

# Ocular morbidity in road traffic accidents

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## Abstract

**Background:** Ocular trauma is an important cause of blindness. Road traffic accidents (RTA) are common occurrences every day. With increasing number of various road transport vehicles traffic accidents keep on increasing, causing mild to severe injuries to the eyes. **Aim:** To study ocular morbidities in road traffic accidents attending tertiary care hospital. **Material and Methods:** A total of 95 patients with history of ocular injuries following road traffic accidents presenting to the casualty and outpatient Ophthalmic Department had underwent detail ophthalmic examination. **Results:** Most common ocular manifestation of RTA is subconjunctival haemorrhage 51 (53.65%) followed by ecchymosis 47 (49.44%). The majority of cases 64 (67.39%) had a visual acuity in the range of 6/6 – 6/12 and only 2 (2.11%) cases had no perception of light after 6 weeks. **Conclusion:** Most of the injuries involved the ocular adnexa, which while causing certain degree of cosmetic disfigurement did not lead to any permanent visual sequelae, injuries involving cornea or sclera had bad prognosis and those with optic neuropathy had worst prognosis.

**Key Words:** Road traffic accidents, ocular trauma, morbidity, vision

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Received Date: 07/09/2019 Revised Date: 17/10/2019 Accepted Date: 01/11/2019

DOI: <https://doi.org/10.26611/10091233>

## Access this article online

Quick Response Code:



Website:

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Accessed Date:

01 December 2019

## INTRODUCTION

Eye injuries are a major and under-recognized cause of disabling ocular morbidity that especially affect the young. The public health importance of ocular trauma is undeniable. Injuries generate a significant and often unnecessary toll in terms of medical care, human suffering, long term disability, productivity loss, rehabilitation services and socioeconomic cost. Road traffic accidents (RTA) are common occurrences every day. With increasing number of various road transport vehicles traffic accidents keep on increasing, causing mild to severe injuries to the eyes. Ocular trauma is an important cause of blindness and it accounts for half or more of eyes enucleated in some studies.<sup>1</sup> Annually, there are in excess of 2 million cases of ocular trauma, with more than 40,000 individuals sustaining significant visual

impairment on a permanent basis.<sup>2</sup> The aim of the present study was to study ocular morbidities in road traffic accidents attending tertiary care hospital.

## MATERIAL AND METHODS

The present study was carried out at Department of Ophthalmology of a tertiary care hospital for a period of one year.

### Inclusion criteria

- Age - more than 18 years
- Patients with history of ocular injuries following road traffic accidents presenting to the casualty and outpatient Ophthalmic Department.

### Exclusion criteria

- Cases of ocular injury due to causes other than vehicular accidents

This study included 1050 cases of Road Traffic Accident (RTA), of which 95 cases presented with ocular injuries. Socio-demographic data and details of the patients were obtained. Information regarding the type of vehicular accident, time and location were noted. Signs and symptoms occurring after the injury were recorded. Thorough examination using a torch light was done. Visual acuity was recorded using Snellen's chart. This was followed by examination under slit-lamp for more detailed examination. Gonioscopy was performed wherever necessary. IOP was recorded with applanation

tonometer. In few cases it could not be recorded. Direct and indirect ophthalmoscopy was performed wherever required. Retinoscopy was performed in cases without media opacities. Plain x-ray skull in A-P view, lateral view, Rheese parieto-orbital-oblique view and Water's view were taken whenever necessary. B-scan ultrasonography was performed in those cases with media opacities who were suspected of having posterior segment abnormality. CT and MRI were done wherever required. Depending on the presentation, patients were subjected to detailed examination by ENT surgeon, General surgeon, Maxillo-facial surgeon and General physician. Patients were managed mainly at casualty and OPD level, with some patients admitted for further management and specialized care. Patients were followed up every week after they were discharged from the hospital and the patients who were treated on OPD basis were also followed up every week.

## RESULTS

The majority 39 (41.05%) of ocular injuries occurred in the age group of 31-40 years and the least number of cases 10 (10.52%) were seen over the age of 50 years. The prevalence of ocular injuries was more in males 67 (70.53%).

**Table 1: Distribution of ocular injuries in RTA**

Characteristics	No. of cases	Percentage
Age		
20-30 years	19	20%
31-40 years	39	41%
41-50 years	27	28.4%
>50 years	10	10.5%
Sex		
Male	67	70.5%
Female	28	29.5%

Right eye was most commonly affected i.e. 52 (54.70%) and both eye involvement was least common i.e. 9 (9.47%). The most common 53 (55.76%) of ocular injuries in RTA was due to 2 wheelers.

