

A STUDY OF OCULAR INJURIES IN CHILDREN

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ABSTRACT

BACKGROUND

Worldwide, ocular trauma is an important cause of eye morbidity and a leading cause of non-congenital monocular blindness among children. In general, children are more susceptible to eye injuries because of their immature motor skills, limited common sense, tendency to imitate adult behaviour without evaluating risks, lessened emotional control, relative ignorance, and natural curiosity. Adult supervision is extremely important in preventing accidents.¹

PATIENTS AND METHODS

The material for this study consisted of paediatric patients below 15 years of age who presented with history of different types of ocular injuries during the period from March 2007 to February 2010. In all cases, a thorough history was obtained from patients and their parents regarding the circumstances leading to the injury, the exact nature of the event and the object causing the injury. All the patients were also subjected to complete ophthalmic examination and followed up for 6 months.

RESULTS

34 (68%) were males and 16 (32%) were females. The average age was 10.9 years (range 1-15 years). The highest incidence of blunt injuries was seen in age group of 11-15 years (58%).

20 (40%) injuries occurred during domestic and leisure activities, 7(14%) injuries occurred at work, 13 (26%) during sports, 6 (12%) were due to assault and 4 (8%) from RTAs.

CONCLUSION

Blunt trauma to the eye causes a wide variety of damage to ocular tissues. Anterior or posterior segments are preferentially involved. Males were observed to be at increased risk for an eye injury necessitating admission to hospital.

KEYWORDS

Paediatric Injuries, Ocular Injuries, Ocular Trauma, Blunt Injuries.

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INTRODUCTION: Children are disproportionately affected by ocular injuries. A study found that the group aged 0 to 5 years was at greatest risk, regardless of sex, and that among those older than 5 years, eye injuries were more frequent in boys.²

In general, children are more susceptible to eye injuries because of their immature motor skills, limited common sense, tendency to imitate adult behaviour without evaluating risks, lessened emotional control, relative ignorance, and natural curiosity. Although most eye injuries are avoidable by simple preventive measures, many children suffer visual impairment that can seriously hamper their psychosocial development. They face a life-time limited vision or even blindness, with all the associated emotional, social, and economic cost to the child, family, and society.

It is not unusual for small children to play with hazardous objects such as needles, knives, glasses, and

pencils left within their reach by parents and supervising adults or older children do not instruct about the dangers these objects pose. Also, children often are allowed to observe adult activities that may pose a risk to them.

Boys are generally granted more liberty than girls, and they tend to spend more time outside. They are allowed and even encouraged to exhibit more competitive and aggressive behaviour as part of their normal characteristics. School-aged children in particular are more often exposed to the environment and tend to be more physically active and to take more risks to gain acceptance by their peers.

Eyes with retinal intraocular foreign body may be more likely to develop endophthalmitis than those with penetrating injuries but no foreign bodies.³

Firework injuries occur in most societies. Firework related injuries usually affect boys.⁴

Victims of shaking injury are always under 3 years and usually under 12 months.⁵

One study found that a higher frequency of ocular trauma occurred in homes, which underscores the great need for primary prevention programs targeting parents and the home environment. The second highest frequency occurred in streets and roads; the third, in schools.

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Ophthalmologists, paediatricians, nurses, social workers, and other professionals involved in the health care of children play an important role in increasing awareness.

AIMS AND OBJECTIVES:

- To determine age and sex incidence and identify the current causes, sites and mechanisms of eye injuries in children.
- To determine the common effects of different types of injuries on ocular structures.
- Explore any possible method of reducing the incidence and assess the need for ocular protective devices to prevent injuries.
- Determine their outcome and assess the effects of different injuries on visual acuity.

Inclusion Criteria: Patients below 15 years of age who presented with history of different types of ocular injuries.

RESULTS: Out of 50 cases, 31 (62%) required admission for further examination and management while remaining 19 (38%) were treated as outpatients. The period of stay in hospital ranged from 3 days to 11 days.

Of the 31 cases which required admission, 15 (30%) were domestic, 4 (8%) occurred at work, 9 (18%) during sports, 2 (4%) assaults and 1(2%) due to RTAs.

Causes of injury: 16% of the injuries were caused with wooden stick or arrow.

Cause	No. of Cases	Percentage
1. Wooden stick/Arrow	8	16
2. Stone	7	14
3. Brick	5	10
4. Assault	4	8
5. RTA	4	8
6. Cricket ball	3	6
7. Gilli danda	3	6
8. Bull gore	2	4
9. Scissors	2	4
10. Fist	2	4
11. Metal piece/wire	2	4
12. Iron rod	2	4
13. Pole	1	2
14. Branch of a tree	1	2
15. Pen	1	2
16. Thorn	1	2
17. Comb	1	2
18. Agarbathi	1	2
Total	50	100

Table 1

Eye Involved: Out of 50 cases, in 27 cases (54%) left eye was involved, and in 23 cases (46%) right eye.

