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Ophthalomology

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ETIOLOGY AND MANAGEMENT OF PEDIATRIC OCULAR TRAUMA IN TERTIARY EYE CARE CENTER IN WESTERN (U.P.)

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ABSTRACT

Background : Pediatric ocular trauma is a significant cause of preventable visual morbidity and unilateral blindness worldwide. Data from developing regions remain limited, necessitating regional clinico epidemiological evaluation to guide prevention and management strategies. **Aims and Objectives:** To determine the incidence, demographic and etiological profile, clinical presentation, and treatment outcomes of pediatric ocular trauma presenting to a tertiary care center in Western Uttar Pradesh, and to assess the role of awareness and prevention. **Materials and Methods:** A prospective interventional hospital based study was conducted from February 2020 to August 2021 at the Emergency Department and Ophthalmology OPD of LLRM Medical College, Meerut. Children <16 years presenting with ocular trauma were included. Detailed history, ocular examination, imaging where indicated, and appropriate medical or surgical management were undertaken. Patients were followed up to six months. Outcomes were assessed by visual acuity and complication profile. **Results:** Of 627 pediatric patients examined, 123 had ocular trauma (incidence 19.6%). Injuries were most common in children aged 6–10 years (45.5%) and in males (57.7%). Mechanical trauma was the leading cause (71.5%), followed by thermal/firework (15.4%) and chemical injuries (13.0%). Closed globe injuries accounted for 46.3% and open globe injuries 25.2%.Open globe injuries had poorer visual outcomes, with most not improving beyond 6/18. **Conclusion:** Pediatric ocular trauma remains a major yet largely preventable cause of visual impairment in Western Uttar Pradesh, particularly among boys aged 6–10 years. Mechanical and domestic injuries predominate. Early presentation and timely management improve visual outcomes, while open globe injuries carry worse prognosis. Community education, supervision of children are essential to reduce incidence and prevent avoidable childhood blindness.

INTRODUCTION

Ocular trauma is one of the most common causes of acquired blindness in children.[1]

There are about 1.6 million people blind due to eye injuries; in addition to this, 2.3 million are having low vision bilaterally and 19 million represent unilateral visual loss, making eye trauma the most common etiology of unilateral blindness.[2,3] Eye injuries measure about 8-14% of the total childhood injuries.[4]

Ocular trauma is one of the leading cause of treatable visual morbidity and blindness.[5] with children at a greater risk due to careless activities. 90% of eye trauma is preventable by taking care of minor things.[6]

The epidemiological parameter of childhood ocular trauma varies from region to region and also varies with demographic data like age and sex.[7]

Hence this study was conducted to evaluate the pattern, causes & treatment outcome of pediatric ocular trauma in this part of the country.

AIMS AND OBJECTIVES

1. To determine the incidence and epidemiological profile of Pediatric ocular trauma attending a tertiary hospital in Western U.P.
2. To determine Role of Health Education and awareness about risk of ocular trauma.
3. To evaluate the various presentations of eye in different accidental injuries.
4. To evaluate the treatment outcome of ocular trauma in pediatric age group.

MATERIALS AND METHODS

Prospective interventional study was conducted during Feb. 2020- Aug 2021 Period at Emergency Department (ED) & Ophthalmology OPD at the Upgraded Department of Ophthalmology, LLRM Medical College, Meerut.

INCLUSION CRITERIA

Study included consecutive cases of ocular trauma in children aged below 16 years of age.

EXCLUSION CRITERIA

Children who had congenital ocular deformities.
Ocular injury older than 1 month duration

Injury repaired elsewhere and who had injury in blind & atrophic Eye. Comatose patients. A detailed history regarding the etiology, site, mechanism and nature of injury was obtained.

The interval between the time of injury and the time of presentation and any treatment undertaken.

Visual acuity was assessed with and without correction. Anterior segment examination was carried out by bright flash light/ slit lamp depending upon the status of the patient. Examination was done by direct and indirect ophthalmoscope as needed.

Ultrasound (B-Scan) of the globe and adenexa and radiography (X-Ray, Computed Tomography, MRI) of the eye for presence of retained intraocular foreign body or wherever possible.

Eye brow and eyelid laceration were sutured in 3 layers deepest muscle layer with absorbable polygalactin 6-0, subcutaneous with polygalactin 6-0 skin with prolene 6-0 absorbable sutures.

Conjunctival laceration was managed conservatively if it was 1cm, while in case of lacerations measuring more than 1 cm continuous suturing with polygalactin 8-0 was done.

Corneo-scleral lacerations

The most preferred suturing method to appose the wound edges is interrupted suturing placed with 10-0 or 11-0 nylon with spatulated needle. The depth of the sutures was 85-90% of full thickness.

Steroid therapy for Traumatic Optic Neuritis can be categorized as follows; high dose of intravenous methylprednisolone per day or mega dose.

The patients with orbital fracture were managed conservatively or surgically depending upon the type of bone fractures.

All patients were appropriately managed and followed up on day 1, day 7, one month, three months & six months after presentations.

OBSERVATIONS AND RESULTS

Out of 627 Children examined in our OPD & Emergency during our study period, 123 presented with ocular trauma. Therefore Incidence of pediatric ocular trauma in our study was fund to be 19.6%.

Table 1: Based on age group.

