

Spectrum of Ocular Trauma Among Children in Tertiary Eye Hospital of Nepal

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ABSTRACT

Introduction

Ocular trauma is an important cause of monocular blindness thus by recognizing its distribution and causes of ocular injury could potentially help to prevent ocular injury thereby reducing ocular injury related blindness.

Objective

To determine the epidemiology and causes of childhood ocular trauma in tertiary eye hospital of Nepal.

Methodology

This is hospital based cross sectional prospective study conducted among 150 cases of pediatric age group (<15 years) patients affected by ocular trauma during January 2010 to June 2011 at BP Koirala Lions Center for Ophthalmic Studies in Kathmandu, Nepal. Age, sex, mechanism and place of trauma, presenting visual acuity and ocular findings in injured eye were analyzed.

Results

Majority of ocular trauma occurred in children aged group ≤ 5 years (39.3%). Among 150 study cases, boys 105 (70%) predominate over girls 45 (30%). Early presentation within 24 hours was found in 82 (54.7%) cases. Closed globe injuries accounted for 75% ocular injuries and sharp objects (51%) was most frequent object responsible for ocular trauma. 57% of child had normal vision at presentation with subconjunctival hemorrhage (26%) being most common ocular finding and among all 41.33% of children needed hospitalization for observation and further treatment.

Conclusion

Children are vulnerable to eye injuries and most of them are preventable. Home being the most common place for ocular trauma in this study hence good parental supervision can significantly prevent ocular trauma related visual disability and blindness. Implementation of well-established safety precautions environment at school can potentially reduce ocular trauma among children.

KEYWORDS

Childhood ocular trauma, closed globe injuries, open globe injuries



INTRODUCTION

Ocular trauma is a leading cause of visual impairment and blindness in young adults and children resulting in ophthalmic morbidity and monocular blindness all over of the world.¹ The functional and cosmetic defect has a significant impact on the personality and lifestyle of the affected individuals. The peculiar anatomic features and the risk of amblyopia cause functional loss inspite of a good anatomic reconstruction.² The significance of the problem is compounded by the findings of various studies that a majority of these injuries are preventable,^{3,6} thus making it an issue of great social and medical concern. The Nepal national blindness survey conducted in the year 1981 has revealed 2.4% of the populations were monocular blind due to eye injury. Tribhuwan University Teaching Hospital (TUTH) study showed 21.1% and the Bhaktapur eye survey showed 0.7 % of blindness due to trauma.⁷⁻⁸ Eye trauma in childhood and its adnexa represent approximately 4-20% of all eye injuries.² By identifying any underlying factors in the etiology of serious injuries, it may be possible to design effective methods for reducing the incidence of visually damaging trauma.⁵

The present study was carried out to determine the nature and causes of injury, duration between injury and presentation and impact of ocular trauma in children.

METHODOLOGY

This is prospective cross sectional hospital based study (January 2010 – June 2011) conducted at BP Koirala Lions Center for Ophthalmic Studies among the children having history of ocular injuries attending either BPKLCOS or Emergency department of TUTH, we included 150 cases of 145 children during the study period. Consent was obtained from parents of all children and institutional review committee approval was received prior to this study. Those

who did not agree to get either medical or surgical treatment in our hospital and whose presenting visual acuity could not be taken were excluded from the study. Specially designed Performa was used which included information on demographic data, nature and cause of injury and duration between injury and presentation for admission. Ocular injuries were classified into open globe injuries, closed globe injuries and lid injuries as given by international trauma classification group.

Visual acuity assessment was performed with catford drum and k-pictures and Lea-symbols in preverbal children. Snellen's distant visual acuity chart was used for the verbal and school going children. The cases where surgical intervention or hospitalization was not required were treated medically on OPD basis. Data entry and analysis was done with SPSS 16.0 version.

RESULTS

Out of 150 ocular injuries, male child had higher incidence of ocular injury in 105 eyes compared to 45 eyes in female children and male to female ratio was 2.3:1. Mean age of study children was 7.2 years with mean age of male children was 7.63 ± 3.8 years whereas that of female children was 6.2 ± 4.0 years which was found to be statistically significant (P value 0.041). Ocular trauma occurred frequently in age group of 0 -5 years (39.3%) followed by 6 -10 years (36%) and >10 years age group (24.7%). Among 150 cases of ocular injury 140 (97%) was unilateral and 5 (3%) children sustain bilateral eye injury. Right eye injury was observed in 78 (52%) of cases and 72 (48%) in left eye. 54.7 % of ocular injury cases presented within 24 hours of eye injury as illustrated in table 1.

Table 1 : Demographic Pattern of Children With Ocular Trauma

Characteristics	No. of Participants	Percentage (%)
Age (mean = 7.2years)		
>0-5 years	59	39.3
>5-10 years	54	36
>10-15 years	37	24.7
Sex		
Male	105	70
Female	45	30
Eye Involvement		
Right Eye	78	52
Left Eye	72	48
Unilateral Cases	140	97
Bilateral Cases	5	3
Ocular Injury to time of Presentation		
> 24 hours	82	54.7
> 24 hours upto 1 week	58	38.7
> 1 week upto < 1 month	5	3.3
> 1 month	5	3.3

House was common site for ocular casualty followed by playground and school classroom accounting for 43%, 38% and 17%

respectively. Sharp object (51%) was most common object responsible for ocular injury among study children as shown in table 2.

