



## CLINICAL AND DEMOGRAPHIC PROFILE OF OCULAR INJURIES IN A SEMIURBAN TOWN IN WESTERN INDIA

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### ABSTRACT

**Background:** Ocular trauma is a significant cause of preventable blindness and visual impairment globally, necessitating a comprehensive understanding of its epidemiology and risk factors. This study aimed to analyze the prevalence and risk factors of ocular trauma presenting to a private hospital setup in a semi urban town in Gujarat, India. **Methods:** A prospective study was conducted over 2 years, involving 75 ocular trauma cases presenting to our hospital. **Results:** The highest incidence of 56% was found in young adult males (20-40), followed by 1-20 years age group (24%). Males were most commonly affected (81.33%) than females (18.66%). Majority of the patients presented to the hospital between 6 hours up to 1 days after injury with iron rod/metal injury being the primary cause (38.66%) followed by agricultural (32%) and chemical (16%) injuries. **Conclusions:** This study highlights the etiologic distribution of ocular trauma in a semi urban agricultural and industrial town in Western India. We also emphasize the need for educating the population to prevent these incidents.

**KEYWORDS:** Ocular Trauma, Risk Factors, Open/closed Globe.

### INTRODUCTION

Ocular injuries constitute a significant cause of visual impairment and blindness worldwide.<sup>[1]</sup> The incidence, causative factors, and outcomes of ocular injuries exhibit regional geographic disparities, underlining the necessity for locale-specific targeted preventive measures and treatment modalities.<sup>[2]</sup> A deeper understanding of the epidemiological patterns, etiology, severity, and visual sequelae can provide valuable insights into developing effective preventive strategies and optimizing management for ocular injuries to prevent visually significant and often permanent sequelae.<sup>[3]</sup> Studies have indicated that majority of ocular injuries are avoidable, emphasizing the need for public health initiatives in raising awareness and promoting eye safety practices.<sup>[4]</sup> This paper adds to the current knowledge on ocular injuries. It seeks to elucidate the patterns of ocular trauma in semi urban industrial town, the predominant causes, and the types of injuries, their management, and outcomes. The findings augment the current understanding of ocular injuries, and provide data that can guide education programs and interventions.

### MATERIALS AND METHODS

**Study Design and Setting:** This is a prospective interventional study, conducted at Vedant Eye Hospital Bhavnagar Gujarat from January 2021 to December 2022. The study comprised a sample of 75 patients presenting

with ocular trauma. Patients diagnosed with pre-existing ocular diseases affecting visual acuity were excluded from the study. Also those with multi system injuries esp. Road Traffic Accidents that require primary emergent treatment with an intensivist for life support were excluded. A detailed ophthalmic evaluation was performed and the data was transferred to statistical software for analysis.

Ophthalmic assessment included appropriate history, visual acuity testing using Snellen's chart, slit-lamp examination, fundus examination, B-scan, radiograph of the orbit, lacrimal sac syringing, and CT scan of the orbit when required in relevant cases. Post-operative evaluation included visual acuity, slit-lamp bio microscopy, detailed fundus examination, and B-scan in relevant cases at every visit on the first and seventh day, then the third and sixth week. Surgical procedures were carried out in cases of open globe injuries under regional anesthesia. Administration of systemic analgesics and antibiotics with initiation of topical medications, and administration of anti-glaucoma medications in selected cases were done on the first post operative visit. Results were entered in an Excel spreadsheet and analyzed using SPSS Statistics version 20.0. The results were expressed in rates, ratios, and percentages. Significant values were calculated using ANOVA test.

**RESULTS**

The study group comprises of 75 cases of ocular trauma presenting to Vedant Eye Hospital Bhavnagar, Gujarat from January 2021 till December 2022. The age and sex

distribution, temporal presentation and etiologic distribution of ocular injuries presenting to us are represented in tabular form as below.

