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Original Research Article

Pattern of ocular trauma at MLB Medical College, Jhansi (UP) - A retrospective study

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Abstract

Introduction: Ocular trauma is an important and yet preventable cause of visual morbidity especially among population in developing countries. Trauma is a significant cause of monocular blindness.
Objective: To determine the pattern of ocular trauma, causative agents and visual outcome among patients presenting to emergency.
Material and Methods: A retrospective study was conducted from April 2013-March 2014 on 400 patients with ocular trauma, presented to the emergency trauma centre at MLB medical college, Jhansi. Specially designed protocol was used to record the information based on the demographic data, nature and cause of injury. Informed consent was taken from all the patients. Data obtained were collected and analysed statistically by simple proportions.
Results: Most common age group was 21-40 years (192 patients), among the pattern of ocular trauma laceration (62.7%) was found to be most common both in male and female patients, followed by peri-orbital haematoma (22.5%). The main causes were found to be work place injuries (32%) and road traffic accidents (28%). The common visual acuity observed on the affected eye on admission was <6/60-3/60 (43.7%) and <3/60 (27.2%).
Conclusion: Public education and awareness program regarding health seeking behaviour for ocular injuries need to be conducted for improved outcome of ocular injuries.
Keywords: ocular trauma, laceration, peri-orbital haematoma

1. Introduction

Trauma is an important cause of ocular morbidity. Worldwide there are approximately 6 million people blind from eye injuries, 2.3 million bilaterally visually impaired and 19 million with unilateral visual loss; these facts make ocular trauma the most common cause of unilateral blindness [1]. Despite the fact that the eyes represent only 0.27% of the total body surface area and 4% of the facial area, they are the third most common organ affected by injuries after the hands and feet [2]. Ocular trauma is an avoidable cause of blindness and visual impairment. According to estimates by WHO, about 55 million eye injuries restricting activities for more than one day occur each year, 750,000 cases requiring hospitalization which includes 200,000 open globe injuries [3]. Male subjects are at higher risk of ocular trauma [4]. Even though ocular trauma has been described as a neglected issue, it was highlighted as a major cause of visual morbidity more recently [5]. Ocular injury occurs in three forms: open globe, closed globe, and adnexal injuries. Open globe injuries are one of the most common emergencies in ophthalmologic clinics and require immediate operation [5]. The age distribution for serious ocular trauma is bimodal with the maximum incidence in young adults and a second peak in the elderly [6]. Injuries with sticks, stones, cricket ball, and metallic objects along with road traffic accidents are the most common [7]. Recognition of the public health importance of ocular trauma has sparked growing interest in studies on eye injuries. The execution of this study became imperative in view of an increasing number of ocular traumas at the only trauma centre in the community. We designed this study to determine the pattern of ocular trauma, causative agents and visual outcome among patients presenting to emergency trauma centre at MLB medical college, Jhansi (UP).

2. Material and methods

A one year of retrospective study was conducted from April 2013-March 2014 on 400 patients with ocular trauma, presented to the emergency trauma centre at MLB medical college, Jhansi. Out of 400 patients visited 307(77%) were males and only 93(23%) were females which shows ocular trauma in the study area is male preponderance. The patients either presented directly to the hospital or were referred from other public or private hospitals. Before that informed consent was taken from all the patients. Approval was obtained from the Ethical Review Committee of the medical college prior to commencement of this study. All the patients were included in the study except those whose eyes with pre-existing diseases like glaucoma, operated eyes (injury to previously operated eyes) or where clinical findings were determined to be of non-traumatic nature (trauma bringing to notice of some other pathology) were excluded from the study. A thorough ophthalmic examination was done which included presenting visual acuity measurement by Snellen's chart, slit lamp examination to evaluate anterior segment injuries with fundus evaluation was done by direct ophthalmoscopy, indirect ophthalmoscopy and slit lamp bio-microscopy. Intraocular pressure was measured in all eyes except in open globe injuries. Gonioscopy to visualize the angle of the anterior chamber was done in closed globe injuries where angle recession was suspected. Data were collected from the clinical records which include age, sex, place and date of trauma; other details included the cause, nature and circumstance of injury using a structured data collection format. It was edited, cleaned, checked for completeness and cross checked for accuracy to ensure quality. Operational definitions were according to World Health Organization (WHO) and Birmingham Eye Trauma Terminology System (BETTS). [8]

