Study of Clinical Profile of Ocular Trauma at a Tertiary Eye Care Centre

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ABSTRACT

Introduction: To study the clinical profile of ocular trauma cases at a tertiary eye care centre in rural North Maharashtra.
Material and Methods: The study was conducted at a tertiary eye care centre between Aug 2011 & Jan 2013. The study includes a total of 403 patients attending eye OPD with a history of ocular trauma. All cases underwent detailed ocular examination of anterior and posterior segment. Investigations were done wherever needed.
Results: Out of 403 cases, 36.25% were in the age group of 16 to 30 years & 29% in the age group of 31 to 45 years. Males were affected 3.7 times more than females. 26% cases sustained trauma while working on the farm while 23% were workplace injuries. Blunt trauma was the commonest presentation at 25.75% followed by foreign body in 21.25%. Cornea (54%) and conjunctiva (24.75%) were most frequently involved. Most of the injuries were mechanical (95.25%) while non mechanical injuries were less (4.75%). Closed globe injuries were common (80.04%) and open globe injuries were less common (14.96%).
Conclusion: Ocular trauma is an important and preventable cause of ocular morbidity in rural areas. Most of the cases of trauma are closed globe mechanical injuries affecting economically earning young population.

Keywords: Ocular Trauma, Rural, Closed Globe Injury

INTRODUCTION

Ocular trauma is a major cause of preventable blindness & visual impairment. Despite having major socioeconomic impact, very less data is available on the magnitude & risk factors of ocular trauma.

Impact of trauma on human eye ranges from minute subconjunctival haemorrhage to a lacerated globe. The outcome is generally not good in patients with grossly reduced visual acuity on presentation. Owing to the delicacy of ocular tissues, delayed presentation worsens the visual outcome.

The impact of ocular trauma in terms of need for medical care, loss of income & cost of rehabilitation services points towards the need for strengthening of preventive measures worthwhile. Mass awareness regarding potential risk factors & agents causing injury can prevent number of ocular hazards.[1-3]

This study aims at providing epidemiological data on ocular injuries in rural north Maharashtra. It will help in the planning and provision of eye care and implementing preventive and safety strategies in this region. This study takes into consideration the causative agents, place of injury, type of injuries & their classification. It gives us detailed information about the nature and severity of ocular morbidity due to trauma. Our hospital is geographically located near the rural population mostly involved in agricultural work. There are few small scale industrial centres in the town & ours is the only tertiary eye care hospital in the region.

Despite its public health importance, there is relatively less population based data on the magnitude and risk factors for ocular trauma, especially for developing countries. Few such studies have been carried out in different parts of India but no such study has been carried out in this region.

MATERIAL AND METHODS

All the patients attending OPD at our institute with primary diagnosis of trauma during the period Aug 2011 to Jan 2013 were included in the study. The ethical committee of our hospital was briefed about the study regarding the rationale, nature & procedure of the study & approval was obtained from the committee. A total of 403 patients were examined & data was collected. The demographic data of each patient including age, sex, address, occupation & financial status were recorded. A detailed history was obtained regarding the trauma, its nature & circumstances. Patients residing in the taluka or a smaller place with no district hospital were labelled as rural. The literacy was determined on the basis of educational status as told by the patient.

Detailed ophthalmological examination of all patients was carried out. Snellen's chart was used to record visual acuity. Slit lamp examination, 90D examination & indirect ophthalmoscopy was carried out. Intraocular pressure was measured with Goldman applanation tonometer. Gonioscopy was done in closed globe injuries. Radiological investigations like X-Ray orbit, CT Scan, MRI were done as indicated.

