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Epidemiological profile of ocular trauma patients attending eye outpatient department in a tertiary care Hospital

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Abstract
Aim: To study epidemiological profile of ocular trauma patients attending eye outpatient department in a tertiary care Hospital.
Material and method: This study was carried out in the Department of Ophthalmology, Mathura Das Mathur hospital, Dr. Sampurnanand medical college, Jodhpur. A prospective study was conducted over a period of 1 year (September 2016 to August 2017) in which all patients admitted or referred to Ophthalmology Department, Mathura Das Mathur Hospital, Jodhpur were included. Total 92 patients were examined in this study. Detailed history taking including demographic data, mode of injury, about primary management, time gap between injury and presentation to the hospital was recorded. History was also taken about the past ophthalmological status of patient.
Results: Males are more prone to injury than females in all age groups, younger age group (first two decades) is particularly vulnerable to injury in both males and females. Home was the most common place of injury in children in both males and females, so parents should be educated about preventive measures. No preventive measures was used in any of work place injury so workers of agriculture and small scale industries should be educated about preventive measures and inspired to use eye protective equipments. Open globe injury is main culprit for hospitalization in ocular trauma.
Conclusion: There is message to planner of health to improve medical and surgical facilities mainly in rural areas by appointing ophthalmologists and anaesthetist with proper OT setup to provide better surgical facilities. This will cause improvement in confidence of ophthalmologists to treat ocular injuries in rural areas. This change in attitude of ophthalmologist will develop faith of rural population to take treatment by those facilities. These efforts may reduce burden on tertiary care level hospitals and also provide immediate needful primary treatment to patients.

Keywords: eye, injury, epidemiology

Introduction
The annual rate of eye injuries is 13.2/1000 population. In an Indian survey, injuries were found to be the cause of blindness in 11.8% of the total blind subjects. In India, the annual incidence is 9.75 severe injuries per 1000 adults. The prevalence is higher in rural areas (4.5%) than in urban areas (3.97 %) [1].
In developing countries like India, activities such as agriculture, carpentry, grinding, chiseling, hammering, welding, handicraft, automobile industries are responsible for many eye injuries. In a five year study of open globe injuries, 33% were occupation related and 79.06% of these were young adults [2].
Although ocular trauma affects all age groups, the distribution for occurrence of serious ocular trauma is bimodal with maximum incidence in young adults and another peak in elderly [3]. Different studies worldwide showed that ocular trauma is more common in males and in those less than 30 yrs. The typical male to female ratio is 4:1 [4].
Available information regarding the distribution and magnitude of ocular trauma in developing countries is very scarce. Existing data are difficult to interpret because reporting is extremely poor and especially because of the completely different setting of the occurrence of ocular trauma [5]. In addition developing countries often lack adequate infrastructure for persons with eye injuries to reach a primary care centre and when one exists, the lack of awareness of preventive measures and/or immediate action increases the risk for complications and consequent visual disability and blindness [6]. Hence the present study was conducted to evaluate epidemiological and clinical profile of ocular trauma patients.

Material and method
This study was carried out in the Department of Ophthalmology, Mathura Das Mathur hospital, Dr. Sampurnanand medical college, Jodhpur. A prospective study was conducted over a period of 1 year (September 2016 to August 2017) in which all patients admitted or referred to Ophthalmology Department, Mathura Das Mathur Hospital, Jodhpur were included. Total 92 patients were examined in this study.

Inclusion criteria of cases
1. Any patient of ocular trauma attending ophthalmology department.
2. Patients repaired or managed in our department who

were admitted in other departments of Dr. Sampurnanand Medical College, Jodhpur.
3. Patient of ocular injury referred to department of ophthalmology with or without primary management
4. Patients willing to give written and informed consent.

Exclusion Criteria
1. Old cases of ocular trauma.
2. Orbital fractures causing no visual loss
3. Patient having associated neurological and other serious life threatening conditions.
4. Children less than 3 year of age and mentally ill patients who are unable to comment on their visual acuity.
5. Patient refusal for study.
6. Medico legal cases.

In this study detailed history taking including demographic data, mode of injury, about primary management, time gap between injury and presentation to the hospital was recorded. History was also taken about the past ophthalmological status of patient.

After enrollment a thorough clinical examination with torch light, slit lamp was carried out. Slit lamp examination includes documentation of size of tear, its location, involvement of visual axis, iris prolapsed, cataract formation and IOFB. Gonioscopy performed of every closed globe injury patient. Detailed fundus examination was done with indirect ophthalmoscopy and slit lamp biomicroscopy. Visual acuity was recorded using Snellen's chart or finger counting depending upon the patient's age and condition at the time of presentation.

