International Journal of Research in Medical Sciences
Bhupally AK et al. Int J Res Med Sci. 2015 Dec;3(12):3714-3719
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20151428

Research Article

Ocular trauma

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Received: 13 October 2015
Revised: 14 October 2015
Accepted:19 Novemberber 2015

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ABSTRACT

Background: Ocular trauma has been a neglected problem. Worldwide there are approximately 1.6 million people blind from eye injuries and 2.3 million bilaterally visually impaired and 19 million with unilateral visual loss; this being a most common cause of unilateral blindness today. The objective of the study was to analyze ocular injuries with respect to the mode of injury, sites involved, and visual outcome.
Methods: This is a hospital based retrospective observational study. Cases included in the study presented to the casualty and Ophthalmology Department in Chalmeda Anand Rao Institute of Medical Sciences from May 2013 to January 2015. Trivial injuries resulting in superficial foreign bodies and uncomplicated superficial corneal abrasions were excluded.
Results: In this study, 76 cases presented with ocular injuries. Majority of the patients were males (83.87%) and the most common age of presentation was between 17 to 39 years (34.8%). Most common mode of ocular trauma in our study was closed globe injury due to blunt trauma (77.6%) followed by chemical injuries (13%) and least common was penetrating trauma. Anterior segment involvement included acute corneal edema (11 cases), scleraltear (10 cases), corneal tears and iris prolapse (9 cases), traumatic cataract (9 cases), traumatic subluxation of lens (8 cases), traumatic subluxation of IOL (5 cases), phacocele (1case), lid laceration (4cases). Posterior segment injuries include traumatic optic neuropathy (6cases) and Berlin's edema (4cases), sub retinal hemorrhage (4cases), vitreous hemorrhage (4cases) and macular hemorrhage (1case).Occupation based injuries were 26 cases (43.3%). A poor visual outcome was associated with posterior segment involvement. Visual acuity in 41 patients was better or equal to 6/12 (54.3%), 15 patients (19.7%) were only able to perceive light and 2 patients (2.6%) underwent enucleation.
Conclusions: This study reinforces that occupational trauma and domestic trauma were common causes and that trauma can cause any extent of damage to ocular structures, and the final visual outcome is dependent on the structures injured and treatment given within appropriate time.

Keywords: Ocular trauma, Mode of injury, Visual outcome

INTRODUCTION

Ocular trauma has been a neglected problem. Worldwide there are approximately 1.6 million people blind from eye injuries and 2.3 million bilaterally visually impaired and 19 million with unilateral visual loss; this being a most common cause of unilateral blindness today.[2-4] The age distribution for occurrence of serious ocular trauma is bimodal, with maximum incidence in young adults and a second peak in the elderly.[5-7] Both hospital and population based studies show predominance in males.[8-10] In addition to impact on vision there are profound

social implications regarding the lost productivity by young men and requirement of caring facilities and rehabilitation of elderly.[11] Developing countries carry the largest burden yet the least to afford.[12,13] Approximately half of all patients with ocular complaints, who present to casualty department do so because of ocular trauma.[14,15] The spectrum of injuries range from very mild non–sight threatening to extremely serious with potentially blinding consequences. As expected, majority of injuries were minor affecting the peri-orbital tissues or the ocular surface, such as foreign bodies. Only 2-3% of all eye injuries required hospital admission[11,14] and it is this small minority of cases that are of interest with regard to management and outcome and therefore have attracted attention. Over 10% of these people will lose useful vision in injured eye. Trauma should be treated seriously in particular, as open wounds from penetrating injuries can rapidly lead to sight threatening infections. These type of injuries often occur in workplace, at home, while participating in sports.[19,20] Injuries to globe can be described as closed globe injuries when the eye wall is intact and open globe injuries when the eye wall has been breached. This can arise either from penetrating object or from a blunt injury severe enough to cause rupture of globe. Open globe injuries may be termed perforating, penetrating or ruptured globe.

