IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 19, Issue 7 Ser.8 (July. 2020), PP 09-13
www.iosrjournals.org

Clinical profile of patients of ocular trauma following road traffic accident presenting to the tertiary health care centre

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Abstract
Purpose - *To study the clinical profile of patients of ocular trauma following road traffic accident presenting to the tertiary health care centre.*
Methods- *This was a prospective observational study that involved 200 eyes of 100 patients with ocular trauma presenting with periorbital ecchymosis , subconjunctival haemorrhage ,lid laceration ,orbital fracture and posterior segment involvement. Diagnostic tests were done in all the patients.*
Results-*There were 76 males and 24 females and the age group taken was 20 to 65 years.*
59 patients belonged to the age group of 20 to 35 years, out of which were 46 males and 13 were females. 31 patients belonged to age group of 36 to 50 years, out of which 22 were males and 9 were females. 10 patients belonged to the age group of 51 to 65 years , out of which 8 were males and 2 were females. There were 88% closed globe injuries and 12% open globe injuries. Most common presentation in ocular trauma patients is ecchymosis(85%) followed by subconjuctival haemorrhage (78%),lid laceration(62%), orbital fracture(35%) , vitreous haemorrhage(28%) ,berlin's edema(26%), retinal detachment(14%) and macular hole(8%).
Conclusion - *Ocular trauma after road traffic accident is a common presentation among young males of age group 20 to 35 years mostly under influence of alcohol. Most common presentation of ocular truma following road traffic accident is ecchymosis followed by subconjuctival haemorrhage ,lid laceration, orbital fracture , vitreous haemorrhage ,berlin's edema, retinal detachment and macular hole. Road traffic accidents are common occurrence owing to increase in number of vehicles and various other reasons. Primary preventive approach such as avoidance of alcohol, strict adherence to traffic rules can prevent ocular morbidity associated with road traffic accidents.*

Keywords: *ocular trauma , road traffic accident ,ecchymosis ,laceration , berlin's edema*

Date of Submission: 04-07-2020 Date of Acceptance: 19-07-2020

I. Introduction

Ocular trauma is a major cause of preventable blindness & visual impairment. Ocular trauma once described as the neglected disorder[1] has recently been highlighted as a major cause of visual morbidity and considered as important public health hazard with enormous economic and social consequences[2].Road traffic accidents are common occurrences every day. It is a major public health problem.[3] Owing to increase in number of vehicles and various other reasons, RTA are on a rise leading to mild to severe injury including injuries to eye. Ocular trauma may involve lids and adnexa, cornea, sclera, lens, retina, optic nerve and orbital walls.

Ocular injuries are divided into open globe and closed globe injuries, however, there may be an overlap in their classification based on the causative agent or inflicting object involved. An open globe injury (an injury penetrating into the globe) involves a full thickness wound of the corneoscleral wall which may result from penetrating or blunt eye trauma. Open globe injuries include lacerations which are futher divided into penetrating injuries, perforating injuries and intraocular foreign bodies . Closed globe injuries are commonly due to blunt trauma whereby the corneoscleral wall of the globe remains intact (a partial thickness corneal wound) however, intraocular damage may be present. They are divided into burns, blunt trauma/contusions and lamellar lacerations.

Open and closed globe injuries are further described in terms of zones, elaborating on which structure of the eye the wound involves and to what extent it is. For open globe injuries a zone I wound involves the cornea, a zone II wound extends into the anterior 5 mm of the sclera and a zone III wound involves the sclera extending more than 5 mm from limbus. In the case of closed globe injuries, a zone I wound involves only the conjunctiva, sclera or cornea, a zone II injury includes the anterior chamber including the lens and zonules and a

zone III injury involves posterior structures including the vitreous, retina, optic nerve, choroid and ciliary body[4,5]

The anterior segment of the eye which consists of the cornea, conjunctiva, trabecular meshwork, anterior chamber, iris, and crystalline lens is vulnerable to direct trauma. Posterior ocular structures include the retina, choroid and optic nerve1. The worst outcome is often seen in the combined anterior and posterior segment injuries with the possibility of losing all useful vision[6,7,8].

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.

Upper and lower eyelid laceration

Periorbital Ecchymosis

Corneal tear with uveal tissue prolapse

Upper lid laceration sutured

II. Method and Material

This was a prospective observational study that involved 200 eyes of 100 patients with ocular trauma presenting with periorbital ecchymosis , subconjunctival haemorrhage ,lid laceration ,orbital fracture and posterior segment involvement . Patients were recruited from the OPD of MLB MEDICAL college, Jhansi ,Uttar Pradesh and were followed from 1st october 2019- 1st april 2020 . It was performed under the Helsinki Declaration of 1975, as revised in 2000. The necessary permission from the Ethical and Research Committee was obtained for the study.