Blindness: Visual acuity <3/60

Eye Wall: Cornea and Sclera

Closed Globe Injury: No full thickness wound of the eye wall

Contusions: no full thickness wound, direct energy delivery (e.g. choroidal rupture, berlin's oedema, retinal detachment, vitreous hemorrhage, concussion cataract, traumatic uveitis,) or due to change in shape of the globe (e.g. angle recession glaucoma)

Lamellar laceration: partial thickness wound of the eye wall

Open Globe Injury: full thickness wound of the eye wall

Laceration: full thickness wound at the impact site of a sharp object by outside- in mechanism

Penetrating: entrance wound only

Perforating: entrance plus exit wound

Intra- ocular foreign body: technically a penetrating injury, but grouped separately because of different clinical implications

Rupture: Full thickness wound by blunt object by inside out mechanism due to increased intraocular pressure

Adenexal injuries: Eyelid and/or conjunctiva injuries

Statistical analysis: Data were entered into a Microsoft Excel spreadsheet and then transferred to Statistical Package for Social Sciences (SPSS®) (trial version 16.0), and was analyzed statistically by simple proportions.

3. Results

Table no.1 shows age groups and sex wise distribution of study patients. Out of 400 ocular trauma patients maximum number of individuals belongs to age group from 21-40 yrs (48%) followed by 41-60 yrs (28%). 77% (307) of male patients and 23% (93) of female patients were studied, which shows that the study is male preponderance.

Table no.2 shows pattern of ocular trauma in relation to age and sex of study patients. Most common pattern was found to be laceration which was seen in (62.7%) of patients followed by peri-orbital haematoma (22.5%). Laceration was found to be more common in age group from 21-40 yrs with male more lacerated than females. Blunt injury was found to be more common in age group of 41-60 yrs. Sclera tear and intra-ocular foreign body were not seen in age group >60 yrs. The various patterns were all male preponderance.

Table no.3 shows distribution of ocular trauma in relation to visual acuity at the time of admission of the study patients. The common visual acuity observed on the affected eye on admission was <6/60-3/60 (43.7%) and <3/60 (27.2%). Lacerations and peri-orbital haematoma were the most common types of ocular trauma affecting most of patient's visual acuity. Within 109 cases of <3/60), 68.8% were due to lacerations whereas 15.5% were due to peri-orbital haematoma. Among 175 cases of <6/60-3/60, 62.2% were due to lacerations whereas 26.8% were due to peri-orbital haematoma.

Figure no.1 shows different causes of ocular trauma. The main causes were work place injuries (32%) and road traffic accidents (28%). Assault (14%) and games (10%) were also found to be important causative agents.

Figure no.2 shows management of ocular trauma study patients at the time of admission. The most common treatment was found to be use of anti-inflammatory drugs and steroids (44%) followed by suturing and repair of lacerations (31%). Irrigation and hyphema washout and conservative treatment were equally important. Evisceration was found to be done only in 2% of study patients.

Table 1: age group and sex wise distribution of the study patients. (n=400)

Age Group(yrs)	Male (%)	Female (%)	Total (%)
< 20	52 (17)	29 (31.1)	81 (20.2)
21-40	159 (51.7)	33 (35.4)	192 (48)
41-60	87 (28.3)	23 (24.7)	110 (27.5)
>60	9 (3)	8 (7.4)	17 (4.3)
Total	307 (77)	93 (23)	400 (100)

Table 2: Diagnostic distribution of pattern of ocular trauma in relation to age and sex among the study patients (n=400)

