



Load and configuration of ocular trauma in pediatric patients of a Tertiary Care Hospital in Mirpur Azad Kashmir.

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Article received on:

26/03/2020

Accepted for publication:

06/07/2020

ABSTRACT... Objectives: This study aims to determine the epidemiology of ocular trauma in the pediatric age group, with its risk factors and consequences, visiting a Tertiary care Hospital in Mirpur Azad Kashmir. **Study Design:** Cross Sectional Observational study. **Setting:** Department of Ophthalmology at Mohammadi Teaching Hospital, Mohiuddin Islamic Medical College, Mirpur Azad Kashmir. **Period:** June 2016 and April 2017. **Material & Methods:** A cross sectional observational study was conducted in our hospital on children aged 0-10 years presenting with ocular trauma in Eye Out Patient Department. **Results:** Of total 40 patients most common age of presentation was 5 and 8 years. Males (72.5%) were more than females (27.5%). Out of total patients, 27 (67.5%) presented with closed globe injury as compared to open globe. Among the closed globe injury most common trauma was with wood followed by stick and fall. In cases of open globe injury, trauma with wood and scissor were common causes. Home was the most common place of injury (20 cases/ 50%), followed by park, road and school. Most frequent cause of admission and type of injury was corneal ulcer. **Conclusion:** Children susceptible to ocular trauma are commonly males at ages 5 and 8 years. They should not be left unsupervised even at home. Objects like wood, stick and scissors etc. should be out of reach of children. Immediate comprehensive primary management and secondary rehabilitation are mandatory in these cases.

Key words: Acquired Blindness, Epidemiology, Ocular Trauma, Visual Acuity.

Article Citation: Mirza UT, Bahoo MLA, Ijaz K. Load and configuration of ocular trauma in pediatric patients of a tertiary care hospital in Mirpur Azad Kashmir. Professional Med J 2020; 27(11):2492-2498.
<https://doi.org/10.29309/TPMJ/2020.27.11.4677>

INTRODUCTION

One of the most significant cause of ocular disability in children is ocular trauma which possibly can be avoidable.¹ Children often have less coordination, reduced ability to operate accurately, lessened emotional control, and deficient awareness for self-protection as compared to adults. The children suffers from monocular visual disability and non-congenital unilateral blindness mainly as a result of ocular trauma.² Every year almost 160,000 to 280,000 children who are under 15 years of age are admitted in hospital due to ocular trauma.¹ The reported incidence of pediatric ocular trauma is 6.8 to 15.2 per 100,000 in the United States and other developed countries of the world.^{3,4} However, reported incidence of ocular trauma in children below 15 years is slightly on higher side in developing countries. A study done in Nepal

reported the incidence of ocular trauma to be 300/100,000 per year⁵ and 13% of ocular blindness was caused by ocular trauma in east Africa.⁶ Ocular trauma leads to multiple visits of hospital.⁷ Due to ocular injuries, people experience a lot of financial and social burden.⁸ Secondary to ocular injuries, there is ample and often redundant burden owing to obligatory medical care, rehabilitation services, long-term disability and loss of productivity.⁹ Diversity of settings in which eye injuries can happen has been seen like while playing in home or outside, at work or as a result of assault or accident.⁵ Ocular injuries in this age group are often more serious.¹ Up to 90 % of the injuries to the eyes can be avoided only by taking simple measures which can significantly reduce the burden of ocular injuries¹⁰ and subsequently proper management of ocular injuries can lessen the burden of blindness as well.¹¹ Although, it's an

important public health problem, there is relatively less population- based data related to the extent and risk factors for ocular trauma, especially from developing countries.¹²

Keeping in view the perspective of public health and injury prevention, estimation of the frequency and variety of these injuries in this age group can be beneficial in minimizing the ocular trauma by targeted educational and legislative efforts.²

Local population data about ocular trauma in children is inadequate in terms of etiology, setting, extent of injury, pattern of injury and management strategies. Aim of the study was to know the epidemiology and complications of the ocular injuries in Mirpur Azad Kashmir. Adequate data about cause and pattern of trauma would help to devise strategies for prevention and management of this devastating ailment. Proper resource allocation for the prevention and treatment of ocular injuries can be planned according to burden of ocular injuries in the region.

MATERIAL & METHODS

A cross sectional observational study was conducted in Ophthalmology department of Mohammadi Teaching Hospital, Mohiuddin Islamic Medical College, Mirpur Azad Kashmir on children aged 0-10 years between June 2016 and April 2017, after approval of ethical review board. All the patients presenting with ocular trauma in Eye Out Patient Department were recruited in the study after the informed consent. Various epidemiological demographic parameters like age, sex distribution as well as other like place at the time of injury, time passed since injury, mode of injury, causative object and nature of injury were recorded in already designed structured Performa.

