



Original Research Article

Ocular injuries following road traffic accidents: A hospital based case series study

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ABSTRACT

Introduction: Road Traffic Accidents (RTAs) are one of the leading causes of ocular trauma, especially in developing countries like India. Aim of the study was to assess the pattern, frequency and visual impairment due to ocular injuries following Road Traffic Accidents in patients attending tertiary care hospital.

Materials and Methods: This Prospective Observational Case-series study was conducted on 63 patients who presented with history of ocular trauma following RTA to Ophthalmology OPD, HSK Hospital, Bagalkot between June 2019-Dec 2019. All the cases were subjected to detailed history taking, anterior and posterior segment examination, additional investigations whenever necessary.

Results: Ocular injuries following RTAs were found to be more common in males (77.7%) compared to females and the maximum number of victims belonged to the age group of 21-30 years (38.09%). Closed globe injuries (85.7%) outnumbered the Open globe injuries (14.3%). Majority of cases had no/slight change in visual acuity following trauma.

Conclusion: Ocular injuries following RTAs are one of the leading causes of avoidable ocular morbidity in working class males. Though severe sight-threatening ocular injuries were less in number, they can be prevented if proper precautionary measures are followed.

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1. Introduction

Ocular trauma remains an important cause of avoidable and predominantly, monocular visual morbidity (visual impairment and blindness)¹ Road Traffic Accidents (RTAs) are one of the leading causes of ocular trauma, especially in developing countries like India.

Though eyes have a protective bony cover for the most part, injuries to globe are not a rare entity. Injuries to and around the eye vary in severity based on the site and impact of trauma. They range from a minor eyelid or corneal abrasion to a more severe globe rupture or lens dislocation.²

Even minimally displaced fractures of orbit can result in functional and aesthetic deformities.³ Eyes being one of the most delicate structures of the body, are prone to permanent

damage despite the protective mechanisms.

It is clear that prevention of severe eye injuries due to RTAs is an accomplishable goal.⁴ It can be achieved by creating awareness in public regarding the hazards of careless driving, use of protective eye wear and legislative changes to alter the circumstances. Thus, the study of pattern and mode of ocular injuries sustained during RTAs is of great value to implement protocols in order to prevent such avoidable injuries.

2. Materials and Methods

This prospective observational case-series study was conducted on patients presenting to ophthalmology OPD of S Nijalingappa Medical College and HSK Hospital, Bagalkot with the history of ocular injuries secondary to Road Traffic Accidents between June 2019 -December 2019.

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2.1. Inclusion criteria

Patients presenting with history of ocular trauma following RTAs to the department of Ophthalmology, SNMC, Bagalkot.

2.2. Exclusion criteria

1. Patients with previous ocular morbidity.
2. Patients with history of ocular injuries due to other causes apart from RTAs.
3. Patients with multiple co-existing injuries to other structures which require immediate intervention.

Ethical clearance was obtained from the Institute's Ethics Committee (Human Studies). Written informed consent (in English and local language) was taken from all study subjects, before enrollment in the study. Patients presenting with history of ocular trauma were recruited from the Ophthalmology department, SNMC Hospital, based on the inclusion/exclusion criteria already mentioned.

Assessment consists of

1. Complete and detailed history, shedding light on the nature and mode of ocular injury, type of vehicle, whether any protective eye equipment was used at the time of injury, time of injury and time of reporting to hospital.
2. Testing for visual acuity.
3. Slit lamp examination of the anterior segment of the injured eye.
4. Fundus examination by Direct and Indirect ophthalmoscopy.
5. B-Scan/ X-Ray/ Gonioscopy/ CT scan/ MRI whenever necessary.

3. Results

Table 1: Age-wise distribution of cases

Age (years)	Number of cases	Percentage (%)
0-10	2	3.17
11-20	5	7.93
21-30	24	38.09
31-40	22	34.92
41-50	7	11.11
51-60	2	3.17
>60	1	1.6

CF:Counting Finger ; PL : Perception of Light; In the present study of 63 cases, 49 (77.7%) were males and 14 (22.2%) were females. Right eye was involved in 36 (57.14%) cases, left eye in 27 (42.85%) cases and both eyes in 12 (19.04%) cases.

Maximum number of victims belonged to the age group of 21– 30 years (38.09%) followed by 31-40 years (34.9%). The incidence was least in the extremes of age [Table 1].

