

Clinical Profile and Visual Outcome of Ocular Injuries Presenting to Tertiary Care Hospital Located on a State Highway

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Abstract

Introduction: Ocular injury is a major cause of ocular morbidity and visual impairment worldwide.

Purpose: The purpose of this study is to identify the various types of ocular injury presented to our tertiary care center, to determine associated visual impairment, and to assess the visual outcome after treatment.

Materials and Methods: This was a hospital-based prospective study conducted over 1 year, and a total of 60 patients of ocular trauma were included in the study. All patients underwent eye examination including visual acuity, anterior segment examination, extraocular movements, intraocular pressure, and fundus examination.

Results: Ocular injuries were more commonly seen in middle-aged adults (43%). The most common mode of injury was road traffic accidents (RTA) (40%). 46.66% of the patients had visual acuity >6/60 at the time of presentation, while after complete treatment at the end of 6 weeks, 76.66% of patients had best-corrected visual acuity >6/60.

Conclusion: RTA is the most common cause of ocular injury presented to our institute as it is situated in a state highway that can be preventable, and the visual outcome depends on the site and size of the injury and the extent of the ocular damage.

Key words: Best-corrected visual acuity, Ocular injury, Road traffic accidents, State highway, Tertiary care center, Visual outcome

INTRODUCTION

Ocular trauma is one of the most common causes of ophthalmic morbidity and monocular blindness worldwide. They have a significant impact on an individual and society in terms of sufferings, medical cost, and loss of productivity.^[1] Of all types of ocular emergencies, ocular trauma is by far the most common constituting nearly 75%.^[2] It can be open globe or closed globe injuries.

In India, there are more than 50 million blind people and this number increases by about 3.8 million per year. Among

the total number of blind cases, 1.2% is contributed by injuries which are preventable.^[3] The WHO program for the prevention of blindness, indicated that there are approximately 55 million eye injuries per year that restrict activities for more than one day.^[4]

The aim of this study is to find the types of ocular injuries presented to our hospital nearby state highways frequently, the extent of visual impairment by these injuries, and the visual outcome after treatment.

MATERIALS AND METHODS

A Prospective cross-sectional study was conducted for 1 year (From December 2016-November 2017) including patients with ocular injuries reported to casualty and Ophthalmology OPD in Raja Rajeswari Medical College and Hospital, Bangalore.

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Month of Submission : 06-2018
Month of Peer Review : 07-2018
Month of Acceptance : 08-2018
Month of Publishing : 08-2018

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Inclusion Criteria

Patients with ocular injuries reported to our casualty and ophthalmology OPD were included in the study.

Exclusion Criteria

Patients with birth injuries, war injuries, ultrasonic injuries, and radiation injuries were not included in the study. A detailed workup of all patients including slit-lamp biomicroscope, direct and indirect ophthalmoscopy, intraocular pressure, color vision, and extraocular movements was done. B-scan ultrasonography was done where media prevent from fundus examination and to rule out retained intraocular foreign body. X-ray orbit and, in few cases, computed tomography (CT) orbit were also done.

The trauma cases were classified based on standardized Birmingham Eye Trauma Terminology, which was endorsed by the American Academy of Ophthalmology, International Society of Ocular Trauma, World Eye injury Registry, and the Vitreous and Retina societies.

The cases were managed on the basis of the guidelines given by the Eye Trauma Society. The visual outcome was recorded at the time of presentation, next day, after 1 week, and at the end of 6 weeks.

A record of pre- and post-treatment, clinical photographs of the patients is maintained. Frequency and percentage were calculated using bar diagram and pie chart for data presentation. The results so obtained are analyzed, discussed, and compared with the existing studies in the literature.

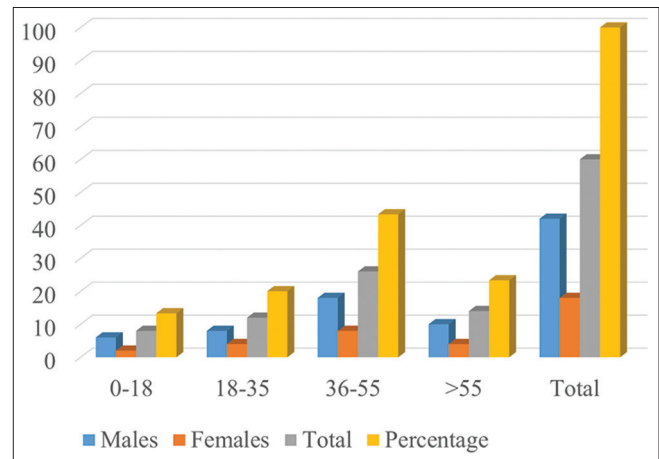
The injuries were classified into extraocular and intraocular. The intraocular injury was further classified into open and closed globe injury according to the Ocular Trauma Classification Scheme.