**Table 2: Vehicle involved and eyes affected**

Characteristics	No. of cases	Percentage
Vehicle involved		
2 wheeler	53	55.8%
3 wheeler	07	7.4%
4 wheeler	20	21.1%
Pedestrians	15	15.8%
Eyes affected		
Left eye	34	35.8%
Right eye	52	54.7%
Both eyes	09	9.5%

Most common ocular manifestation of RTA is subconjunctival haemorrhage 51 (53.65%) followed by ecchymosis 47 (49.44%).

**Table 3: Ocular involvement in RTA cases**

Ocular involvement	No. of cases	Percentage
Orbital fracture	11	11.57%
Ecchymosis	47	49.44%
Lid tear	24	25.25%
Sub-conjunctival haemorrhage	51	53.65%
Conjunctival tear	6	6.31%
Conjunctival foreign body	8	8.42%
Conjunctival chemosis	18	18.94%
Corneal abrasion	3	3.16%
Corneal foreign body	5	5.26%
Corneal tear-full thickness	5	5.26%
Corneal tear – partial thickness	3	3.16%
Scleral laceration	2	2.10%
Hyphaema	3	3.16%
Sphincter tear	3	3.16%
Iridodonesis	1	1.05%
Traumatic mydriasis	5	5.26%
Iris prolapse	5	5.26%
Subluxation of lens	2	2.10%
Dislocation of lens	1	1.05%
Traumatic cataract	6	6.31%
Berlin's oedema	2	2.10%
Pre-retinal haemorrhage	1	1.05%
Vitreous haemorrhage	2	2.10%
Traumatic optic neuropathy	2	2.10%

The majority of cases 64 (67.39%) had a visual acuity in the range of 6/6 – 6/12 and only 2 (2.11%) cases had no perception of light after 6 weeks.

**Table 4: Vision at the time of presentation**

Vision	No. of cases	Percentage
6/6-6/12	64	67.39%
6/18-6/36	11	11.58%
6/60-CF	16	16.85%
PL-PR	02	2.11%
NO PL	02	2.11%
<b>Total</b>	<b>95</b>	<b>100%</b>

Improved visual acuity was seen in 89 (93.72%) cases, in the range between 6/6-6/12 at the end of 6 weeks.

**Table 5: Vision at the time of discharge**

Vision	No. of cases	Percentage
6/6-6/12	89	93.72%
6/18-6/36	04	4.21%
6/60-CF	0	0%
PL-PR	0	0%
NO PL	2	2.11%
<b>Total</b>	<b>92</b>	<b>100%</b>



Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 1: Subconjunctival haemorrhage; Figure 2: Sphincter tear; Figure 3: Hyphaema; Figure 4: Iridodialysis; Figure 5: Traumatic cataract

## DISCUSSION

In this study, patients above the age of 18 years were selected. The majority of ocular injuries occurred in the age group of 31-40 years and least number of cases of RTA were seen in patients over 50 years of age. There were a total of 67 males and 28 females. Male:female ratio was 2.4:1. Similar male predominance was found in a study from Western Maharashtra by Patil *et al*.<sup>3</sup> Out of 350 cases of RTA, male were 288 (82.3%) and female were 62 (17.7%) with M:F ratio of 4.6:1. The highest number of victims were between 20-29 years of age. Out of 95 patients with ocular injuries, most were due to motorized 2 wheelers 53 (55.76%) followed by 4 wheelers 20 (21.04%), pedestrians 15 (15.78%) and 3 wheelers 7 (7.36%). In the study done by Patil *et al*,<sup>3</sup> majority (35%) were due to motorized 2 wheelers followed by 4 wheelers (25.9%). A total number of 11 (11.57%) orbital fractures were seen during the period of our study. Of these 4 cases had medial wall fracture, 2 cases had fracture of orbital rim, 3 cases had floor fractures, one case had lateral wall fracture and 1 patient had a pure blow out fracture. In a study of orbital fractures in a tertiary health care center by Kamath *et al*,<sup>4</sup> 22 among 35 patients had infraorbital rim fracture, floor fracture was seen in 10 patients, lateral wall fracture in 4 patients, medial wall fracture in 6 patients, pure blow out fracture in 5 patients and roof fracture in 1 case. Ecchymosis was one of the most common clinical finding; out of the total number of 95 cases, 47 patients had ecchymosis. 46 patients with ecchymosis were associated with other clinical findings while 1 patient had only ecchymosis. 24 patients had lid tear, most of them being partial thickness lid tear. Four cases had both upper and lower lid tear. 7 cases had associated fracture orbit. Three lid tears had no associated ocular injuries, one patient had Berlin's oedema and one had vitreous haemorrhage. Subconjunctival haemorrhage was most common clinical finding in our study. 51 (53.65%) cases had subconjunctival haemorrhage. They varied from small petechiae to large extravasations. In severe subconjunctival haemorrhage, posterior limit could not be made out. 10 patients did not have any associated clinical findings. Conjunctival tear was seen in 6 (6.31%) patients. Conjunctival tear did not exceed more than 5 mm. Conjunctival foreign body was observed in 8