Birmingham eye trauma terminology was used to group the ocular injuries¹³ naming closed globe which included contusion and laceration and open globe injuries which included laceration and rupture. Periorbital and adnexa injuries were also recorded. Snellen's chart was used for estimation of Visual acuity. On Slit lamp examination, detailed examination of eye and fundus assessment with

90D Lens was done.

The recorded data were entered in excel and 23rd version of SPSS was used for statistical analysis. Percentages and frequencies were used for the epidemiological parameters.

RESULTS

In this study 40 eyes of 40 patients were studied during a period of June 2016 and April 2017. Mean age of patients was 6.4 ± 1.5 years, ranging from 1 to 10 years. Most frequent injuries were at the age 5 and 8 years (Figure-1) Trauma was more in males (72.5%) than in females (27.5%). 50 % of the all ocular injuries occurred at home followed by 35% at park, 5 % on road side and 10% in school. The distribution of all cases according to place of injury and gender is given in Table-I.

Most common nature of injury was projectile (45%), others were house hold (27.5%), fall (10%), blunt (7.5%), chemical (5%), sports (2.5%) and assault (2.5%) (Figure-2). The distribution of nature of injury in relation to mode of trauma is given in Table-II.

As per early seeking of treatment, 42.50% eye injuries were reported between 24 hours to 7 days, 35% of cases were between 6 to 24 hours and remaining 22.50% eye injuries reported in less than 6 hours (Figure-3).

Regarding the mode of injury, 25 eyes (62.5%) presented with closed globe injuries where object of trauma was wood in 14.81% followed by stick, wire, stone, fruit seed, unknown, viper, spoon, shoe heal, plastic pen, knife, fire cracker, finger, bed edge and ball. 30% of closed globe injuries occurred in home while 20% in park. Open globe injuries presented in 27.5% where most trauma was secondary to wood (18.18%) and Scissor (18.18%) followed by syringe, stone, stick, knife, glass piece, fruit seed and door handle. 17.5% of the open globe injuries occurred at home while 10% happened in park. (Table-III). There were only 4 (10%) cases of adnexal injuries in which objects were dust, fire cracker, fall and ball.

Severe visual loss, that is visual acuity of $< 6/60$,

occurred mostly with open globe injury that is 20% (8 cases) followed by 15% cases with close globe injury (6 cases). (Table-IV)

Closed globe injuries presented with corneal ulcer in most of the cases (17.5%) while others were conjunctival hemorrhage (12.5%), cataract (10%), hyphema (7.5%), uveitis (5%), corneal abrasion (5%), conjunctivitis (2.5%) and conjunctival foreign body (2.5%). In open globe injuries, most frequent presentation was corneal tear (12.5%) followed by cataract (5%), corneal ulcer (5%), sclera perforation (2.5%) and uveal prolapsed

(2.5%). Among adnexal injuries, 7.5 % patients came with eyelid laceration and remaining 2.5% were having conjunctivitis (Table-V) Out of all patients with ocular trauma, 77.5 % cases required admission while remaining 22.5% were treated as outpatient. Surgery for cataract, corneoscleral tear and eyelid laceration was performed in 32% of cases where most commonly open globe injury (22.5%) was the reason while closed globe injury represented 10 % cases admitted for surgery. (Table-VI).

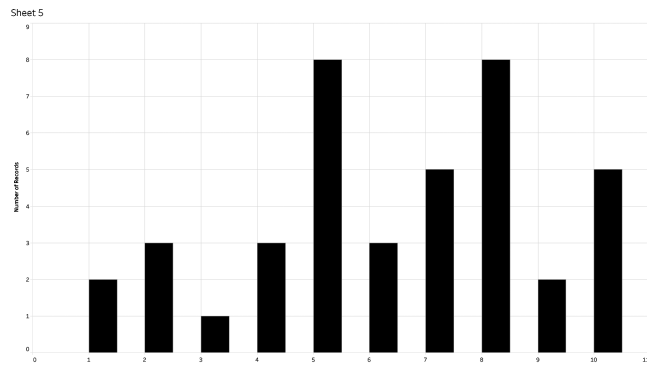


Figure-1. Distribution of cases according to age.