Table 2 : Place and agent causing ocular trauma

Characteristics	No. Of Participants	Percentage (%)
Place of Injury		
House	64	43
Playground	57	38
Classroom	26	17
Road Traffic Accident	3	2
Agent for Ocular Trauma		
Sharp Objects	76	51
Blunt Objects	62	41
Firecrackers	10	7
Chemicals	2	1

Initial (presenting) visual acuity was in the category of 6/6-6/18 in 57%; 6/18-6/60 in 9%, <6/60-3/60 in 2% and <3/60 in 32% of cases. None of the children had NPL vision at the time of presentation following trauma as shown in table 3.

Close globe injury (75%) was most frequent impact of ocular injuries among children in this study followed by open globe

injury (25%). Among 113 close globe injury cases, large proportion of cases had subconjunctival hemorrhage (34%) and hyphema (22%) as second common finding. Out of 37 cases of open globe injury 5 cases were associated with endophthalmitis at presentation. Majority of open globe injury was due to sole trauma in cornea 30 (81%), and rest was associated with scleral perforation as demonstrated in table 4 and 5.

Table 3 : Visual acuity at presentation in injured eye

Vision Category	No. of Eyes (n=150)	Percentage (%)
< 6/6 - 6/18	85	57
< 6/18 - 6/60	14	9
< 6/60 - 3/60	3	2
< 3/60	48	32

Table 4. Classification of ocular trauma among injured eye of children

Type of Eye Injury	No. of Eyes (n=150)	Percentage (%)
Open Globe Injury	37	25
Zone I	30	
Zone II	2	
Zone I + II	4	
Zone I + II + III	1	
Close Globe Injury	113	75
Zone I	69	
Zone II	25	
Zone III	3	

Table 5 : Impact of ocular injury among trauma eyes

Ocular Impact of Trauma	No. of Eyes (n=150)	Percentage (%)
Subconjunctival Hemorrhage	39	26
Hyphema	25	17
Conjunctivitis	6	4
Lid Ecchymosis	8	5
Lid Laceration	8	5
Corneal Ulcer	9	6
Corneal Foreign Body	9	6
Corneo-scleral Perforation	37	25
Comotio Retinae, Retinal Ischemia	3	2
Conjunctival Laceration	3	2
Corneal Abrasion	3	2



DISCUSSION

We found male children had higher tendency for ocular injury than female which is similar to findings of other literatures such as Caroline J MacEwen et al,¹⁰ Shoja et al¹⁴ Saxena et. al¹⁸ and this may be due to fact that girl children are more involved with indoor games where as boys are involved in more outdoor and aggressive games. However, in contrast to the higher frequency of ocular trauma in younger age group 0-5 years in this study, other study have shown 5-10 years of age group children more vulnerable for ocular trauma.⁹ This variation of finding may be possibly due to lack of facility for younger children surgery and this may be the reason for relative older children as common age for ocular trauma in other study in compare to our current study.

House was the commonest place for eye injury (43%) as in many similar studies by Kaur et al,¹¹ Angelino et.al.¹³ This is followed by 38% in playground and school classroom (17%) as third site for ocular injury. This disagrees with study findings from MacEwen et al where school is more frequent than playground.¹⁰ Study done in western Nepal showed 55.5% of the children had sustained trauma in the field.⁹

In this study the most frequent agent of eye injury was sharp objects (51%) and this finding was comparable to studies from Kaur et al who had 73.67%,¹¹ but this finding was not supported by Angelino et al¹³ and Aboel-Fetoh et al¹⁵ study. Sports related ocular injury accounted only in 8.7% of cases in our study however it is reported to be higher in other study.^{10,12} This difference may be due the difference in daily activities of children among various countries worldwide.

Early presentation within 24 hours of ocular trauma was seen among 45.3%of cases in this study. However, 54.7% of patients presented late after ocular trauma ranging after 24 hours to 1 month and late presentation may be possibly due to ignorance, illiteracy, poor socioeconomic condition and difficult to access hospital. Among all, 42% patients underwent surgical intervention. The cases requiring surgical intervention in cases of ocular injury is variable from different parts of the world 17.6%-58.3%.¹³⁻¹⁶

Closed globe injury(75%) was the most frequently observed ocular injury in children in our study, which is consistent with the reports from Angelino et al,¹³ Aboel-Fetoh et al.¹⁵ Where as open globe injury was the most common cause of ocular injury in studies done Saxena et Al,¹⁸ Shoja et al,¹⁴ Hosseini et al.¹⁹ We found open globe injury to be 25% among all children with ocular trauma.

