

Original Research Article

A 5 year retrospective study on epidemiological pattern of ocular trauma

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ABSTRACT

Background: One of the delicate structure in the human body is eye and trauma to the eye is essentially a very grave matter. Major cause of preventable monocular blindness and visual impairment in the world is ocular trauma. So any injury to the eye must be deemed to be an ocular emergency and should be handled with utmost care. Despite its public health importance, there is relatively less population based data on the magnitude and risk factors for ocular trauma specially from developing countries. The objective of the study was to find out the epidemiological pattern of ocular trauma.

Methods: The present study was 5 year retrospective study of all the patients who reported directly with ocular injury or referred from the casualty to the department of ophthalmology from January 2013 to January 2018. Various parameters like age, sex, mode of injury, type of injury etc. of all patients seen during this period were analyzed.

Results: Total of 4192 ocular trauma patients were seen during study period. Maximum number of ocular trauma patients i.e. 1146 were seen in age group of 21-30 years. Males i.e. 3490 outnumbered females in the present study. Road traffic accidents were the most common cause of ocular trauma and accounts for 1760 cases. Most common reported ocular trauma was periorbital oedema/ecchymosis followed by laceration. Surgical intervention was done in 1660 cases whereas 2532 were managed medically.

Conclusions: From present study, we may conclude that the maximum number of ocular trauma patients were seen in the age group of 21-30 years with more preponderance in males. Road traffic accidents were the most common cause of ocular trauma. The fact that the lifetime prevalence of ocular trauma is higher than that of eye diseases, which can be decreased by implementing the traffic rules with strict force and imposing heavy fine and license cancellation for drunken driving.

Keywords: Ocular trauma, Periorbital oedema/ecchymosis, Road traffic accidents

INTRODUCTION

One of the delicate structure in the human body is eye and trauma to the eye is essentially a very grave matter. So, any injury to the eye must be deemed to be an ocular emergency and should be handled with utmost care.¹ Common cause of monocular visual impairment and blindness worldwide with significant socioeconomic

impact is ocular trauma. It has been reported that up to one-fifth of adult populations have had ocular trauma (OT) at some point in their lives. It may range from occurrence of minor corneal abrasions and sub-conjunctival hemorrhage to a badly lacerated globe with complete loss of vision.² Globally about 55 million eye injuries restricting normal activities for more than one day occur every year; 750,000 cases require

hospitalization each year, including some 200,000 open-globe injuries; and almost 19 million with unilateral blindness or low vision from it.³ With the increase in Road Traffic Accidents, the injuries to humans vary from mild to severe including injury to eyes. Out of all types of ocular emergencies, ocular trauma is by far the commonest, constituting nearly 75% of all ocular emergencies.⁴ Ocular trauma is the leading cause of non-congenital unilateral blindness in children. Worldwide 2% to 14% of the pediatric ocular trauma patients ended in severe visual impairment or blindness. Compared to closed globe injuries, open globe injuries yield worse visual outcomes in ocular trauma.²

There is a phenomenal increase in the number of Road Traffic Accidents (RTA) in our country. There is a spurt in the number of vehicles occupying the road and the number of new drivers also increasing. With the increase in Road Traffic Accidents, the injuries to humans vary from mild to severe including injury to eyes. Early diagnosis and appropriate management of the injuries helps the patients to restore the vision and avoid complications.¹ Thus, present study was conducted to see epidemiological pattern of ocular trauma.

METHODS

The present study was retrospective study of all the patients who reported directly with ocular injury or referred from the casualty to the eye department of government medical college Jammu from January 2013 to January 2018. The records (emergency register/admission files) of all patients seen during this period was reviewed and any injury to the eye and adnexa which led to an emergency ophthalmology referral or the patient with eye injuries themselves presented to the eye department were included in the study.

