

## A Retrospective Study of Incidence of Ocular Trauma at a Tertiary Care Hospital.

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### Abstract:

**Background:** Ocular trauma is a major cause of preventable blindness & visual impairment especially in the developing countries **METHODS:** This was a retrospective study of 200 patients with ocular trauma from February 2018 to March 2018 in a tertiary care centre, Sarojini Devi eye hospital, Hyderabad. **RESULTS:** This 2 month study of ocular trauma at Sarojini devi eye hospital included 200 eyes. Ages were divided into four groups as <20 years, 20-40, 41-60 and ≥60 years. Time interval from injury to presentation was divided into four groups as 0-24 hours, 24-48 hours, 2-4 days, and ≥4 days. Initial and final VAs were grouped under no light perception (PL -ve), light perception (PL+) to CF-1m, CF-2m to 5m, 6/60-6/24, 6/24-6/9, better than 6/9. **CONCLUSION:** This study in a developing country such as India underscores that trauma remains a significant cause of monocular vision loss in all age groups with a large proportion affecting younger patients,

**Key words:** Trauma, F.B, conjunctival tear, corneal tear, sclera-corneal tear, globe rupture, results.

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### I. Introduction:

Ocular trauma is a major cause of preventable blindness & visual impairment especially in the developing countries. 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 hemorrhage 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. The epidemiology of ocular trauma has been well described in developed countries.

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.

The only national estimate regarding the Indian subcontinent is from a survey conducted from 1971-1974, where ocular trauma accounted for 1.2% of national blindness.

The purpose of this study is to provide the epidemiological data on ocular injuries during a 2 month study (February 2018- March 2018) at a tertiary care hospital, Sarojini Devi eye hospital.

### II. Methods:

This was a retrospective study of 200 patients with ocular trauma from February 2018 to March 2018 in a tertiary care centre, Sarojini Devi eye hospital, Hyderabad. Patient data consisting of name, age, sex, mode of injury, extent of injury, management and outcome was noted and analyzed.

In all the cases, detailed history, clinical examination and all necessary investigations were carried out. Data was collected from the clinical records using a structured data collection format. Detailed history of mechanism of injury was noted. Common symptoms at presentation included pain, loss of vision, blurring of vision, redness, increased tearing, swelling around eye and bleeding. Initial assessment also included injury to other organs, whether there has been loss of consciousness, previous eye surgical history, status of tetanus prophylaxis, possible contamination of the wound.

Examination included examination of face, orbital area, and eyelids and the eyeball. Examination of the eyelids, face, eyeball, and orbital rim for presence of injury, visual acuity of both eyes using a visual-acuity charts, peripheral vision, pupils reactivity to light and presence of an afferent pupillary defect, extra-ocular movements, anterior segment evaluation by slit lamp biomicroscope, confrontational visual fields, fundus evaluation, gonioscopy, tonometry. X-ray and/or CT scan and/or B-scan were done wherever necessary. This was followed by proper management according to the injury. Close follow-up was done for complications. At each visit vision was noted and final visual outcome at 6 weeks was noted and analyzed.

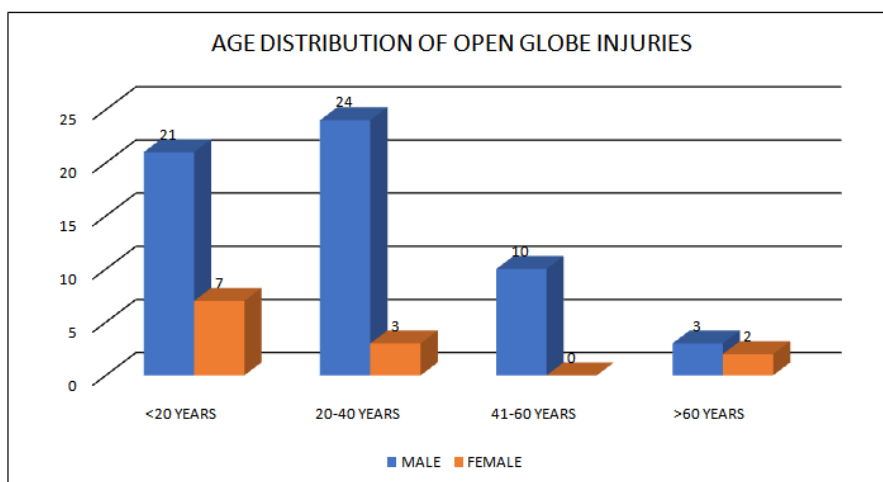
Ocular trauma was classified according to the standardized international classification of ocular trauma, Birmingham Eye Trauma Terminology system (BETTS).

