

Original Research Article

Pattern of Ocular Trauma in Road Traffic Accidents in a Tertiary Care Hospital of Eastern India

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Abstract: Ocular injury in road traffic accidents can range from trivial subconjunctival hemorrhage to vision threatening injury. Aim of this study was to evaluate various types of ocular injuries following RTA and to assess visual outcomes and risk factors. Consecutive 144 patients of RTA having ocular injuries presenting to OPD or emergency of tertiary care hospital between May 2018 to April 2019 were included in the study. Detailed history and complete ocular examination were done with follow up at 1st and 4th week. Most cases were in age group of 20-40 years, more in males (64.6%) and in two wheelers (72.2%), not wearing helmet (88.5%). Most common injuries were subconjunctival hemorrhage and lid ecchymosis. Severe injury leading to visual loss seen in 15.2% cases like sclero-corneal tear, lens dislocation and vitreous hemorrhage. Younger age group and males were mostly affected. Important risk factors were rash driving under alcohol influence, not wearing helmet and in two wheelers.

Keywords: Ocular injury, Road traffic accidents, Subconjunctival hemorrhage, sclero-corneal tear, vitreous hemorrhage.

INTRODUCTION

Although the eyes represent only 0.1% of the total body surface and only 0.27% of the anterior body surface, their significance to individuals and society is disproportionately higher: most of the information reaches humans through vision. Consequently, the socioeconomic impact of ocular trauma can hardly be overestimated. Those affected often have to face loss of career opportunities, major lifestyle changes; and, occasionally, permanent physical disfigurement.

In addition to the physical and psychological (Eisner, G. 1980) costs of eye injuries to the individual, the direct and indirect financial costs to society are enormous. The cost-effectiveness of well-planned preventive measures based on sound epidemiologic data has repeatedly been demonstrated (Rowsey, J.J., & Hays, J.C. 1984; Dangel, M. E., & Keates, R. H. 1980).

Ocular trauma in road traffic can result in a wide spectrum of tissue lesions of the globe, optic nerve, and adnexa, ranging from the relatively superficial to vision threatening. Ocular trauma is

frequent and avoidable cause of visual impairment, constituting approximately 75% of ocular emergencies (Dangel, M. E., & Keates, R. H. 1980). Approximately 1.6 million people are blind from ocular injuries worldwide and further 19 million with unilateral visual loss which makes ocular trauma - m/c cause of unilateral blindness (Lima-Gómez, V., & Razo Blanco-Hernández, D. M. 2010). Road traffic accidents (RTA) being one of the most common risk factor.

It is of public health importance to identify risk factors and plan strategy for prevention and proper management of such injuries. So the present study aims in providing information on the pattern of ocular trauma, most common risk factors, magnitude of ocular injuries and assess final visual outcome following road traffic accidents.

MATERIALS & METHODS

Patients presenting with history of ocular injuries following RTA were selected from the Out-patient Department of the Ophthalmology, Emergency Wards, Casualty at RIO, Rajendra Institute of Medical

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Sciences, Ranchi. Ethical clearance was obtained for this study from Institute Ethics Committee. It was a hospital based prospective study and informed consent was taken for the study. Present study included 144 patients between May 2018 to April 2019. The injuries were classified using Birmingham Eye Trauma Terminology System. (BETTS) (Kuhn. F. *et al.*, 2002). (Fig.1)

When a patient presented with a history of ocular injury following RTA, a detailed history regarding age, sex, type of vehicle the patient was travelling and signs and symptoms occurring following the injury were taken.

Comprehensive ophthalmological evaluation (thorough ocular examination using torch light, best corrected Snellen visual acuity, detailed slit lamp examination, IOP measurement, fundus examination etc.) were done in each patients. X-ray skull, USG B-scan and/or CT scan was done whenever indicated.

Routine investigation of blood and urine were done as required.

Depending on the presentation patients were subjected to detailed examination by ENT surgeon, General Surgeon, General Physician and Dental Surgeon. Patients were managed at casualty or OPD level. Some were admitted as in- patients for further management and specialized care. Patients seen at casualty and OPD were asked to follow-up after 1st and 4th week, at each follow up visual acuity was recorded.

Inclusion criteria

Patients with ocular injuries associated with RTA of all ages, both sexes and who were co-operative, were included in the study.

Exclusion Criteria

Those terminally ill, unconscious, non-co-operative patients and ocular injuries other than RTA were excluded from the study.

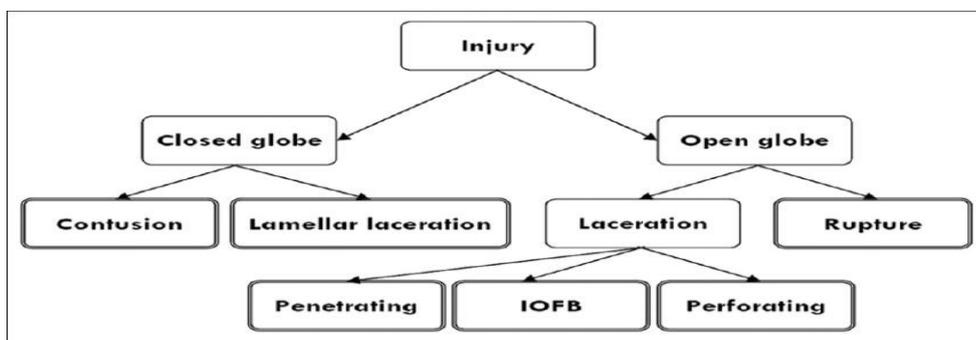


Fig.1- Classification of ocular trauma (BETT).