METHODS

This was a hospital based retrospective observational study. Cases included in this study presented to the casualty and the ophthalmology department in Chalmeda Anand Rao institute of Medical Sciences from May 2012 to January 2015. Trivial trauma resulting in superficial foreign bodies and uncomplicated superficial corneal abrasions were excluded. Written informed consent was taken from all the study patients for the appropriate treatment. Institutional ethics committee approval was taken before starting the study. Detailed ocular examination included visual acuity, anterior segment examination, slit lamp biomicroscopy, IOP (intraocular pressure measurement by applanation tonometer, gonioscopy and direct and indirect ophthalmoscopy in all patients. USG (B) was carried out to assess posterior segment status particularly retinal detachment, vitreous haemmorrhage and to rule out retained intraocular foreign body in patients with hazy media.

RESULTS

It was found that 76 patients presenting with ocular complaints seen at the casualty and OPD were due to ocular trauma in the time period from May 2012 to January 2015.Of the studied 76 cases, as seen in table2 (demographic information) people in younger age group were slightly more affected by trauma than other age group. Males were more affected than females. Among the causes of injury, occupation based ocular injury (26%) was the most common cause of followed by domestic trauma and sports injury (21%) with cricket ball or marble stones.

Varied materials (Table 3) were involved in causation of injury that included common things like wooden stick (used while walking), cricket ball, occupation based instruments to uncommon chemicals like fevi kwik (adhesive) and mobile blasts. Most common mode of injury was closed globe injury (77.6%) including blunt trauma and partial thickness lamellar lacerations followed by chemical injuries (13%) then lid laceration (5.2%) and least common was complete penetrating injury (1.3%). Visual outcome was 6/12 and better in 54.3% of patients and 15% of patients were only PL positive. Enucleation was done in 2.6% of patients.

Table 4 below shows detailed injury pattern affecting anterior segment, mode of injury, intervention done and final visual outcome. Final visual outcome of 6/12 and better was observed in 41 patients. Anterior segment injuries included corneal tear and iris prolapse managed with corneal suturing as shown in fig 2, traumatic cataract, subluxation of intraocular lens (Figure 3, 4), traumatic subluxation of lens (Figure 5),traumatic absorption of lens(Figure 6) managed with PCIOL and SFIOL implantation and phacocele (Figure 7) leading to aphakia.

Table 1: showing the management of the cases of ocular trauma in relation to their percentages.

Intervention done	Percentage of cases
Conservative	68 %
Surgical	31.5%

Table 2: Demographics.

Gender	Males	83.87%
	Females	15.7%
Age	0-16 years	27.3%
	17-39 years	34.8%
	40-59 years	26%
	>60years	10%
Education	Illiterates	56%
	Upto primary	32%
	>primary	12%

Table 3: The common materials involved in causation of ocular injuries.

Source of injury	Percentage of causation
Wooden sticks	26%
Twigs/leaves	13%
Cricket ball/sports	13%
Occupational instruments	11.4%
Chemicals like acid ,cement, fevi kwik	10%
Stones	10.8%
RTA/Fall on blunt objects	10.6%
Cotton fields	3.2%
Animal horn	2%

Table 4: Detailed injury pattern affecting anterior segment, mode of injury, intervention done and final visual outcome.

V A	Anterior segment	Mode of Injury	Material	Treatment	1st follow-up	Final VA
Cf 3mts	Scleral tear & Corneal tear with iris prolapse	Laceration	Marble stone,	Scleral tear, Corneal tear repair	Cf 3mt with PHL 6/18	6/12
Cf 1mt	Corneal tear & iris prolapse	Laceration	wooden stick	Corneal tear repair	Cf 1mt with PHL 6/36	6/12
Cf 3mt	Corneal tear & iris prolapse	Laceration	wooden stick	Corneal tear repair	Cf 3mt with PHL 6/36	6/18
Cf 1 mt	Corneal tear& iris prolapse	Laceration	fall on Bl-unt object	Corneal tear repair	Cf 1mt with PHL 6/36	6/12
Cf 3mt	Lower lid laceration	Laceration	fall on object	Lower lid repair	6/60 PHL 6/36	6/9
6/60	Lower lid laceration	Laceration	Stick	Lower lid repair	6/36PHL 6/12	6/9
Cf 1mt	Upper lid laceration	Laceration	RTA	Upper lid repair	6/60PHL 6/36	6/12
Cf 3mt	Upper lid laceration	Laceration	stick	Upper lid repair	6/60PHL 6/12	6/12

