



CLINICAL AND DEMOGRAPHICAL PROFILE OF OCULAR TRAUMA IN ARID AREA OF RAJASTHAN.

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ABSTRACT

Aims: To study the presentation and visual outcome of Ocular trauma patients in arid area of Rajasthan, India. **Methods and Material:** A prospective study was conducted from 1st January to 31st December 2013 in medical college associated hospital. Patients with ocular injuries of sufficient severity (require surgical intervention or indoor treatment with close supervision) were hospitalized. Detailed history was taken with respect to demographics, cause and type of injury, time to and type of ophthalmic treatment. All patients who were admitted, were clinically examined, medical and/or surgical management were done and followed up to assess visual outcome and complications. **Result:** Male and Female patients ratio was 2.69: 1, with mean presentation age of 19 years. Total 33 out of 48 patients referred early within 48 hours of injury. Home was the most common place (43.75%) and wooden object was most common object of injuries. No safety measure was used in any of the workplace injury. Most common clinical findings were corneal tear (41.66%) followed by Hyphema (35.41%). Total 63.33% patients had improvement of 2 lines on Snellen chart in visual acuity. **Conclusion:** Males are more prone to injury than females in all age groups, Open globe injury is main culprit for hospitalization in ocular trauma. Primary wound repair provided visual improvement of 2-3 line on snellens chart in most of patients.

KEYWORDS : Ocular trauma, Open globe injuries, Demography, Management, ocular B-scan

INTRODUCTION

Eye is the organ for sense of vision which is one of the most valued and powerful senses nature has bestowed us. Any harm to the eyeball may affect development, independency, quality of life and safety of an individual, so nature has provided various protective mechanisms.^[1] Despite all protective mechanisms, eyes remain quite vulnerable to trauma. Trauma has long been considered a result of random, unrelated, and unpreventable factor rather than a disease and received far less attention. Ocular trauma has recently been highlighted as a major cause of visual morbidity and considered an important public health hazard with enormous economic and social consequences.^[2] WHO program for the prevention of blindness, suggests that around 55 million eye injuries, restricting activities for more than one day, occur each year, 750,000 cases require hospitalization each year, including 200,000 open globe injuries. Incidence for hospitalized ocular injuries varies among different countries, for instance 6.8 per 1000 in United States, 20.53% for India and 12.9% in Pakistan. Data collected from these kinds of studies, has allowed an analysis of risk factors, incidence, prevalence and impact of eye injuries in terms of visual outcome and to define the target groups for prevention and education on ocular trauma.

METHODS AND MATERIAL:

This prospective study was carried out over a period of 1 year (1st January to 31st December 2013) in Medical College associated eye hospital.

Inclusion criteria of cases- 1. Any patient of ocular injury of sufficient severity (require surgical intervention or indoor treatment with close supervision) admitted in unit-1st, Department of Ophthalmology. 2. Ocular injury patients repaired or managed in our Department who were admitted in other departments of our Medical College and associated group of hospitals.

Exclusion criteria of cases- 1. Patients of ocular injury who had been operated elsewhere, attending our Department for follow up only. 2. Ocular trauma patients were taking treatment on Out Patient Department (OPD) basis. 3. Patients of ocular injury having associated severe systemic injury. 4. Medico-legal cases.

In this study detailed history including demographic data, mode of injury, about primary management, time gap between injury and presentation to the hospital was recorded.

A thorough clinical examination with torch light and slit lamp was carried out which includes documentation of size of tear, its location, involvement of visual axis, iris prolapse, cataract formation, IOFB, pupillary reaction, colour vision, extraocular motility, IOP (in close globe injury, if possible) and fundus examination.

Visual acuity was recorded using Snellen chart for distance and Jaeger

chart for near.

Birmingham Eye Trauma Terminology (BETT) as described by **Kuhn F et al (1996)**^[3] and Standardized ocular trauma classification as described by **Pieramici D.J. et al (1997)**^[4] were used to grade all injured eyes at initial examination. Routine investigations- CBC, Hb, BT, CT, urine albumin and sugar, X – ray orbit were done before surgical repair.

X ray was done to rule out intra ocular foreign body and orbital fracture. Whenever required, CT and/or MRI were done. USG B scan was done immediately for close globe injury and after one week or when the eye condition permits for open globe injury, to rule out posterior segment pathology. All primary surgical repairs were done by the single anterior segment surgeon with more than 10 years of experience for open globe injury and no primary vitreoretinal procedure was done. Close globe injuries managed medically with close supervision. Follow up at first week, third week and sixth week were done to assess recovery, visual outcome and complications. Student t test was used for statistical analysis.

RESULTS:

Total 1247 patients (598 males and 649 females) admitted for management of various eye disease, out of which 48 cases (3.85% of total admission) admitted for management of ocular trauma. Total 52.08% patients admitted through Eye OPD rest 47.91% admitted after OPD hours, through casualty department. 33 out of 48 patients (68.75%) referred early within 48 hours of injury. Male female ratio was 2.69: 1, but in first decade of age it was 1.375: 1 and after 2 decade of age it was again 2.5: 1.

