



PROFILE OF BLUNT INJURY OF EYE - A HOSPITAL BASED STUDY

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ABSTRACT

The study was conducted from June 2010 – May 2012. Detailed history with special reference to age, sex, and mode of injury, causes and circumstances of trauma were recorded. Ocular examination done to assess causes and level of loss of vision. B-scan was done for the posterior segment. The patients were followed up for 3 months. There were 76 patients of blunt ocular trauma (63.16% males & 36.84% females), mean age 20.02 yr. Right eye was more commonly involved ($p=0.02$). Commonest trauma was occupational (39.47%) and commonest trauma causing agent was wood (35.52%) (*vegetative material 19.73%, wood stick 10.12% & pencil 5.2%*) ($p=0.04\%$). 53.94% eyes had visual acuity of 0.1-0.6 log mar. Commonest cause of diminution of vision after 3 months was cataract 31.63% ($p=0.05$). More eye care programs are needed to educate about ocular safety and hence reducing blindness due to ocular trauma.

KEYWORDS: Blunt trauma, traumatic cataract, occupational injury, vegetative injury



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INTRODUCTION

Worldwide, interest in ocular trauma is rapidly growing as increasingly effective techniques for prevention and treatment are developed. Injuries account for 1.37% of overall blindness in the developing world. Of this the pediatric age group accounts for 8 to 14% of all eye injuries. Pediatrics ocular injury is usually accidental and unioocular (1,2). In contrast, adult ocular injury is usually the result of intentional assault. Males are more commonly affected than females at a ratio of approximately 4:1 and they also suffer injury at a younger age (3-5). Initial visual acuity, presence of an afferent pupillary defect, the type of injury, the location and extent of injury mainly contribute to the final visual outcome in patients with ocular injuries. While a focused history and prompt ocular examination is essential for immediate management, patient education regarding safety precautions and risk reduction help to prevent future recurrences. The present study was undertaken to assess the profile of blunt ocular trauma in a tertiary hospital in North India.

MATERIALS AND METHODS

A prospective study was conducted at upgraded department of Ophthalmology, tertiary eye care centre in North India between June 2010 to May 2012 on a total of 76 patients of blunt ocular trauma. An informed consent of the patients and approval of the ethical committee was taken prior to the enrollment of the patients for the study. The detailed history regarding circumstances at the time of injury, relation with work, intent, mode of injury (sharp/blunt/mixed), time elapsed for primary care, medical and surgical history was taken and recorded. Patients coming to the Eye O.P.D have been from both urban as well as rural background with no population bias. General condition of the patient was seen and then detailed ophthalmological check up was done. Initial visual acuity (best corrected/with pin hole, near vision, light perception with strong light source), pupillary reaction (to assess the optic nerve and

retinal function) and ocular motility was assessed. Detailed examination of various ocular and adnexal structures was done. The location, extent and type of injury was carefully examined. Detailed fundus examination with direct and indirect ophthalmoscope was done and fundus picture taken. B scan was done for posterior segment evaluation in cases of absent fundus glow. The patients were reassessed after one week of treatment and then again after three months. Visual outcome was graded as good (6/6-6/12), fair (6/18-6/24), satisfactory (6/36-6/60) and poor (<6/60). The findings were compiled and analyzed using SPSS 15.0 Version statistical software. Chi square test was used to compare the changes from baseline to follow up and p value of < 0.05 was considered as statistically significant.

RESULTS AND DISCUSSION

A total of 76 patients of blunt ocular trauma were enrolled for the study. Of them 63.16% were males and 36.84% were females in a ratio of 2:1. Patients were nearly equally divided in the age group of 5-14 years (28.9%), 15-24 years (23.7%) and 25-34 years (22.4%) having the mean age of 20.02 years. Injury to right eye was more common (61.86%) as compared to left eye (28.2%) (p=0.02). The commonest circumstance for trauma was occupational (39.4%) and the commonest agent causing trauma was wood 27 (35.52%) (vegetative material (19.73%), wood stick (10.12%) and pencil (5.2%) and this was statistically significant (p=0.04). Next commonest agent causing trauma was stone (21.1%). At the time of first visit, commonest corneal presentation was corneal abrasion and oedema in 67.1% and 19.7% patients respectively. By the 3rd month of follow up, these conditions improved though scarring developed in 23.7% of patient's eyes even after prompt management. Anterior chamber had hyphema in 39.5% patients at presentation. Findings in iris like iridodonesis (18.3%), mydriasis (6.0%), miosis (5.6%) did