Table 5: showing anterior segment involvement and final visual outcome

V A	Anterior segment	Mode of Injury	Material	Treatment	1st follow-up	FINAL VA
1) Cf 1mt	Traumatic cataract	Blunt trauma	Stick	PCIOL	Cf 3mt PHL 6/18	6/9
2) Cf3mt		Closed globe injury	Fire cracker	PCIOL	6/36	6/12
3) Cf1mt			fall on blunt object	PCIOL	6/36	6/12
4) HM+ve			fall on blunt object	PCIOL	6/60	6/36
5) Cf 1mt			fall on blunt object	PCIOL	6/60	6/24
6) Cf 2mt			Stick	PCIOL	6/24	6/12
7) Hm+ve	Traumatic absorption of lens		Stick	PCIOL	6/36	6/24
8) Hm+ve	Traumatic subluxation of lens		Stick	SFIOL	6/36	6/12
9) HM+ve	Traumatic subluxation of lens		Stick	SFIOL	6/60	6/24
10) HM+ve	Traumatic subluxation of IOL		animal horn	SFIOL	6/36WithPHL 6/18	6/9
11) HM+ve	dislocation of lens(PHACOCELE)	Closed globe injury	animal horn	Aphakia	Cf 3mt with PHL 6/60	6/60
12) pl-ve	Blast injury	Blast injury	Fire cracker	Aphakia	Pl-ve	Pl-ve

Table 6: Posterior segment involvement and final visual outcome.

VA	Posterior segment	Material	Time of presentation	Treatment	Final VA
1. HM+ve	Vitreous Haemorrhage	Sports ball	1 week after trauma	Conservative treatment	6/36
2. 6/60		Animal horn			6/24
3. HM+ve	Macular haemorrhage				CF 1m
4. Cf 1/2 mt	Sub retinal haemorrhage	Sports ball			6/36
1. PL-ve	Traumatic optic neuropathy	Sports ball	1-5 weeks after trauma	IV Methyl Prednisolone	PL-ve
2. HM+ve					HM+ve
3. Cf 1/2mt					Cf 1/2
4. Cf Cf					CF cf
1. 6/36	Berlins edema	Sports ball	1 week after trauma	Conservative treament	6/18
2. Cf 1mt		stick			6/36
3. Cf 1mt		Sports ball			6/36

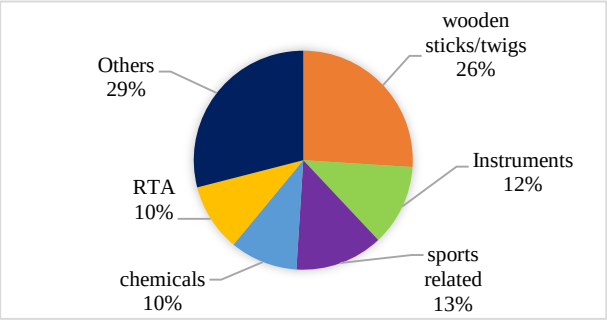

Figure 1: Common causes of ocular injuries in relation to their percentages.

Figure 2: Corneal tear- repaired iris prolapsed.

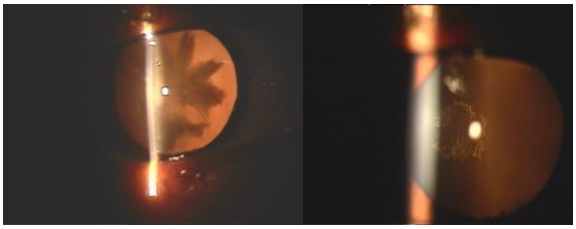

Figure 3: Traumatic cataract- PcIOL implanted.

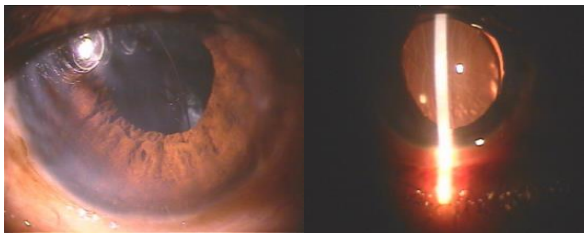

Figure 4: Traumatic subluxation of IOL SFIOL-implantation.

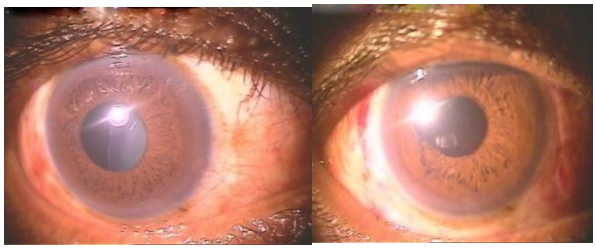

Figure 5: Traumatic subluxation of lens.