(8.42%) patients and chemosis in 18 (18.94%) patients. Most of the foreign bodies were sand particles and were lodged in bulbar and upper tarsal conjunctiva. In present study, 16 (16.83%) patients presented with corneal injuries, 3 (3.16%) patients had corneal abrasion, 5 (5.26%) patients had full thickness corneal tear, 3 (3.16%) patients had partial thickness corneal tear and 5 (5.26%) patients had corneal foreign body. 5 patients with full thickness corneal tear were associated with iris prolapse, out of which 1 patient had posterior dislocation of lens and 1 patient had subluxated lens. 2 (2.10%) patients had scleral laceration. None of them were full thickness and were not associated with uveal prolapse. In our study, 3 (3.16%) cases of hyphaema were presented. All the cases of hyphaema involved <1/3rd of the anterior chamber. All 3 cases had only marginal increase in intraocular pressure. One patient with hyphaema had associated fracture orbit. Most common findings were traumatic mydriasis 5 (5.26%), 5 (5.26%) cases of Iris prolapse, followed by 3 (3.16%) patients with sphincter tear and 1 (1.05%) with iridodonesis. Our study was compared with a study of 205 cases by Canvan and Archer,<sup>5</sup> in which 79 cases had Iris and pupillary injuries. Nine eyes had lenticular involvement. Majority of them 6 (6.31%) had traumatic cataract, 2 (2.10%) had subluxation of lens and 1 (1.05%) had dislocation of lens. 4 (4.21%) patients had early rosette cataract and 2 (2.10%) patients had total cataract. As opposed to 52 eyes out of 212 eyes in a study by Canavan and Archer,<sup>5</sup> our study had 3 patients with lenticular damage. Findings were comparable with that of Mukherjee AK *et al*<sup>6</sup> who analyzed 82 patients hospitalized for penetrating eye injuries. Concomitant injuries in the eye were laceration of lid (26), lacrimal canalicular injuries (8), conjunctival tears (38), iris tear (30), ciliary body tear (20), lens (45), posterior segment damage (28), and hyphaema (32). In 12.10% of cases glass caused injury following road traffic accidents. Two patients had vitreous haemorrhage. One patient of vitreous haemorrhage had associated fracture orbit and the other patient had associated ecchymosis and subconjunctival haemorrhage. At the time of presentation both patients had perception of light and improved upto 6/18 and 6/12 respectively after 6 weeks. 2 (2.10%) cases of Berlin's oedema were observed in this study. Both the cases of Berlin's oedema had concomitant orbital

fracture. Hermman<sup>7</sup> found 17 cases of Berlin's oedema in 677 cases. One (1.05%) patient presented with pre-retinal haemorrhage. The haemorrhage was resolved by 6 weeks with no sequelae. Two patients (2.11%) had traumatic optic neuropathy. Both patients presented with no perception of light, and even after 6 weeks their vision did not improve. Our study was compared with a study of indirect optic nerve injury in two-wheeler riders in North-East India by Bhattacharjee *et al*<sup>8</sup> out of 129 consecutive cases of cranio-orbital injury, 35 patients had indirect traumatic optic neuropathy. Most of the patients with RTA had vision in the range of 6/6-6/12 64 (67.39%) at presentation, and 27 (28.43%) patients had vision in range of 6/18 to counting fingers 1 metre. 2 (2.11%) patients had only perception of light and 2 (2.11%) patients did not have perception of light. At the end of 6 weeks most of the patients i.e. 89 (93.72%) had good vision in the range of 6/6-6/12 and 2 patients, who previously had no perception of light with traumatic optic neuropathy, showed no improvement in visual outcome.

## CONCLUSION

Most of the injuries involved the ocular adnexa, which while causing certain degree of cosmetic disfigurement did not lead to any permanent visual sequelae, injuries

involving cornea or sclera had bad prognosis and those with optic neuropathy had worst prognosis. If we follow the traffic rules appropriately ocular morbidity can be prevented.

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Source of Support: None Declared  
Conflict of Interest: None Declared