

Epidemiology and Pattern of Ocular Trauma in Tertiary Care Hospital of North India

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Abstract

Ocular trauma is an important public health problem and an important cause of monocular visual impairment and blindness. The principal objective of this study was to study the epidemiology and pattern of visual deficits following ocular trauma at a tertiary care centre in North India. A prospective, hospital based observational study was conducted on patients of ocular trauma attending emergency services and OPD in Regional Institute of Ophthalmology, PGIMS Rohtak, Haryana, India. 200 patients of ocular trauma attending emergency and OPD of Regional Institute of Ophthalmology PGIMS, Rohtak were included in the study. In our study, predominant age group involved was of 21-40 years comprising 43% cases because of more outdoor activities and more active lifestyle. Male to female ratio was found to be 4.8:1. Ocular trauma was found to be more common in students(37%) followed by labourers (20%), farmers(20%) and industry workers (13%). Road side accident was major cause of ocular trauma followed by assault. Ocular trauma is more common in young males which are productive population of economy. RSA was found to be most common cause of it. The visual outcome

depends on initial visual acuity, type of injury, extent of ocular damage and time of presentation.

Keywords: Ocular trauma, open globe injury, closed globe injury

Introduction

Eye injury is one of the most common cause of ophthalmic morbidity and monocular blindness in all parts of the world. Blindness is a major issue in developing countries like India and main cause of unocular blindness is ocular trauma. Ocular injuries mostly affect young population and therefore, ocular injuries assume immense socioeconomic importance involving great loss of human socioeconomic efficiency and monetary loss.¹

The eyes occupy only 0.1% of the total and 0.27% of the anterior body surface area; however ocular trauma is far more commonly seen than what these small figures might indicate. Out of all types of ocular emergencies, ocular trauma is by far the commonest, constituting nearly 75% of all ocular emergencies.² As many as half a million people in the world are blind as a result of ocular injuries. Trauma is the most important cause of unilateral loss of vision, particularly in developing countries accounting for 1.37% of overall blindness.³

The annual rate of blindness due to ocular trauma is 1.6 million.⁴ The World Health Organisation programme for the prevention of blindness research indicated that there are approximately 55 million eye injuries per year that restrict activities for more than one day.⁵ Ocular trauma is an avoidable cause of blindness and visual impairment. According to estimates by WHO 750,000 cases require hospitalization which includes 200,000 open globe injuries. Even though ocular trauma has been described as a neglected issue, it was highlighted as a major cause of visual morbidity more recently.⁶

In India, there are more than 50 million blind people and this number increases by about 3.8 million per year. Amongst the total number of blind cases, 1.2% is contributed by injuries which are preventable.⁷ Approximately 75% of the population suffering from ocular trauma are monocular blind.⁸ One out of twenty patients presenting to the ophthalmologist has an ocular injury.⁹ The age distribution of occurrence of serious ocular trauma is bimodal with the maximum incidence in young adults (first 3 decades), peak incidence at 21 years and a second peak in the elderly.¹⁰ Nearly 90% of eye injuries can be prevented by relatively simple measures.¹¹

Classification of Ocular Trauma (Birmingham Eye Trauma Terminology)¹²

1. Closed Globe Injuries

- (a) Contusion
- (b) Lamellar laceration (Partial thickness wound in eye wall)

2. Open Globe Injuries

- (a) Penetrating (Entrance wound only)
- (b) Perforating (Entrance and exit wound)
- (c) IOFB (Intra Ocular Foreign Body)
- (d) Globe Rupture

The causes of ocular injuries are diverse and tend to vary in different geographical areas. They are also related to the socioeconomic status of the study population.¹³ Assault, motor vehicle accident, task related including workplace and travel, recreation and falls have all been noted as significant cause of ocular injury. Sharp objects (broken glass, knives, metal), blunt objects (fists, sports balls) and the projectiles have all been implicated in severe ocular injury as well.¹⁴

Material and Methods

A prospective, hospital based observational study was conducted on patients of ocular trauma attending emergency services and OPD in Regional Institute of Ophthalmology, PGIMS Rohtak.

