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A Hospital Based Retrospective Study on Prevalence and Pattern of Concussion Injury of Eye

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Abstract **Original Research Article**

Aim: The present hospital based retrospective study was undertaken to evaluate the prevalence and pattern of ocular concussional injury. ***Methods and Methodology:*** 260 patients were taken for study. Old trauma cases who came for follow-up were excluded from study. Vision testing, slit lamp biomicroscopy, fundoscopy and intra ocular pressure assessment were performed in all cases. Data were collected from clinical records in a standard data collection format which included age, sex, place, data of trauma, visual acuity, cause, mode of injury, clinical presentation etc. ***Results:*** Ocular concussional injury was seen among all age group with male preponderance. Most cases were unilateral and majority of them reported with 24 hours of injury with various clinical presentations. Sub-conjunctival haemorrhage was the commonest trauma. ***Conclusion:*** Domestic accident and work place injuries are frequent causes of concussional eye injury. Ophthalmologist need to create community awareness and pay special attention for its prevention and prompt recovery from ocular damage.
Keyword's:- Concussional eye injury, prevalence, pattern, vision testing, clinical records, clinical presentation, subconjunctival haemorrhage, awareness, prevention.

INTRODUCTION

Ocular trauma is a significant cause of unilateral blindness and visual impairment in many communities throughout the world [1]. Eye injuries are routinely common because new hazards frequently arise in everyday, but identifying the underlying factors in their aetiology, it may be possible to devise effective strategy for reducing the incidence of visually damaging trauma [2, 3]. Worldwide, there are approximately 1-6million people blind from eye injuries, 2.3 million bilaterally visually impaired, and 19 million with unilateral visual loss [4]. In India also, the prevalence of ocular trauma is considerable and was reported as 2.4% [5].

Ocular traumas are primarily classified into two groups: Open globe injury and closed globe injury apart from chemical burns and foreign body impaction. So far closed globe injury is concerned; any of the ocular structures can be damaged. In most concussional injuries of the eye, anterior segment bears the brunt of both direct and indirect forces [6]. Among posterior segment injuries, retinal detachment is the most frequently encountered posterior segment pathology subsequent to closed globe contusion injures [7]. Male are more than four times more likely than females to have ocular injuries and young individuals are more likely than older ones. Blunt objects account for large of percentage of ocular injury [30%] [8, 9]. The highest proportion of injuries occurred at work place, at home, on the street and roads [10]. As regards aetiological factors, sticks, foreign bodies, stones and metallic objects are the major offending agents of ocular trauma [11, 12].

Aim of the study

This hospital based retrospective study was conducted to evaluate the prevalence, demographic picture and pattern of concussion injury of eye among ocular trauma patients attending Eye OPD (Regional Institute of Ophthalmology) of Gauhati Medical College.

MATERIALS AND METHODS

This retrospective study was conducted amongst the concussion eye injury patients who attended at Eye Outpatient dept. (OPD) and emergency unit of Regional Institute of Ophthalmology, Gauhati Medical College, and Guwahati for a period of one year. There were 260 patients with concussional eye injury out of total of 28,602 eye patients in eye OPD and emergency unit during the period. The incidence of

concussion injury of eye was calculated from the above data. All cases of ocular concussional injury were taken for the study except the old trauma cases who came for follow up. Those patients with bilateral ocular concussional injury, the records of the worse eye was taken for study (there were 2 bilateral cases and in both the cases, left eye was more injured). All patients were subjected to visual acuity testing, intraocular pressure measurement, slit lamp biomicroscopy and fundoscopy. Data were collected from clinical records available in OPD record unit which include age, gender, place and data of trauma; other details included the visual status, time of presentation, laterality of ocular trauma, cause and nature of trauma and clinical presentation using a structured data collection format. It was edited, cleaned, checked for completeness and cross checked for accuracy.

RESULTS AND OBSERVATIONS

The present retrospective study comprised of 260 patients with ocular concussional injury. Beforehand, we determined the incidence of concussional eye injury among all eye patients attending Regional Institute of Ophthalmology in a period of one year. The results are presented below:-

Incidence of concussion injury of eye attending Eye OPD

Table-1: Incidence of concussion injury

Total No. of eye patient	28,602
No. of patients with ocular concussion injury	260
Incidence of concussion injury	0.90%

