

A CLINICAL STUDY OF OCULAR MANIFESTATIONS IN PATIENTS OF HEAD INJURY

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ABSTRACT

BACKGROUND

This study aims to record the prevalence and pattern of various ophthalmic manifestations in patients of head injury and to attempt a correlation between the ocular signs, neurological signs and final outcome.

MATERIALS AND METHODS

Hundred and twenty patients with head injury having ocular findings, presenting from December 2014 to July 2016, were taken for study. Detailed ophthalmological examination of the patients was carried out and the results of the study are depicted in the form of percentages, graphs and charts.

RESULTS

The most common cause of head injury found in our study was road traffic accident. The commonest eye finding was oedema and ecchymosis of eyelids. Prime causal factors affecting visual acuity found in our study were corneal tear, globe rupture, optic nerve injury and avulsion of eyeball.

CONCLUSION

Head injuries with ocular manifestations occur in younger age group. Road traffic accident was the most common cause. Males have to work outside their home for their jobs more than that of females. So they are more prone to accidents. Oedema and ecchymosis of eyelids constitute the most common ocular finding. Patients with mild ocular injuries pointed towards good visual prognosis. Most of them had mild head injury and hence good prognosis in terms of survival of the patient. The patients with severe ocular injuries like corneal tear, globe rupture and optic nerve injury showed poor visual prognosis.

KEYWORDS

Ocular Manifestations, Head Injury, Outcome.

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BACKGROUND

Man's endeavours to attain higher and still higher speeds in travel, to mechanise civilian industry with machines of greater power and to search for more and still more effective techniques of destruction in war have all combined to heighten the incidence of head injuries.¹The eye is frequently involved in head trauma due to proximity of the eye to the head as well as due to the neural connections between the eye and the brain.² Head injuries cause the hospitalisation of 200 – 300 persons per 100,000 populations per year, and about 25% of these are associated with ocular and visual defects.³

This study aims to record the prevalence and pattern of various ophthalmic manifestations in patients of head injury and to attempt a correlation between the ocular signs, neurological signs and final outcome.

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Aims and Objectives

1. To study the prevalence and pattern of ocular manifestations in patients of head injury.
2. To study the correlation between the various ocular findings, neurological status and final outcome in patients of head injury.

MATERIALS AND METHODS

The study period was from December 2014 to November-December 2016. Hundred and twenty patients with head injury having ocular findings were taken for study.

Inclusion Criteria

1. All patients of head injury presenting to our hospital within one week of injury.
2. Patients of head injury who have not taken any previous treatment at tertiary care centre.

Exclusion Criteria

1. Patients of head injury who have taken previous treatment at any tertiary care centre.
2. All patients of head injury presenting to our hospital after 1 week of injury.
3. Patients with past history of head injury.
4. Patients with any previous central nervous system abnormalities.

Detailed ophthalmological examination of the patients was carried out. Patients were evaluated on day 0, day 1, day 7, on the day of discharge and after one month. Day 0 was considered as the day on which first encounter with the patient occurs. The results of the study are depicted in the form of percentages, graphs and charts.

RESULTS

Age Wise Distribution of Patients

Table No. 1 shows age wise distribution. Maximum numbers of patients 54 (45%) were noted in age group 16-30 years.

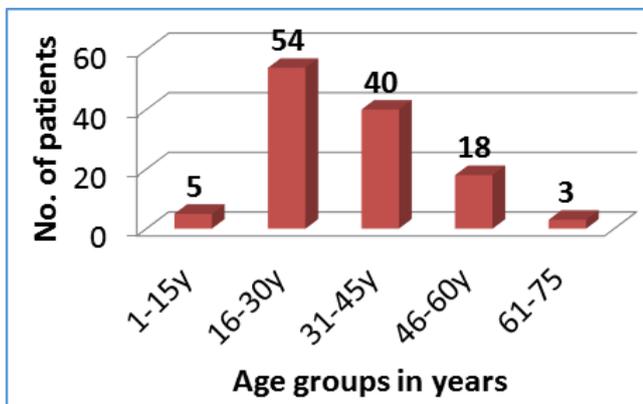


Table 1. Age Distribution

Sex Wise Distribution

Table No. 2 shows sex wise distribution of patients. Out of 120 patients, 101 (84.17%) were male and 19 (15.83%) were female. Male to female ratio was 5.3:1.

