Research Article

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Pattern of ocular trauma in tertiary care hospital in Khammam

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ABSTRACT

Background: Ocular trauma is an important public health hazard. The objective of the study was to determine the pattern of ocular trauma among patients presenting in Mamata Medical College and Hospital, Khammam

Methods: Two years retrospective review of records of 120 patients with ocular trauma seen from Jan 2013 to Feb 2015 was done using a structured format.

Results: Ocular trauma accounted for 1.2% of the total ocular patients seen at OPD and Emergency. Of the studied 120 cases, 74 patients were below 30 years of age. 17 (14.16%) patients presented to hospital within 2-7 days of injury.

Conclusion: Duration of presentation has significant association with the presence of infection & other complication. The cause of injury were road traffic accidents, occupation related and sports playing & recreational activities in 54(45%), 39(32.5%) and 24(20%) respectively. Closed globe injuries accounted for 38(31.66%) and open globe for 58(48.33%) and adenexal injuries constituted 24(20%). Delay in presentation was associated with complications.

Keywords: Ocular Trauma, Blindness, Open globe injury, Close globe injury

INTRODUCTION

Trauma to the eye and its surrounding structures remains a leading cause of visual morbidity and blindness. Many ocular traumas are an avoidable cause of blindness and visual impairment. Worldwide there are approximately 6 million people blind from eye injuries, 2.3 million bilaterally visually impaired and 19 million with unilateral visual loss; these facts make ocular trauma the most common cause of unilateral blindness. According to estimates by WHO, about 55 million eye injuries restricting activities for more than one day occur each year, 750,000 cases requiring hospitalization which includes 200,000 open globe injuries. 3

Ocular injuries can assume unusual social and economic importance involving a huge cost in human unhappiness, economic inefficiency and monetary loss.

In view of public health importance, this study will provide information on magnitude and pattern of ocular injuries at

Mamata General Hospital, Khammam. It will serve as the basis for designing and implementing preventive measures.

METHODS

A two years retrospective study was conducted which included 120 patients of ocular trauma in Department of Ophthalmology, Mamata Medical College and Hospital, Khammam from Jan 2013 to Feb 2015.

Operational definitions were according to World Health Organization (WHO) and Birmingham Eye Trauma Terminology System (BETTS). 4

Blindness: Visual acuity <3/60 Eye Wall: Cornea and Sclera

Closed Globe Injury

 Contusions: no full thickness wound, direct energy delivery (e.g. choroidal rupture) or due to change in shape of the globe (e.g. angle recession) Lamellar laceration: partial thickness wound of the eye wall

Open Globe Injury: full thickness wound of the eye wall

- Laceration: full thickness wound at the impact site of a sharp object by outside- in mechanism
- Penetrating: entrance wound only
- Perforating: entrance plus exit wound
- Intra- ocular foreign body: technically a penetrating injury, but grouped separately because of different clinical implications
- Rupture: Full thickness wound by blunt object by inside out mechanism due to increased intraocular pressure
- Adenexal injuries: Eyelid and/or conjunctiva injuries

During the initial examination, we also evaluated the ocular trauma score (OTS)⁵ of each and every injured eye using the Ocular Trauma Scoring system, developed by Kuhn et al., since it provides prognostic information regarding the final visual outcome post-eye injury. It is a scoring system that takes into account six variables [Table 1]. Higher OTS scores tend to indicate a better visual prognosis.

Table 1: The ocular trauma score.

Variables	Raw points
Initial vision	
NPL/enucleation/evisceration	60
LP/HM	70
1/60-5/60	80
6/60-6/15	90
6/12	100
Rupture	-23
Endophthalmitis	-17
Perforating injury	-14
Retinal detachment	-11
RAPD	-10

NLP: No light perception, LP: Light perception, HM: Hand movement, RAPD: Relative afferent papillary defect. Note: With the final score, each eye evaluated was placed within an OTS category: Category 1:0-44 points, Category 2:45-65 points, Category 3:66-80 points, Category 4:81-91 points, Category 5:92-100 points.

Based on literature review, the factors likely to predict outcome after open globe injury are mechanism or type of injury, preoperative visual acuity (VA), time lag between injury and surgery, relative afferent pupillary defect (RAPD), size and location of the wound. Besides the above listed variables, other parameters that can predict vision outcome are retinal detachment, uveal or retinal tissue prolapse, vitreous hemorrhage, lens damage, hyphema and number of operative procedures. ^{6,7,8,9,10,11}

RESULTS

It was found that the ocular trauma accounted for 120 patients in the time period from Jan 2013 to Feb 2015.

In our study 92 (76.66%) presented within 2 days, 24 (20%) presented in 2-7 days while 4 (3.33%) after 7 days of injury. Right eye was involved in 53 (44.16%) patients, left eye was involved in 62 (51.66%) patients. 5 patients had bilateral injury. Age group and sex distribution of cases is shown in Table 2.