Extent of Injury: Anterior segment was involved in 39 cases (78%), anterior and posterior segments were involved in 11(22%) cases.

Ruptured globe was seen in 6 (12%) cases and all 6 cases were primarily treated to maintain the integrity of the eye ball and one of those 6 cases went for phthisis bulbi. Two cases of corneoscleral tear were enucleated as they were badly torn and had no perception of light.

Extent of injury occurring during different activities:

Injuries	Work	Domestic Activity	Sports	RTA	Assault	Total
Lid haemorrhage	1	1	1	1	-	4
Lid laceration	1	3	1	-	-	5
Subconjunctival Haemorrhage/ Laceration	4	5	2	2	3	16
Corneal abrasion/FB		3	1			4
Corneal tear	1	9	4	-	-	14
Scleral tear	-	2	2	-	-	4
Hyphaema	1	2	2	1	1	7
Traumatic uveitis	1	-	1	1	-	3
Iris tear/dialysis	1	-	1	-	1	3
Traumatic mydriasis	2	-	2	-	3	7
Traumatic cataract	2	3	4	-	1	10
Lens displacement	-	-	1	1	1	3
Vitreous haemorrhage	1	-	3	-	-	4
Retinal Oedema	2	-	1	-	-	3
Retinal detachment	-	-	2	-	-	2
Choroidal tear	-	-	2	-	-	2
Macular hole	-	-	2	-	-	2
Blow out fracture of orbit	-	-	-	1	-	1
Globe rupture	1	1	3	-	1	6

Table 2

Out of 50 cases, 20 (40%) were treated conservatively while 30 cases (60%) required surgical intervention. Lid tear repair was done in 6 cases, corneal/scleral tear repair was done in 18 cases, Primary PC IOL implantation was done in 9 cases, ACIOL implantation in 1 case and plain extraction of lens in 1 case. Enucleation was done in 2 cases.

Effect on Intraocular Pressure: Angle recession of varying degree was seen in 2 cases (4%) and those 2 cases had rise in intraocular pressure. In one case, in addition to angle recession of 900, there was subluxated lens with vitreous herniation into anterior chamber which may have contributed to high pressure.

Visual Acuity:

Initial Visual Acuity:

Visual Acuity	Work	Domestic activity	Sports	RTA	Assault	Total (%)
6/6	2	1	1	2	-	6(12%)
6/9	-	-	1	-	-	1(2%)
6/12	-	2	-	-	1	3(6%)
6/18	-	1	-	-	1	2(4%)
6/24	-	-	-	-	-	-
6/36	-	-	-	-	1	1(2%)
6/60	-	3	-	1	-	4(8%)
5/60	-	-	-	-	-	-
3/60	-	-	-	-	-	-
1/60	-	-	-	-	-	-
CF 4 mt	-	1	-	-	-	1(2%)
CF 2 mt	-	1	-	-	-	1(2%)
CF/CF	1	2	2	1	-	6(12%)
HM CF	-	-	3	-	2	5(10%)
PL + PR +	3	5	4	-	1	13(26%)
Following Light	-	2	-	-	-	2(4%)
NO PL	1	2	2	-	-	5(10%)

Table 3

Final Visual Acuity (6 months after Injury):

Visual Acuity	Work	Domestic activity	Sports	RTA	Assault	Total (%)
6/6	3	4	2	3	2	14(28%)
6/9	-	1	4	-	-	5(10%)
6/12	-	2	-	-	2	4(8%)
6/18	-	1	-	1	-	2(4%)
6/24	-	-	-	-	-	-
6/36	-	1	-	-	-	1(2%)
6/60	-	1	5	-	1	7(14%)
5/60	-	2	-	-	-	2(4%)
3/60	-	-	-	-	-	-
1/60	-	-	-	-	-	-
CF 4 mt	-	2	-	-	-	2(4%)
CF 2 mt	-	-	-	-	-	-
CF/CF	1	1	-	-	-	2(4%)
HM CF	-	-	-	-	-	-
PL + PR +	3	-	1	-	-	4(8%)
Following Light	-	2	-	-	-	2(4%)
NO PL	-	3	1	-	1	5(10%)

Table 4

The injuries caused 10 cases (20%) to become partially blind (6/24 to 3/60) and 15 cases (30%) totally blind (less than 3/60 vision) in affected eye. Out of these 15 cases, 5 cases had no PL as the final vision, 2 of which were enucleated, 2 cases went for phthisis bulbi.