Inclusion criteria

1. All patients between the age group 20 to 65 years of ocular trauma following road traffic accident who presented to the OPD of MLB medical College Jhansi with periorbital ecchymosis , subconjunctival haemorrhage ,lid laceration ,orbital fracture and posterior segment involvement.

Exclusion criteria

1.Patients outside the age group of 20 to 65 years.
2.Patients with any other corneal pathology.
3.Patients with other conjunctival diseases.
4.Patients with any other ocular pathology.
5.Mentally or physically unfit patients.

All patients were subjected to a detailed history taking, complete ophthalmic examination in diffuse and focal light and B-scan of the affected eye

III. Results

2. A total of 200 eyes of 100 patients were studied. We included only eyes with periorbital ecchymosis , subconjunctival haemorrhage ,lid laceration ,orbital fracture and posterior segment involvement. There were 76 males and 24 females and 60% of the studied eyes were right eye

Table1: Age distribution in ocular trauma patients following road traffic accident

	Age group	no. of patients
1	20 to 35 years	59
2	36 to 50 years	31
3	51 to 65 years	10

Table2: Gender distribution in ocular trauma patients following road traffic accident

	Gender	no. of patients
1	Male	76
2	Female	24

Table3: Types of ocular injury after road traffic accident

	Types	% of patients
1	Closed globe injuries	88
2	Open globe injuries	12

Table 4: Clinical presentation in patients of ocular trauma

	Presentation	% of patients
1.	Ecchymosis	85%
2.	Subconjuctival haemorrhage	78%
3.	Lid laceration	62%
4.	Orbital fracture	35%
5.	Vitreous haemorrhage	28%
6.	Berlin's edema	26%
7.	Retinal detachment	14%
8.	Macular hole	8%.

IV. Discussion

Ocular trauma is a major cause of visual morbidity. One out of every twenty patients seen by an ophthalmologist is a case of ocular trauma.Road traffic accidents resulting in ocular trauma is the major cause of avoidable blindness. The study shows increased incidence of road traffic accidents in males. This may be explained by their increased outdoor activities, rash driving and alcohol abuse. Right eye was more frequently involved in this study which was similar to *Alam J et al*.[9] Only 12% patients gave the history of alcohol consumption during the time of accident which is considered a risk factor impacting road traffic injuries.4 Around 77% of the patients were riding two wheeler similar to study reported by *Puzari et al*[10]. According to *Das et al* [11] significant delay in seeking medical care is reported in developing countries including India.6 About 68% of the patients who reported were from rural place. *Puzari BS et al* [10]in his study concluded that presention after ocular trauma is Ecchymosis(78.33%), Subconjunctival haemorrhage(83.33%),Corneal tear (3.33%), Hyphema (6.66%), Vitreous haemorrhage (1.66%), intra ocular foreign body (1.66%) and PL negative (1.66%). Ocular trauma is a preventable public health problem. Henceforth ocular injuries as and when they occur have to be tackled efficiently and methodically. If the final visual acuity has to be improved, better first aid facilities, referral service, trained ophthalmologist who can assess and manage ocular injuries on an emergency basis, well equipped facility, visual rehabilitation, follow up services are of paramount importance. On the other hand unsafe roads, distracted driving, exhaustion, alcohol intoxication are some of the reasons leading to road traffic accidents. Therefore primary preventive approach like avoidance of alcohol, wearing protective eyewear, helmets, training of drivers, proper infrastructure including maintenance of roads, enforcing road safety standards and vehicle standards must be implemented. *Shtewi ME et al* [12]concluded in his study that most of the patients of ocular trauma presented with ecchymosis (37.7%), subconjunctival haemorrhage(42.4%), corneal tear(46.7%), hyphema(50%), vitreous haemerrhage(23.6%), intraocular foreign body(9.8%) and PL negative(3.28%). *D Das S Gupta et al* [11]in his study showed the epidemiology and pattern of motorcycle accident related ocular injuries in a rural tertiary care hospital in eastern India and found males to be predominantly affected. *R Pal Ghosh et al* [13]in his study

emphasized on public health crisis of road traffic accidents in India and did risk factor assessment and gave recommendations on prevention on the behalf of the academy of family physicians of India.

V. Conclusion

ocular trauma is a common presentation following road traffic accident and tends to occur more in males of 20 to 35 years age group usually under the influence of alcohol. Our study spans over a period of 6 months and is prospective in nature focusing on age and gender distribution and clinical profile of ocular trauma patients after road traffic accident. Most predominant presentation is ecchymosis followed by subconjunctival haemorrhage ,lid laceration ,orbital fracture and posterior segment involvement. All ocular structures are vulnerable to injury, but the site often depends on the cause and mechanism of ocular injury. Ocular trauma is a preventable public health problem and hence the need for increasing awareness among the general public.

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