Sample Size: 200 patients of ocular trauma attending emergency and OPD of Regional Institute of Ophthalmology PGIMS, Rohtak were included in the study.

Inclusion Criteria: All patients with ocular injuries reporting to casualty and Ophthalmology OPD were included.

Exclusion Criteria: Patients with any kind of birth injury or congenital ocular defect causing visual deficits were excluded. All patients with any kind of thermal injuries, chemical injuries, ultrasonic injuries and radiation injuries were excluded.

Statistical analysis of the data was done and represented suitably using appropriate statistical tests that included Chi Square test for checking associations and T test for comparing quantitative data with the help of SPSS ver. 17.0 software. All P-values reported are two sided and a value less than 0.05 was considered significant.

Operational definitions were according to Birmingham Eye Trauma Terminology System (BETTS)¹⁵

TERM	Definition and Explanation
Closed Globe Injury	No full thickness wound of eyeball
Open Globe Injury	Full thickness wound of the eyeball
Contusion	There is no (full thickness) wound
Lamellar laceration	Partial-thickness wound of the eyeball
Penetrating Injury	Entrance wound
Perforating injury	Entrance and exit wounds
IOFB	Retained foreign object
Rupture	Full thickness wound of the eyeball caused by a blunt object
Laceration	Full thickness wound of the eyeball caused by a sharp object

Results

Out of 200 patients, 24 were in age group 0-10 years, 30 patients were between the age group 11-20 years, 48 were in age group 21-30 years, 38 patients were between the age group 31-40 years, 24 patients belonged to age group 41-50 years, 20 patients were in age group 51-60 years and 16 patients were more than 60 years. Ocular trauma was more common in the age group between 21-30 and 31-40 years (48 and 38 respectively). So it was observed that maximum patients (24%) were in age group 21-30 years followed by age group 31-40 years (19%). Out of 200 patients of ocular trauma, 166 were male (83%) and 34 were females (17%). Male to female ratio was found to be 4.8:1.

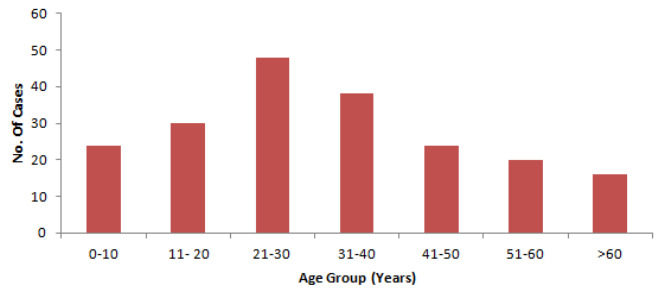


Figure 1 : Age Incidence

Total number of patients from rural region were 148 (74%) and urban region were 52 (26%). From both rural and urban region, male population was more commonly affected (83%) in comparison to female population (17%). Out of 200 patients, 98 patients had an injury in right eye, 98 patients had in left eye while in only 4 patients, there was a bilateral injury. Bilateral injuries were very uncommon (2%) and these are caused by roadside accident.

Out of 200 patients, 74 were students, 40 were labourer, 26 each were farmers and industrial workers, 16 were housewives, 14 were sedentary workers and 4 were shopkeeper. So, it was observed that maximum number of patients (37%) were student. 60 were involved in road side accidents, 44 patients were involved in home related injuries, 40 had assault related injuries, 30 were involved in work-related injuries and 26 were sports related injuries. So, it was observed that RSA (Road Side Accidents) was the major cause of injury (30%). Out of 200 patients, 60 had road side accidents (RSA), 22 had an injury with wood, 20 with a stick, 16 with a fist, 12 each with stone and metal, 10 each with rod and cracker, 8 with table, 4 each with glass, door, knife and blade whereas 2 each with sand, shoe, pipe, pillar, nail, tennis ball and pencil. So it was observed that RSA is major cause of injury (30%) followed by wood (11%).

