

# Evaluation of Paediatric Ocular Injury in Tertiary Care Centre

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## ABSTRACT

**Aim:** To evaluate epidemiological characteristics and visual outcome of paediatric ocular injury in tertiary care centre.

**Materials and methods:** A single centre, hospital based study carried out during January 2016 to December 2016, where children upto 15 years of age with ocular injury attending casualty were included.

**Result:** In our study, a total of 55 patients were enrolled. Incidence of ocular injury in children has been found to be 51.60 %. The highest incidence of eye injuries has been found in 6 – 10 year primary school age group. The majority of patients were males (83%). The incidence of ocular injury was more in rural areas (70.9%) as compared to urban areas (29.1%). Sport and play were responsible for majority (61.82%) of eye injuries in children. All children were followed up for a period of 3 months. 12(23.52%) children achieved a good visual acuity (6/12 or better), 21 cases achieved moderate vision, 18 children got poor vision (6/60 or less). Four children had poor visual outcome in form of endophthalmitis.

**Conclusion:** Ocular injuries most commonly presented in young male boys. Continual and efficient health education of caretakers of children is mandatory for good preventive results.

**Key words:** Ocular injury, visual acuity endophthalmitis.

## INTRODUCTION

Injury in one form or another is the commonest cause of eye disease, but the pattern of its incidence is constantly changing. This pattern varies according to environment- military or civilian, industrial, agricultural or domestic. Ocular injuries are the most common cause of noncongenital acquired monocular blindness and visual impairment among children under 15 year's group. Ocular injury accounts for 8-14% of total injuries suffered by children. [1] The report of WHO's 2<sup>nd</sup> International symposium on ocular injury in Geneva, 1992 indicates that it is the third most important cause of blindness after cataract and nutritional blindness. [2]

Children with ocular injuries if not treated are vulnerable to functional reduction of visual acuity and develop dense amblyopia. Moreover, ocular injury in children is of greater significance, as in addition to physical disability, it has major impact on social and psychological development of child. Many studies have evaluated various aspects of paediatric ocular injury. The purpose of this study was to evaluate the epidemiology of ocular injury, to analyse the pattern and visual outcome in children upto 15 years attending tertiary care centre.

## MATERIALS AND METHODS

The present prospective, observational study of paediatric ocular injury was conducted in Dept. of Ophthalmology, Rajindra Hospital, Patiala from 1-01-2016 to 31-12-2016. Fifty five children of the age of 15 years and below with ocular injuries were admitted in the hospital during this period. Informed consent was obtained from patients or guardians. Patient demographic details such as age, sex and address were noted. The mode of injury, course of events and nature of treatment before coming to hospital were noted. The exact time of injury and time of reporting to hospital were recorded.

Thorough evaluation of visual acuity by Snellen's chart (4 year and above) and paediatric acuity chart (below 4 years), slit lamp examination to evaluate anterior segment injuries, and fundus examination by indirect ophthalmoscopy were done. B-scan in hazy media was done to evaluate the status of retina. X-ray orbit and CT scan were done for any evidence of fracture in suspected cases. All patients were managed according to the presentation and severity. Patients were followed up on day 1,7,30, 60 and 90 when final visual acuity was recorded. Observations collected were made to statistical analysis.

## RESULTS

A total of 107 cases of ocular injuries were admitted in this period; out of

which, 55 cases (51.40%) were children of the age of 15 years or below. Maximum numbers of cases (36.36%) were seen in the last quarter of the year. The least no. of injuries was seen in the month of March. The distribution of ocular injury was more in rural children (70.90%) as compared to urban children (29.10%).

Mechanical injuries were responsible for most of the cases (94.54%) of ocular injury in children. Among these, sports and play were responsible for majority (61.82%) of cases of ocular injury in children. Injury with cricket bat & ball, sticks or twigs were the most common cause (25.45%) of ocular injury in children, followed by bow and arrow (18.18%). Domestic injuries accounted for 21.82 percent cases, whereas firecrackers were responsible for 7.27 percent cases of injury. Injuries due to sports and play occurred predominantly in male children (M: F ratio 7.5: 1). Domestic injuries had a male to female ratio of only 2:1. Injuries due to sports and play were most common in 6-10 year age group; whereas domestic injuries were more predominant in the 0 -5 year age group.

**Table I: Distribution of ocular injury in rural and urban area.**

	Males		Females		Total	
	No.	%age	No.	%age	No.	%age
Rural	35	63.63	4	7.27	39	70.90
Urban	11	20.00	5	9.09	16	29.10
Total	46	86.63	9	16.36	55	

**Table II: Aetiology of ocular injury according to age**

Category of Injury	0-5 years		6-10 years		11-15 years		Total	
	No.	%age	No.	%age	No.	%age	No.	%age
Sports and play	6	10.90	18	32.73	10	18.18	34	61.81
Domestic	7	12.73	3	5.45	2	3.63	12	21.82
Fire crackers	1	1.82	1	1.82	2	3.63	4	7.27
Miscellaneous	2	3.63	1	1.82	2	3.63	5	9.09
Total	16	29.09	23	41.82	16	29.09	55	

**Table III: Structures involved in ocular injury in children**

Structures involved	No. of cases	%age
Cornea	39	70.90
Sclera	9	16.36
Hyphaema	16	29.09
Iris prolapse	11	20.0
Iritis	11	20.0
Iris tear or dialysis	4	7.27
Traumatic cataract	14	25.45
Vitreous haemorrhage	3	5.45
Retina	5	9.09
Endophthalmitis	5	9.09
Lids	8	14.54

In the present study, corneal involvement was seen in maximum number (70.90%) cases. Uveal tissue (47.27%) and lens (25.45%) were other frequently involved structures. 43.63% of children reported to hospital within first 24 hours. Another 18.18% cases presented within 24-72 hours.

