

Clinical Profile of Pattern of Ocular Trauma in Pediatric Population Presenting To MKCG Medical College

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Abstract: **Aim:** To identify cause, clinical profile and evaluate final visual outcome of ocular trauma in pediatric age-group (= < 15 years) patients attending OPD. **Materials and Methods:** Hospital based observational study was carried out in opd & casualty of MKCG medical college & hospital, Berhampur (Orissa) during OCT 1 2017-DEC 31 2017 where children up to 15 years age with history of ocular trauma attending the opd were included. Demographic details like age and sex, activity at time of injury, identifiable objects causing injury, presence or absence of supervision during injury were noted with follow-up period of 60 days. **Results:** In our study, total 23 patients were enrolled. The age-group most affected was 7 years and above. Boys (78%) were affected more than girls (22%). Adnexal injuries found in (8%) eyes, whereas closed and open globe injuries in (48%) and (44%), respectively. Most of children reported to casualty within 12 hours (56% eyes), remaining after 12 hours (48% eyes). The objects causing injury were blunt objects (14%), household objects (10%). The other causes of injury were sports (69%), accidental fall (4%), burn (8%), others (19%). Best corrected visual acuity (VA) of more than 6/18 achieved in 2 childrens, 6/18-6/60 in 4 eyes, < 6/60-counting finger close face (CFCF) in 6 eyes. Rest didn't come for follow up. **Conclusion:** The age-group most affected was 7 years and above. Boys were affected more than girls. The time of reporting to casualty was within 24 hours. Blunt objects, and household objects (Toys) were common causes of injury. The places of injury were home, playground, and others. Most of the children achieved best corrected visual acuity (BCVA) more than 6/18.

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I. Introduction

Ocular trauma is one of the major cause of non congenital mono-ocular visual disability in children. Pediatric eye injuries accounts for approximately 8-14% of total injuries and the most common type requiring hospitalization. Unlike in adults, pediatric injuries are age specific. Younger children suffer mostly from toy injuries while older childrens suffer mostly from outdoor recreational activities. Males often suffer more than females due to their adventurous and aggressive nature. Pediatric ocular trauma is of particular concern as it is prone to amblyopia. Even small trauma to the eye may lead to permanent visual impairment creating severe impact on future and quality of life. Ocular trauma can be in a wide spectrum resulting in cosmetic problems to vision threatening. Consequently the socioeconomic impact can be loss of career opportunities, major lifestyle changes, permanent physical disfigurement.

There are few studies conducted regarding pediatric ocular injuries in hospital set up, hence, we conducted an observational study to analyze the pattern and outcome of injuries in Mkcg medical college

II. Material And Methods

All the pediatric ocular injuries reporting to OPD and Casualty of Mkcg medical college, Berhampur, Orissa over the above time period was included in this study.

Study Design: Prospective observational study

Study Location: This was a tertiary care teaching hospital based study done Department of Ophthalmology at M.K.C.G Medical College Berhampur, Orissa, India

Study Duration: October 2017 to December 2017.

Sample size: 23 patients.

Sample size calculation: The sample size was estimated on the basis of a single proportion design.

Subjects & selection method: The study population was drawn from patients attending OPD and casualty of M.K.C.G Medical college and hospital.

Inclusion criteria:

1. Ocular trauma in pediatric age group less than 15 years.
2. Either sex
3. Aged 0-15 years
4. No systemic complications.

Exclusion criteria:

1. Patients with congenital cataract.
2. Patients with genetic disorders
3. Patients on other concurrent trauma.
4. Patients with acquired metabolic disorder.

Procedure methodology

Complete ophthalmic evaluation was done in all cases. The assessment includes a visual acuity test, slit lamp evaluation, funduscopy by both direct and indirect in closed globe injuries along with non-contact tonometry .The injuries were classified according to BETTS (BIRMINGHAM EYE TRAUMA TERMINOLOGY SYSTEM) classification . All patients were recorded under a standard evaluation protocol which consists of patients name ,age ,sex ,socioeconomic status ,time since injury ,place of injury & distance from tertiary hospital ,type of health care first given ,time delay in treatment ,circumstances of injuries ,BCVA at time of arrival ,type of injury according to BETTS classification & treatment given