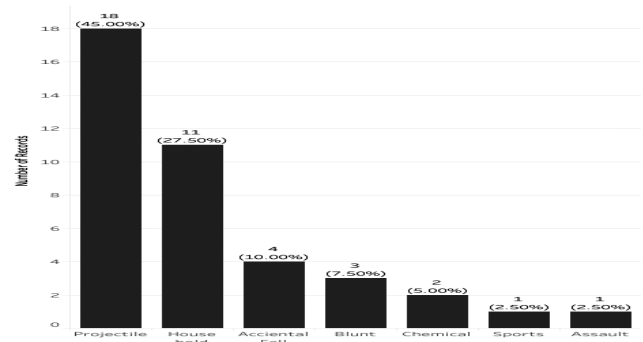


Figure-2. Frequency of cases in relation to nature of injury.

Place of Injury	GENDER		Total
	Females	Males	
House	8 (20%)	12 (30%)	20 (50%)
Park		14 (35%)	14 (35%)
Road		2 (5%)	2 (5%)
School	3 (7.5%)	1 (2.5%)	4 (10%)
Grand total	11 (27.5%)	29 (72.5%)	40 (100%)

Table-I. Place of injury in relation to sex.

Nature of injury	MODE OF TRAUMA			Grand Total
	Adnexal	Closed Globe	Open Globe	
Accidental Fall	1 (2.50%)	3 (7.50%)		4 (10.00%)
Assault		1 (2.50%)		1 (2.50%)
Blunt		3 (7.50%)		3 (7.50%)
Chemical		1 (2.50%)	1 (2.50%)	2 (5.00%)
Household		5 (12.50%)	6 (15.00%)	11 (27.50%)
Projectile	2 (5.00%)	12 (30.00%)	4 (10.00%)	18 (45.00%)
Sports	1 (2.50%)			1 (2.50%)
Grand Total	4 (10.00%)	25 (62.50%)	11 (27.50%)	40 (100.00%)

Table-II. Nature of injury in relation to mode of trauma.

Objects of Injury	HOUSE	PARK	ROAD	SCHOOL	Grand Total
Ball		1 (2.50%)			1 (2.50%)
Bed edge	1 (2.50%)				1 (2.50%)
Door handle	1 (2.50%)				1 (2.50%)
Dust		1 (2.50%)			1 (2.50%)
Fall	1 (2.50%)			2 (5.00%)	3 (7.50%)
Finger	1 (2.50%)				1 (2.50%)
Firecracker			1 (2.50%)		1 (2.50%)
Fruit seed	3 (7.50%)				3 (7.50%)
Glass piece	1 (2.50%)				1 (2.50%)
Knife	2 (5.00%)				2 (5.00%)
Plastic pen				1 (2.50%)	1 (2.50%)
Scissor	2 (5.00%)				2 (5.00%)
Shoe heal	1 (2.50%)				1 (2.50%)
Spoon	1 (2.50%)				1 (2.50%)
Stick	2 (5.00%)	2 (5.00%)			4 (10.00%)
Stone	1 (2.50%)	2 (5.00%)			3 (7.50%)
Syringe	1 (2.50%)				1 (2.50%)
Unknown		1 (2.50%)		1 (2.50%)	2 (5.00%)
Viper	1 (2.50%)				1 (2.50%)
Wire	1 (2.50%)		1 (2.50%)		2 (5.00%)
Wood		7 (17.50%)			7 (17.50%)
Grand Total	20 (50.00%)	14 (35.00%)	2 (5.00%)	4 (10.00%)	40 (100.00%)

Table-III. Objects of trauma in relation to place of injury.

Mode of Injury	6/18-3/60	6/18-6/6	<6/60	Grand Total
Adnexal		4 (10%)		4 (10.00%)
Closed Globe	9 (22.50%)	10 (25.00%)	6 (15.00%)	25 (62.50%)
Open Globe	2 (5.00%)	1 (2.50%)	8 (20.00%)	11 (27.50%)
Grand Total	11 (27.50%)	14 (35.00%)	15 (37.50%)	40 (100.00%)

Table-IV. Severity of visual loss in relation to mode of injury.

Type of Injury	Adnexal	Closed Globe	Open Globe	Grand Total
Cataract		4 (10.00%)	2 (5.00%)	6 (15.00%)
Conjunctival hemorrhage		5 (12.50%)		5 (12.50%)
Conjunctivitis	1 (2.50%)	1 (2.50%)		2 (5.00%)
Corneal abrasion		2 (5.00%)		2 (5.00%)
Corneal ulcer		7 (17.50%)	2 (5.00%)	9 (22.50%)
Foreign body Conj/Cornea		1 (2.50%)		1 (2.50%)
Hyphemia		3 (7.50%)		3 (7.50%)
Lid laceration	3 (7.50%)			3 (7.50%)
Partial/full thickness corneal tear			5 (12.50%)	5 (12.50%)
Scleral perforation			1 (2.50%)	1 (2.50%)
Uveal prolapse			1 (2.50%)	1 (2.50%)
Uveitis		2 (5.00%)		2 (5.00%)
Grand Total	4 (10.00%)	25 (62.50%)	11 (27.50%)	40 (100.00%)

Table-V. Type of injury in relation to mode of trauma.

