

# Ocular Manifestations in Road Traffic Accidents: A Study Done at A Medical College Hospital in South India

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## ABSTRACT

**Introduction:** Ocular trauma due to road traffic accidents are increasing in number and are a cause of concern. This study aimed to evaluate the frequency of different types of ocular injuries in road traffic accidents and assess the visual outcome.

**Material and methods:** This was a cross sectional, non interventional, hospital based study done during a period of 6 months from December 1st 2015 to may 31st 2016 done at a Medical College Hospital from South India. A total of 40 patients who met with ocular injury were included in this study. Demographic data and other details were obtained and analyzed.

**Results:** Of 40 patients, male - 38, female - 2; most of the patients who sustained injuries were between 41 to 50 years (40%, 16/40). Right eye injury was more frequent (60%, 24 patients). The visual acuity immediately after the trauma ranged between 6/6 to perception of light (PL). Most common form of injury was sub conjunctival hemorrhage constituting 70% (28/40) followed by ecchymosis constituting 50% (20/40).

**Conclusion:** Immediate medical attention and appropriate surgical or nonsurgical conservative management will aid in quick visual rehabilitation of the patient.

**Key words:** ocular trauma, road traffic accidents

## INTRODUCTION

Road traffic accidents are common now a day. Trauma to eye can cause severe and permanent visual impairment owing to its delicate and complex architecture.<sup>1</sup> Motor vehicular crashes are one of the leading cause of ocular trauma in United States and form an unique risk factor for the same.<sup>2-4</sup> Ocular trauma due to road traffic accidents resulting in visual loss may cause enormous trauma to the person and to the society on the whole. Ocular trauma may involve the eye lids, lacrimal canaliculi, orbital wall, peri orbital structures, conjunctiva, cornea, sclera, extra ocular muscles. In some instances there may be prolapse of uveal tissue, vitreous hemorrhage, choroidal hemorrhage, globe rupture. This paper analyzes the spectrum of ocular injuries seen in road traffic accidents in a South Indian city and assesses the visual outcome by providing appropriate medical and surgical treatment

This study was performed to evaluate the frequency of different types of ocular injuries in road traffic accidents and assess the visual outcome along with the age and gender distribution of the study group.

## MATERIAL AND METHODS

This is a cross sectional, non interventional, hospital based study done during a period of 6 months from December 1<sup>st</sup> 2015 to May 31<sup>st</sup> 2016 done at NRI academy of medical sciences, Chinakakani, Guntur, Andhra Pradesh after obtaining the ethical clearance from the ethical board of the college.

## Inclusive criteria

- 1) Patients between 1 to 60 years of age.
- 2) Individuals who were driving or were in the vehicle during accident.
- 3) Patients who sustained ocular injuries during the road traffic accidents.

## Exclusive criteria

- 1) Patients who sustained ocular injuries due to domestic trauma.
- 2) Patients who sustained ocular injuries due to assault.
- 3) Patients who sustained ocular chemical injuries.

A total of 40 patients who sustained ocular injuries due to road traffic accidents (also fulfilled the inclusion and exclusion criteria) and attended the causality department & ophthalmology outpatient department of Medical college hospital during the study period were included in this study. Demographic data and details were obtained and analyzed. Bed side vision was recorded. Thorough slit lamp evaluation of anterior segment and fundus examination were done. X ray of orbit (AP and Lateral view) and computerized tomography (CT) scan were done in all suspected cases of orbital rim fractures and peri orbital trauma. The results were analyzed and conclusions were drawn.

## STATISTICAL ANALYSIS

Microsoft office 2007 excel sheet was used to tabulate data. Mean, ratio and percentages of the variables were calculated and the results were analyzed.

## RESULTS

### Age and gender distribution

In the study of 40 patients (male -38: female 2), the youngest patient was 12 years and eldest patient was 49 year old; the details are shown in Table-1. Most of the patients who sustained injuries were between 41 to 50 years (40%, 16/40), followed by second decade (30%, 12/40).

### Laterality

Right eye injury was more frequent (60%, 24 patients) than left eye (40%, 16 patients). One patient had bilateral eye injury.

### Consciousness

All except one patient were conscious and coherent when they

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**How to cite this article:** Parri Muralidhar, N. Lakshmi Chowdary. Ocular manifestations in road traffic accidents: a study done at a medical college hospital in South India. International Journal of Contemporary Medical Research 2016;3(8):2337-2339.

were brought to OPD. One patient had altered sensorium.

### Visual acuity (VA)

The visual acuity immediately after the trauma ranged between 6/6 (on Snellen chart) to perception of light (PL). The details are shown in Table-2.

### Type of injury

Most common form of injury was subconjunctival hemorrhage constituting 70% (28/40), followed by ecchymosis constituting 50% (20/40). The frequencies of different types of injury are shown in Table-3. Extra ocular muscles were involved in 16 patients (40%); superior and inferior rectus muscles were involved in 8 patients each respectively (20%). Twenty patients had fracture of periorbital structures (fracture of maxillary sinus – 8, fracture of frontal bones -12); details are shown in table 3. One patient had blunt injury resulting in dislocation of lens with hyphaema. Vision was profoundly decreased in one person due to traumatic optic neuropathy exhibiting Relative Afferent Papillary Defect (RAPD) sign.