RESULTS

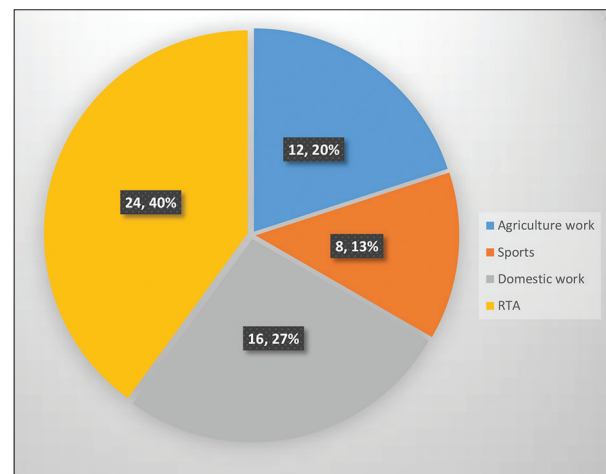
In our study, we found a higher incidence of ocular injuries in middle-aged males (36–55 years) (43.33%) [Table 1 and Graph 1]. Most common mode of injury was RTA (40%) followed by domestic work injury (26.66%) [Table 2 and Graph 2].

Closed globe injuries (80%) were more common than open globe injuries (20%) [Table 3 and Graph 3]. Conjunctiva was the commonly involved ocular structure (80%) followed by periorbital lesions (66.6%) [Table 4 and Graph 4]. Conjunctival chemosis was the most common conjunctival lesion (83.3%) followed by subconjunctival hemorrhage (79.16%) [Table 5 and Graph 5]. Periorbital

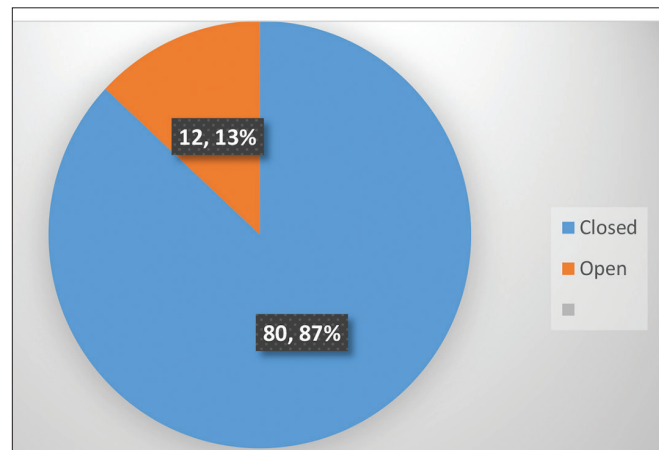
edema was the most common periorbital lesion (84.2%) [Table 6 and Graph 6].



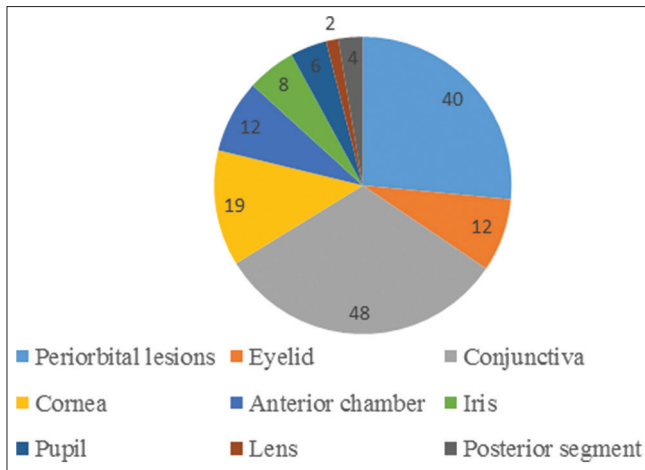
Graph 1: Our study showed that the highest incidence of ocular injuries was in the middle-aged adults (36–55 years). Furthermore, it is seen that ocular injuries are common in males compared to females



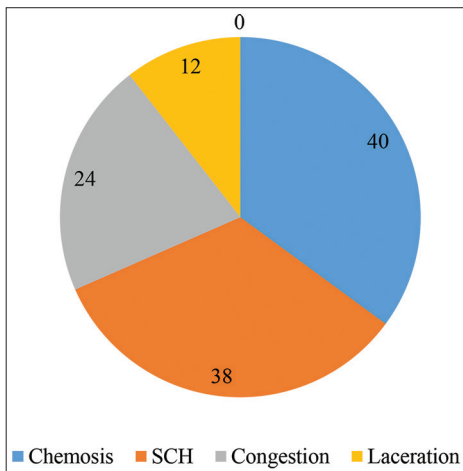
Graph 2: Our study showed that RTA-related ocular injuries was the most common mode of injury