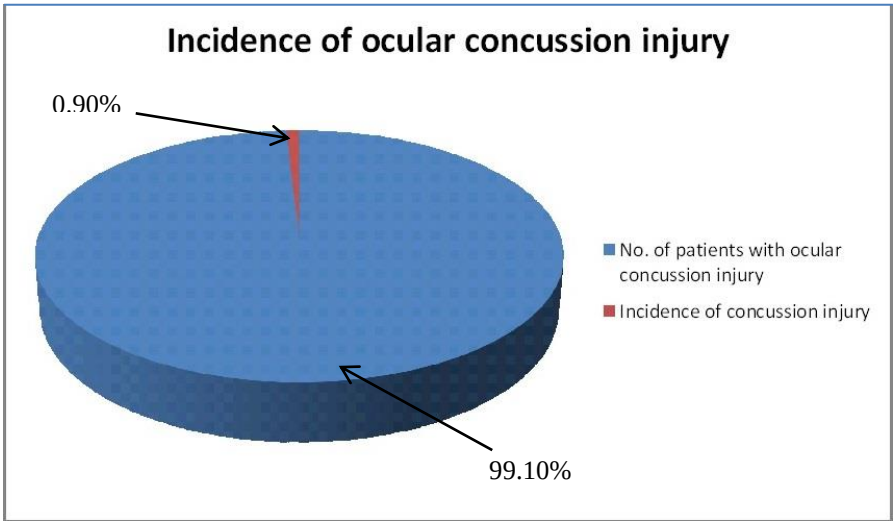

Fig-1

Distribution of ocular concussional injury among males and females

Table-2: Gender distribution

Gender	Number	Percentage
Male	215	82.69%
Female	45	17.31%

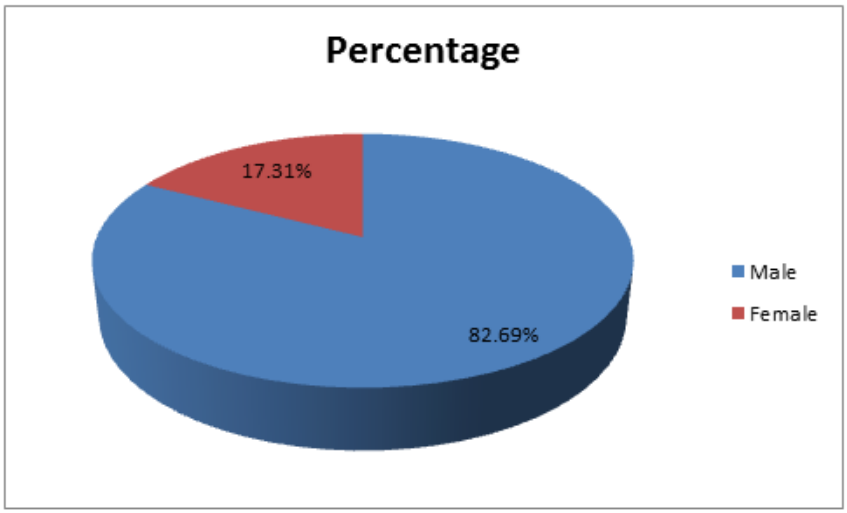

Fig-2

Age distribution of concussional ocular trauma

Table-3: Age distribution

Age (yrs)	No. of Ocular	Percentage
0-10	11	4.23%
11-20	19	11.15%
21-30	80	30.77%
31-40	75	28.85%
41-50	48	18.46%
51-60	12	4.62%
>60	5	1.92%