Table 2: Extra-ocular injuries

Extra-ocular injuries	Number of cases	Percentage(%)
Eyelid bruising	35	55.55
Eyelid oedema	43	68.25
Eyelid laceration	27	42.85
Orbital wall fracture	11	17.46

Table 3: Anterior segment injuries

Anterior segment injuries	Number of cases	Percentage (%)
Conjunctival laceration	13	20.6
Subconjunctival Haemorrhage	39	61.9
Corneal abrasion	12	19.04
Corneal tear/Perforation	6	9.52
Scleral tear/Perforation	3	4.76
Hyphaema	11	17.46
Angle Recession	5	7.93
Iris injury	8	12.7
Traumatic cataract	4	6.3
Lens dislocation	2	3.17

Table 4: Posterior segment injuries

Posterior segment injuries	Number of cases	Percentage (%)
Vitreous Haemorrhage	3	4.76
Comotio Retinae	4	6.3
Retinal Detachment	2	3.17
Retinal tear	1	1.6
Optic nerve injury	0	0

Table 5: Time of presentation to hospital

Time of presentation	Number of cases	Percentage (%)
<6 hours	45	71.43
6-24 hours	8	12.7
24-48 hours	5	7.93
<1 week	3	4.76
>1 week	2	3.17

Table 6: Visual Acuity at presentation

Visual Acuity	Number of cases	Percentage
6/6-6/9	28	44.44
6/12-6/18	12	19.04
6/24-6/36	9	14.3
6/60-CF 1 meter	5	7.93
<CF 1 meter- PL positive	5	7.93
PL negative	4	6.3

The study also showed that RTAs involving ocular structures happened more at night (81%) compared to those occurred in day time. None of the cases was wearing any protective eye equipment during the accident.

Ocular trauma following RTAs was more common in two wheeler riders (79%) than those traveling in autos and four wheelers.

Closed globe injuries were more common (85.7%) compared to open globe injuries (14.3%). Extra-ocular injuries involving the lid (lid oedema, laceration) were more common compared to the injuries involving the anterior segment (Subconjunctival haemorrhage, corneal tears etc) [Tables 2 and 3]. Posterior segment involvement was comparatively rare [Table 4].

Most of the patients reported to the hospital within 6 hours of trauma (71%) [Table 5]. Severe sight-threatening injuries were comparatively less in number (14%) and 6.3% cases had complete loss of vision [Table 6]. In majority of cases, there was no/slight change in visual acuity following trauma.

4. Discussion

The incidence of ocular trauma following RTAs is more in males than in females as males are more involved in risky outdoor jobs and driving heavy vehicles where as majority of females are confined to safe household work involving lesser risk. This is in accordance with many previous studies.⁴⁻⁷

The increased incidence of RTAs at night can be attributed to poor visibility, reduced wakefulness and drunken driving.

Two wheelers contributed more to ocular trauma as the exposure, area of contact and direct impact are high in case of two wheelers compared to four wheeler vehicles.

Working population (20-40 years) constituted the majority of victims of ocular trauma compared to the less productive age groups due to work related transportation requirements. This is in well agreement with the study done by Namala B et al.⁴

Closed globe injuries were more than open globe injuries. A study done by Guly CM et al.⁷ also concluded that blunt trauma was more common in incidence than penetrating trauma. Lid oedema was the most common presentation followed by subconjunctival haemorrhage and lid laceration. This can be explained by increased availability and exposure of structures that are more anteriorly situated than the deep seated posterior structures that are well protected by the bony orbit. Hence, most of the patients had good visual acuity at the time of presentation. Sight threatening injuries resulted from severe injuries involving the structures in the visual axis like corneal tears/perforations, traumatic cataract/ subluxation, globe rupture, vitreous haemorrhage and retinal detachment which together constituted less than 25% of the cases.

5. Conclusion

Ocular trauma following RTAs is one of the leading causes of ocular morbidity and vision loss in developing countries like India where the use of two-wheeler vehicles is on the rise and awareness in public regarding the eye protection equipment is poor. Working class males are the most affected population. Closed globe injuries outnumbered open globe injuries and the visual prognosis was good in majority of cases.

Visual acuity at the time of presentation directly correlated with the severity, mode of injury and involvement of vital structures in the visual axis. Ocular trauma following RTA is the leading cause of avoidable ocular morbidity and measures should be taken to prevent the same.

6. Recommendations

1. Strict law enforcing the compulsory use of helmets for two-wheeler riders
2. Compulsory use of safety seat belts for four wheeler vehicle users.⁸⁻¹⁰
3. Strict regulation against drunken driving.
4. Increasing awareness in public regarding the potential hazards of rash and careless driving.
5. Encouraging the public to use eye protection equipment.

7. Source of Funding

None.

8. Conflict of Interest

None

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