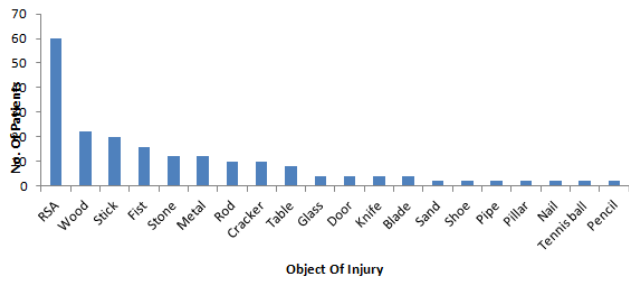


Figure 2: Cause of Injury

Out of 200 patients, 54 presented within 24 hours, 88 patients consulted between 1-5 days, 34 between 6 days-1 month, 18 between 1-12 month and 6 patients presented after 12 months. It was observed that majority of patients (44%) presented between 1-5 days of injury while a few of them (3%) presented after 12 month of injury.

Out of 200 patients, 162 (81%) had closed globe injuries, whereas 38 (19%) had open globe injuries. The number of eyes that accounted for rupture, penetrating, IOFB, perforating injuries were 8 (4%), 10 (5%), 2 (1%) and 18 (9%) respectively in open globe injury group. In closed globe injury group, contusion, lamellar laceration, superficial foreign body and mixed injuries were found in 74 (37%), 26 (13%), 48 (24%) and 14 (7%) eyes respectively. It was found that the perforating (9%) and contusion injuries (37%) were the most common cause of open and closed globe injuries respectively.



Fig 3: Lid Ecchymosis with Subconjunctival Hemorrhage

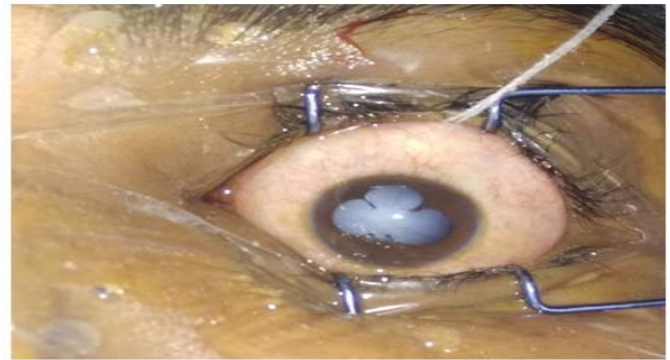


Fig 4: Traumatic Cataract with Festooned Pupil

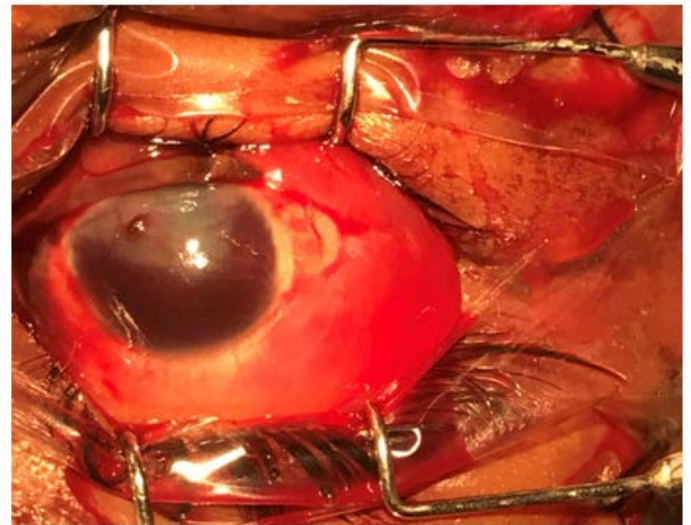


Figure 5: Limbal Tear with Uveal Prolapse

In our study, conjunctiva (79%) was the most common structure involved in ocular trauma followed by trauma to eyelid (66%) and cornea (43%). Edema (33%) was the most common finding in periorbital lesions, whereas edema (62%) followed by ecchymosis (53%) were common in eyelid injuries. Conjunctival chemosis (61%) followed by subconjunctival hemorrhage (51%) were the most frequently encountered conjunctival injuries. Among the corneal injuries, laceration (13%) was the most common finding whereas it was collapse (11%) for anterior chamber lesions. Iris prolapse (8%) and irregular pupil (15%) were the most frequently observed sign among injuries to iris and pupil respectively. Scleral laceration (6%) was found to be the most common form of

