

A prospective study of pattern and visual outcome in paediatric ocular trauma in a tertiary care hospital

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Abstract

Introduction:Ocular trauma is an important cause of ocular morbidity and represents the most common ocular emergency. Ocular injuries range from subconjunctival hemorrhage, without much visual significance to sight-threatening injuries such as globe ruptures and retinal detachments.

Materials and Methods:A prospective study was done among children who reported with ocular trauma to the department of ophthalmology between June 2016 to June 2018. 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. **Results:**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. 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. **Conclusion:**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.

Key Words:Ocular trauma, Visual acuity, NOPL.

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Introduction

Ocular trauma is an important cause of ocular morbidity and represents the most common ocular emergency. Ocular injuries range from subconjunctival hemorrhage, without much visual significance to sight-threatening injuries such as globe ruptures and retinal detachments. Individuals in their productive age are the most common victims, especially children and those involved in sports, industrial, and construction workers, thus imposing a heavy burden on our economy. Ocular trauma is the second leading cause of visual loss in US. According to a survey the incidence of ocular trauma in USA is 2.4 million per a year[2]. Ocular trauma includes penetrating and blunt injuries. Penetrating injuries are at higher risk of developing endophthalmitis as compared to blunt trauma[3]. Blunt trauma is associated with skin or corneal abrasion, hyphema, posterior vitreous detachment, vitreous hemorrhage and retinal detachment in majority of cases[4]. Injuries caused by sharp objects result in better visual outcome than those caused by blunt objects and injuries limited to anterior segment have better prognosis than those involving the posterior segment. Pediatric age group accounts for a large

proportion of ocular trauma. Most of the times the source of trauma were household objects i.e knives, fork, Pencil, etc. In young age group road traffic accidents and physical abuse came out to be the leading cause of ocular trauma.

Materials and methods

A prospective study was done among children who reported with ocular trauma to the department of ophthalmology between June 2016 to June 2018. 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 severe corneal edema, advanced lens opacification, massive hyphaema and massive vitreous haemorrhage. Among the cases, ultra-sonography was done and x-ray/ CT scan of the orbit was done to rule out intra ocular foreign body (IOFB) or orbital fracture wherever necessary. Depending on

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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 $\leq 1/2$ of anterior chamber, traumatic mydriasis, Iridodialysis (<math>< 2</math> 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). 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.

Table 1: Demographic profile of patients

S.No	Age Group (years)	Male		Female		Ratio
		Number	Percentage	Number	Percentage	
1	0-5	13	17.1%	4	16.7%	3.3:1
2	5-14	50	65.8%	16	66.6%	3.1:1
3	14-18	13	17.1%	4	16.7%	3.3:1
4	Total	76		24		3.2:1

Table 2: Etiological factors

S.No	Etiological factors (n=69)	Number	Percentage
1	Wooden stick	10	14.5%
2	cricket ball	9	13%
3	Gullidanda	9	13%
4	Fall	8	11.6%
5	Stone/Gravel	8	11.6%
6	Toys	5	7.2%
7	Tree Twig	5	7.2%
8	Fist	4	5.8%
9	Iron Nail	2	2.9%
10	Slap	2	2.9%
11	Thick Rope	2	2.9%
12	Unknown	5	7.2%
13	Total	69	100%

Table 3: Type of Injury

S.No	Type of Injury	Number	Percentage
1	Close Globe	69	69%
2	Open Globe	23	23%
3	Burn	08	8%
4	Total	100	100%

Table 4: Pre-Treatment Visual Acuity

S.No	Visual Acuity	Number	Percentage
1	>6/12	48	48%
2	6/18-6/36	18	18%
3	6/60-2/60	21	21%
4	1/60-PL	10	10%
5	NOPL	03	3%
6	Total	100	100%

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 al 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[6-10] 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 one study [6] reported ambulatory vision in 52.8% of children in their study and one 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. 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) who reported almost 12.3% in their study, which can be attributed to greater percentage of open globe injuries in their study.

Conclusion

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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