70.83% injuries occurred in first 2 decades. Mean age of presentation was 19 years; it was somewhat younger in male (16.84 years) and elder in female (25.61 years). Incidence of injury decreases with advancing age. In present study, it is observed that percentage of admission was high (14.58%) during March (a month of Holi festival) and (27.09%) during June and July (summer vacation).

Total 60.42% patients were resident of rural area in which most of patients belonged to Village (47.92%) and 39.58% patients were resident of urban area. Sex ratio in rural population was 3.14: 1 and in urban population it was 2.17: 1.

Home was the most common place (43.75%) of injury followed by street (29.17%). Male female ratio in home injury was 1.33: 1 and in street injury it was 2.5: 1. Total 22.92% injuries were related to workplace and most common age group for workplace related injury was 3rd decade in which 54.54% of total work place related injuries occurred. 100% workplace injuries were in male. No safety measure was used in any of the workplace injury. Most common object causing ocular trauma was wooden objects (31.25%) followed by metal objects 18.75%. Animal injury had two peaks one in first decade second in 5-6th

decade. Fall injury was common in older age group.

Most common clinical findings were corneal tear (41.66%) followed by Hyphema (35.41%). The incidence of open globe injuries (75%) was more than closed globe injuries (16.67%). Incidence of either eye involvement is equal in this study group and no one had bilateral involvement.

Most of the patients were managed surgically (85.42%). Total 11 patients were not available for follow up, in which 7 patients were referred to higher center and remaining 4 were lost in follow. Out of 4 who were lost, 3 patients had no PL (perception of light) and one had inaccurate PR (projection of rays). Most common reason for referral was clinical diagnosis of endophthalmitis (3 patients out of 7 for management of endophthalmitis) followed by IOFB (2 patients out of 7 patients), other causes were retinal detachment (1 patient) and persistent chorioretinal edema (1 patient).

The common procedures were corneal suturing (41.67%), iris abscission (31.25%) and lens matter removal (25%). Most common pathological B scan finding was vitreous hemorrhage (20.83%) followed by Retinal detachment (10.42%).

Improvement in visual acuity (2-3 line on snellens chart) after 6 weeks was present in 63.33% patients, 30 % patients had no change in visual acuity and 6.66% patients had deterioration in visual acuity.

DISCUSSION

This is a hospital based case series study of ocular injuries of sufficient severity necessitating admission. Hospital based studies provide very less comprehensive data than population based studies. It indicates only tip of iceberg of disease which manifest clinically and provide low rates But it well represents the severity of disease.^[5] Serious eye injuries are more likely to result in visual impairment thus a focus on these types of injuries is important.^[6]

This study provides insight on the clinical and demographical profile of ocular trauma in hospitalized patients. Ocular trauma patients comprise 3.85% of total hospital admission. Male patients were predominated in this study. In almost all the studies the incidence of injuries in males was much higher than females. Possible explanation for this is a great mobility, activity, aggressiveness and risk taking behavior of males.^[7] This study reports, 70.83% injuries occurred in first 2 decades.[Table 1] I Q Malik et al (2012) also reported almost 70% ocular injuries occurring in first two decades.^[8]

In first decade male to female ratio was 1.37:1 and after 2nd decade it again became 2.5:1. Similar results were observed by I Q Malik et al (2012) also reported male: female ratio 1.6: 1 in first decade which drastically increased to 10: 1 after first decade.^[8] Increased percentage of females in first decade may be because of, in this age group male and female are more likely to share similar environment throughout the day.^[9] Another reason is, in Indian society female child is usually neglected and do not gain same level of care and supervision as male child.^[10]

This study shows that injuries were more common in rural population (60.42%). P R Sthapit et al (2011)^[11] also reported that injuries were more common in rural population (60.7%) as compared to urban population (39.3%) but S Cillino et al (2008)^[12] reported no statistical difference in rates of ocular injuries in urban (4.2/100,000; 95% CI, 4.1–4.3) and rural (5.5/100,000; 95% CI, 5.4–5.65) population. There was no statistically significant relationship in time of presentation within 48 hours or after 48 hours between rural and urban population ($\chi^2 = 0.776$, $p = 0.780$).

Percentage of admission was high (14.58%) during March, a month of Holi festival and 27.09% during summer vacation (June and July). This may be due to dust and wind and more involvement in games in summer vacation.^[10]

In this study, home was the most common place (43.75%) of injury followed by street (29.17%) and then workplace (22.92%). As per Boo Sup Oum et al (2004) study 34.9% injuries occurred at workplace, 32.2% at home and 25% at street.^[13] Only 1 case (2.08%) of injury was reported at school, which indicates that children are under more supervision in school than home and street, leads to reduced incidence of injury at school. All workplace injuries were in male may be due to male dominance, cultures and traditions of society. 100% patients

with workplace related ocular injury did not use any form of eye protection while working. These data's are higher than foreign studies as Comparative statistics of The Bureau of Labour in the USA^[14] shown that 59% of workers do not wear protective eye wear during work, because most of the patients in present study belong to agricultural work and to small scale industries. In India possible ocular injuries and hazards in agriculture are not yet listed in the classification of hazards requiring eye and face protection (IS 8520, Clause 2.1) and also not yet appreciated by workers or their supervisors in agricultural work and small scale industries.^[15]