The injuries were classified into Extraocular and Intraocular categories. The intraocular injuries were further classified into open and closed globe injury according to ocular trauma classification scheme as those involving blunt force resulting in contusion (closed globe injury) or rupture (open globe injury), and those involving sharp forces, resulting in lamellar laceration (closed globe injury), penetrating, perforating and intra ocular foreign body (open globe injury). The final visual outcome was measured with snellen's chart and graded.

Data was pooled and entered on to a excel spreadsheet and analyzed using appropriate technique.

Results

From September 2016 to August 2017 total 1347 patients admitted in department of ophthalmology, Sampurnanand medical college Jodhpur, Rajasthan out of which 92 patients admitted for management of ocular trauma in which 68 were males (of total admissions) and 24 females (of total admissions). In this study we studied these 92 patients of ocular trauma admitted in Department of ophthalmology, Dr. Sampurnanand medical college, Jodhpur, Rajasthan. 73.91% patients were males and 26.09% were females. Male female ratio was 2.83: 1, but in children aged below 12 years this ratio is 1.8:1 while in adults aged 13-25 ratio rises to 3.5:1. (Table 1).

63.04% patients were resident of rural area in which mostly patients belonged to villages and 36.96% patients were resident of urban area. Sex ratio of rural population was 3.14:1 and in urban population it was 2.4:1. We observed that incidence of RE involvement is 46.74% and of LE is 48.91%. Incidence of involvement of both eyes is 4.35 % (graph 1).

Home was the most common place of injury (44.56%) followed by workplace ((35.87%) than street (20.97%). In children most common place of injury was home followed by school.

46.34% Male and 53.65% female got injured at home .male female ratio in home injury was 1:1.58. In work place injuries male female ratio was 10.01:1. Most common age group was involving young adults. In street injuries male female ratio was 3.33:1 (Table 2). Most common object causing ocular trauma was wooden stick (31.52%), metal object (16.30%) and followed by stone injury (11.96%). Wooden objects were most common object causing injuries in both males (58.62%) and females (41.37%). Metal injury was most common object of injury in young working age group. Road traffic accidents were also a common mode of injury, mostly in males because in India mostly males drive vehicles. Fire cracker and stone injury were mostly occurred in children. Fall injury was most common in old age group (Table 3). The incidence of open globe injuries (47.83%) was more common than closed globe injuries (10.87%) as shown in table 4.

Table 1: Age distribution of studied subjects

Age group (in years)	Male	Female	Total
3-12	18	10	28 (30.43%)
13-25	21	6	27(29.35%)
26-40	17	6	23 (25%)
41-60	9	3	12 (13.04%)
>60	2	0	2 (2.17%)
TOTAL	68 (73.91%)	24 (26.09%)	92 (100%)

Table 2: Distribution of places of injury in males and females in different age group

Age (in years)	Home		Assault		Street		Work		School	
	M	F	M	F	M	F	M	F	M	F
3-12	14	10	0	0	3	0	0	0	1	0
13-25	5	6	0	0	4	1	7	1	0	0
26-40	0	4	1	0	2	2	16	1	0	0
40-60	0	2	0	0	3	0	6	1	0	0
>60	0	0	1	0	0	0	1	0	0	0

Table 3: Distribution of objects of injury in males and females in different age group

Object causing	Age (in years)										Total
	3-12		13-25		26-40		40-60		>60		
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Wooden stick	7	3	6	2	3	6	1	1	0	0	29
Metal object	2	3	3	0	4	0	2	0	1	0	15
Glass	0	0	0	1	1	0	0	0	0	0	2
Stone	2	0	3	0	5	0	0	1	0	0	11
Animal	0	2	1	2	0	0	1	1	0	0	7
Scissors	1	0	0	0	0	0	0	0	0	0	1

Pencil	1	0	1	0	0	0	0	0	0	0	2
Fall injury	0	1	0	0	0	0	0	0	0	1	2
RTA	0	0	3	1	3	0	3	0	0	0	10
Cracker	2	1	1	0	0	1	0	0	0	0	5
Sport	2	0	1	1	0	0	0	0	0	0	4
Other	1	0	0	0	0	0	0	0	0	0	1
Assault	0	0	0	0	1	0	0	1	1	0	3

Table 4: Distribution of patients according to type of injury

Type of injury	No. of patients	Percentage
Closed globe	38	41.3
Open globe	44	47.83
Lid injury	10	10.87
Total	92	100

