

## Profile of Patients of Ocular Trauma Visiting Municipal Eye Hospital Ahmedabad in the Months of August and September 2016

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### Abstract:

**Introduction:** Globally, more than 55 million eye injuries occur per year, while there are approximately 1.6 million people with blindness from ocular trauma. The prevalence of ocular trauma in India was reported as 2.4%. Measures to create awareness about ocular trauma and preventive measures would result in a great decrease in ocular morbidity and mortality due to trauma. **Objectives:** To assess the proportion of different types of ocular injuries among the patients. To correlate the different causative factors and conditions leading to Ocular Trauma. To make recommendations for public health and clinical strategies for the prevention, management, and research of ocular trauma in the future. **Method:** The study design was cross-sectional, done in Municipal Eye Hospital Ahmedabad with help of semi-structured pilot tested questionnaire from August 2016 to September 2016. The type of sampling is non-random with sample size of 141. **Results:** Out of 141 cases, maximum injuries were observed in male patients and in the 15-29 years age group (34%). Extra ocular foreign body injury (max. in 15-29 age groups) was seen maximum followed by blunt trauma (max. in children). Patients with extra ocular foreign body injuries reported the earliest. Only 15% of patient reported with complication (max. in Open Globe injuries). Vision was affected in 9.9% patients with maximum in wooden stick injuries and 19% eyes required surgical intervention. **Conclusion:** Eye should be protected while driving to prevent exposure of foreign body. Patients who reported within 24 hours had the least complications. So, Awareness should be created by the authorities through mass media regarding ocular trauma and benefits of early reporting.

**Key words:** Blunt Trauma, Extra ocular foreign body, Open Globe injuries

### Introduction:

Ocular trauma is one of the leading causes of preventable blindness in world today, 90% of all eye injuries are preventable.<sup>[1,2]</sup> Globally, more than 55 million eye injuries occur per year, while there are approximately 1.6 million people with blindness from ocular trauma, 2.3 million people who are bilaterally visually impaired, and 19 million people with unilateral blindness or visual loss.<sup>[3]</sup> The incidence of ocular trauma may be higher in developing countries. The prevalence of ocular trauma in India was reported as 2.4%.<sup>[4]</sup> Ocular trauma is a major cause of preventable monocular blindness and visual impairment in the world.<sup>[5]</sup> Decrease or loss of vision, either monocular or binocular, may result in significant economic burdens to families and countries due to time lost from work, or school, and

family care giving, expensive hospitalization, special visit and treatment, prolonged follow-up, and visual rehabilitation. Prevention is always better than cure: measures to create awareness about ocular trauma and preventive measures would result in a great decrease in ocular morbidity and mortality due to trauma. Early detection and management hold the key to trauma management and prevention of further complications. In this study we have profiled ocular trauma that were reported to Municipal Corporation run tertiary care Eye Hospital, its clinical presentation, cause and nature of trauma, the extent of damage and the loss of vision associated with it, along with other parameters.

### Objectives:

1. To assess the proportion of different types of ocular injuries among the patients

2. To correlate the different causative factors and conditions leading to Ocular Trauma
3. To make recommendations for public health and clinical strategies for the prevention, management, and research of ocular trauma in the future.

**Method:**

It was a cross-sectional study carried out in Municipal Eye Hospital of Ahmedabad with help of Self-structured Pilot tested Questionnaire. The time period of the study was from 1<sup>st</sup> August 2016 to 30<sup>th</sup> September 2016. A total of 141 patients were selected for the purpose of study.

Inclusion criteria: All cases of ocular trauma reported during the study period were included in the study. Exclusion criteria: Those who did not give consent were excluded from the study.

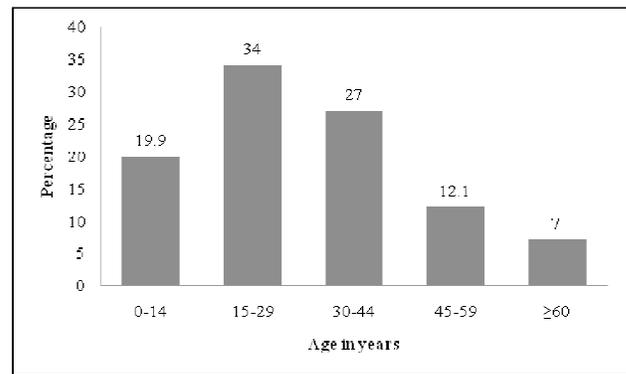
Ethical considerations: Permission was obtained from the head of institution, heads of ophthalmology and community medicine and the Superintendent of Municipal eye hospital. Verbal consent of study population was obtained and they were ensured of confidentiality and were explained about the purpose of study.