Complete details of ophthalmological examination included initial best corrected visual acuity, ruling out any eyelid injury, conjunctival tear or subconjunctival haemorrhage, examination of the cornea for foreign body, abrasion, laceration or perforation ,any scleral tear or laceration, ruling out hyphaema, iris injuries or afferent papillary defect. Examination of posterior segment was carried out for

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Age Group (Years)	Male		Female		Total	
	Cases	%	Cases	%	Cases	%
upto 15	43	13.56467	18	20.93023	61	15.13648
16-30	123	38.80126	23	26.74419	146	36.22829
31-45	97	30.59937	21	24.4186	118	29.2804
46-60	38	11.98738	16	18.60465	54	13.3995
Above 60	16	5.047319	8	9.302326	24	5.955335
Total	317	100	86	100	403	100
Total	403	100				

Table-1: Age and Sex-wise Distribution of Ocular Injury Cases

Causative Agent	No. of Cases	%
Blunt	103	25.55831
Foreign Body	85	21.09181
Vegetative Matter	66	16.37717
Sharp	63	15.63275
Sports Equipment	20	4.962779
Finger/Fist	17	4.218362
Chemical	16	3.970223
Animal Part	13	3.225806
Fire Cracker	5	1.240695
Other	15	3.722084
Total	403	100

Table-2: Distribution of Cases by Causative Agents

Time of Reporting (Less Than)	No. of Cases	%
24 Hours	141	34.98759
72 Hours	114	28.28784
7 Days	73	18.11414
15 Days	46	11.41439
30 Days	29	7.19603
Total	403	100

Table-3: Distribution of ocular injury cases as per reporting time after injury

Ocular Structure Involved	No. of Cases (Including Multiple Structure Injury)	%
Cornea	216	54
Conjunctiva	97	24.25
Lens	53	13.25
Lid	32	8
Retina	30	7.5
Iris	27	6.75
AC	25	6.25
Vitreous	22	5.5
Sclera	18	4.5
Orbit	4	1
Optic Nerve	3	0.75

Table-4: Distribution of cases by ocular structure involved

detection of vitreous haemorrhage, retinal detachment, retinal break or tear, choroidal rupture, choroidal haemorrhage or subretinal haemorrhage. The record of previous treatment, if any, was obtained from the patient and findings at the time of initial examination were noted. The patients were followed up after two days, one week, two weeks & thereafter as per requirement.

All the terminologies were based on BETTS i.e. Bermingham Eye Trauma Technology. It establishes easy to use, unambiguous terminology organized in a clinically relevant design.

STATISTICAL ANALYSIS

Standard classification with ocular trauma score was used to classify the injuries. The data was entered regularly. Nominal data was presented as numbers & percentage. Data analysis & percentage calculation was done using Microsoft Office Excel.

RESULTS

A total of 403 eyes were examined during the period of one and half years. The number of persons sustaining injuries was highest i.e. 145 (36.25%) in the age group of 16 to 30 years followed by 116 cases (29%) in the age group of 31 to 45 years). 43 cases (13.65%) were found to be males in the age group of 1 to 15 years. 18 cases (21.18%) were females in the same age group. Number of cases in the age group of 16 to 30 years was 123 (38.78%) for males & 23 (27.06%) for females. Number of cases in the age group 31 to 45 years was 97 (30.40%) in males & 21 (23.53%) in females. Number of cases in the age group 46 to 60 years was 38 (12.06%) in males & 16 (18.22%) in females. Number of cases above 60 years of age were 16 (9.41) in males & 8 (5.08%) in females.] a total of 315 (78.75%) patients were males & 85 (21.25%) patients were females. Most of the females sustaining injury were agricultural workers (Table 1).

Most of the patients had involvement of only one eye, right eye being involved in 196 (49%) cases, left eye being involved in 197 (49.25%) cases & both eyes were involved in only 7 (1.75%) cases.

In 104 cases (26%) location of the injury was farm, in 92 (23%) cases, the injury occurred at work place other than farm, 80 (20%) cases sustained injury at home, 55 (13.75%) sustained injury on the street & 13 (3.25%) sustained injury at school.