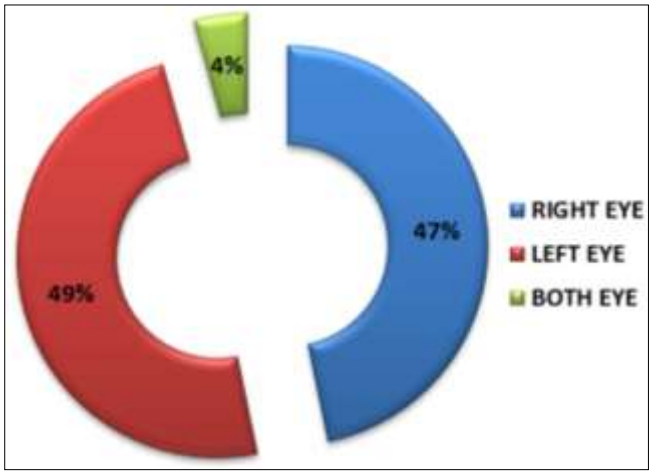

Fig 1: Study of involvement of eye

Discussion

During this study period, total 92 patients of ocular trauma were studied, 68 patients were male (73.91%) and 24 were female (26.09%). In almost all the studies the incidence of injuries was much higher in males than females[6-9]. Possible explanation of this is a great mobility and activity of males, aggressiveness and risk taking behavior [10].

Sex ratio in children age <12 was comparatively lower that was 1.8:1 and in working young age group it again rises to 3.5:1. Similar results were observed by Parul Desai *et al* (1996) as overall male: female ratio 5.4:1 which got reduced to 2.16:1 in the younger age group of 0-14 years [9]. Increased percentage of females in first decade maybe because of, in this age group male and female are more likely to share similar environment throughout the day, sharing similar exposure to the risk of an injury [9]. Another reason is, in our society female child is usually neglected than male child and they do not gain same level of care and supervision as male child [11].

In this study mean age of presentation was 20 years; it was somewhat younger in males than in females. Similar results shown in study done by I Q Malik *et al* (2012) in which mean age of presentation was 18.24 years[12] and in study done by S Vats in which 24.2 years was mean age of presentation [13].

In the present study, it was found that most of cases belonged to rural population (63.04%) while 36.96% belonged to urban population. Similarly P R Sthapit *et al* [10]. also reported that injuries were more common in rural population (60.7%) as compared to urban population (39.3%) but S Cillino *et al*[14] reported no statistical difference in rates of ocular injuries in urban (4.2/100,000; 95% CI, 4.1-4.3) and rural (5.5/100,000; 95% CI, 5.4-5.65) population.

In this study home was the most common place (44.56%) of injury followed by workplace (35.87%) and than by road traffic accident at street (20.97%). As per Boo Sup Oum *et al*[15] study 34.9% injuries occurred at workplace, 32.2% at home and 25% at street. (40)

In this study 35.87% injuries were related to workplace and most of these injuries occurred in males (Male: Female= 10:1). Most common age group for work related injury was of young age (12-40 years) which was 75.76% of total workplace related injuries. Usha Vasu *et al*[2] (2001) reported similar results that 33.3% injuries related to work place; 95.35% were males and 79.06% were between 16-45 year of age. In our study 90.91% work place injuries were in males may be due to male dominance, cultures and tradition of society.

Most common object causing ocular trauma was wooden objects (31.52%) followed by metal objects (16.30%) and then stone. Tsedeke Asaminew *et al* [16]. (2009) also reported most common object causing injury was wooden material (40.9%) followed by metal (30%). Mehul shah *et al* [17]. (2013) also reported most common object of eye injuries as wooden stick 55.9%. This data higher than in present study because, their study was focused on rural tribal population not on urban or industrialized population. In present study wooden object injuries were common because 60.42% patients in present study belong to rural areas.

The incidence of open globe injuries (48%) was more than closed globe injuries (41%). S Cillino *et al* [14]. (2008) reported similar incidence of open globe injuries (146 eyes) and closed globe injuries (152 eyes). Boo Sup Oum *et al*[15] (2004) reported closed globe injuries (85.5%) were more common than open globe (14.2%) injuries in patients presented to emergency department.

Conclusions

a. Males are more prone to injury than females in all age groups, younger age group (first two decades) is particularly vulnerable to injury in both males and females.
b. Rural environment is more exposed to ocular injury.
c. Home was the most common place of injury in children in both males and females, so parents should be educated about preventive measures. No preventive measures was used in any of work place injury so workers of agriculture and small scale industries should be educated about preventive measures and inspired to use eye protective equipments.
d. Open globe injury is main culprit for hospitalization in ocular trauma.

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