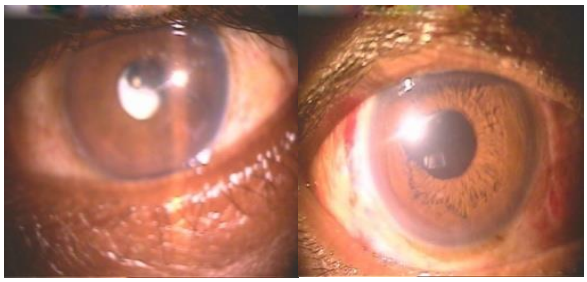

Figure 6: Traumatic absorption of lens, PCIOL.

Figure 7: Phacocele , SFIOL implantation.

Figure 8: Berlins edema, after 1 month.

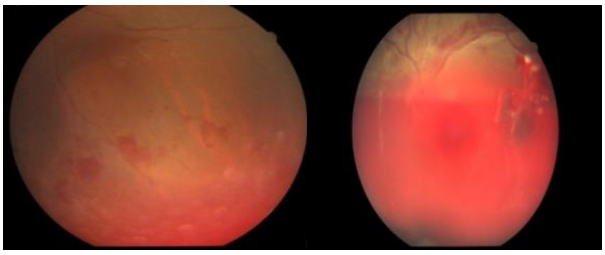

Figure 9: Vitreous haemmorrhage on follow up.

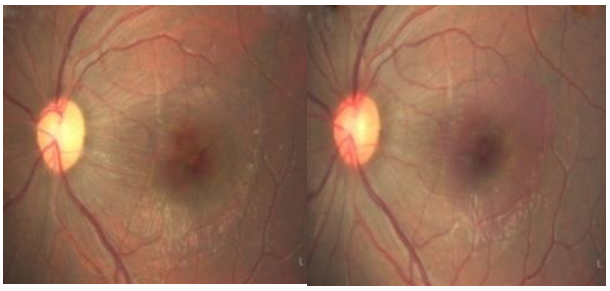

Figure 10: Subretinal haemmohage, after 3months

DISCUSSION

Eye trauma remains a neglected public health problem and can be prevented by appropriate interventions. In our study, 83.87 % of the cases were males. The most common age involved was between 17-39 years. The higher risks in young men appear to reflect a combination of higher risk of work related , sports related and motor vehicle crash related ocular injuries In our study closed globe injuries were the most common (77.6%) followed by chemical injuries (13%) then lid lacerations (5.2%) and least common was complete penetrating injuries. Occupation based injuries were most common (26%) followed by domestic and sports related injuries (21%).Initial visual acuity was a strong predictor of visual outcome. Groessl et al.[21]described in their study of 42 patients with penetrating ocular injuries that an initial visual acuity of LP or worse was associated with poor visual outcome. The visual outcome also depends upon the site, the open globe or closed globe), the extent of ocular damage, the period between the time of injury and the instigation of treatment. The incidence of ocular trauma can be decreased by the proper use of safety devices like protective goggles or shields, face masks etc. during work. The counseling of farmers regarding the usage of protective glasses at work and the education of parents and teachers regarding the prevention of ocular injuries in children may go a long way in reducing the visual morbidity from ocular trauma. Thus it is recommended preventive measures advocated by health workers to emphasize the importance of early health seeking behavior and follow up of patients with ocular trauma. Simple safety procedures should be advocated using mass media. The low frequency of eye protective device use reinforces the need for a better understanding of the limitations of existing occupational eye safety programmes.

Prevention: The adage "an ounce of prevention is worth a pound of cure "is most apt for ocular trauma. Prevention of devastating ocular injuries through stronger educational campaign and mandatory use of safety glasses in hazardous occupations shows a foresight in protecting vision that most up to date and heroic surgical efforts to save sight cannot match.

ACKNOWLEDGEMENTS

Sincere gratitude is hereby extended to all those who never ceased to help us until this study is structured.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Bhupally AK, Chigiri SS, Swathi M, Rohini M, Shruthi T. Ocular trauma. Int J Res Med Sci. 2015;3:3714-9.