 6/12, 18 patients have visual acuity 6/18– 6/36 and 3 cases had NOPL (table-4). In the final visual outcome 63% patients had good visual acuity > 6/12, 23% had visual acuity 6/18– 6/36. 9% patients had visual acuity 6/60–2/60 and 2% cases has visual acuity 1/60 to PL. 3% cases had NOPL. The comparison of pre-treatment visual outcome was statistically significant at 0.01% level.

Type of Injury	Number	Percentage
Close Globe	69	69.0%
Open Globe	23	23.0%
Burn	08	08.0%
Total	100	100.0%

Table 3. Type of Injury

Visual Acuity	Number	Percentage
>6/12	48	48.0%
6/18-6/36	18	18.0%
6/60-2/60	21	21.0%
1/60-PL	10	10.0%
NOPL	03	03.0%
Total	100	100.0%

Table 4. Pre-Treatment Visual Acuity

DISCUSSION

This study was motivated by the fact that there is lack of research data concerning the prevalence of final visual outcome in paediatric ocular trauma in central India. Ocular trauma constitutes about 12.9% of all cases admitted in developing countries. In our study it was found that the most common age group involved was 5-14 years similar to other studies by Puodziuvene et al (older than 7 years),⁴ and Chakraborti C et al⁵ respectively. However male children were more prone to ocular injuries with a ratio of 3.2:1 which is consistent with various other studies, this could be due to the fact that boys tend to take part in more violent and aggressive nature of activities than girl's in this age group.

Injury due to wooden stick 14.5% was the most common aetiological factor in our study similar to in a study by Puodziuvene et al who also reported 24.8% wooden stick injuries, also children are routinely engaged in farming or domestic chores in as many household lack proper intra structure especially in rural India. According to 2009-10 census there was a gross dropout rate of 26.3% in (class I to VIII) out of which one fourth children were employed in agriculture sector.

Close globe injury accounted for almost 69% of the total type of injuries in our study which could be due to the fact that they were sustained while playing in school.

Concerning the final visual outcome in our study 63% patients had good visual acuity >6/12, however Narang et al⁶ reported ambulatory vision in 52.8% of children in their study and Puodziuvene et al reported 65.4% regained a good visual acuity (>0.5) the reason for the better outcome of final visual acuity in our study could be due to the fact that majority of the patients sustained closed globe injuries similar to in a study by

Katiyar. V et al.⁷ Studies on paediatric trauma have reported poor visual acuity at presentation along with open globe injuries among the predictors associated with poor visual outcome. In our study 3% of the patient had monocular blindness (NOPL) as compared to Shazia Qayum et al⁸ who reported almost 12.3% in their study, which can be attributed to greater percentage of open globe injuries in their study.

CONCLUSIONS

By identifying the underlying etiological factor and determining the appropriate management, good visual acuity can be achieved in children with closed globe injuries who present early irrespective of the type of injury.

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