Changes in visual acuity after management and complete follow up were evaluated. 64.70 % children achieved a final visual acuity 6/36 or better. 18 children (35.29%) got poor vision (6/60 or less) or no vision at all. 4 children (9.09%) had bad outcome in form of endophthalmitis.

**Table IV: Final Visual Acuity in Ocular Injury in Children**

Final Visual acuity	No. of cases	%age
6/12 or better	12	23.52
6/18-6/36	21	41.18
6/60- PL +ve	18	21.57
PL-ve	4	13.72
Total	55	

## DISCUSSION

In current study, we focussed on the causes of eye injuries in children aged 15 years and below reporting at tertiary care centre. We evaluated the frequency, distribution, initial and final visual acuity in enrolled patients. In our study, the highest incidence (41.82%) was found in 6-10 year age group. This finding is consistent with most of Indian studies. Children in this age group are immature, curious about their surroundings, making them more susceptible to injuries. [3] In our study, there were 46 boys (83.63%) as compared to 9 girls (16.36%) The preponderance of ocular injury in boys is probably due to greater liberty and stimulus to aggressiveness given to boys in all societies.



**Fig1: Perforating injury with cataract, iridocyclitis and hypopyon**

In our study, maximum numbers of cases 20/55 cases (36.36%) were observed in the last quarter of the year. It was due to the fact that festivals like Dussehra and Diwali fall in this period. This is in contrast to other studies, where summer vacation months accounted for more number of injuries as children spend more time

outside. [4] Rural children were involved in 70.90% cases as compared to 29.10% of urban children. The higher incidence of ocular injury in rural children is due to the fact majority of population lives in rural areas and they play games like cricket ball & bat, gilli-danda bow and arrow etc without any supervision.

In our study, mechanical injury was responsible for most of the cases of ocular injury (94.54%) which are similar to other studies. In the present study, perforating injuries were seen in 52.72% cases; while concussion injuries were seen in 32.72% children. Bow and arrow, pen/pencil caused perforating injuries in all the cases. Injury with cricket ball & bat, sticks and twigs, gilli danda resulted in non perforating injuries in majority of cases as reported by Saxena et al. [5] Titiyal et al and Qayum et al also reported that perforating injury was the commonest type of injury in children. [6,7]

Domestic injuries had an incidence of 21.81% and were most common in 0-5 year age group. These were caused by a variety of objects like blade, scissors, knife, pen, nail, hand fan and iron piece etc. Two children suffered pecking injury by birds-one by cock and another by crow. These were two of the rarer cases. Fire cracker injuries resulted in 7.27% cases. These were sustained during festive season of Dussehra and Diwali.

Initial good visual acuity and primary management are important factors for final visual outcome. Penetrating injuries and posterior segment involvement adversely affect visual results. [8] In our study, 12 children (23.52%) achieved a good final visual acuity (6/12 or better), 21 (41.81%) children had moderate visual acuity. 18 children (35.29%) got either poor vision (6/60 or less) or no vision at all. Bhandary et al (2009) reported lower accuracy of ocular trauma score (OTS) in predicting long term visual outcome while Theresa et al (2014) reported that 83% correspond to OTS proposed final visual acuity and remaining 17% fell into the category one below or above proposed in

this study. [9,10] Four cases of ocular injury developed endophthalmitis. Two cases had penetrating ocular injury with 'broomstick bows and arrows' which is a unique penetrating injury among Indian children. Two cases reported after 7 and 12 days. This delay resulted in severe outcome of injury.

## CONCLUSION

The proverbial saying 'Prevention is better than cure' can't be better applicable than for prevention of ocular injury in children. Any injury, howsoever minor, is likely to leave behind some after-effects on this delicate organ.

The present study confirms that male children of school-going age are the high-risk group and play and sports are the most important cause of paediatric ocular injury. Continual and efficient health education of children, teachers and parents of this high risk group should be undertaken. The necessity of seeking professional medical help immediately after injury and danger of delaying treatment should also be stressed. The children require continuous supervision and training while growing up and not just part-time supervision.

Home is a hazardous place regarding ocular injury particularly for pre-school children. Dangerous sharp-edged household implements like knife, scissors and blades etc. should be kept out of reach of small children. Marketing of children's toys without safety standards should be prohibited. The sale of dangerous toys like bow and arrow and fire crackers should be controlled.

The suffering and grave damage caused for years to come, are cause of deep concern in paediatric ocular injury. Hence

all preventive measures should be stressed on and undertaken.

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