Treatments	Adnexal	Closed Globe	Open Globe	Grand Total
Admitted for Medical purpose	3 (7.50%)	13 (32.50%)	2 (5.00%)	18 (45.00%)
Admitted for Surgery		4 (10.00%)	9 (22.50%)	13 (32.50%)
As outdoor patient	1 (2.50%)	8 (20.00%)		9 (22.50%)
Grand Total	4 (10.00%)	25 (62.50%)	11 (27.50%)	40 (100.00%)

Table-VI. Treatments given in relation to mode of injury.

Sheet 2

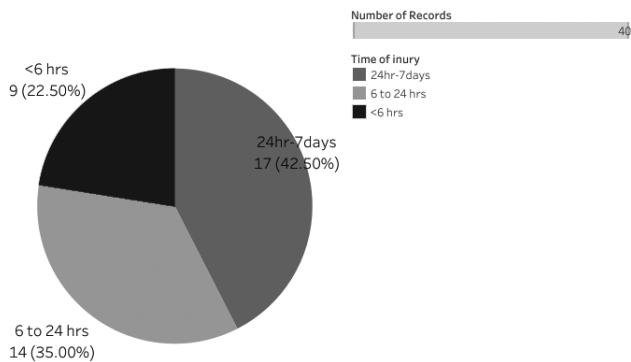


Figure-3. Number of cases with respect to time of injury.

DISCUSSION

Ocular trauma is one of the preventable causes of visual impairment and blindness.¹⁴

Forty patients having ocular trauma were included in this study. Our study reported the vulnerable age was between 5-8 years. Cao et al. 2013 also reported that the most vulnerable age for having ocular trauma is below 11 years.² Young age group is more prone to get ocular trauma may be due to their increased risk taking conduct and dynamic life style.¹⁵ Primary school children are more susceptible than the other aged group, though they are comparatively mature than the preschool aged children, but this susceptible age group is slightly more independent which may make them more vulnerable.²

Moreover, boys outnumbered the girls. In conation with our findings other studies also reported that in patients affected with ocular trauma majority are male.^{2,16} Male children are indulged more in outdoor activity with increase susceptibility to ocular trauma.

Our study reported that predominant type of injury was closed globe followed by open angle

similar to other studies.¹⁷ In closed angle type of injury the most common mode of trauma was projectile and object was wood in majority of the case. Similarly, open globe injury happened mostly due to wood.

In our study in both types of ocular injury i.e. open globe and closed globe the most frequent location of injury was at home similar to other studies.² A potential explanation for the higher risk at home might be that due to the fact that the toys or domestic utensils can be found in any home, which imposes potential danger for children. Sharp objects like knives and scissors, toys and bullets remained the leading agents of the home-related eye injuries according to the recorded injury causes.¹⁸ Moreover, due to inadequate adoption of safety measures during common house hold activities may be reason for majority of ocular trauma in women and children at home.¹⁵

Majority of the cases presented in the eye department after 24 hours. Our finding is comparable to other studies.¹⁴ However, only few cases presented within 6 hours of receiving an injury.

Severe visual loss, that is visual acuity of < 6/60, occurred mostly and was found more in patients with open globe injury followed by close globe injury. Different studies reported different pattern of visual loss ranging from good visual acuity¹⁶ to severe visual loss at the time of presentation.¹⁵

This difference in pattern is possibly be attributed to difference in severity of ocular trauma as well as due to difference in inclusion criteria of visiting patients. In our study most of the visited patients required admission for different treatment modalities like for medical purpose or for surgery

etc.

CONCLUSION

Pediatric ocular trauma is common in males of age group 5 to 8 years. The frequent type of injury was closed globe which mostly occurred at homes with wood. Ocular injuries resulted in substantial visual loss at the time of presentation

LIMITATIONS

Small sample size which may not be true representative of population as well as patients from high socioeconomic strata were unlikely to come to public hospital.

RECOMMENDATIONS



Further researches are needed to study the impact of health education on adaptation of safety measures in preventing ocular trauma and also it will help in establishing preventive and management strategies to cope with ocular trauma.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	M. Luqman Ali Bahoo	Critical review and analysis of data.	
3	Kanwal Ijaz	Drafting of article, Interpretation of data, Literature review.	