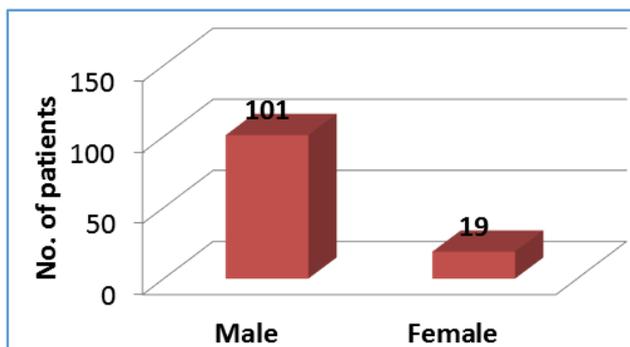


Table 2. Sex Wise Distribution

Cause of Head Injury

Chart No.1 shows distribution of causes of head injury in our study. Out of 120 patients, in 86 (71.67%) patients, road traffic accident was found as a cause of head injury. Out of those 86 patients, 72 were male patients and 14 were female. Assault, as a cause of head injury was found in 25 (20.83%) patients, out of which 22 were male and 3 were female patients.

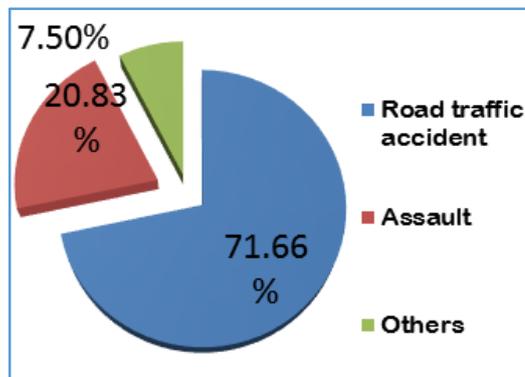


Chart 1. Causes of Head Injury

Various ophthalmic findings in 120 cases of head injury

Table No.3 shows the pattern of ophthalmic findings observed in our study. The commonest eye finding was oedema and ecchymosis of eyelids seen in 98 (81.67%) patients followed by subconjunctival haemorrhage in 44 (36.66%) patients. In all, 70 out of 120 (58.33%) patients had a combination of two or more ocular findings.

Ophthalmic Findings	No. of Cases	Percentage
EYELID		
Oedema and ecchymosis	98	81.67
Lacerated wound	31	25.83
Lagophthalmos	2	1.66
CONJUNCTIVA		
Subconjunctival haemorrhage	44	36.66
Chemosis	12	10.0
CORNEA		
Corneal tear	3	2.5
Ophthalmic findings	No. of Cases	Percentage
Anterior Chamber Hyphaema	1	0.83
IRIS		
Iris tissue prolapse	1	0.83
Sphincter tear	1	0.83
PUPIL		
Bilateral, dilated, non-reacting pupil	4	3.33
Bilateral, semidilated, sluggishly reacting	3	2.50
Unilateral, semidilated, sluggishly reacting	2	1.66
FUNDUS		
Papilloedema	3	2.5
FRACTURES OF ORBIT		
Lateral wall	11	9.16
Medial wall	6	5.0
Floor	2	1.66
Roof	1	0.83
EXTRAOCULAR MOVEMENTS		
Normal	118	98.33
Restricted	2	1.66
Globe rupture	1	0.83
Avulsion of eyeball	1	0.83

Table 3. Various Ophthalmic Manifestations



Photograph 1. Shows a Case of Globe Rupture



Photograph 2. Shows a Case of Enophthalmos and CT Scan Image of the Same Case Showing Fracture of Floor of Orbit of Left Eye and its Three Dimensional View of Skull, Ophthalmic Signs of Neurological Significance

Cornea and sclera

Cases of corneal and corneoscleral tear were managed by tearsuturing. Postoperatively, patients were given systemic antibiotics and local antibiotics with steroids.