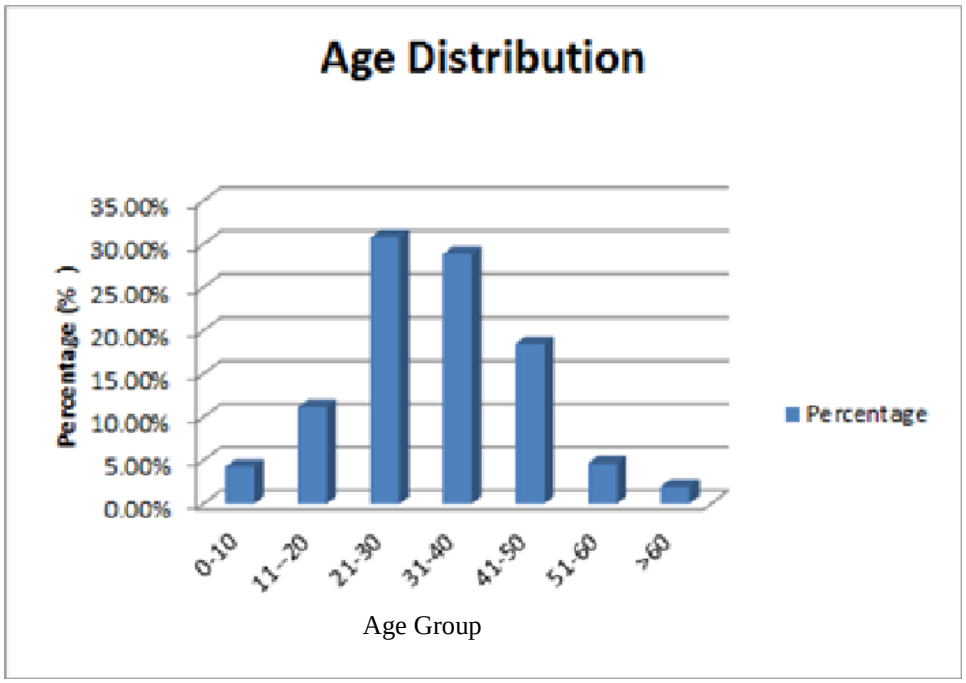

Fig-3

The Maximum number of ocular concussional trauma cases was in the age between21-30 years (30.77%) which in closely followed by the age group between 31-40year (28.85%) and the minimum number were found in the age group of above 60 years (1.92%).

Laterality of eye involvement in ocular concussional injury

Table-4: Laterality of ocular concussional injury

Eye	Number	Percentage
Right eye	113	43.46%
Left eye	145	55.77%
Both eyes	2	0.77%

It was observed that left eye was involved more (55.77%) than right eye (43.46%) and both eyes were affected in only in 0.77%

Causative agents involved in concussion injury of eye

Table-5: Agents of trauma

Agents of trauma	No. of cases	Percentage
Wooden Object	58	22.31%
Metallic objects	45	17.31%
Fall	16	6.15%
Fist/elbow/Hand	14	5.38%
Bamboo stick	27	10.38%
Vegetables /Fruits	15	5.77%
Non-specific (RTA and other)	85	32.70%

It was noted that among different agents of trauma, most of the concussional injury occurred from non-specific agents [32.7%) following by wooden objects (22.31%) and metallic objects [17.31%).

Distribution of ocular concussional injury; based on aetiology (mode of injury)

Table-6: Mode of injury

Cases	No.	Percentage
RTA	60	23.08%
Work place injury	65	25.00%
Domestic Accident	76	29.23%
Assault	40	15.38%
Others	19	7.31%

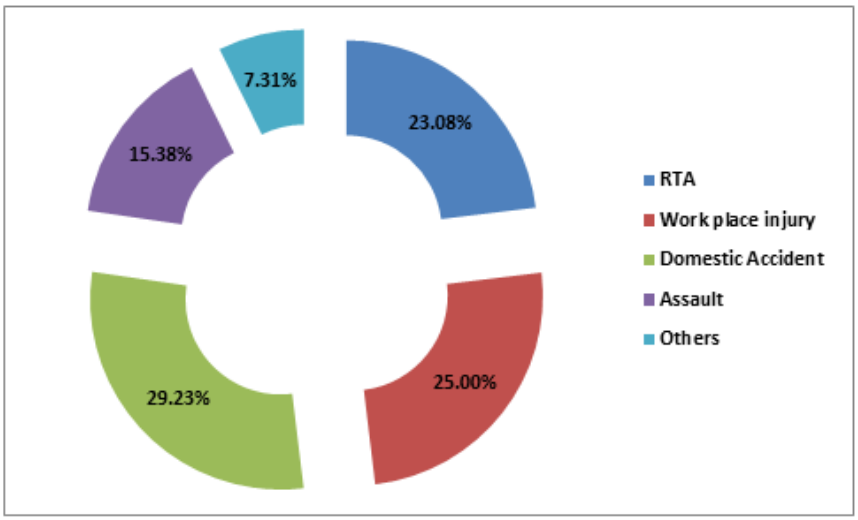

Fig-4

Most of the concussional injury of eye occurred following domestic accident (29.23%) while work place injury and RTA accounted for 25.00% and 23.08% of cases respectively.

Distribution of patients according to the visual status at the time of presentation at hospital

Table-7: Visual status

Visual Acuity	Number	Percentage
6/6-6/12	170	65.38%
6/18-6/36	64	24.62%
6/60-F.C	24	9.23%
PL Present	2	0.77%
PL Absent	0	0%

FC = Finger counting
PL = Perception of light

The maximum number of patients (65.38%) had visual acuity between 6/6-6/12 whereas 0.77% of patients had only perception of light.