Statistical analysis

The data was recorded on a predesigned pro forma and was then transferred to an excel spread sheet

III. Result

A total of 23 patients reported from Oct 1 2017 –Dec 31 2017. Mean age of injury was (9.65+/-2) years .Male is to female ratio (3.6:1). Male child between the age of 11 and 15 years constituted the largest group accounting for (52.17%) of total patients. Less than half of the cases (34.78%) first sought treatment at some other government health facility before being referred to Mkcg. About (65.22%) came directly to Mkcg. Mean time interval from the onset of injury to contact with health facility was (10+/-2) hrs . (21.73%) children belongs to urban population and (78.26%) children belong to rural population. More than 24 hrs delay in presentation is due to distance from periphery to hospital and mode of transport

In this study three varieties of ocular trauma were seen. Closed globe injury were due to blunt trauma whereas injury with sharp objects caused open globe injury or adnexal injuries..

TYPE OF INJURY	No. of cases
Open globe	10
Closed globe	11
adnexal	2

Following table shows the distribution of types of injuries in childrens in different age group.

Age of patients	OPEN GLOBE	CLOSED GLOBE	ADNEXAL
0-5 years	3	1	-
6-10 years	2	4	1
11-15 years	6	5	1

Majority of children sustained injuries during outdoor activities out of which 10 were males(43.4%) and they were in the age group of 7-15 yrs .This was followed by domestic injuries accounting 21.7% .Ocular injuries associated with fire cracker injury accounted for 4.34% .Thermal injuries accounted for 8.69% and chemical injuries were seen in none



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CIRCUMSTANCES OF INJURY	0-5YEARS	6-10 YEARS	11-15 YEARS
Domestic environment	2	1	2
Outdoor playing/recreational activities	2	5	8
Fire cracker injuries	-	-	1
Assaults/physical attacks	-	-	-
Animal bites	-	-	-
Thermal/chemical burns	1	1	-

Most of the open globe injuries were caused by injury with sharp objects. Out of patients with open globe injury corneal tear was seen in 8 cases(34.78%),scleral tear in 3 cases(13.04%), Laceration in the corneo-scleral region of eye 2 cases(8%) ,globe rupture due to penetrating cornea /sclera wound with uveal tissue prolapse seen in 3 cases(13%) . Only 1 retained intra ocular foreign body (thorn) was reported.



Closed globe injuries due to cricket ball/blunt trauma was seen mostly in males during outdoor activities.Out of 11 patients with closed globe injuries hyphema seen in 4 cases(36%) ,angle recession in 3 cases(27%) , lens damage in none ,vitreous haemorrhage in 3 cases (27%) and 1 case with retinal detachment



Closed globe injury with traumatic mydriasis



Adnexal injuries along with open globe injuries seen in 2 cases with lid injury in one.



5 cases presented with conjunctival tear in total along with sub-conjunctival haemorrhage

TYPES OF OBJECTS CAUSING INJURY	PERCENTAGE
Wood/thorn	39.13(9 cases)
Iron	17.39(4cases)
Stone	13.04(3 cases)
Cricket ball	13.04(3cases)
Fire crackers	4.34(1 case)
Thermal burns	8.69(2cases)
fall injury	4.34(1case)

Majority of children suffered injury while playing outside in school/playground which deemed for parental supervision necessary

Only 1 patient was registered as medico-legal case. Of all the cases 13 patients required surgical intervention at the time of presentation and the rest were conservatively managed

BCVA at presentation in most of the children below 10 years could not be assessed as they were in pain and due to fear. However 4 Patients with closed globe injuries who came for follow up during this period had VA better than 6/18 and some were missed as they could not be documented

IV. Discussion

The incidence of pediatric ocular trauma was found to be 9.38% among all injuries in this study. Dandona&dandona et al[7] reported that ocular trauma accounts for 4.2% -7% of all childhood blindness though the total incidence was not reported. Higher incidence in males can be explained on the basis of their dynamic nature & they spend more time outside with less adult supervision & exhibit more uninhibited behaviour compared to females.