Cornea	No. of Cases	Management Done
Corneal tear	2 cases	Corneal tear & Corneoscleral tear suturing done
Corneoscleral tear	1 case	



Photograph 3. Shows a Case of Right Eye Corneal Tear and Suturing Done

Globe Rupture

A case of globe rupture was managed by evisceration. The empty socket was examined on postoperative day for any discharge and oozing and was advised application of antibiotic ointment in the cavity for 1week.



Photograph 4. Shows a Case of Globe Rupture

Sl. No.	Ophthalmic Findings	No. of Patients	Percentage
1	Pupillary abnormalities	9	7.5
2	Papilloedema	3	2.5
3	Lateral rectus palsy	1	0.83
4	Traumatic optic neuropathy	1	0.83

Table 4. Showing Ophthalmic Manifestations of Neurological Significance

Management of Patients in the Study

Part of eye involved-

Eyelid-

Patients of oedema and ecchymosis of eyelids were managed medically by oral antibiotics for 7 days and cold compression of the eye involved. Patients who presented with lacerated wound of eyelids were managed by suturing the wounds layer wise with 5-0 silk suture and Vicryl suture.

Eyelid	No. of Cases	Management Done
Oedema and/or ecchymosis of eyelids	98 cases	Treated medically with oral antibiotics and cold compression
Lacerated wound	31 cases	Wound suturing done in all cases
Lagophthalmos	2 cases	Treated medically with lubricant eye drops and lid taping done

Optic Nerve Injury

A case of optic nerve injury was treated medically with intravenous methylprednisolone 1 gram daily for 3 days followed by systemic steroids in tapering dose. The patient presented with visual acuity of no perception of light and didn't recover his vision.

Visual Acuity	No. of Cases	Percentage
6/6-6/18	81	67.5%
6/24-6/60	15	12.5%
FC 5 metres - FC 1 metre	6	5%
PL+ PR accurate in all quadrants	3	2.5%
No PL	1	0.83

Can't be assessed as patient is unconscious or drowsy	14	11.67%
Initial Visual Acuity of Patients in the Study at the Time of Admission		

Prime causal factors affecting visual acuity found in our study were corneal tear in 2.5% cases, globe rupture in 0.83% cases and optic nerve injury in 0.83% cases.

Glasgow Coma Score	Number of Cases	Percentages
13-15 (Mild Head Injury)	91	75.83
9-12 (Moderate Head Injury)	17	14.17
<or equal to 8 (Severe Head Injury)	12	10.0
Glasgow Coma Score		

Correlation between the Glasgow Coma Score, Ophthalmic Findings and Outcome of the Patients

Out of 120 patients, 12 patients had severe head injury, out of which 11 patients died and 10 patients had ocular findings of neurological significance. Seventeen patients had moderate head injury. The patients who died were those who presented with papilloedema, lateral rectus palsy and vitreous haemorrhage. Ninety one patients had mild head injury and none of the patients had ocular findings of neurological significance. None of these patients died.

DISCUSSION

Age Distribution

In the present study, the maximum number of patients were noted in age group 16-30 years. Out of 120, 54 (45%) patients were seen in this age group. As this is the young and most active age group, it is more prone to accidents.

Smruthi et al⁴ in their study found that young adult males in age group 21-30 years (44.4%) were more vulnerable to head injury. Sharma B et al⁵ in their study found that the most common age group involved was 21-40 years group (67.40%).