RESULTS

This study includes 144 cases of ocular injuries following RTA who presented at RIO, Rajendra Institute of Medical Sciences, Ranchi for a study period of one year from May 2018 to April 2019.

Incidence of Ocular Injuries with respect to timing:

Out of these 144 cases- (30.6%) cases took place at day

time and (69.4%) at night mostly under influence of alcohol.

Age Distribution: In this study of 144 cases, the number of cases in different age groups was as follows (table 1), most of them were in age group of 20-40 yrs (65.6%).

Table 1: Age wise distribution of ocular injuries in RTA

Age in years	No. of cases	Percentage
0-10	2	1.38
11-20	17	11.80
21-30	53	36.80
31-40	47	32.68
41-50	20	13.88
>51	5	3.47
Total	144	100

Gender distribution: Of the 144 patients, 93(64.6%) were males and 51(35.4%) were females with a male: female ratio of (1.8:1).

Type of Vehicle Involved: Out of the 144 patients, 104 patients who sustained ocular injuries in the vehicular accidents were with 2 wheelers, 24 (16.6%) patients

with 4 wheelers, 13 (9.02%) patients with heavy vehicle, 3(2.08%) patients were pedestrians. Ocular injuries due to vehicular accidents involving two-wheelers had the maximum incidence (72.2%) and most of them are not using safety measures (88.5%).

Eye Involved: Out of the 144 patients, 76(52.77%) of the patients sustained injury to the right eye, 54 (37.50%) patients had left eye involvement and 14 (9.73%) patients had bilateral involvement.

Type of Ocular Injury: Among these 144 cases, subconjunctival hemorrhage (87.5%) (Fig.2) was maximum followed by lid edema and ecchymosis (Fig.3) (75%) and lid laceration (19.4%) (Fig.4). Severe injury leading to visual loss seen in 15.2% cases like sclero-corneal tear, orbital wall fracture, vitreous hemorrhage, posterior segment involvement (Table.2).

Table.2-Clinical Findings in Ocular Injuries

Clinical Findings	No. of cases
Lid ecchymosis, edema	108
Subconjunctival hemorrhage	126
Lid laceration	28
Retained foreign body	
Conjunctival	10
Corneal	5
IOFB	1
Orbital fracture	4
Traumatic mydriasis	11
Traumatic hyphaema	3
Corneo-scleral perforation	4
Posterior segment involvement	2



Fig.2- Showing subconjunctival hemorrhage



Fig.3 –Showing lid edema & ecchymosis



Fig.4 &5 -Showing lid laceration before and after repair

Visual acuity at presentation- Out of 144 cases of ocular injuries due to RTA, majority of patients (108) were having VA 6/6. (Table. 3)

Table 3-Visual acuity at presentation

VA at presentation	No. of cases	Percentage
6/6	108	75
6/9-6/60	18	12.5
CF	12	8.3
PL +	4	2.8
PL -	2	1.4
Total	144	100

DISCUSSION

In this study of 144 cases, we analyzed presentations and pattern of ocular trauma associated with road traffic accidents. In a study done by Rekhi, G. S., & Kulshreshtha, O. P. (1991), ocular trauma accounted for 11.82% of blindness. Review of studies has shown that majority of trauma resulting in blindness occurs with mean age of presentation below 30 (± 5) years and common cause is road traffic crashes and falls (Mac Ewen, C.J. 1999). In present study maximum cases were shown in 20-40 year's age group (65.6%). Incidence is more common in males than female (4:1 ratio) (Cillino, S. *et al.*, 2008), while in present study incidence of male to female was (1.8:1 ratio). Ocular trauma due to road traffic accidents is preventable. A study done in Northern Ireland has shown that there is a 60% reduction in perforating eye injuries following seat belt legislation (Johnston, P. B., & Armstrong, M. F. 1986).

In present study, most of the RTA cases causing ocular trauma were caused by two wheelers (72.2%) which is inconsistent with study done by Panagiotidis *et al.*, found that (86.56%) of ocular trauma were following cars accidents while (11.95%) were occurred following motorcycle accidents (Panagiotidis, D. N. *et al.*, 2004).

In present study we found very few people (11.5%) were using safety measure while driving whereas Panagiotidis *et al.*, found that 5.2% of car drivers were using seat belts and none of the two wheeler driver had used helmets (Panagiotidis, D. N. *et al.*, 2004).

In our study 95.8 % patient had closed globe injury and 4.2 % had open globe injury while in a study done by Smith *et al.*, found 68.58 % and 3.41% patients respectively.

In our study 75 % (108) patient had visual outcome of 6/6, 12.5 % (18) had 6/9-6/60, 8.3% (12) had CF, 2.7% (4) had PL and 1.38% (2) had no perception of light. While in study by Shtewi *et al.*; 30.43 % patient had 6/6, 50.30 % patient had 6/9-6/60, 15.94 % had CF and 3.28 % had no perception of light while in present study.

Although anterior segment injury (e.g. Subconjunctival haemorrhage) was more common than posterior segment injury; severity of diminution of vision was seen more in posterior segment injury.

CONCLUSION

Ocular injuries in RTA results in spectrum of damage to intraocular structure and adnexa. Raising public awareness of safe driving and use of protective wear such as seat belts, crash helmet and protective glasses can decrease incidence and severity of ocular injury

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