### Management

Visual acuity was assessed and detailed examination of anterior segment and posterior segments was done with torch light and slit lamp biomicroscopy. The severity of injury was assessed. Vision improved with conservative treatment without any surgical procedure in ecchymosis, subconjunctival hemorrhages and periorbital trauma. Lid tears were repaired under local anesthesia. X ray of orbit (AP and Lateral view) was taken to rule out any muscle entrapment in patients with fractures of orbital rim. Hyphaema was treated by non surgical medical management. Lens was removed in lens dislocation patient. Worsening grade of vision was found in patients with multiple eyes injuries. Vision was not recovered in a patient who presented with PL vision where optic nerve was damaged.

## DISCUSSION

Ocular trauma is one of the main causes of blindness and ocular morbidity. Ocular trauma has profound effect on both professional and personal life of the patient influencing his family as well as the society. Especially in our study where the peak age group was between 41 to 50 years who are the main bread winners of the family. Peak age in this study is higher than that reported in literature; Ezegwui IR<sup>1</sup> had reported peak age between 16 to 30 years in his study. Armstrong GW et al<sup>2</sup> and Arora AS et al<sup>3</sup> have also reported similar results.

In this study, male patients were more commonly affected than female patients with M: F ratio of 19:1. Shtewi M EL et al<sup>4</sup> have done a two year study from an Eye hospital in Libya on road traffic accidents and ocular trauma; they reported that out of 248 patients included in their study, 186 (75%) were male and 62 (25%) were female. Similarly Johnston PB<sup>5</sup> from Northern Ireland reported the incidence as 72.20% in males and 27.80% in females after seatbelt legislation. Arora AS et al<sup>3</sup> have done a similar study from India, Rajasthan and reported the M: F ratio to be 2.5:1.

Right eye injury was more frequent (60%, 24 patients) than left eye (40%, 16 patients), in this study similar to other studies.<sup>3,4,6</sup> The visual acuity immediately after the trauma ranged between 6/6 to PL. Most of the patients had VA between 6/9 to 6/36,

Age group	Number (percentage) n=40
10-20	4 ( 10% )
21-30	12( 30% )
31-40	8( 20% )
41-50	16( 40% )

**Table-1:** Age distribution

Visual acuity	No. of Patients( n=40)
6/6-6/9	8 ( 20% )
>6/9-6/18	12 ( 30% )
>6/18-6/36	12( 30% )
>6/36-6/60	6(15%)
Hand movements	1(2.5%)
PL+	1(2.5%)

**Table-2:** Visual acuity at presentation

Type of injury	No. of Patients( n=40)
Lid tear	4 ( 10% )
Lid abrasion	8 ( 20% )
Ecchymosis	20 ( 50% )
Extra ocular muscle paralysis	
Superior rectus	8 ( 20% )
Inferior rectus	8 ( 20% )
Medial rectus	0
Lateral rectus	0
Fracture of orbital rim	
Lateral wall	4( 10% )
Medial wall	4( 10% )
Floor	4 ( 10% )
Peri orbital structures	
Fracture of maxillary sinus	8 ( 20% )
Fracture of ethmoidal sinus	0
Fracture of frontal bones	12 ( 30% )
Subconjunctival hemorrhage	28 ( 70% )
Corneal abrasion	4 ( 10% )
Hyphaema	4 ( 10% )
Lens dislocation	1(2.5%)
Traumatic optic neuropathy	1(2.5%)

**Table-3:** Type of injury

who had sustained ocular adnexal injury, periorbital fracture, subconjunctival hemorrhage, and ecchymosis. Drastic fall of VA to hand movements and perception of light had occurred in two patients who sustained dislocation of lens and posterior segment involvement mainly traumatic optic neuropathy. After treatment there is regain of VA to 6/9 in patients who sustained ocular adnexal injury and periorbital fracture.

Most of the patients had sustained subconjunctival hemorrhages, ecchymoses and ocular adnexal injuries rather than penetrating globe injuries involving posterior segment of the eye. Oum BS<sup>7</sup> and Kulkarni AR et al<sup>8</sup> had also made similar observations in their respective studies. Closed globe injuries were more common in our study than open globe injuries similar to that reported by Mittal G<sup>9</sup> Arora AS et al<sup>3</sup> and Gully CM et al.<sup>10</sup> The eye ball is protected by bony socket and periorbital structures, which are the first structures to take the impact of the injury during road traffic accidents, so they are more frequently injured rather than posterior segment; this might be the probable explanation for the type and distribution of injuries seen in our study.

## CONCLUSION

Ocular injuries due to road traffic accidents are on rise, due to increasing vehicular traffic. They cause profound effect on the vision of the patient leading to significant burden on their families and to the society as a whole. Strict implementation of the existing traffic rules by the governments and adherence to the same by the civilians can reduce the impact of injury. Immediate medical attention and appropriate surgical or nonsurgical conservative medical management will aid in quick visual rehabilitation of the patients.

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**Source of Support:** Nil; **Conflict of Interest:** None

**Submitted:** 30-06-2016; **Published online:** 31-07-2016