### III. 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.

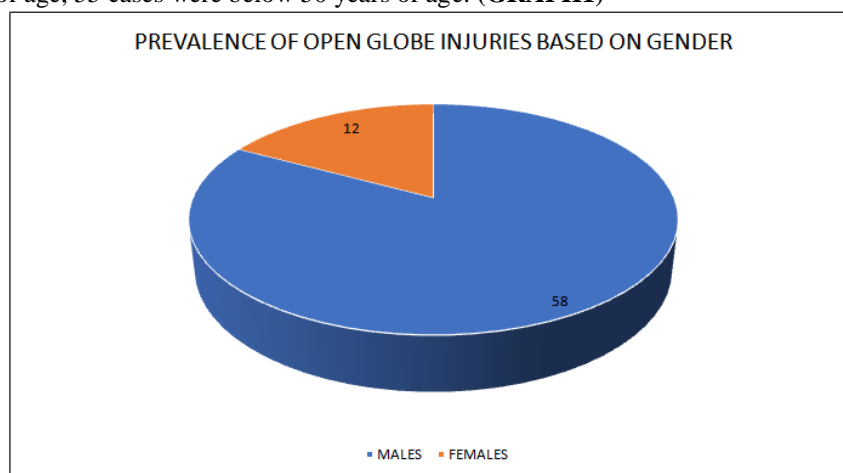
### IV. Results

This 2month study of ocular trauma at Sarojini devi eye hospital included 200 eyes. Ages were divided into four groups as <20 years, 20-40, 41-60 and ≥60 years. Time interval from injury to presentation was divided into four groups as 0–24 hours, 24–48 hours, 2–4 days, and ≥4 days. Initial and final VAs were grouped under no light perception (PL -ve), light perception (PL+) to CF-1m, CF-2m to 5m, 6/60-6/24, 6/24-6/9, better than 6/9. Out of total 200 cases, 130 eyes needed no repair, 70 underwent either corneoscleral or corneal or scleral repair.



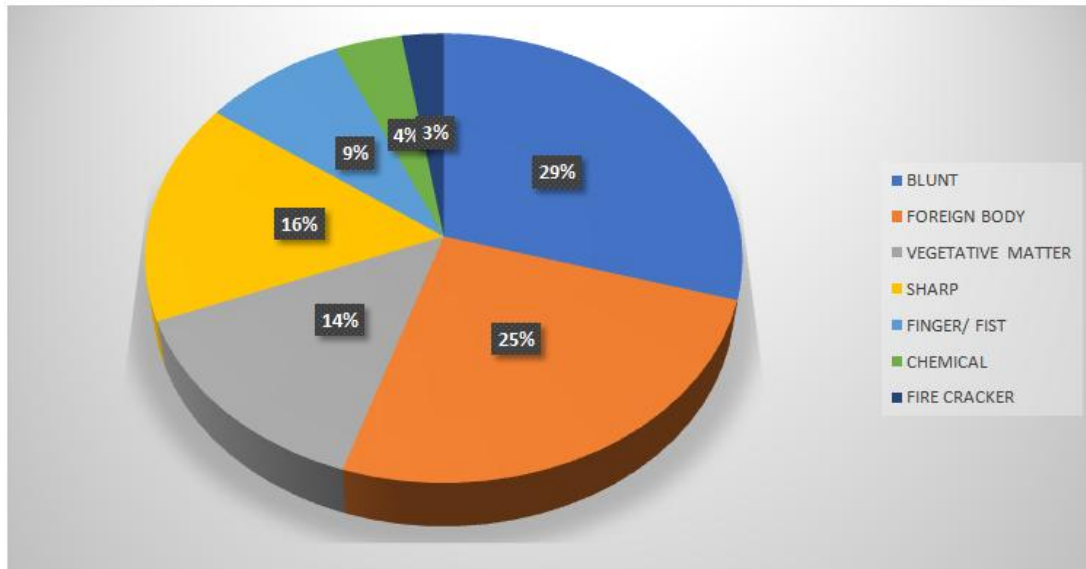
**GRAPH 1: AGE DISTRIBUTION OF OPEN GLOBE INJURY CASES**