Age Group	Male	Female	Total (%)
0-5 Years	27	19	46 (37.39%)
6-10 Years	34	22	56 (45.53%)
11-16 Years	10	11	21 (17.08%)

Most of the ocular injuries were between 6-10 years 56 (45.5%) followedby 0-5 years 46 (37.39%).

Table 2: Depending upon sex of the patients.

Gender	Number
Male	71 (57.72%)
Female	52 (42.28%)
Total	123

Out of 123 children, 71 (57.72%) were male and 52 (42.28%) were females.

Table :3 Based upon the time of presentation of injury.

Time of presentation of injury	Number (%)
<24 hrs	31 (25.20%)
>24 hrs	66 (55.65%)
>48 hrs	26 (21.13%)

In our study 66 patients ie. approximately 55.6% patients presented 24 hour injury had occurred. 31 (25.25%) patients in our study presented within 24 hours.

Table :5 Based upon the source/mode of injury

Source of injury	Number	%
1. Mechanical	88	71.54
a. Projectiles (Stone, Ball, Gulli, Toy-gun	31	25.20
b. Sharp Objects (Knife, Needle, Pencil Tip, Scissor, Stick	23	18.70
c. Fall/Hits (Fist, Cricket Bat)	16	13.01
d. RTA	14	11.38
e. Miscellaneous (Bird's Break, Animal's Horn, Hen's, Leg, Cooker's Blast	4	3.25
2. Thermal/Fire Work injury	19	15.45
3. Chemical Injury	16	13.01

Mechanical injuries were the leading cause for pediatric ocular trauma accounting for 88(71.45%) cases, followed by 19(15.44%) thermal/firework injuries and 16(13.02) chemical injuries.

Among the mechanical causes majority of ocular injuries are caused by projectile objects was 31(25.20%) followed by sharp objects 23(18.69%) like knife rest of the injuries were caused by fall/hit 16(13%) and RTA 14(11.38%) Out of 123 patients 88 patients constitute globe injuries. Out of 123 patients, 57 (46.34%) presented with closed globe injury and 31 (25.20%) presented with open globe injury.

Table :6 Based upon various ocular presentation due to Thermal/Firework injury.

Presentations	Number
Corneal Epithelial Defect	5
Corneal haze (Iris details visible)	6
Corneal Haze (Iris details Obscured)	4
Opaque cornea (Iris and pupil details obscured	4
Total	19

Table : 7 Based upon various ocular presentation due to chemical injury.

Presentations	Numbers (%)
Corneal Epithelial Defect	6
Corneal haze (Iris details visible)	2
Corneal Haze (Iris details Obscured)	4
Opaque cornea (Iris and pupil details obscured	4
Total	16

In our study we found out that 19 out of 123 patients presented with various ocular presentations due to Thermal/Firework injury and 16 patients out of 123 presented with various ocular presentations due to chemical injury (Lime, holy colors).

Table: 8 Based upon the type of management of the patient.

Type of management	Number (%)
Medical management	69(56.09%)
Surgical management	54(43.90%)

Out of 123 patients 69(56.09%) patients received medical management while 54(43.90%) required surgical interventions.

Table : 9 Based upon the distribution of visual acuity at presentation & after treatment.

Visual Acuity	At presentation		After Treatment	
	No	%	No	%
6/6-6/12	45	36.59	56	45.53
6/18-6/60	33	26.83	27	21.95
6/60-PL+	28	22.76	25	20.33
PL denied	6	4.88	6	4.88
Children where VA couldn't be assessed	11	8.94	9	7.32
Total	123		123	

In our study at the time of presentation 45(36.58%) of patients presented with 6/12 or better visual acuity. 33(26.83%) presented with visual acuity between 6/18-6/60 while 28(22-76%) presented with visual acuity between 6/60-PL positive. Poor prognosis in these patients was due to vitreous hemorrhage, optic neuritis, endophthalmitis, retinal detachment and secondary glaucoma.

Preverbal Children where visual acuity couldn't be assessed at the time of presentation and after completion of treatment were 11 and 9 respectively.

In our study those 31 patients (25.20%) that presented with open globe injury as compared to closed glove injury couldn't improve beyond than 6/18.

CONCULSION

That Pediatric ocular trauma can cause loss of vision, cosmetic and personality defects. Our data supports the need for prevention of eye injury in children. The age group form 6 to

10 years (Males>females) is most susceptible for trauma. The prevalence of ocular injuries happening at home is perhaps a reflection of less supervision at home. Hence, it is imperative that parents and family members should be mode aware about the common modes of trauma, the need of supervision of the objects of play and use of safety eyewear such as safety goggles.

Houses, playgrounds and schools must be made safe and common items of trauma such as sharp objects, household lime, acids must be kept out of reach of children.

It is very essential to educated children, parents, and teachers regarding ocular health. Intensive campaign may be done before festival seasons about safety measures to increase public awareness. Legislation is needed to ban/discourage the use of crackers, gulli danda & bows and arrows by children. Media can play important role in creating awareness or sensitizing the mass regarding prevention of ocular trauma. Importance of seeking early medical help must be impressed on parents. Emergency department physicians and health personnel must be made aware of the basic treatments in case of ocular emergencies and about prompt referral to ophthalmologists when needed.

Timely referral and management can help to prevent blindness ariginating from ocular trauma. Follow-ups of children are important for treating complications in the long term.

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