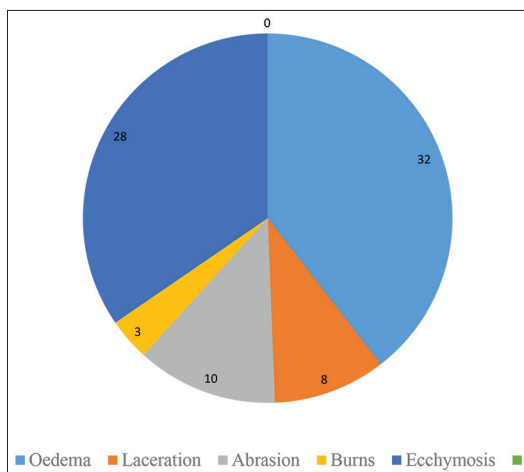
Graph 3: Our study showed that closed globe injuries were common than open globe injuries



Graph 4: Our study showed that conjunctiva was the commonly involved ocular structure



Graph 5: Our study showed that conjunctival chemosis was the most common conjunctival lesion



Graph 6: Our study showed that periorbital edema was the most common periorbital lesion

Our study showed that 46% had visual acuity better than 6/60 at presentation and 23% of patients presented with

Table 1: Our study showed that the highest incidence of ocular injuries was in the middle-aged adults (36–55 years). Furthermore, it is seen that ocular injuries are common in males compared to females

Age (years)	Males	Females	Total (%)
0–18	6	2	8 (13.33)
18–35	8	4	12 (20)
36–55	18	8	26 (43.33)
>55	10	4	14 (23.33)
Total	42	18	60 (100)

Table 2: Our study showed that RTA-related ocular injuries was the most common mode of injury

Mode of injury	Number of patients (%)
Agriculture work	12 (20)
Sports	8 (13.33)
Domestic work	16 (26.66)
RTA	24 (40)

RTA: Road traffic accident

Table 3: Our study showed that closed globe injuries were common than open globe injuries

Type of injury	Number of patients (%)
Closed	48 (80)
Open	12 (20)

Table 4: Our study showed that conjunctiva was the commonly involved ocular structure

Ocular structure	Number of patients (%)
Periorbital lesions	40 (66.6)
Eyelid	12 (20)
Conjunctiva	48 (80)
Cornea	19 (31.6)
Anterior chamber	12 (20)
Iris	8 (13.33)
Pupil	6 (10)
Lens	2 (3.33)
Posterior segment	4 (6.66)

visual acuity from 6/60 to 3/60. At 6 weeks' follow-up after treatment, 76% of patients had visual acuity better than 6/60. Four patients had just perception of light (PL) and 4 had no PL at the time of presentation. At the end of 6 weeks among 4 PL-positive patients, one of them improved to 2/60 of visual acuity.

DISCUSSION

Ocular trauma is an important cause of blindness and ocular morbidity. Most previous studies on the profile and prognostic factors in ocular trauma have been carried out

in more developed countries where modern facilities for managing ocular trauma are widely available.^[5]

There is a paucity of studies on the profile of ocular trauma from the less developed countries.^[6]

Hence, we conducted this study. The common injuries encountered in our study were as follows:

There was an increased incidence of ocular injuries in middle-aged adults (43%) with a male preponderance (70%). This study was in close relation with Ilisar *et al.*,^[7] Niiranen,^[8] and Jain *et al.*^[9] Male preponderance is seen because they are more frequently exposed to outdoor work compared to females. This was in correlation with Balaghafari *et al.*^[10] and Sharma *et al.*^[11] Ocular injury stands next to cataract and strabismus as a leading cause for hospitalization.^[12]

The most common cause of ocular injury was road traffic accident (RTA) (40%) presenting to our hospital as it is situated in a state highway. Enock *et al.*^[13] and Mowatt *et al.*^[14] found that motorcycle-related RTA was the most common cause of ocular injury.

Table 5: Our study showed that conjunctival chemosis was the most common conjunctival lesion

Conjunctiva lesions	Number of patients (%)
Chemosis	40 (83.3)
SCH	38 (79.16)
Congestion	24 (50)
Laceration	12 (25)

Table 6: Our study showed that periorbital edema was the most common periorbital lesion

Periorbital lesions	Number of patients (%)
Oedema	32 (84.2)
Laceration	8 (21.05)
Abrasion	10 (26.3)
Burns	3 (7.8)
Ecchymosis	28 (73.6)

Table 7: Visual acuity of patients at the time of presentation and at various follow-ups

Visual acuity	0 th day (%)	1 st day (%)	1 week (%)	6 weeks (%)
>6/60	28 (46.66)	32 (53.33)	40 (66.66)	46 (76.66)
6/60–3/60	14 (23.33)	11 (18.33)	7 (11.66)	4 (6.66)
3/60–1/60	10 (16.66)	9 (15)	5 (8.33)	2 (3.33)
PL present	4 (6.66)	4 (6.66)	4 (6.66)	3 (5)
No PL	4 (6.66)	4 (6.66)	4 (6.66)	4 (6.66)