Pattern of ocular trauma	Age group and Sex								Total (%)
	<20 yrs		21-40 yrs		41-60 yrs		>60 yrs		
	Male	Female	Male	Female	Male	Female	Male	Female	
Laceration	32	12	112	22	50	14	4	5	251 (62.7)
Periorbital haematoma	8	9	31	6	22	7	5	2	90 (22.5)
Blunt injury	5	0	6	2	10	2	0	1	26 (6.5)
Sclera tear	4	6	6	2	2	0	0	0	20 (5)
Foreign body	3	2	4	1	3	0	0	0	13 (3.3)
Total (%)	52 (13)	29 (7.3)	159 (40)	33 (8.2)	87 (21)	23 (6)	9 (2.2)	8 (2)	400 (100)

Table 3: Distribution of ocular trauma in relation to visual acuity on admission (n=400)

Pattern of ocular trauma	Visual acuity of affected eye on admission				
	6/6-6/18	<6/18-6/60	<6/60-3/60	<3/60	Total (%)
Laceration	52	15	109	75	251(62.7)
Periorbital haematoma	11	15	47	17	90 (22.5)
Blunt injury	2	4	12	8	26 (6.5)
Sclera tear	6	3	5	6	20 (5)
Foreign body	6	2	2	3	13 (3.3)
Total (%)	77 (19.2)	39 (9.9)	175 (43.7)	109 (27.2)	400 (100)

Figure 1: Causes of ocular trauma among study patients (n=400)

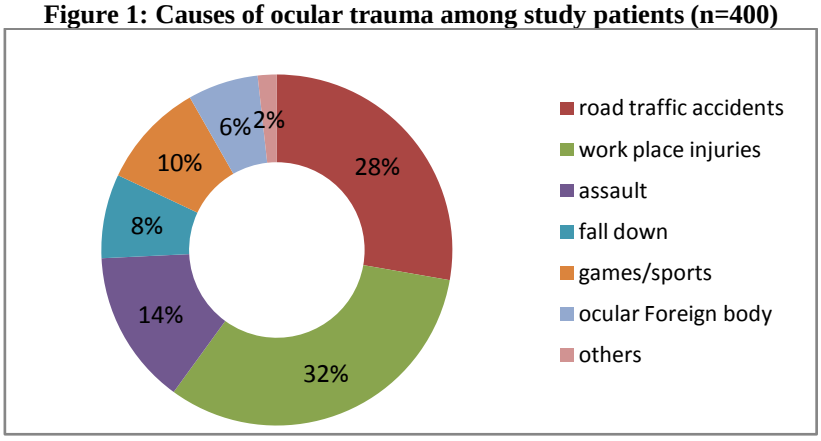
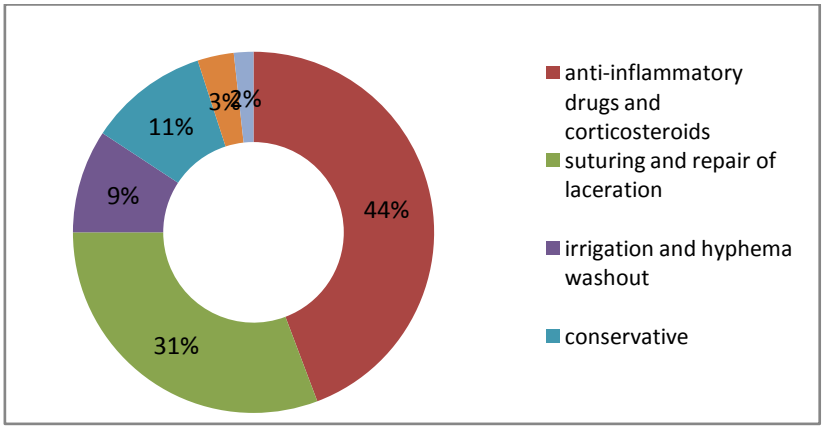


Figure 2: Distribution of ocular trauma management on admission (n=400)