In our study, 28 patients were in the age group of <20 years, 27 cases in 20-40 years age group, 10 cases in 41-60 age group and 5 patients in >60 years age group. Out of 70 cases which underwent repair, 15 cases were above 50 years of age, 55 cases were below 50 years of age. (GRAPH1)



**GRAPH 2: GENDER DISTRIBUTION OF OPEN GLOBE INJURIES**

There were 12 females and 58 males in the open globe injuries group which underwent surgical repair. (GRAPH2)



**GRAPH 3: DISTRIBUTION OF CASES BASED ON CAUSATIVE AGENT**

Injuries were most commonly caused by blunt objects in 59 cases (29.5%), foreign bodies were found in 51 cases (25.5%), vegetative matter caused injuries in 28 cases (14%), 32 cases (16%) sustained injuries with sharp objects, 17cases (8.5%) sustained injuries with finger/ fist. 8 cases (4%) had chemical injuries and fire cracker injuries were seen in 5 (2.5%) cases.(GRAPH 3)

| Time of presentation | No. Of cases | %    |
|----------------------|--------------|------|
| 0-24 hours           | 76           | 38%  |
| 24-48 hours          | 80           | 40%  |
| 2-4 days             | 28           | 14%  |
| >4 days              | 16           | 8%   |
| Total                | 200          | 100% |

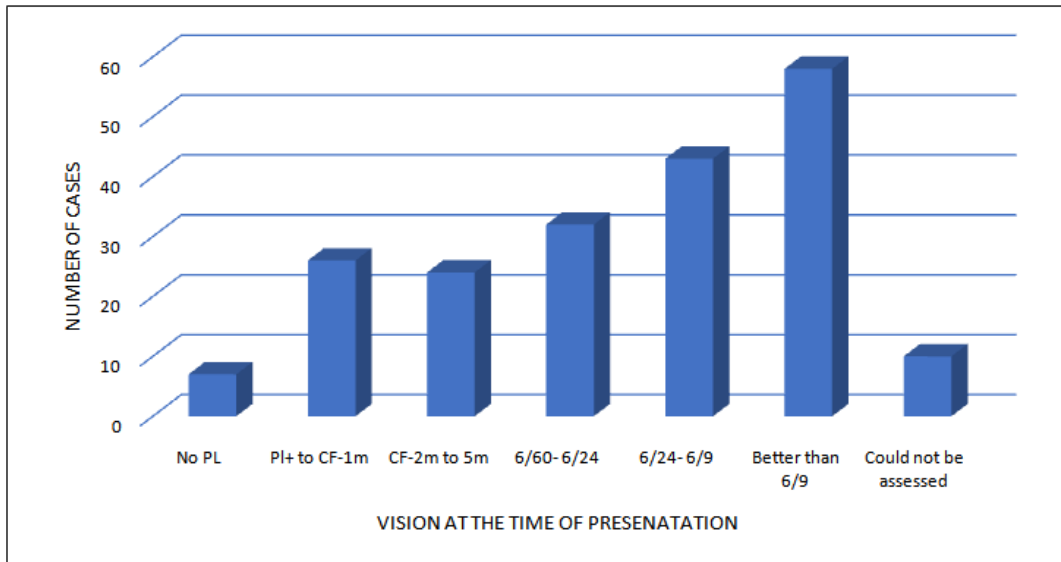
**TABLE 1: DISTRIBUTION OF OCULAR CASES ACCORDING TO REPORTING TIME OF INJURY**

In our study, 78% of the ocular trauma cases reported within 48 hours, while 14% reported within 2-4 days, and 8% reported after 4 days of trauma (TABLE 1)