In our study middle aged males were more frequently involved in driving vehicle owing to male preponderance. Ocular trauma due to road traffic accidents are preventable, this was in correlation with a study done in Northern Ireland in 1986 which found that there was 60% reduction in perforating eye injuries following seat belt legislation.^[14]

In our study we noted closed globe injuries (80%) were more common than open globe injuries (20%), which could be due to vehicular congestion causing slower moving traffic leading to lesser impact accidents. This was in correlation with the study done by Vasu *et al* who found that 38.10% were open globe injuries while 61.90% were closed globe injuries.^[15]

In our study, conjunctiva (80%) was the commonly involved ocular structure and this was in consistent with Pai *et al.*^[16] followed by periorbital lesions (66.6%). Conjunctival chemosis (83%) followed by subconjunctival hemorrhage (79%) [Figure 1] was frequent injuries in conjunctiva.

Periorbital edema [Figure 2] was the most common periorbital lesion seen in our study.

Patients with open globe injury were presented with a corneal tear with or without uveal tissue prolapse, traumatic cataract, corneoscleral tear, foreign body in anterior chamber, vitreous hemorrhage, retinal detachment [Figure 3], and intraocular foreign body.

Patients with closed globe injury were presented with full or partial thickness upper or lower lid tear, burns, conjunctival tear, subconjunctival hemorrhage, corneal lamellar laceration, corneal abrasions, hyphema, traumatic cataract, etc.

In our study, 48 (80%) patients were managed medically and the remaining 12 (20%) were managed surgically. Most of the patients showed improvement in vision after treatment. Four patients were severely injured came with no PL. Visual acuity at the time of presentation and on follow-up is shown in Table 7.

Factors associated with the final visual outcome were initial visual acuity, type, site, size of the injury, and extent of ocular damage.

In our study, we noticed that only few people use safety measures while driving. Panagiotidis *et al.* found that 5.2% of the car drivers were using seat belts and none of the two-wheeler accident victims had used helmets in their study.^[17] Schrader *et al.* in their study also observed that, despite compulsory seat belt legislation in Germany, majority of their study group had not worn their seat belts at the time



Figure 1: Sub conjunctival hemorrhage, ecchymosis



Figure 2: Periorbital edema

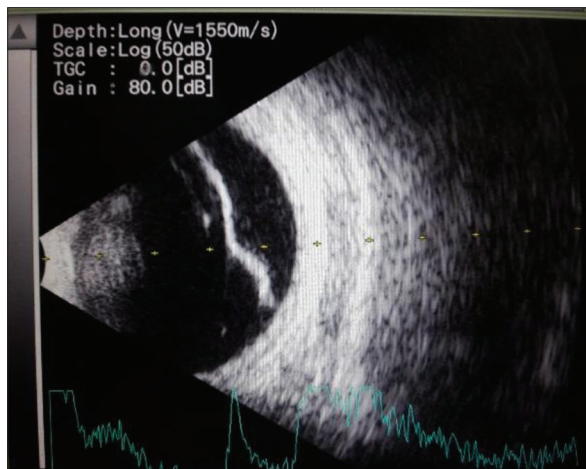


Figure 3: B-scan showing retinal detachment

of the accident.^[18] Schrader *et al.* also found that 50% of cases were inebriated at the time of accident. Probably a higher percentage of cases under the influence of alcohol would have been detected in our study if breath analysis

test or blood alcohol levels were done.

In our study most of the patients who were from poor economic background had less awareness regarding use of protective eye wear. This was comparable with the study done by Avinash Mishra *et al* (2014) who noted 5% wearing eye protection.^[18]

CONCLUSION

Ocular trauma is one of the most common causes of monocular blindness. Ocular injuries are more common in middle-aged adults seen more commonly in males. RTA is the most common cause of injury. Closed globe injuries are more common than open globe injuries. Conjunctiva is the most frequently injured structure.

Primary preventive approach such as promoting safe riding practices and strict implementation of traffic rules such as riding at safe speed, wearing seatbelts and helmet for head safety, and avoiding alcohol before driving is needed to prevent RTA and associated ocular morbidity.

Emphasizing the need to use eye protective measures among workers in industries and fireworks to prevent ocular injuries.

The impact of ocular trauma in terms of medical care, loss of income, and cost of rehabilitation services clearly highlight, the importance of preventive strategies.

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How to cite this article: : Kumar MS, Vishwas D. Clinical Profile and Visual Outcome of Ocular Injuries Presenting to Tertiary Care Hospital Located on a State Highway. Int J Sci Stud 2018;6(5):76-81.

Source of Support: Nil, **Conflict of Interest:** None declared.