Data collection and analysis: Demographic data and a detailed history of each subject were taken. The clinical data of affected eye, ophthalmologic status post injury, causes and types of ocular trauma, time interval from injury to presentation, duration of hospitalization, and follow-up were collected from the clinical records. It was analyzed using appropriate statistical parameter. Associations between variables were checked by Chi-Square test and significance was considered when  $p < 0.05$ . The patient's records were kept confidential. Operational definitions were according to World Health Organization (WHO) and Birmingham Eye Trauma Terminology System (BETTS).<sup>[6]</sup>

**Results:**

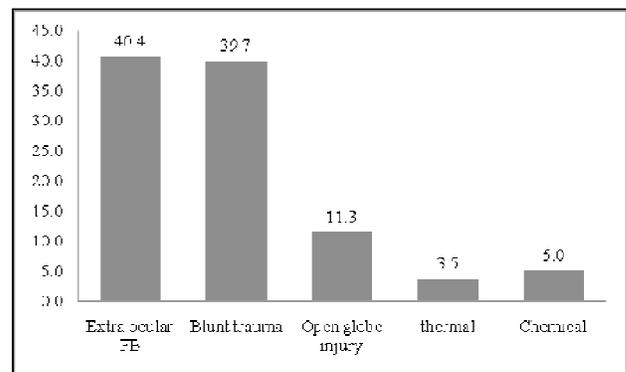
Mean age was  $28.96 \pm 16.4$  years. The largest age group was 15–29 years followed by 30–44 years, presenting two peaks of the age distribution and accounting for 34% and 27%, respectively. (Graph 1)

**Graph 1: Age Distribution of patients [n = 141]**



Males had a higher rate than females (74.5% versus 25.5%), with a male-to-female ratio of 3:1. Extra ocular foreign body Injury (40.4%) was seen maximum followed by Blunt Trauma (39.7%). (Graph 2)

**Graph 2: Type of injuries [n = 141]**



Extra ocular foreign body injuries were significantly higher in 15-29 year age groups and Blunt trauma was significantly higher in 0-14 year age group. (P value = 0.01). (Table 1)

Only 15% of patients reported with complications and it was significantly higher in Open Globe injuries. (P value = 0.001). (Table 2)

There was a wide variety of injury causes that resulted in ocular trauma. Most of the injuries were caused by foreign body (36, 25.5%). (Table 3)

Foreign body was the main cause in all age groups except for patients aged 0 to 14 years old, for whom the main causes were injury by wooden stick. (Table 4)

Of the patients, 82.6% presented within 24 hours after eye injuries. A further 13.9% presented between

**Table 1: Age v/s type of injury [n=141]**

Age (in Completed Yrs)	Type of Injury									
	Extra ocular FB		Blunt Trauma		Open Globe		Thermal		Chemical	
	No.	%	No.	%	No.	%	No.	%	No.	%
0-14	3	5.3	19	33.9	4	25	1	20	1	14.3
15-29	24	42.1	13	23.2	4	25	1	20	6	85.7
30-44	17	29.8	13	23.2	5	31.3	3	60	0	0
45-59	12	21.0	5	8.9	2	12.5	0	0	0	0
≥60	1	1.8	6	10.8	1	6.2	0	0	0	0
Total	57	100	56	100	16	100	5	100	7	100

**Table 2: Complication v/s type of injury [n=141]**

Type of Injury	Complication	
	Frequency	Percent
Extra ocular FB	0	0
Blunt Trauma	6	28.57
Open Globe	14	66.67
Thermal	1	4.76
Chemical	0	0
Total	21	100

**Table 3: Cause of injury [n=141]**

Cause of injury	Frequency	Percent
Extra ocular FB	0	0
Blunt Trauma	6	28.57
Open Globe	14	66.67
Thermal	1	4.76
Chemical	0	0
Total	21	100

**Table 4: Age v/s Cause of Injury [n=141]**

Age (in Completed Yrs)	Cause of Injury													
	Ball		Dust		FB		Finger		Iron		Wooden Stick		Other	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0-14	2	20	1	16.7	1	2.8	3	33.3	1	5.3	7	50	13	27.6
15-29	4	40	3	33.4	19	47.2	2	22.3	7	26.3	2	14.3	17	34
30-44	2	20	1	33.4	10	30.6	2	11.1	8	47.4	3	21.4	9	21.4
45-59	2	10	1	16.7	6	19.4	1	22.2	3	21	0	0	6	8.5
≥60	0	10	0	0	0	0	1	11.1	0	0	2	14.3	2	8.5
Total	10	100	6	100	36	100	9	100	19	100	14	100	47	100

**Table 5: Time elapsed since injury [n=141]**

Type of injury	Time elapsed since injury						Total	
	< 24 hours		24 - 48 hours		>48 hours			
	No.	%	No.	%	No.	%	No.	%
Extra ocular FB	42	44.2	12	75	1	25	55	47.8
Blunt Trauma	41	43.1	3	18.8	2	50	46	40.0
Open Globe	2	2.1	0	0	1	25	3	2.6
Thermal	3	3.2	1	6.2	0	0	4	3.5
Chemical	7	7.4	0	0	0	0	7	6.1
Total	95	100	16	100	4	100	115	100

one and two days from the occurrence of the injury. Only 3.5% presented more than 2 days after sustaining the eye injuries. Out of all the cases, patients with extra ocular foreign body injuries reported the earliest. (P value = 0.001) (Table 5)