Injury by wooden stick & vegetative matter are relatively common as they are available in form of play objects. A study done by saxena et al.[9] revealed bow & arrow to be the commonest mode of injury in 15.2% childrens which shows 39.13% in our study

56% patients presented <12 hrs and 44% presented between 12-48 hrs. This could be due to (1.)Distance of health care from patients needing better transport(2)Bias of parents by quacks regarding poor treatment in medical colleges and motivating them to private clinics(3)Medico legal complications of trauma(4)Gender bias in males which was more preferred than females regarding expenditure in treatment.

Most common age group is 7-15 yrs and in this age group most were due to outdoor playing/recreational activities. Lamellar laceration was most in closed globe type. Laceration in corneal region was the most common injury which was associated with poor visual prognosis. Closed globe injuries were more in urban population & mostly by cricket ball & open globe injuries were mostly in childrens playing with toys.

Initial visual outcome serves as an important factor in predicting final visual outcome. However BCVA in our study in patients with open globe injury could not be recorded at time of arrival due to immense pain but post operative follow up done after 7 days and 1 month with vision upto 3/60. As opposed to study by Agarwal et al [11]who reported that initial visual outcome could be a cause for poor visual outcome in cases with concurrence of endophthalmitis. Although our findings suggest that BCVA is a reflection of damage caused due to trauma leading to uveal tissue injury, traumatic cataract & posterior segment involvement. Patients with closed globe injury presented with VA 6/18-6/60 out of which 4 were followed up with improvement in VA & rest could not be documented.

Early interventional studies have a better chance of better visual outcome whereas delayed presentation leads to substantial damage, inflammation and secondary infection which deteriorates the condition

Studies have shown that final VA was significantly poor in eyes where primary repair was delayed beyond 24 hrs. This matches to my study where all repair are done under general anesthesia in pediatric cases and availability of anesthesiologist for ophthalmology emergency OT is questionable.

In non mechanical injuries follow up were done for any development of corneal opacity. Lid injuries were followed up for any development of ectropion or punctal block.

V. Conclusion

Open globe injuries occurring at home can be prevented by appropriate care by parents. Most of the patients are from poor background and from rural area. Higher public awareness of protecting pre-school going childrens from home related injuries should be done by barring specially china made toys which are most harmful & eye catching. Chemical injuries & fire works can be prevented under proper supervision. Timely diagnosis & quick referral from primary health care facilities in remote areas can improve visual outcome in childrens

Ocular trauma can be in a wide spectrum resulting in cosmetic problems to vision threatening, consequently the socioeconomic impact can be loss of career opportunities, major lifestyle changes, permanent physical disfigurement. There are few studies conducted regarding pediatric ocular injuries in hospital set up, hence, we conducted an hospital based observational study to analyze the pattern and outcome of injuries in Mkgc medical college. Although this study was for a short duration (3 months) it correlated with certain previous studies in past. During Oct1-dec31 2017 23 children upto 15 years with history of ocular trauma were reported. Demographic details like age, sex, activity at time of injury, identifiable objects causing injury, presence or absence of supervision during injury, were noted with follow up period for 60 days.

The age group most affected was 7 years and above. Boys (78%) were most affected than girls (22%), adnexal injuries were found in 8% where as closed and open globe injuries seen in 48% & 44% respectively. Most of the childrens reported to casualty/opd within 12 hrs (56%), remaining after 12 hrs (48%). The objects causing injury were blunt objects (14%), household objects (10%). The other causes of injuries were sports (69%), accidental fall (4%), burn (8%), others (19%). BCVA of more than 6/18 achieved 2 children, 6/18-6/60 in 4 eyes, <6/60-CF in 6 eyes. Rest did not come for follow up. Mode of transport and proper communication being a major factor in visual outcomes in pediatric patients, parents need to be counselled well regarding safety and supervision.

Also due to poor socioeconomic status factor most of the parents could not afford to advance private eye care centers and solely depends on Govt tertiary care hospitals which are better than local Govt. periphery hospitals, Hence government should take utmost care to improve the standard of tertiary care hospitals so that poor can also be benefitted with better visual acuity.

Like other awareness programmes running currently in Indian health scenario government should also plan for pediatric care and child awareness programmes regarding ocular injury prevention and counselling. Banning certain attractive cheaper china made toys can also prove to be beneficial.

Hence my study would throw some light in Indian scenario regarding prevention and proper counselling in parents regarding ocular injury as even small trauma to the eye may lead to permanent visual impairment creating severe impact on future and quality of life.

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