Injuries were most commonly caused by blunt objects in 103 cases (25.75%), foreign bodies were found in 85 cases (21.25%), vegetative matter caused injuries in 66 cases (16.9%). 63 cases (15.75%) sustained injuries with sharp objects. 20 (5%) cases sustained injuries with sports equipments. 13 cases (3.5%) sustained injuries with animal parts (horns or tail). 5 cases (1.25%) had cracker injuries and other causes of injury were seen in 158 (3.75%) cases (Table

2).

141 cases (35.9%) reported to the hospital within 24 hours. 114 cases (28.8%) reported within 48 hours. 73 cases (18.25%) reported within 7 days. 46 cases (11.50%) reported within 15 days & 29 patients (7.25%) reported after 15 days (Table 3).

Closed globe injuries were present in 324 (85.04%) of cases & open globe injuries were present in 57 (14.96%) cases. In case of open globe injuries 46 cases (80.70%) had penetrating injury, 4 cases (7.02%) had intraocular foreign body and 7 cases (12.28%) had mixed injuries. 15 cases (26.32%) had open globe injury involving zone 1, 24 cases (42.11 %) had injury involving zone 2 & 18 cases (31.58%) had injury involving zone 3.

In closed globe injuries, 133 cases (41.05%) had contusion, 113 cases (34.88%) had superficial foreign body, 66 cases (20.37%) had lamellar laceration & 12 cases (3.70%) had mixed injuries. 255 cases (78.70%) of closed globe injuries involved zone 1, 39 cases (12.04%) involved zone 2 & 30 cases (9.26%) involved zone 3).

As shown in table 4, we found that maximum ocular injury cases involved the cornea (216, 54%) followed by conjunctiva (24.25%) and lens (13.25%).

DISCUSSION

Ocular injuries can occur in almost any setting. These mainly include rural agricultural farms, occupational work places, homes, recreational and sports centres and road accidents.

From the available literature it is seen that very less data on ocular injuries is available from Indian studies. No such data is available from Central India where this study was undertaken.

Epidemiological profile of ocular trauma varies in developing and developed countries. Economical background, public awareness and availability of resources are responsible for this difference. This data is helpful in defining target population and accordingly, preventive measures can be taken.

In this study, 403 patients were included out of which 65.25% were found to be in the age group of 15 to 45 years. Out of the total numbers of the patients in this age group, 69.21% were males. So, potential earning group was more commonly affected leading to loss of work days & economic burden on their family.

A similar study carried out by Somen Misra has recorded the percentage of adults in the same age group as 55%. Out of which, 71.67% were males[1]. Our study also observed 3.7% more dominance of ocular trauma in males than females. A study by Wong et al[2] found that males have 4 times higher risk than females. According to Misra, incidence was 71.6% in males & 28.3% in females. This male preponderance is explained on the basis that men are more commonly involved in agricultural & industrial work. In the same study, 26.7% of patients were in the age group of 0-10 years, which indicates trauma as an important cause of childhood ocular morbidity. Vats et al[3] also observed that most of the injuries in children lead to greater ocular damage.

Our study found that most of the ocular injuries are unilateral. We also found that both right and left eye were involved almost equally, right eye injuries being 49% & left eye injuries being 49.25%. We also found 1.75 cases of bilateral injuries. In similar studies Sinha[4] reported right eye preponderance in 68.4% & study in rural South India by Arvind Hospital[5] reported 0.4% cases with bilateral injury. The most common site for ocular injury in our study was farm (26%) followed by workplace (23%). Injuries at home were found in 20% injuries on street were found to be 13.75%.

Urban slum population study found higher prevalence of ocular trauma at workplace. Krishnaiah et al[6] have reported that majority of eye injuries occurred at the workplace (55.9%) followed by home (21.7%). Playgrounds & schools accounted for 4% injuries in our study. This is comparable to a study carried out by Singh D. V. et al[7] which reports 7.6% injuries at recreational venue. In this study, injuries on street accounted for 13.75% cases. These were in the form of ocular involvement in vehicular accidents or foreign bodies. Similar finding have been reported by S. Khatry et al[8] with 13.7% cases of injuries on the street.