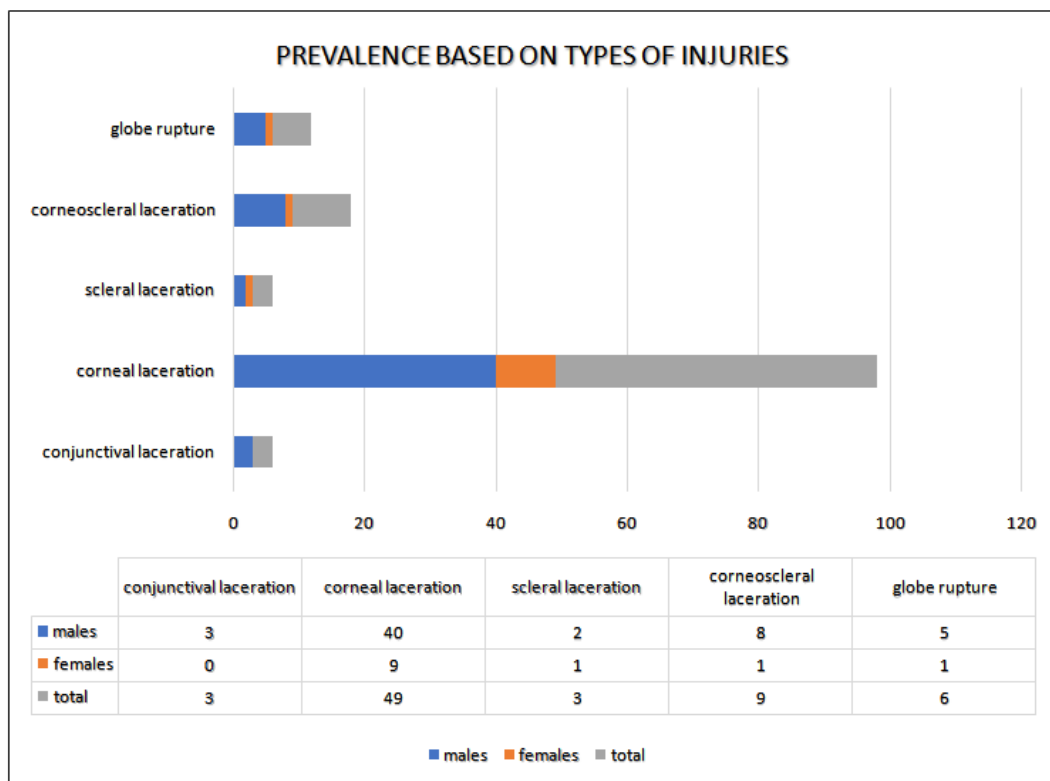
Out of 200 cases, 58 patients (29%) had best corrected visual acuity of 6/9 and better at the time of presentation. 43 cases (21.5%) had BCVA upto 6/24 ; 32 cases had vision upto 6/60, 26 patients had perception of light (PL) to counting fingers- 1m . 7 patients (3.5%) had no perception of light. Vision could not be assessed in 10 cases (5%) due to hyphema, posterior segment pathology, non-cooperative patients (TABLE 2)

| Visual acuity at presentation | No of cases | %    |
|-------------------------------|-------------|------|
| No PL                         | 7           | 3.5  |
| Pl+ to CF-1m                  | 26          | 13   |
| CF-2m to 5m                   | 24          | 12   |
| 6/60- 6/24                    | 32          | 16   |
| 6/24- 6/9                     | 43          | 21.5 |
| Better than 6/9               | 58          | 29   |
| Could not be assessed         | 10          | 5    |

**TABLE 2: DISTRIBUTION OF INITIAL VISUAL ACUITY AT PRESENTATION**



**GRAPH 4: VISUAL ACUITY AT PRESENTATION OF TRAUMA**



**GRAPH 5: PREVALENCE BASED ON TYPES OF INJURIES**

Incidence of cases which needed repair for ocular trauma were 70 (Out of 200) accounting to 30%. Number of cases which underwent corneal tear repair were 49 (out of 70) accounting to 70%  
 Number of cases which underwent scleral tear repair were 3 (out of 70) accounting to 4%. Number of cases which underwent corneoscleral tear repair were 9 (out of 70) accounting to 16%  
 Number of cases which underwent wound exploration and globe rupture with repair were 6 accounting to 13%.



