

## Ocular Manifestations of Head Injury

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### Abstract:

**Introduction:** Head injuries are frequently associated with ophthalmic manifestations and consequent morbidity, but many of the ophthalmic findings are often ignored and present much later to specialist neuro-ophthalmic clinics.

**Purpose:** To evaluate various ocular manifestations of head injury, to assess the significance of ocular signs in diagnosis and outcome evaluation of such patient.

**Methods:** A prospective study for a period of 2 years (October 2016 to September 2018) in NRI Medical College and General Hospital, Chinakakani.

**Results:** Total number of cases in the study was 40. Of 40 patients 30 males and 10 females most of the patients who sustained injuries were between 31 to 40 years (30%, 12/40), followed by age group 21-30 years (22.5%, 9/40). Majority of the cases are reported after Road Traffic Accident (62.5%, 25/40) followed by Fall from height (25%, 10/40) and Assault (12.5%, 5/40). Most common form of injury was ecchymosis constituting 32.5% (13/40) followed by sub conjunctival hemorrhage constituting 25% (10/40).

**Conclusion:** Ocular manifestations are frequently associated with head trauma either by Direct or Indirect force. Relatively Afferent Pupillary Defect (RAPD) being most common and best early indication to post-traumatic reduced vision does not play a major role in causing final poor visual outcome.

**Key words:** Ocular trauma, Road Traffic Accident (RTA)

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### I. Introduction

Head injuries are a cause of hospitalization of 200-300 persons per 100,000 population per year and about 25% of these are associated with ocular and visual defects<sup>1</sup>.

Ocular trauma secondary to head injury is the cause of blindness in more than half a million people worldwide and of partial loss of sight in many more and it is often the leading cause of unilateral loss of vision, particularly in developing countries<sup>2</sup>. 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<sup>3</sup>. Hence, the role of ocular injuries secondary to head trauma in the causation of blindness and overall prognosis of patients has become a subject of immense importance.

### II. Materials and Methods

**Source of study** – Total number of cases were 40. All cases in the study came to Emergency Medicine, some cases are referred from Department of Neurosurgery, NRI Medical College and General Hospital, Chinakakani during the period of 2016-2018.

**Duration of study** – 2 years (October 2016 to September 2018).

#### Inclusion Criteria –

- 1) Patients between 5 to 60 years of age.
- 2) Patients who sustained head injury during the road traffic accidents.
- 3) Patients who sustained head injury due to fall from height.
- 4) Patients who sustained head injuries due to assault.

**Exclusion Criteria –**

1) Cases of mechanical injury to eyeball (contusion ,concussion,or penetrating injuries) are excluded from this study.

**Study Design:** It is a prospective hospital based study.  
There is no potential risk in the study.

**Statistical analysis:** Results will be expressed in form of percentages.

**III. Results**

**Age and gender distribution:**In the study of 40 patients (Males -30 and Females -10), the youngest patient was 6 years and eldest patient was 55 year old. The details are shown in Table-1. Most of the patients who sustained injuries were between 31 to 40 years (30%, 12/40), followed by age group 21-30 years (22.5%, 9/40).

**TABLE 1:** Age distribution of study population:

AGE (in years)	Number of cases	Percentage
1-10 years	1	2.5
11-20 years	6	15
21-30 years	9	22.5
31-40 years	12	30
41-50 years	8	20
51-60 years	4	10
Total	40	100

**Nature of injury:**

In a study population of 40 cases, 25 patients sustained injuries due to RTA, 10 cases sustained injuries due to fall from height , 5 cases sustained injuries due to Assault. The results are shown in table 2.

**Table 2:** Nature of injury:

Nature of injury	Number of cases	Percentage
Road Traffic Accident	25	62.5 %
Fall from height	10	25 %
Assault	5	12.5 %
Total	40	100

**Type of injury:**

Out of 40 cases, 1 case had Orbital emphysema, 2 cases had Lateral orbital wall fracture, 13 cases had Black eyes, 6 cases had ptosis,1 case had Lagophthalmos with Exposure Keratitis , 10 cases had Subconjunctival Haemorrhage, RAPD is seen in 8 cases , Pin point pupil seen in 1 case, Dilated and Fixed pupil seen in 6 cases , Papilloedema is noticed in 4 cases, Subhyaloid haemorrhage is seen in 1 case, Third nerve palsy seen in 4 cases , Sixth nerve palsy is seen in 1 case , seventh nerve palsy is seen in 1 case , InternuclearOphthalmoplegia is seen in 1 case .various types of injuries are shown in table 3 .  
Two patients with RAPD had profound loss of vision upon presentation.

**Table 3:** Type of injury:

Type of Injury	Number of patients (n=40)
Orbital emphysema	1 (2.5%)
Lateral orbital wall fracture	2(5%)
Black eyes	13(32.5%)
Ptosis	6(15%)
Lagophthalmos with exposure keratitis	1(2.5%)
Subconjunctival haemorrhage	10(25%)
Relative Afferent Pupillary Defect	8(20%)
Pin point pupil	1(2.5%)
Dilated and fixed pupil	6(15%)
Papilloedema	4(10%)
Subhyaloid haemorrhage	1(2.5%)
Third nerve palsy	4(10%)
Sixth nerve palsy	1(2.5%)
Seventh nerve palsy	1(2.5%)
Internuclearophthalmoplegia	1(2.5%)

**Management:** Provisional diagnosis is made by various clinical methods of examination and cases were subjected to special investigations like X-ray Skull, CT Brain and Orbits, MRI. Initially for every patient Bed side visual acuity, Colour vision, Dilated fundus examination was done.

When the patient condition improved and recovered a detailed ocular examination was done including Visual Acuity testing, Colour vision, Slit lamp examination, Refraction, Intraocular Pressure, Dilated fundus examination, visual fields testing.

All the cases were given routine medical treatment and surgical interference wherever and whenever indication arose.

#### IV. Discussion

During 2 years study period, a total of 100 cases of head injury cases were examined and 40 cases are having ocular manifestations (40 %). Head injuries are frequently associated with ophthalmic manifestations and consequent morbidity. Not every head injury patient develops ocular manifestations. Sharma et al<sup>4</sup>, Khulkarni et al<sup>5</sup>, Odeh et al<sup>6</sup> studies showed ocular manifestations in 50.16%, 83.5%, 25.3% cases with head injuries.

Study done by Anu Malik et al<sup>7</sup> shows 68.8% cases of RTA, 13.2% cases of Fall from height, 18% cases of Assault. Present study shows 62.5% RTA, 25% fall from height and 12.5% assault shows that high velocity injuries even with little area of contact produce a significant amount of morbidity and mortality.

Studies done by Kanwal Zareen Abbasi et al<sup>8</sup> showed 79% males and 21% females, sustained head injuries with ophthalmic manifestations. In the present study of 40 cases, 75% were Males and 25% were Females.

Ocular manifestations are very common in young adults due to RTA under the influence of alcohol. Indirect forces through high velocity impacts are major mechanism for various ocular manifestations of head injury. These forces are transmitted by surrounding bony orbital walls. Majority of forces are transmitted in injuries of Frontal bone.

Most common form of injury was ecchymosis constituting 32.5% (13/40) followed by subconjunctival hemorrhage constituting 25% (10/40).

#### V. Conclusion

Ocular manifestations are frequently associated with head trauma either by Direct or Indirect force. Pupillary involvement determines the final visual outcome. RAPD being most common and best early indication to post-traumatic reduced vision does not play a major role in causing final poor visual outcome.

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