Sex Distribution

Males are more exposed to ocular injuries. Males have to work outside their home for their jobs more than that of females. So they are more prone to accidents. In the study of Pradeep et al,⁶ they found that among 106 patients only 18 patients were female (16.98%) and rest 88 were male (83.02%), the male to female ratio being 5:1.

Cause of Head Injury

Road traffic accident as a cause of head injury was found in 86 (71.67%) patients and assault was found in 25(20.83%) patients. Pradeep P et al⁶ also found that among the various causes of head trauma, road traffic

accident (RTA) was found to be the commonest cause (66.98%) followed by Assault (16.98%).

Road Traffic Accidents were accounted for the commonest mode of injury (74%) in the study of Smita K S et al.⁷

Pattern of Ophthalmic Findings

Various ophthalmic findings in 120 cases of head injury-

a. Eyelid and conjunctiva

Sandhya et al⁸ found similar pattern of ophthalmic findings in their study. Out of 31 patients, ecchymosis and periorbital oedema were seen in 18 patients, subconjunctival haemorrhage was found in 8 patients.

b. Cornea

In the present study, corneal involvement was in 2.5% cases. Three patients presented with corneal tear. In the study of A.R. Kulkarni et al,⁹ they also found two out of 200 patients with corneal tear contributing to 1% of cases.

c. Anterior chamber

In the present study, anterior chamber is involved in 0.83% of cases. One case presented with hyphaema in anterior chamber. In the study of A.R. Kulkarni et al,⁹ one out of 200 cases presented with hyphaema in anterior chamber contributing to 0.5% cases.

Ophthalmic findings of neurological significance

In the present study, ophthalmic eye signs of neurological significance were found in 13 (10.83%) patients. Pupillary involvement in 9 patients (7.5%) was the commonest neuro-ophthalmic sign followed by papilloedema in 3 patients (2.5%). Out of three patients of papilloedema, one patient was noted with abducens nerve palsy. Traumatic optic neuropathy was seen in 1(0.83%) patient.

In the study of A.R. Kulkarni et al,⁹ ophthalmic eye signs of neurological significance were found in 32/200 patients. Pupillary involvement in 13/200 cases (6.5%) was the commonest neuro-ophthalmic sign followed by papilloedema in 11/200 cases. Traumatic optic neuropathy was observed in 1/200 and lateral rectus palsy in 4/200 patients. In the study of Sandhya et al,⁸ ophthalmic findings of neurological significance was found in 18 patients. Out of these, pupillary abnormalities were seen in 10 patients, cranial nerve involvement in one patient, neurogenic ptosis was seen one patient and traumatic optic neuropathy was noted in 6 patients.

Traumatic optic neuropathy was found in 1 (0.83%) patient, who presented with total visual loss, with visual acuity of no perception of light in affected eye. In the study of Pradeep et al,⁶ traumatic optic neuropathy was diagnosed in 2 (1.88%) cases with severe visual impairment. It manifested with loss of visual acuity in one eye accompanied with the presence of anipsilateral afferent pupillary defect.

Majority of patients who died were in severe head injury group, who had ocular findings of neurological

significance like pupillary abnormalities and papilloedema. In the study done by A.R. Kulkarni et al,⁹ 11 deaths were seen in severe head injury group, in whom, pupillary abnormalities and papilloedema were present. In moderate head injury group, patients with papilloedema and lateral rectus palsy showed poor prognosis. Thus, the present study is comparable to A. R. Kulkarni et al⁹ study.

CONCLUSION

In this study, patients with mild ocular injuries had good visual prognosis. Most of them had mild head injury and hence also showed good prognosis in terms of survival of the patient.

The patients with severe ocular injuries like corneal tear, globe rupture and optic nerve injury showed poor visual prognosis. Some of them had mild head injury and showed good prognosis in terms of patient's survival.

Most of the patients with ophthalmic findings of neurological significance like pupillary abnormalities, lateral rectus palsy and papilloedema had severe head injury and pointed towards poor prognosis in terms of patient's survival.

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