not alter much during the period of follow up. Trauma to the lens led to the development of cataract in 31.6% of patients by 3rd month. Cataract was mostly cortical (45.5%) and of posterior subcapsular (11.8%) type. Blunt ocular trauma can be defined using the basic physics concept of energy exchange. Energy is transferred between the injurious object and periocular or globe structures without intrusion of the injured tissue by the offending object (6). Therefore any of the ocular structure can be affected and traumatized by blunt trauma. In one of the study it is reported that secondary to ocular injury worldwide, 1.6 million people are blind, 2.3 million have low visual acuity bilaterally and 19 million have unocular blindness or low vision(17). Baseline examination findings and visual acuity are important in advising parents and family members on the prognosis and final visual outcomes. Diagnostic ultrasound may provide useful information about the posterior segment in the cases in which fundal glow is absent. Male preponderance in the present study is found to be 2:1 as has also been reported by Pandita and Merriman (7) who had the male to female ratio of 3:1. This male preponderance is universally reported and thought to be related to occupational exposure, participation in dangerous sports and hobbies, alcohol use and risk taking behavior (8-11). Children and students (of first and second decade) represented 28.9% of the injuries similar to the findings of Dannenberg et al (5). This reinforces the need for prevention of childhood injuries

within the house and during sports (12). As it has also been reported the right eye (61.8%) involvement was more than the left eye (28.2%) (13). It may be because, having the right side dominance, people try to protect themselves by bringing their right side forward reflexly and thus in turn get more traumatized on the right side.

The major agents causing trauma were stone (21.1%) and vegetative matter (19.7%) , fire crackers (13.2%) , cricket ball (11.8%) and wood stick (10.5%) whereas there were very less cases of trauma by pencil tip, shuttle cock ,fall and fist which was contradictory to findings of a study who reported the maximum cases of trauma by fist/stick (23.8%). This is probably due to area wise changes in life style and occupational pattern (14). The visual prognosis, after the management remains satisfactory in our study. Final visual acuity was 6/6 to 6/18 in 56.6% of patients and 6/18 to 6/60 in 38.2% patients. This was because the anterior segment was most commonly affected by trauma and this segment has a very good ability to heal. This has also been reported in previous studies (15). Factors adversely affecting visual outcome are complex trauma and delay in referral. Aside from visual impairment, eye injury is known to cause significant morbidity in terms of pain, psychosocial stress and economic burden. With proper information and education, up to 90% of eye injuries and a significant amount of its burden are preventable (16). But once the injury has occurred, the prevention of blindness depends upon the early and efficient management techniques.

Table 1
Baseline characteristics of the patients

Parameters	No. (n=76)	%
Age in years		
5-14	22	28.9
15-24	18	23.7
25-34	17	22.4
35-44	10	13.2
>=45	9	11.8
Sex		
Male	48	63.2
Female	28	36.8
Eye involved		
Right	47	61.8
Left	29	38.2

Table 2
Profile of change in ocular findings at presentation, 1st week and 3rd month

	Baseline		One week		3 rd month		P-value		
	No.	%	No.	%	No.	%	Baseline vs One week	Baseline vs 3 rd month	One week vs 3 rd month
Visual acuity									
6/6-6/9	15	19.7	17	22.4	26	34.2	<0.0001	<0.0001	<0.0001
6/9-6/18	19	25.0	20	26.3	17	22.4			
6/18-6/24	18	23.7	20	26.3	16	21.1			
6/36-6/60	14	18.4	16	21.0	13	17.1			
<6/60	10	13.1	3	3.9	4	5.3			
Cornea									
Abrasion	57	75.0	14	18.4	58	76.3	<0.0001	<0.0001	<0.0001
Edema	9	11.8	51	67.1	7	9.2			
Bloodstaining	10	13.2	6	7.9	7	9.2			
Scarring	0	0.0	5	6.6	4	5.3			
AC									
Normal	46	60.5	72	94.7	75	98.7	<0.0001	<0.0001	<0.0001
Hyphaema	30	39.5	4	5.3	1	1.3			
IRIS									
Normal	53	69.7	51	67.1	56	73.7	<0.0001	<0.0001	<0.0001
Mydriasis	14	18.4	17	22.4	16	21.1			
Miosis	5	6.6	5	6.6	4	5.3			
Iridodonesis	4	5.3	3	3.9	0	0.0			
Lens									
Normal	75	98.7	75	98.7	52	68.4	0.11	<0.0001	<0.0001
Cataract	1	1.3	1	1.3	24	31.6			
Vitreous									
Normal	62	81.6	61	80.3	72	94.7	<0.0001	<0.0001	<0.0001
Hemorrhage	14	18.4	15	19.7	4	5.3			
Retina									
Normal	65	85.5	62	81.6	58	76.3	<0.0001	<0.0001	<0.0001
Retinal edema	8	10.5	5	6.6	16	21.1			
Retinal detachment	3	3.9	9	11.8	2	2.6			

CONCLUSION

Eye injuries resulting from ocular trauma pose a frequent threat to vision. Therefore the most effective approach to ocular trauma is a proactive approach to prevention. Primary prevention of ocular injury is firmly based on improving patient education, proper safety equipment and practices, risk reduction and close supervision of all high risk activities. Once injury has occurred the management plan should be directed firstly to restore intraocular

anatomy and secondly to restore visual function and achieve complete functional rehabilitation.

Conflict of Interest

Conflicts of interest declared none.

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