Various epidemiological parameters available in hospital records like age, sex, type of injury etc were recorded. World Health Organisation (WHO) and Birmingham eye trauma terminology system (BETTS) were used as operational definitions.⁵

World Health Organization (WHO) and Birmingham Eye Trauma Terminology System (BETTS) describes definition of ocular trauma as Blindness: Visual acuity <3/60 Eye Wall: Cornea and Sclera Closed Globe Injury: not a full thickness wound of eye wall contusion: direct energy delivery like choroidal rupture or due to change in shape of the globe like angle recession Lamellar laceration: partial thickness wound Open Globe Injury: A full thickness wound of the eye wall Laceration: Wound by a sharp object by outside- in mechanism Penetrating: Presence of an entrance wound only Perforating: Presence of an entrance as well as an exit wound Intra-ocular foreign body Rupture: Wound caused by any blunt object via inside out mechanism due to raised intraocular pressure Adenexal injuries: Eyelid and conjunctiva injuries.

Statistical analysis

The data was analysed using statistical software MS Excel/SPSS version 17.0 for windows. Data presented as percentage (%) as discussed appropriate for quantitative and qualitative variables.

RESULTS

The cause of blindness or partial loss of vision in more than half a million people worldwide, is the ocular trauma. Blindness in trauma results from phthisis bulbi, corneal scars, hyphaema, cataract, retinal detachment, macular scar and optic neuropathy.⁴ During study period total of 4192 patients having ocular trauma were studied. Maximum number of ocular trauma patients were seen from 1 Feb 2016 to 31 Jan 2017 i.e. 959 followed by 906 from 1 Feb 2017 to 31 Jan 2018. Monthwise, maximum number of patients i.e.1190 were seen from October to December followed by July to September every year (Table 1).

Table 1: Year-wise and month wise distribution of studied subjects.

Year wise	No of patients	%age
1 Jan 2013 to 31 Jan 2014	710	16.9
1 Feb 2014 to 31 Jan 2015	766	18.3
1 Feb 2015 to 31 Jan 2016	851	20.3
1 Feb 2016 to 31 Jan 2017	959	22.9
1 Feb 2017 to 31 Jan 2018	906	21.6
Month wise every year (total)		
January to March	956	22.8
April to June	945	22.5
July to September	1101	26.3
October to December	1190	28.4

Out of total no. of patients maximum number of ocular trauma patients i.e.1146 were seen in age group of 21-30 years followed by 682 in 31-40 years. Elderly patients i.e. ≥61 comprised only 288 patients. Males i.e. 3490 outnumbered females who were 702 in present study (Table 2).

Table 2: Age and sex wise distribution of studied subjects.

Age group (in years)	No of patients	%age
≤ 10	670	16
11-20	643	15.3
21-30	1146	27.3
31-40	682	16.3
41-50	484	11.5
51-60	279	6.7
≥61	288	6.9
Sex		
Males	3490	83.3
Females	702	16.7

Road traffic accidents are the most common cause of ocular trauma and accounts for 1760 cases followed by domestic accidents which contributed 1018 cases. Cracker injury comprised 90 cases only which mainly occurs on Diwali and Dussehra festivals (Table 3).

Table 3: Distribution of ocular trauma patients on the basis of mode of injury.

Mode of injury	No of patients	%age
Road traffic accidents	1760	42
Domestic accidents (fall)	1018	24.3
Violence related (assault)	128	3.1
Cracker injury	90	2.1
Others	1196	28.5
Total	4192	100

Most common reported ocular trauma was periorbital oedema/ecchymosis i.e. 1422 cases followed by laceration which were 1297. Corneal abrasions/foreign body comprised 489 cases (Table 4).

Table 4: Distribution of ocular trauma patients on the basis of type of injury.

Type of injury	No of patients	%age
Periorbital oedema/ecchymosis	1422	33.9
Lacerations	1297	30.9
Corneal abrasions/fb	489	11.7
Corneoscleral perforations	365	8.7
Others	619	14.8
Total	4192	100

Out of total no. of patients maximum number of ocular trauma patients i.e. 2532 were managed medically whereas surgical intervention was done in 1660 cases. Surgical intervention done in the form of repair of lid tear, conjunctival tear, corneo-limbal-scleral tears etc. (Table 5).

Table 5: Distribution of ocular trauma patients on the basis of requirement of surgical intervention.