Out of all the cases, 57 (40.4%) patients had injuries in their left eyes whereas 79 (56.1 %) had injuries in their right eyes. Both eyes were involved in 5 (3.5%) patients. In terms of management, 71% eyes were medically treated, and the rest 19% eyes required surgical intervention. Out of those surgically treated patients, maximum surgeries were required in open globe injury. All the cases of extra ocular foreign body are treated medically followed by blunt trauma. Ocular wall repair (13 %), lensectomy, or

phacoemulsification (34.8%) was the most common surgical procedures and Posterior vitrectomy was required for 21.7 % eyes. Removal of foreign body was performed in 14 (9.9 %) eyes and saline wash was given to 16 (11.34 %) eyes. Out of the 141 cases, 60 (42.6%) cases had visual outcome of 6/6 – 6/9, but 14 (9.9%) patients were documented to have a blinding outcome i.e., visual acuity of <6/60.

**Discussion :**

In our study, males had a higher rate than females. Other studies also reported a higher rate in males. [7-11] This might be due to different occupational exposure between different genders. Most females are housewives and engaged in occupations with low risk; however, males are prone

to do rough work and more likely to take part in dangerous sports and activities.

Mean age was  $28.96 \pm 16.4$  years (1-74 years). Most of the eye injuries were found in young-aged groups (15–29 years) followed by middle-aged groups (30–44 years) which is coincident with other studies.<sup>[12,13]</sup> This may be explained by the fact that the working population is of high risk and accounts for the largest portion of ocular trauma. People between the age of 30 to 44 years old and 15 to 29 years old are exactly the major labors and play major roles in supporting families, resulting in a significantly larger portion than others.

After injuries, over four-fifths of patients (82.6%) presented on the same day as sustaining their injuries, and 3.5% patients still had a delay of 3 days before clinical review. In the JUDO study 31.6 % patients presented within 48 hours whereas 28.6% arrived one week or later.<sup>[14]</sup> Cao et al.<sup>[15]</sup> thought that delayed presentation was a matter of concern about final VAs. This suggests that the public's awareness of seeking medical care in timely manners should be improved. Our study showed a significant association between duration of presentation and presence of complication at presentation which may affect the final visual outcome.

In our study, Extra ocular foreign body injuries (40.4%) were the most common type of ocular trauma, and metallic objects, widely used in workplaces, remained the leading (25.5%) agents that cause eye injuries, which were consistent with other studies.<sup>[15,16]</sup> The main contributing factor for the higher proportion of work-related injury is the local work tasks, which commonly involve high-powered tools that generate metal fragments at high velocities. However, another important factor is disregarding the safety of workers.

Of the documented ones, in the JUDO study, wood is the commonest material accounting 40.9% followed by metal 18.1% and stone 13.3%.<sup>[14]</sup> Regarding the material of injury the commonest material accounting for trauma was metal in 13.5 % patients, followed by wood, in our study.

With regard to surgical procedures, of the 141

injured eyes, 13 % had ocular wall repairs, 34.8 % had lensectomy or phacoemulsification, and 11.34% had anterior chamber washouts, which suggest that injury is preferred in the anterior segment of the globes than the posterior segment, highlighting the significance of the anterior segment. This suggests that wearing eye-protection devices should be introduced, because such anterior segment injuries would have been easily blocked by eye-protection devices.<sup>[17]</sup>

Out of the 141 cases, 60(42.6%) cases had visual outcome of 6/6 – 6/9, but 14(9.9%) patients were documented to have a blinding outcome i.e., visual acuity of <6/60. Study of JUDO showed 21.1% of the ocular injuries were documented to have a blinding outcome i.e., visual acuity < 6/60.<sup>[14]</sup>

#### **Conclusion :**

There were some limitations in our study, comprehensive information about medical records was not sufficient enough to display and information provided by the patients may not be completely accurate. However, with these limitations, our data still provided useful information concerning the clinical characteristics of ocular trauma.

In conclusion, susceptible population of eye injuries were middle and young-aged groups, and the proportion of males was higher. Delay in presentation, has a significant association with presence of complications which may have a detrimental visual outcome.

#### **Recommendations :**

Thus it is recommended preventive measures advocated by health workers to emphasize the importance of early health seeking behaviour and follow up of patients with ocular trauma. Efforts should be invested in education for eye protection in order to prevent ocular trauma in the young and middle-aged working groups. Simple safety procedures like wearing goggles in driving, protective goggles in welding, supervising children while playing, etc. should be advocated using mass media. A standardized reporting system, as exists in other countries, is recommended and would help to

evaluate changes in the epidemiology of eye injuries over time and provide population-based longitudinal data for preventive strategies.

### Declaration:

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Conflict of Interest: Nil

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