Table 2: Age group and sex distribution of ocular trauma patients.

Age (yrs)	Male	Female	Total (%)
< 5	4	3	7 (5.83)
5 - 14	8	7	15 (12.5)
15 - 24	16	10	26 (21.66)
25 - 34	19	9	28 (23.33)
35 - 44	15	7	22 (18.33)
45 - 54	10	3	13 (10.83)
55 - 64	2	0	2 (1.66)
> 65	5	2	7 (5.83)
Total	79 (65.83%)	41 (34.16%)	120 (100)

Among the causes of injury, road traffic accidents accounted for maximum number of cases, i.e., 54 (45%), followed by occupation related 39 (32.5%), followed by sports, playing and recreational activities which accounted for 24 (20%) and others like domestic accidents, violence related were other identified causes. Causes of injury and sex distribution of cases is shown in Table 3.

Table 3: Cause of injury and sex distribution of ocular trauma cases.

Cause of Injury	Male (%)	Female (%)	Total (%)	
Road Traffic Accidents	38 (31.66)	16 (13.33)	54 (45)	
Occupation Related	23 (19.16)	16 (13.33)	39 (32.5)	
Sports, Play, Recreational	16 (13.33)	8 (6.66)	24 (20)	
Domestic Accidents	1 (0.8)	1 (0.8)	2 (1.6)	
Violence Related	1 (0.8)	0	1 (0.8)	
Total	79 (65.83)	41 (34.16)	120 (100)	

Regarding the material of injury the commonest material accounting for trauma was wooden stick in 22 (18.33%) patients, followed by stone in 12(10 %), followed by finger nail trauma, fall from height and playing with ball in 5 cases each. Other miscellaneous mode of injury included fire cracker injury, injury with hot oil, blunt trauma, iron rod. Playing with bow and arrow, and gullidanda are a unique and common cause of ocular injury in our country. Clinical findings on presentation are shown in Table 4.

Table 4: Clinical findings on presentation.

Clinical Findings	Number	Percentage
Subconjunctival Haemorrhage	5	4.16
Corneal / Corneo- Scleral / Scleral Laceration	16	13.33
Hyphaema	5	4.16
Conjunctival Laceration	4	3.33
Corneal Epithelial Defects	1	0.83
Traumatic Iridocy clitis	5	4.16
Cataract/ Subluxated/ Dislocated Lens	15	12.5
Lid / Canalicular Laceration	24	20
Angle Recession Glaucoma	5	4.16
Vitreous Haemorrhage	8	6.66
Retained IOFB	7	5.83
Retinal Detachment	3	2.5
Macular Hole / Scar	5	4.16
Iridodialy sis	4	3.33
Endophthalmitis	3	2.5
Traumatic Optic Atrophy	10	8.33

Open globe injuries were found to be more common accounting for 58 (48.33%) patients than closed globe injuries which accounted for 38 (31.66%) patients. Adenexal injuries were present in 24 (20%) patients. Complications such as traumatic cataract, endophthalmitis, hyphaema, raised intraocular pressure, hypopyon were present in 36(30%) patients. Out of these, only 9 (25%) patients presented within 24 hours. Presence of complications was found to have significant association with the duration of presentation. Involvement of the posterior segment was a significant factor responsible for a poor visual outcome. Retinal detachment and endophthalmitis were specially found to be associated with a bad visual prognosis. Type of injury and final visual outcome is shown in Table 5.

Coming to the visual acuity at presentation, 40 (33.33%) had visual acuity of 6/6- 6/18 while 63 (52.5%) patients were blind at presentation i.e., visual acuity <3/60. Visual acuity was NPL in 17 (14.16%) cases. Final visual outcome (1 week after treatment) was difficult to analyze as in 14 (11.66%) cases, it was not documented and 8 (6.66%) were not cooperative. Out of the remaining 98 cases, 54 (45%) cases had visual outcome of 6/6 – 6/18, but 30 (25%) patients were documented to have a blinding outcome i.e., visual acuity of <3/60, in-spite of the best operative procedures and management which could be given to the patients. Non –surgical and surgical management in eye injury cases is shown in Table 6.

Table 6: Non-surgical and surgical management in eye injury cases.

Management	Number of Cases	Percentage (%)
Non- Surgical	41	34.16
Surgical	79	65.83
Ocular Wall Repair	16	13.33
Lens Extraction	15	12.5
Posterior Vitrectomy	15	12.5
A. C Wash	5	4.16
Scleral Buckle	3	2.5
Keratoplasty	5	4.16
Enucleation	5	4.16
Glaucoma Surgery	2	1.66
Canalicular Anastomosis	6	5
Orbital Fracture Repair	7	5.83
Total	120	100

Table 5: Type of injury and final visual outcome.