Surgical intervention	No of patients	%age
Required (treated surgically)	1660	39.6
Not required (treated medically)	2532	60.4
Total	4192	100

DISCUSSION

The proverbial saying ‘Prevention is better than cure’ can’t be better applicable than for prevention of ocular injury in children. Any injury, howsoever minor, is likely to leave behind some after-effects on this delicate organ. The necessity of seeking professional medical help immediately after injury and danger of delaying treatment

should also be stressed.⁶

Out of total 4192 patients maximum number of ocular trauma patients i.e.1146 were seen in age group of 21-30 years followed by 682 in 31-40 years in the present study. Tharanivel V et al in a study showed maximum incidence of injury was between the age of 11-30 years which could be explained due to exposure to play for things in children and machinery in the employed section.¹ Ranjan A et al in a study also found maximum numbers of patients (569 = 44.3%) in 21-40 years age group.⁷

Males i.e. 3490 outnumbered females in present study. This is probably due to greater liberty and stimulus to aggressiveness given to boys in all societies. Moreover, males belong to the working class and thus exposed to the risk of occupational hazards. Another study found that males (76.01%) are affected more commonly than females (23.99%). Cornea was most commonly affected in about 47.6% followed by iris in 32.64%.⁸ Tharanivel V et al in a study showed maximum incidence of perforating injuries is more in males. In this study 88 were males and 12 were females.¹ Puzari et al and Cilino et al had a male female ratio of 4:1.^{9,10} Other studies showed a greater percentage of males compared to females.^{4,11} Marudhamuthu E et al in their study also found that males (85.33%) had more injuries when compared to females (14.67%).⁴

Road traffic accidents are the most common cause of ocular trauma and accounts for 1760 cases in the present study. Alcohol, non-safety measures and not following traffic rules are common causes of ocular injuries in RTAs.⁴ In a study reported from Libya on 1210 patients of all types of eye injuries 20.5% patients were found to have been caused by road traffic accidents.¹² Bow and arrow, pen/pencil caused perforating injuries in all the cases. Injury with cricket ball and bat, sticks and twigs, gilli danda resulted in non perforating injuries in majority of cases. Fire cracker injuries were sustained during festive season of Dussehra and Diwali. Penetrating injuries and posterior segment involvement adversely affect visual results.⁶

In the present study most common reported ocular trauma was periorbital oedema/ecchymosis followed by laceration. Menon L et al in a study found that the most common ocular injury in their study was periorbital oedema with ecchymosis (68.6%) followed by eye brow laceration (63.9%) and lid laceration (48.2%).¹³ These were also the commonest ocular injuries reported by Alam J et al and Kumarasamy et al in their studies.^{14,15} Marudhamuthu E et al also found that periorbital ecchymoses is the commonest eye injury i.e. 121 cases in their study.⁴

Surgical intervention was done in 1660 cases in the present study which comprised repair of lacerations around eye (eyebrow, lid etc) and those involving the cornea-limbal-sclera (penetration/perforation/traumatic

evisceration).

Large number of ocular trauma patients reported in this institution may be because of reason that this hospital is the largest service/referrel hospital in state with eye care facility.

Every patient with some form ocular injury must be evaluated thoroughly for head injury with special attention to pupillary reactions and visual acuity assessment.¹⁶

This study has several limitations. As this was a retrospective record based study only data entered in the register could be used. Detailed socio-demographic records were not available at the institute records, therefore not included in the study. The long term outcome of the patients were not available as during active follow-up records were not entered in hospital register. Also, the figures might under represent as some patients with minor eye injuries could have attended other service provider in the area.

CONCLUSION

From present study, we may conclude that maximum number of ocular trauma patients were seen in age group of 21-30 years with more preponderance in males. Road traffic accidents are the most common cause of ocular trauma. The fact that the lifetime prevalence of ocular trauma is higher than that of eye diseases, which can be decreased by implementing the traffic rules with strict force and imposing heavy fine and license cancellation for drunken driving.

Recommendations

Authors recommend that there is need to increase awareness in the travelling public especially for vulnerable groups and stopping drunken driving is urgently needed in order to reduce ocular morbidity due to ocular trauma. Preventive eye care programs (safety measures and following traffic rules) for the travelling population is of utmost priority. A reduction in ocular trauma will reduce permanent visual impairment, leading to a significant reduction in the burden on the health services of the region and the nation on the whole.

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