4. Discussion

Ocular trauma is an important cause of blindness and ocular morbidity. Most previous studies on the profile and prognostic factors in ocular trauma have been carried out in more developed countries where modern facilities for managing ocular trauma are widely available [9]. There is paucity of studies on the profile of ocular trauma from the less developed countries [10]. In our study we found 192 (48%) patients belong to age group between 21-40 years with male to female ratio was 3:1. There was a preponderance of male subjects in our study which is in accordance with some other Reports [11,12]. The explanation for this could be the greater risky, occupation and stimulus to aggressiveness given to males in almost all societies and better access to health services. This is comparable to the demographic profile of ocular trauma patients found by recent study from south India where males (86.8%) outnumbered the females (13.2%) and children (<16 years) constituted 46.8% of the total affected population[13]. As reported by some other studies [14] most of our patients belonged to a young and active age group. This finding is understandable as such people are likely to engage in risky behaviours and activities which may predispose to ocular injuries. Our study did not show significant association between involvements of either eye. Among the causes of injury, work place injuries accounted for maximum number of cases (32%), followed by road traffic accidents (28%), sports ,playing and recreational activities which accounted for (10%) patients and others like assault, fall down related were other identified causes. Study of JUDO showed commonest causes of injury were violence related 37.2% of the documented causes[15]. In industrialized countries, most causative agents are metal filings (41.8%) and sharp objects (59.2%) as mentioned in M. Hossain' study [1].

According to a study conducted in Haryana, males (76.01%) were more frequently affected than females (23.99%). In occupational injuries (38.26%), those occurring during agricultural activities (19.9%), were most common followed by industrial accidents (12.24%).[16]. In the current study open globe injury were more as compared to closed globe injury, were lacerations (62.7%) is the most common followed by peri-orbital haematoma (22.5%). Various epidemiological studies have shown higher incidence of closed globe injury as compared to open globe injury. In a study in Malaysia closed globe injuries were 61.1% and open globe injury were 34.8%. [17]. Majority of population concerned with these diagnosis was group aged between 21-40 years while blunt injury and penetrating injuries where low. This could be due to the low level of criminalities observed in Jhansi where most of injuries are related to the type of activities people are involved in, such as farming, travelling or home related activities. Desai *et al* [3] and Nirmalan *et al* [18] found that blunt ocular injuries were more elevated than penetrating injuries with a rate of 54.4% and 54.9% vs. 23.3% and 46.9% respectively. Visual acuity of the injured eye on admission for patients received at medical college were distributed as follow: visual acuity (<6/60-3/60): 43.7%, visual acuity (<3/60): 27.2%, visual acuity (6/6-6/18): 19.2% and visual impairment (<6/18-6/60): 9.9%.These percentages were lower compared to C. Iqbal [19] *et al.* who described 81.1% of visual acuity below 3/60, 12.2% of visual acuity (<6/18-6/60). This could be related to the fact that at medical college there was a high rate of ocular trauma not due to criminality. However, C. Omolase *et al* [1] described a little difference while describing 50.8% of visual acuity (6/6-6/18), 32.6% of visual acuity below 3/60, 12.1% of visual acuity (6/18- 6/60) and 4.5% of visual acuity (<6/18-6/6). The management mostly performed at emergency trauma centre was based on steroids and anti-inflammatory therapy (44%).This percentage of steroids and anti-inflammatory drugs at trauma centre was elevated with a low percentage of surgery (2%) and conservative management (11%) compared to M. Zhang's [20] findings which describes ocular trauma management with 52.6% of surgery and 22.2% of conservative management.

5. Conclusion

This study is male preponderance like other studies but direct comparison of this study with the data from some of the studies reviewed was difficult in some aspects, due to different classification, definition and methods of reporting used in these studies. This study also has shown that work place injuries and road traffic accidents are the commonest causes of ocular injuries followed by recreational activities. Thus there is a need for strict reinforcement of traffic rules and industrial safety protocols. Individuals at risk need to be educated regarding use of protective gear. Simple safety procedures like wearing seat belts in driving, protective goggles in welding, supervising children while playing etc. should be advocated using mass media. The impact of ocular trauma in terms of medical care, loss of income and cost of rehabilitation services clearly highlights the importance of preventive strategies. Good training in how to deal with different types of ocular trauma is important for resident ophthalmologists which would go a long way in salvaging the vision of patients. Our data support the need for improving health services by providing them with facilities and equipment which is

necessary for urgent management of ocular trauma. Also public education and awareness program regarding health seeking behaviour for ocular injuries need to be conducted for improved outcome of ocular injuries.

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