Type of Injury	Final Visual	Outcome, V/A	1			Total No. (%)
	6/6 – 6/18 (%)	< 6/18 – 3/60 (%)	<3/60 – NPL (%)	Not Documented (%)	Not Co- operative (%)	
CLOSED GLOBE						
Lamellar Laceration	5 (4.16)	0	0	3 (2.5)	2 (1.66)	10 (8.33)
Contusion	13 (10.83)	1 (0.83)	3 (2.5)	9 (7.5)	2 (1.66)	28 (23.33)
OPEN GLOBE						
Penetrating	9 (7.5)	12 (10)	25 (20.83)	2 (1.66)	2 (1.66)	50 (41.66)
Perforating	0	0	1 (0.83)	0	0	1 (0.83)
IOFB	3 (2.5)	1 (0.83)	1 (0.83)	0	2 (1.66)	7 (5.83)
Rupture	0	0	0	0	0	0
Adenexal	24 (20)	0	0	0	0	24 (20)
Total	54 (45)	14 (11.66)	30 (25)	14 (11.66)	8 (6.66)	120 (100)

DISCUSSION

The magnitude of ocular trauma was found to be 1.2% out of total ocular patients seen in the outpatient department. This figure is significantly lower as compared to a study done at JUDO, south west Ethiopia, 12 where it was found to be 6.9%. It was found

in this study that 63.8% patients were below 30 years of age with mean age of 25.5 (SD±15.6) years and male to female ratio of 3.2:1.

In our study we found 74 (61.66%) patients were below 30 years with mean age of 28.8(SD±17.1) years with male to female ratio was 1.5:1. The explanation for this

could be the greater risky, occupation and stimulus to aggressiveness given to males in almost all societies and better access to health services. Age group and sex distribution of cases is shown in Table 3.

In the JUDO¹² study 31.6 % patients presented within 48 hours whereas 28.6% arrived one week or later. According to our study, 88 (73.3%) presented within 2 days, 17(14.16%) presented in 2-7 days while 15(12.5%) after 7 days of injury. Our study did not show significant association between involvements of either eye. Right eye was involved in 53(44.16%) patients, left eye was involved in 62(51.66%) patients. 5 patients had bilateral injury. The slight predominance of the left eye injuries may be explained by the fact that most people are right handed and the left eye of the victim is the one which is more vulnerable to an attack from a right handed person.

Among the causes of injury, road traffic accidents accounted for maximum number of cases, i.e., 54 (45%), followed by occupation related 39(32.5%), followed by sports, playing and recreational activities which accounted for 24 (20%). Causes of injury and sex distribution of cases is shown in Table 4.

Study of JUDO¹² showed commonest causes of injury were violence related 37.2% of the documented causes.

In this study open globe injuries were found to be more common accounting for 58(48.33%) patients than closed globe injuries which accounted for 38(31.66%) patients, as according to studies conducted worldwide. ^{13,14,15} But study at JUDO¹² showed closed globe injuries (45.4%) were encountered more than open globe injuries (22.7%). Type of injury and final visual outcome is shown in Table 5. A patient with corneo- scleral tear with iris prolapse is shown in Figure 1. Figure 2 shows corneo-scleral tear repair with A.C reformation done in the same patient.



Figure 1: Corneo-scieral tear with iris prolapse.

Blunt injury can affect the internal structures of the eye by coup-countercoup mechanism resulting in more significant damage and similarly significant injury to optic nerve. With blunt injury, wound can get extended posterior to recti insertion resulting in poorer final vision outcome. Presence of vitreous loss does indicate associated vitreoretinal disturbances and possibly retinal trauma. During the primary corneoscleral wound repair, surgeon needs to pay attention to vitreous in the wound and try and clear it off the wound with help of sponge vitrectomy otherwise vitreous incarceration in the wound can result in vitreoretinal traction with possible poorer outcome. Non –surgical and surgical management in eye injury cases is shown in Table 6.



Figure 2: Corneo-scleral tear repair done with A.C reformation.

Blowout fractures result from blunt-force injury to the orbit, with the transmitted force causing fracture of the weakest points of the orbit, mainly the floor and medial wall. Clinically, the patient will have lack of elevation on attempted up-gaze (due to entrapment of the inferior rectus in the fracture), loss of infraorbital sensation and subcutaneous crepitus. Facial X-rays or a CT scan will show opacification of the maxillary sinus because of herniation of the orbital contents and entrapment of the inferior rectus. Figure 3 is C T scan showing left orbital floor fracture with herniation of tissue into the maxillary sinus.



Figure 3: CT scan showing left orbital floor fracture with herniation of tissue into the maxillary sinus.

This study also has shown that road traffic accidents are the commonest causes of ocular injuries followed by occupational accidents & recreational activities. Simple safety procedures like wearing seat belts in driving, protective goggles in welding, supervising children while playing, etc. should be advocated using mass media.

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