#### **V. Discussion:**

There are approximately 2.5 million new eye injuries in the United States each year and the number in India is even more. Young males are more likely to have ocular injuries than older individuals or females. Blunt trauma accounts for the largest percentage of eye injuries (29%)

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.

This retrospective, hospital-based study provides data on the current pattern of serious ocular injuries in patients admitted to a tertiary care center in the emergency department. Epidemiological profile of ocular trauma varies in developing and developed countries. Economical background, public awareness and availability of resources being responsible for this difference.

Most of the patients who sought healthcare for ocular trauma in our study were males (78%). This could be explained by the health-seeking behavior of the population studied, where males are given preferential treatment and adventurous activities of children.

A similar study carried out by Somen Misra has recorded the percentage of males affected as 71.67%. Our study also observed more dominance of ocular trauma in males than females. A study by Wong et al found that males have 4 times higher risk than females. The restricted mobility of the elderly leading to inability in accessing medical facilities situated at distances could be another reason for this disproportionate statistic. Vats et al also observed that most of the injuries in children lead to greater ocular damage.

Krishnaiah et al have reported that majority of eye injuries occurred at the workplace (55.9%) followed by home (21.7%).

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 29% cases. Nirmalan 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 25% cases. Abraham et al reported wooden stick as an offending agent for ocular injury in 21% cases. We had 16% of cases of injury caused by sharp objects while

Vats et al 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.

We found 4% cases of chemical injuries while S. Khattry has reported 1.30% chemical injuries. Singh D. V. et al have reported 5% cases of chemical injuries. We also observed 3% fire cracker injuries 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 78% of cases reported within 48 hours, while 14% reported within 2-4 days, and 8% reported after 4 days of trauma. While Saxena R observed that 24% cases reported within 6 hours, a study by Gyasi found that 57.3% cases sought medical aid within 48 hours after injury.

Anterior segment was most commonly involved in our study with 76% while posterior segment was involved in 20% cases. Both anterior and posterior segments were involved in 4% cases. They were the most serious injuries which occurred due to penetrating trauma. Extraocular involvement was found in 5.5% which included lid tear orbital fracture etc.

Our study consisted of 65% closed globe injuries and 35% open globe injuries. Closed globe injuries were common in the form of superficial foreign body & blunt trauma. It is consistent with eye injuries in Singapore Study by Woo in which they found 95% injuries to be closed globe and 5% injuries to be open globe.

Out of the total 70 open globe injuries, 91.4% were penetrating injuries with 4.2% conjunctival laceration, 70% corneal laceration, 4.2% scleral laceration, 12.8% corneoscleral laceration. 8.5% cases had rupture of globe. Out of these, 27.5% involved zone 1, 42.50% involved zone 2 and 30% involved zone 3.

Mass education is the need of the hour regarding paying immediate attention to ocular trauma. Agricultural and industrial labourers, students and housewives should be educated regarding important measures of prevention of trauma, to obtain immediate treatment and to be aware of consequences of ocular injuries. Industrial workers and agricultural workers involved in spraying of pesticides and fertilizers should be educated about protective eye wear and safety measures.

## **VI. Conclusion**

Ocular trauma in developing countries has not been studied extensively. This study in a developing country such as India underscores that trauma remains a significant cause of monocular vision loss in all age groups with a large proportion affecting younger patients, thereby entailing increased lifetime of disability years.

The need for adoption of safe behaviour in the home environment, which is traditionally envisaged as safe, use of protective eyewear to avoid most workplace-related injuries and early intervention are other aspects highlighted by this study.

## **LIMITATIONS OF STUDY**

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

Sample size is limited. Needs extensive research including larger populations for proper documentation and conclusions.

Limited duration of study period.

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