In 32 patients, it was not possible to see details of posterior segment at presentation because of cloudy cornea, hyphaema and traumatic cataract, in which 15 patients (46.88%) had pathological B scan. JP Chugh et al (2001) reported ultrasonography could delineate pathological lesion in posterior segment in as high as 21% of patients with opaque media.^[16] Most common pathological B scan finding was vitreous haemorrhage (20.83%) followed by Retinal detachment (10.42%).[Table 4]

Most of the patients were managed surgically (85.42%). Most of patients (63.33%) usually shown improvement in visual acuity after primary repair at 6 weeks, 30% patients shown no visual improvement and 6.66% patients shown deterioration in visual acuity.[Table 5] Overall visual improvement was statistically significant ($\chi^2 = 14.32$, $p = 0.013$) but it was not their BCVA, vision further improved after suture removal, traumatic cataract removal etc. Visual improvement at 6 weeks in open globe injuries were statistically significant ($\chi^2 = 12.28$, $p = 0.015$) but in case of closed globe injuries, there were no statistically significant improvement ($\chi^2 = 7.33$, $p = 0.059$).

Main drawback of study was limited number of patients, short follow up period and unavailability of posterior segment treatment facility. This study highlights that males particularly in rural area are prone to injury.

Table 1

Age distribution of studied subjects			
Age in year	Male	Female	No. of patients and Percentage
0-10	11	8	19 (39.58%)
11-20	14	1	15 (31.25%)
21-30	7	-	7 (14.58%)
31-40	1	-	1 (2.08%)
41-50	2	-	2 (4.17%)
51-60	-	2	2 (4.17%)
61-70	-	1	1 (2.08%)
71-80	-	-	-
> 80	-	1	1 (2.08%)
Total (48)	35	13	100%

Table 2 Distribution of patients according to Clinical Finding in Eye with Ocular Trauma

Clinical finding in Eye with ocular trauma	No. of Patients	Percent age
Lid tear	6	12.5%
Subconjunctival hemorrhage	7	14.58%
Corneal epithelial defect	1	2.08%
Corneal ulcer with Foreign body (FB)	1	2.08%
Corneal opacity	4	8.33%
Corneal tear	20	41.67%
Corneoscleral tear	11	22.92%
Scleral tear	1	2.08%
Hyphema	17	35.42%
Iridodialysis	2	4.17%
Traumatic cataract	12	25%
Subluxated Lens	1	2.08%
Intraocular Foreign body (IOFB)	3	6.25%
Chemical burn	1	2.08%
Vitreous hemorrhage	1	2.08%
Retinal detachment	-	-
Retrobulbar hemorrhage	2	4.17%
Posterior segment details not seen	32	66.67%

*One patient may have more than one finding.

Table 3 Distribution of patients according to Surgical

Management

Management	No.	Percentage of total 48 cases
Lid repair	5*	10.41%
Corneal Suturing	20	41.67%
Scleral Suturing	1	2.08%
Corneoscleral Suturing	8	16.67%
Iris abscission	15	31.25%
Removal of foreign body	3	6.25%
Anterior Vitrectomy	7	14.58%
Lens matter removal	12	25%
Evisceration	1	2.08%
IOL Implantation	5	10.42%
YAG LASER Lens matter dispersion	2	4.17%
Intavitreal drug	1	2.08%

*In one case lid repair was not done.

† One patient may have more than one procedure.

Table 4

Finding of B Scan ultrasonography after 1 week		
Finding	No. of Patients	Percentage
Normal B Scan	24	50%
Cataractous changes	4	8.33%
Subluxated Lens	1	2.08%
Vitreous Hemorrhages (Floaters)	10	20.83%
IOFB	2	4.17%
Endophthalmitis	1	2.08%
Posterior vitreous detachment	5	10.42%
Retinal detachment	3	6.25%
Choroidal detachment	1	2.08%
Oedema of retinochoroidal layer	2	4.17%
Pthysical eye	1	2.08%
Not done*	6	12.5%

*B scan was not done because of either referred or lost in follow up before one week and in one which was eviscerated.

† One patient may have more than one finding.

Table 5

Comparison of visual acuity preoperative and postoperative stage (after 6 weeks)		
Visual acuity	No. of Patients Preoperative	No. of patients Postoperative
PL absent	4*	2
PL to HM present	22†	4
FC - 1ft to <6/60	6	7
6/60 to < 6/24	3	6
6/24 to < 6/18	1	2
6/18 to 6/6	5	9
Cannot be assessed	7	7

*Total 3 patients with PL absent in injured eye were lost one patient left against medical advice, one patient discharged on request and last one lost in follow up.

†8 patients lost from group with PL to HM present, 7 referred to higher center and one was lost in follow up.

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