Various agents like wooden sticks, vegetable matter, dust or other foreign bodies, animal body parts or sports objects can cause mild to grave ocular injuries. In our study, blunt objects were the most common agent found in 25.75% cases. Nirmalan[5] also observed blunt objects to be the common cause of injury in 54.9% of their cases. In our study, foreign bodies were found in 21.25% cases. Abraham et al[9] reported wooden stick as an offending agent for ocular injury in 21% cases. We had 15.75% of cases of injury caused by sharp objects while Vats et al[3] have reported 2.5% injuries with sharp objects. The increased incidence of injuries with sharp objects in our study can be attributed to the use of agricultural equipment & industrial injuries as many people in this area are agricultural workers or workers on power looms. The study by S. Khatry et al[8] reported that 25.8% cases were due to agricultural agents. We found 4% cases of chemical injuries while S. Khatry has reported 1.30% chemical injuries. Singh D. V. et al[7] have reported 5% cases of chemical injuries. We also observed few cases of injury due to animal parts 3% & fire cracker injuries were observed to be 1.25% in this study.

Delay in seeking medical help after an ocular injury increases the severity of the disease and affects the final visual outcome. The causes of delay are illiteracy, ignorance, rural status & poverty. We found that 35% cases reported within 24 hours, 28% within 72 hours and 18.5% within 7 days. 11% cases presented within 7 to 15 days & 7.25% presented after 15 days. While Saxena R[10] observed that 24% cases reported within 6 hours, a study by Gyasi[11] found that 57.3% cases sought medical aid within 48 hours after injury.

Anterior segment was most commonly involved in our study with 82.75% while posterior segment was involved in 7.25% cases. Both anterior and posterior segments were involved in 4% cases. These were among the most serious injuries occurring due to penetrating trauma. Extraocular involvement was found in 5.5% which included lid tear,

orbital fracture etc. 85.04% of our cases were closed globe injuries and 14.96% were open globe injuries. Closed globe injuries are more common in the form of superficial foreign body & blunt trauma. This is consistent with eye injuries in Singapore Study by Woo[12] in which they found 95% injuries to be closed globe and 5% injuries to be open globe. Out of the total closed globe injuries in this study, 78.70% were involving zone 1, 12.04% cases involved in zone 2 and 9.26% cases involved zone 3. Out of the total 57 open globe injuries, 45.61% were penetrating injuries, 35.09% had rupture of globe, 7.2% had intraocular foreign body and 12.28% had mixed injuries. Out of these, 26.23% involved zone 1, 42.11% involved zone 2 and 31.58% involved zone 3.

Out of 19 cases of non mechanical injury, 16 (84.21%) were chemical injuries. Out of 16 cases of chemical injury, 11 (68.75%) cases were grade 1 and 5 (31.25%) cases were grade 2.

Taking into consideration the ocular morbidity because of trauma in the young wage earner age group, the need for its prevention cannot be over emphasized. In rural area ocular trauma mainly affects agricultural workers and labourers in small scale industries. Mass education regarding paying immediate attention to ocular trauma is necessary. Agricultural and industrial labourers, students and housewives should be educated regarding measures of prevention of trauma, importance of obtaining immediate treatment and consequences of ocular injuries. Industrial workers and agricultural workers involved in spraying of pesticides and fertilizers should be educated about protective eye wear.

LIMITATIONS OF STUDY

Ours being a speciality eye hospital in rural set up, cases of ocular trauma associated with polytrauma and patients with poor general condition could not be included as they had to be referred elsewhere.

CONCLUSION

Ocular trauma sustained during agricultural work is an important cause of ocular morbidity in rural India where farming is a major occupation. It still remains a common and preventable cause of ocular morbidity. The commonest age group affected is that of young adult males. The commonest type of injuries being closed globe injuries affecting the anterior segment of the eye. The visual outcome depends upon severity of the injury and the time taken for reporting to a speciality eye care centre.

Effective mass education is needed for prevention of ocular injuries and seeking early medical help. Eye care programmes need to consider ocular trauma as a priority in the rural population.

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