Out of 37 open globe injury, corneal perforation (67.56%) was the commonest ocular manifestation found. This finding is in consistent with reports from Saxena et al 44%,¹⁸ Angelino et al 66.7%.¹³ None of the cases in our study had intraocular foreign body or rupture of globe.

Majority of children (56.7%) had normal vision in trauma eye at presentation with visual acuity category of 6/6-6/18. Overall we found, 25% of cases of open globe injury, 75% of cases of closed globe injury. This finding was consistent with study reported by Saxena et al⁴⁰ and Juan et al,¹⁷ where higher percentage of cases had no visual impairment in closed globe injury.

We found incidence of post-traumatic endophthalmitis rate at presentation was as 8.1%, which seems to be lesser in compare to other studies (14.0%,¹⁹ 11.91%¹⁰ and 54.16%²⁰) this may be due to that other studies had only open globe injuries cases in their study.

CONCLUSION

As this study was done in a limited time period sample size is small. The irreversible nature of visual loss and immense morbidity associated with it need to be emphasized and publicized. Prevention campaign of ocular trauma is still vital for reducing morbidity and treatment costs associated with pediatric ocular injuries. Parents, elders, teachers and caretakers have an important role to play in prevention of injuries in children. We recommend government and non-government organization to look at the severity of ocular trauma and to take necessary ocular trauma prevention campaign.

REFERENCES

1. Rooper Hall MJ. Prevention of blindness from trauma. *Trans Ophthalmol* 1978; 314-8.
2. Rohrbach JM, Szurman P, Bartz – Schmidt KU. Eye trauma in childhood and youth. *Klin Monatsbl Augenheilkd* 2004; 221: 631-45.
3. Niiranen M, Raivio I. Eye injuries in children. *Br J Ophthalmol* 1981; 65: 436-438.
4. Grin TR, Nelson LB, Jeffers JB. Eye injuries in childhood. *Pediatrics* 1987; 80: 13-17.
5. LaRoche GR, McIntyre L, Schertzer RM. Epidemiology of severe eye injuries in childhood. *Ophthalmology* 1988; 95: 1603-1607.
6. Nelson L, Wilson TW, Jeffers JB. Eye injuries in childhood: demography, etiology and prevention. *Pediatrics* 1989; 84:438–441.
7. Koirala S et.al, Epidemiology of Ocular injury in pediatric population. National conference on children's sight in Nepal. Organizers: Seva Foundation, Seva Service Society and Nepal Ophthalmic Society, Kathmandu, October 1998.
8. Upadhyay MP, Karmacharya PCD, Koirala S, et al. Epidemiologic characteristics, predisposing factors, and etiologic diagnosis of corneal ulceration in Nepal. *Am J Ophthalmol* 1991;111:92-9
9. Adhikari RK, Pokhrel H, Chaudhary H, Chaudhary. Ocular trauma among children in western Nepal: agents of trauma and visual outcome. *Nep J Oph* 2010;2(4):164-165
10. MacEwen, C. J., Baines, P. S. and Desai, P., Eye injuries in children: The current picture. *Br. J. Ophthalmol.*, 1999; 83: 933–936.
11. Apjit Kaur and Ajai Agrawal ; Pediatric ocular trauma. *CURRENT SCIENCE* 2005; 89(1):43-46.
12. Grin TR, Nelson LB, Jeffers JB. Eye injuries in childhood. *Pediatrics* 1987; 80: 13-17.
13. Angelino Julio Cariello, Nilva Simerem Bueno Moraes, Somaia Mitne, Celina Shizuka Oita, Bruno Machado Fontes, Luiz Alberto Soares Melo. *Epidemiological findings of ocular trauma in childhood* *Arq Bras Oftalmol.* 2007;70(2):271-5
14. M. R. Shoja , A. M. Miratashi. Pediatric ocular trauma *Acta Medica Iranica*, 2006;44(2): 125-130.
15. Nagah Mohamed Aboel-Fetoh et,al , Pattern of Childhood Ocular Trauma; *The Egyptian Journal of Community Medicine* April 2009; Vol. 27 No. 2
16. Poon AS, Ng JS, Lam DS, Fan DS, Leung AT. Epidemiology of severe childhood eye injuries that required hospitalization. *Hong Kong Med J.* 1998;4:371–4.
17. Serrano JC, Chalela P, Arias JD. Epidemiology of childhood ocular trauma in a northeastern Colombian region. *Arch Ophthalmol.* 2003; 121:1439-1445.
18. Saxena R, Sinha R, Purohit A, Dada T, Vajpayee RB, Azad RV. Pattern of pediatric ocular trauma in India. *Indian J Pediatr* 2002; 69: 863–7.
19. Hamid Hosseini et.al: Clinical and Epidemiologic Characteristics of Severe Childhood Ocular Injuries in Southern Iran; *Middle East Afr J Ophthalmol.* 2011 Apr-Jun; 18(2): 136–140
20. Narang S, Gupta V, Simalandhi P, et.al, Paediatric open globe injuries. Visual outcome and risk factors for endophthalmitis, *Indian J Ophthalmol.* 2004; 52:29-34.