**Table 1: Table showing age and sex distribution of patients with ocular injuries.**

AGE in Years	No. Of Patients	Percentage
1-20	18	24%
20-40	42	56%
40-60	13	17.3%
>60	02	2.66%
Gender		
Males	61	81.33%
Females	14	18.66%

**Table 2: Table showing temporal presentation of patients since injury.**

Time since injury	No. Of Patients	Percentage
0-6 hrs	09	12%
6-24 hrs	32	42.66%
1-3 days	20	26.66%
3-7 days	11	14.66%
1 wk -1 month	03	4%

**Table 3: Table showing percent wise distribution depending on mode of injury.**

Type of Object	No. Of Patients	Percentage
Vegetative Matter/ wood/ Thorn	24	32%
Iron rod/ nail	29	38.66%
Chemical	12	16%
Blunt injury	05	6%
Sharp Objects [Toys /Pen /Scissor]	03	4%
RTA	02	2.66%

**Table 4: Table enlisting site wise distribution of ocular injury.**

Place of Injury	No. Of Patients	Percentage
Home	03	4%
Farm	24	32%
Workplace [Industry/factory]	41	54.66%
Playground/ School	05	6%
RTA	02	2.66%

**DISCUSSION**

Ocular trauma significantly contributes to preventable blindness and visual impairment across the globe.<sup>[1-4]</sup> and is an evolving sub-speciality.<sup>[5]</sup> Despite its critical implications on public health, population-based data on ocular trauma's prevalence and risk factors remain scarce, particularly from developing nations.<sup>[6-9]</sup>

In our study, we observed the highest incidence of ocular trauma in young adult males aged 20-40 years (56%), followed by under 20 years (24%), with only 2.66% of cases involving adults above 60 years. These findings can be attributed to young adult working population engaged in farming and industrial activities and the less than 20 year age group that includes children who tends to engage in playing and other activities often

unsupervised. Adults above 60 years generally defer to opt out for work or otherwise, and are hence less susceptible to ocular trauma. Other studies have reported similar findings, further corroborating our findings.<sup>[6-9,12-15]</sup> There is a higher incidence of ocular trauma in males (81.33%), which aligns with the results of other studies. Those engaged in industrial work were more susceptible to trauma due to increased exposure to metallic objects and chemicals and also due to improper use of safety equipments. Considering the timeline between the injury occurrence and hospital presentation, we found that 42.66% of the cases presented between 24 hours to 1 day of injury, while 26.66% of cases presented within the first 3 days and only about 4% presented later than a week. This delay in seeking treatment can be attributed to the lack of knowledge about the grave nature of the

condition or non-availability or poor access to medical care. Similar findings were reported in other studies.<sup>[12-15]</sup>

Examining the type of injuries, our study found that open globe injuries were more common, involving penetrating trauma with sharp objects, followed by blunt injuries and chemical injuries. While these results might indicate a higher frequency of open globe injuries, it can be presumed that cases of closed globe injuries with less severe consequences might not have sought immediate medical attention due to unaffected initial visual acuity or general negligence. Similar trends were reported in other studies.<sup>[10-15]</sup> Our study identified vegetative matter, such as sharp sticks and wood, as the second most common agents causing ocular injury, accounting for 32% of the cases after iron rod/metallic injury (38%). Most of young adult population in our area are engaged in farming and metal casting industries. The predominance of chemical plants in our area attributed to increased incidence of injury with alkaline chemicals. Other injury-causing agents included sharp objects and household items (4%), road traffic accidents (2.66%), and blunt injury (6%). Road traffic incidents due to associated grave co morbidity with multi system involvement prefer to report to a tertiary care centre due to accessibility to life support systems. Of the five cases due to blunt trauma two had hyphema, one had iris sphincter tears, one had rosette cataract and another had commotio retinae. In summary, our study provides insights into ocular trauma in terms of age, gender, geographical distribution, time to presentation, type of injury, injury-causing objects. It is crucial to continue research in this area, given the significant impact of ocular trauma on visual health, particularly in developing nations. We advocate sensitising the population regarding awareness about ocular trauma through education programs, safety drills in industries/factories and promoting use of protective eye gear etc. to minimise the adverse visual outcomes in ocular trauma.

## CONCLUSION

Our findings suggest a high incidence of ocular trauma, in young adult males primarily engaged as industrial workforce and in agricultural farming. Open globe injuries, predominantly caused by vegetative matter and metallic objects were the most common, with Zone 1 of the ocular globe being the frequently affected area. Delay in presentation to the primary caregiver and grave injury affecting visual axis were adverse events for better final visual outcome. These results highlight the importance of creating awareness about eye safety and emphasizing preventive measures. Prompt access to healthcare services post-injury is also crucial, considering the significant delay in hospital presentation observed. Eye care programs targeting high-risk ocular trauma groups may need to consider ocular trauma as a priority in eye health awareness strategies to reduce blindness due to trauma. Further sensitisation and public awareness is necessary to better understand ocular trauma's epidemiology and devise effective preventive strategies

like, especially in countries like India, which harbours a significant portion of the world's blind population.

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