scleral injury whereas it was traumatic cataract for lenticular lesions. Among posterior segment injuries, hemorrhage (6%) was most frequently encountered in vitreous and detachment in retina (6%). Out of 200 patients, 168 had only anterior segment involvement while 32 had both anterior and posterior segment involvement. Patients with only anterior segment involvement have better presenting VA than patients with both anterior and posterior segment involvement. 43% cases with anterior segment injuries had presenting BCVA of 6/18 or better while only 2% cases with both anterior and posterior segment injuries had presenting BCVA of 6/18 or more.

Discussion

Ocular trauma is a major public health problem and an important cause of monocular visual impairment and blindness. Present prospective, hospital based observational study was conducted to depict the epidemiology and profile of ocular trauma and pattern of visual deficit at a tertiary hospital.

In our study, predominant age group involved was found to be 21-40 years(43% cases) because of more outdoor activities and more active lifestyle. This was consistent with the study by Dhasmana et al on 103 eyes of 88 patients which showed that mean age of presentation was 31.2 ± 13.6 years.¹⁶

Out of 200 patients, there were 166 males and 34 females. In our study, right and left eye were involved in 98 cases each (49% each) whereas both eyes were involved in 4 cases (2%). In a study by Maurya et al, left eye was affected in 46.34%, right eye in 42.68% while in 10.98% cases, both eye were injured.¹⁷

In our study it was observed that ocular trauma was more common in students (37%). This was followed by labourers (20%), farmers (20%) and industry workers (13%). In a study by Shaeri et al, students (35.4%) were

the most frequently involved population followed by laborers (22%) and industrial workers (20.7%).¹⁸ The possible reason behind the high incidence of ocular trauma among these populations could be their work place exposure, lack of awareness and lack of use of safety gears by this population as well as more active lifestyle of the youth in terms of sports activities, driving and occupational exposures.

According to place of injury, RSA (30%) formed the major bulk in our study, followed by home related trauma (22%), assault (20%), work place injury (15%) and sports related injury (13%). In a study by Nagrale et al, the place of injury were RSA, occupation related and sports related activities in 54 (45%), 39 (32.5%) and 24 (20%) respectively.¹⁹

In our study, we found that the most common cause of injury was road side accident (30%) followed by injury due to wood (11%), stick (10%) and fist (8%). While this is consistent with some studies, others do have a variety of findings. A study by Enock et al comprising of 182 patients showed that motorcycle related road traffic accident was the most common cause of ocular injury in 56 patients.²⁰

Out of 200 patients examined in our study, 27% presented within 24 hours whereas 44% presented between 1-5 days, 17% patients between 6 days-1month and 12% later than 1 month. The main cause of late presentation to hospital was found to be lack of awareness among general population.

In our study, out of 200 patients with ocular trauma, 162 had closed globe injuries whereas 38 had open globe injuries. This was consistent with the study conducted by Misra et al who found that closed globe injury (68.33%) was more common than open globe injury (31.67%).⁷

Conclusion

It is clear from our study that ocular trauma is more common in young males which are productive population of economy. The road side accident was found to be the commonest cause of ocular trauma. The visual outcome depends upon the initial visual acuity, type of injury, extent of ocular damage and the period between the time of injury and presentation to the hospital. Many of the injuries could have been prevented, if the patients had used protective eye gear during work or play. This awareness can be brought about by health education in schools and factories. Early referral, prompt evaluation and treatment can reduce the sight threatening complications as well as salvage the eye, both anatomically and functionally

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