DISCUSSION:

Age Incidence: In the present study, the highest incidence of ocular trauma was observed in the age group 11-15 years (58%) followed by those in the age groups 6-10 years (38%) and 0-5 years (4%).

Other Studies: The maximum incidence of injuries was seen in the age group 11-16 years. 73 out of total 143 children were in the age group of 11-16 years (51.04%) AJ Luff et al.⁶

The highest incidence of injuries was seen in the age group of 5 to 14 years. 78 injuries occurred in this age group out of 93 children. Caroline J Mace Wen et al.⁷

The present study with highest incidence of ocular injury in the age group of 11-15 years is almost correlating with the study conducted by AJ Luff et al, where the incidence of ocular injury is 51.04% in the same age group.

Sex Incidence: In the present study, the highest incidence of trauma was seen in males (68%) than females (32%). Male: Female ratio 2.125:1.

63 male children were injured compared to 17 females with ratio of male: female 3.7:1. S.G. Jaison et al.⁸

Activity at the Time of Injury: 20 (40%) injuries occurred during domestic and leisure activities. This was the common source of perforating ocular trauma. The commonest causes were injuries by Wooden Stick, Scissors, Garbathi, etc.

Other Studies: Most injuries (42 out of 72), 58.3% occurred at home C.G. Thomson et al.⁹

In the present study, 40% of injuries occurred during domestic and leisure activities at home. In the study conducted by Juan C. Serrano, 44.4% of injuries occurred at home. So these two studies are correlating.

Cause of Injuries: In the present study, 16% of the injuries were caused by wooden stick and in 14% of cases injury was caused by stick.

The commonest mode of injuries was by blows and falls (37%) Ellen Strahlman et al.¹⁰

In the present study, the commonest cause of injury was by wooden stick/arrow (16%).

Extent of Injury:

	No. of Cases	Percentage
Lid haemorrhage	4	8
Lid laceration	5	10
Sub conjunctival haemorrhage/laceration	16	32
Corneal abrasion/FB	4	8
Corneal tear	14	28
Scleral tear	4	8
Hyphaema	7	14
Traumatic uveitis	3	6

Iris Tear/dialysis	3	6
Traumatic mydriasis	7	14
Traumatic cataract	9	18
Lens displacement	3	6
Vitreous haemorrhage	4	8
Retinal oedema	3	6
Retinal detachment	2	4
Choroidal tear	2	4
Macular hole	2	4
Blow out # of orbit	1	2
Globe rupture	6	12

Table 5

In the present study, the commonest injury was subconjunctival haemorrhage/laceration (30%) followed by corneal tear (26%), while in the study conducted by A. Moreira et al,² the commonest injury was burns (24%) followed ocular perforation (13.7%). So the present study does not correlate with study conducted by Carlos A. Moreira et al.²

Final Visual Acuity: Visual impairment and blindness from ocular trauma at final discharge from followup.

Final visual Acuity	No. of eye injured	Percentage
Good visual outcome: 6/18 or better	25	50%
Low vision		
1) Less than 6/18-6/60	8	16
2) Less than 6/60-3/60	2	04
Blindness:		
1) Less than 3/60 - 1/60	-	-
2) Less than 1/60 - PL+	10	20
3) No light perception	5	10
Total	50	100

Table 6

In the present study, highest number of patients had vision better than 6/18 (50%) and no light perception in 10% of the patients.

CONCLUSION: Blunt trauma to the eye causes a wide variety of damage to ocular tissues. Anterior or posterior segments are preferentially involved.

Males were observed to be at increased risk for an eye injury necessitating admission to hospital.

Angle recession was seen in 2 (4%) cases and those 2 cases went for glaucoma. Longer followup may identify additional cases of glaucoma.

Most eyes recover and retain good visual function after contusion injury confined to the anterior segment despite frequent widespread structural changes. But this is not true with blunt injury involving the posterior segment in which visual prognosis is less favourable.

In case of paediatric traumatic cataract, timely aspiration of cataract and PC IOL implantation can prevent the development of amblyopia. In case of corneal tear, proper suturing of the wound reduces the amount of post-operative astigmatism, which is frequently irregular in nature.

Steroids have definitely reduced the incidence of loss of vision because of their use in a wide variety of lesions of contusion injuries such as traumatic iridocyclitis and macular oedema.

B-scan ultrasonography plays a vital role in assessing damage to the eye and orbit.

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