Time of presentation of patient at hospital

Table-8: Time of presentation

Time	Number	Percentage
<24hrs	114	43.85%
24-48 hrs	80	30.77%
>48 hrs – 1 week	48	18.46%
➢ 1 week	18	6.92%
		(43.85%)

Most of the patients (43.85%] attended our hospital before 24 hrs while 6.92% of cases attended after 1 week.

Clinical presentation of concussional injury of eye among patients

Table-9: Clinical presentation

Clinical presentation	Number	Percentage
Conjunctival injury	28	10.77%
Lid injury	50	19.23%
Pericular ecchymosis	26	10.00%
Subconjunctival haemorrhage	70	26.92%
Corneal abrasion and oedema	42	16.15%
Hyphaema	18	6.92%
Trauma tic mydriasis	8	3.08%
Subluxation of lens	5	1.92%
Pigment on lens (Vossius Ring)	6	2.31%
Traumatic tiridocytits	3	1.16%
Vitreous haemorrhage	2	0.77%
Retinal Detachment	2	0.77%

Maximum number of cases presented with subconjunctival haemorrhage (26.92%) followed by lid injury (19.23%) and corneal abrasion and oedema (16.15%) among others as showed above.

DISCUSSION

On our hospital based retrospective study, the incidence of concussion injury of eye was found to be 0.90% among all eye patients. Males were noticed to be more (82.69%) affected than females. Similar to our study, jain and Soni [13], Pai S.G.*et al*. [14] and Sana Nadeem *et al*. [15] also found male preponderance. As regards, age distribution, maximum number of patients of ocular concussion injury belonged to age group between 21-30 years (30.77%) which corroborates with the findings of D.B. Karki *et al*. [16] (26.60%) and Ulgantheran V *et al.* [17] (43.2%) who also observed maximum case in the age between 21-30 years. Left eye was more involved (55.77%) than right eye (43.46%) which is similar to the findings of Adhikari R.K. *et al.* (Left eye=51.9% and Right=eye 42.7%) [18] And S.K. Khatry *et al*. (Left eye=53.3%and Right eye=45.5%) [19].

Most of the concussional eye injury in our study occured from non-specific agents (32.70%)

followed by wooden objects (22.31%) and metallic objects (17.31%). Likewise Kaur *et al*. in 2005 [20], in his study found that non-specific agents caused maximum injuries (31.59%) followed by wooden object (28.07%) and metallic objects (17.54%). On evaluating the aetiology of ocular concussional injury in our retrospective study domestic accidents (29.23%) and work place injury (25%) were most frequent causes and our observation tallies with the observations of Y.M. Canavan *et al*. [21]. (Domestic accidents=58.5% and occupational injury= 9.8%) and Titiyal *et al*. [22] (Domestic accidents=34.1% and occupational injury =20%). In this study, the highest number of concussional eye injury (65.38%) had visual acuity in between 6/6 - 6/12 and in no case, perception of light was absent. This corroborates with the findings of Dr. Hendge R. Duttatray *et al*. [23]in which also maximum number of ocular injury patients (56.66%) had vision in between 6/6-6/12 at presentation.

Most of our patients (43.85%) attended Eye OPD or emergency unit within 24 hrs while only 6.92% came after 1 week. Other workers such as Avinash Mishra *et al*. [24] (with 83.6%), Titiyal *et al*. [22] (with 74.56%) and Al Attas *et al*. [25] (with 61.1%) observed that majority of ocular injury cases presented with 24 hrs. Subconjunctival haemorrhage was the commonest clinical presentation in our study followed by lid injury and corneal lesion. Dr. H.R. Dattatray *et al*. [23] also found subconjunctival haemorrhage as the commonest presentation in their study.

Conclusion

Eye injury is the leading cause of preventable ocular morbidity, monocular visual impairment and blindness worldwide. It is prevalent among all age group being more frequent in younger age group and in males than females which is due to more outdoor activities of young's and males. Concussion injury of eye which is a closed globe injury occurs more commonly than open globe injury. It is mostly unilateral and shows more involvement of left eyes. Apart from non-specific causes, wooden and metallic objects are common offending agents, and domestic accidents and work place injury account for most of the cases. Subconjunctival haemorrhage is the commonest presentation and majority of the patients reported with 24hrs of injury. Community awareness about prevention and setting up a healthy working environment both at home and work place would reduce this ocular morbidity to a considerable extent. Ophthalmologist and paramedical group need to pay special attention and provide prompt service for prevention and optimal recovery from ocular damage involved following trauma.

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