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RESEARCH ARTICLE

A STUDY ON PENETRATING INJURIES OF THE EYE IN GOVERNMENT GENERAL HOSPITAL, GUNTUR, ANDHRA PRADESH

***Dr. B. Chandra Sekhar and Dr. B. Trimurthulu**

Department of Ophthalmology, Government General Hospital, Kakinada, Andhra Pradesh, India

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ABSTRACT

Ocular trauma is a major cause of visual impairment in all parts of the world. In India the incidence varies between 5% and 10% where as it is 10% to 15% in western world. Eyeball penetration is effected by wide range of objects, Work related injuries; in rural sector penetrating injuries from vegetative materials is common. Rapid advancement in ophthalmic micro surgical techniques and instrumentation has altered management profile and outcome of penetrating injuries

Materials and Methods: The present study comprises 72 cases of penetrating eye injury patients attending Government General Hospital, Guntur, Andhra Pradesh during last three years.

Results: In the present study males (68%) are double the time more vulnerable to sustain injuries than females (32%). Non occupational injuries (70.83%) are above 2.5 times more common when compared to occupational injuries (29.17%). Commonest object involved in causing penetrating injuries is stone (22.22%) Most common ocular structure involved is cornea (66.67%), followed by Iris (33.33%);

Conclusions: In conclusion the incidence of eye trauma is fairly frequent in this region and constitutes a major health problem. Efforts to prevent ocular injury should particularly be directed towards improving safety measures at work places, Improvement in the domestic habits such as chopping and gathering wood, agricultural work would prevent farm related injuries. The importance of seeking professional medical help soon after injury and the danger in delaying treatment should be stressed.

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INTRODUCTION

Ocular trauma is a major cause of visual impairment in all parts of the world. Despite the protection offered to the eye by virtue of its placement in elastic fatty tissues of the orbit that has overhanging bony margins and reflex mechanisms like blink reflex, head turning reflex and reflex lacrimation, it is still vulnerable especially from lateral aspect. Penetrating injuries of the eye is more common in civilian practice than in warfare. Eyeball penetration is effected by wide range of objects such as sharp edged tools, house hold implements, splintered spectacles, bottles and wind screens. Work related injuries like chiseling, lathe machine and tool grinding result in penetration by metallic missiles and retained intraocular foreign bodies. In rural sector penetrating injuries from vegetative materials (e.g. thorn) is common injury which is frequently contaminated. High velocity particulate missiles cause considerable ocular damage in road traffic accidents and war related injury. Rapid advancement in ophthalmic micro surgical techniques and instrumentation has altered management profile and outcome of penetrating injuries, yet extensive keratolenticular trauma remains a major challenge. Limited repair and primary reconstruction has been superseded by much more radical measures aimed at quicker rehabilitation and active prevention of otherwise severe late complications. Every penetrating injury should alert the clinician for the retained intra ocular foreign body and of subsequent endophthalmitis.

It is estimated that 2.4 million sustain eye injury worldwide annually; Urban : Rural ratio is 3:1, male: female ratio 9:1. According to W.H.O, the current global estimates showed a total of 1.6 million going blind by ocular trauma annually and 2.3 million suffer with low vision due to trauma. In India the incidence varies between 5% and 10% where as it is 10% to 15% in western world. Lower incidence is due to less reporting due to lack of education and awareness.

Eye injuries are preventable. Mandatory use of seat belts during driving, safety glasses in sports and industry and awareness in general public regarding dangerous sports like bow and arrow and fire crackers can go a long way in reducing the incidence of eye injuries.

**Corresponding author: Dr. B. Chandra Sekhar,*
Department of Ophthalmology, Government General Hospital, Kakinada, Andhra Pradesh, India.

MATERIALS AND METHODS

The present study comprises 72 cases of penetrating eye injury patients attending Government General Hospital, Guntur, Andhra Pradesh during last three years. After eliciting history, evaluation of visual acuity, anterior segment examination is performed both under diffuse illumination and slit lamp. Fundus examination with direct and indirect ophthalmoscopy was done depending upon the patient cooperation.

All cases of minor non penetrating eye injuries like small corneal foreign bodies, abrasions of lids, conjunctival tears not requiring sutures and sub conjunctival hemorrhage were treated on outpatient basis and were not included in the present study. Cases of penetrating injuries involving two and more than two structures where surgical intervention required were prepared for surgery under general anesthesia/local anesthesia.

All cases are investigated for hemoglobin percentage, urine examination for sugar, X-ray of orbit, ultra sonogram and CT scan wherever needed. Detailed neurological examination was done to rule out any intracranial lesion and opinion of neurosurgeon and ENT surgeon was obtained for deserving cases. These cases were studied, investigated, treated and followed up for an average period of three months.

OBSERVATIONS

In the present study males (68%) are double the time more vulnerable to sustain injuries than females (32%).The incidence of penetrating injuries is higher in the age group of 21-30 Years (33.33%) and least (5.6%) incidence of injuries is seen in the age group of 0-10 Years. Above 50 years of age group the incidence was negligible. The striking observation from the study is non occupational injuries (70.83%) are above 2.5 times more common when compared to occupational injuries (29.17%).

It is observed that in 30 cases, non-metallic (41.67%) objects are involved followed by organic (36.11%) and metallic (16.67%) objects. It is observed that 24 cases (33.33%) were injured in Agriculture field, followed by in industry (26.39%), at road 13.89%, 12.5% of cases are at home, and very few at play ground (2.78%).

Commonest object involved in causing penetrating injuries is stone (22.22%). In 19.44% of cases it is stick and in 15.28% cases it is thorn and road traffic accidents constitute 8.33%. Most common ocular structure involved is cornea (66.67%), followed by Iris (33.33%); Corneo scleral injury is seen in 29.17% of cases. Posterior segment damage in 23.61% of cases and the sclera injury is seen among very few cases (5.56%). It is observed that the major brunt is borne by the cornea resulting in corneal opacity in 48 cases (66.67%), followed by lenticular complications in 14 cases (19.44%). Adherent leucoma is seen even in post operative cases (12.5%). Phthisis Bulbi is the end result in severely damaged eyes observed in 13.89% of cases.

From the above table it is observed that in no case (6/6) vision is possible. In 20 cases manageable visual acuity (6/36) is achieved. In 8 cases (11.11%) up to 6/60 were maintained. 3 cases (4.17%) were lost to follow up. In 27 cases (37.5%) vision of more than 6/60 is obtained.

Visual outcome

S. No.	Visual acuity	No. of cases	Percentage (%)
1	6/6	0	0
2	6/9	2	2.78
2	6/12	2	2.78
3	6/18	2	2.78
4	6/24	6	8.33
5	6/36	8	11.11
6	6/60	7	9.72
7	6/60 – CF 3 mt.	8	11.11
8	C.F. – H.M.+	19	26.39
9	H.M. - P.L.	6	8.33
10	Unknown / cannot be assessed.	12	16.67

DISCUSSION

Penetrating ocular injuries are one of the leading causes of monocular blindness and visual impairment. Majority of the patients in our study i.e. 40 cases (55.56%) belonged to the age groups of 21 - 40 years, are the working age group. Even in the age group of 0 - 10 years there are 4 cases i.e. (5.56%). Ocular trauma is leading cause of monocular Blindness in children worldwide (W.H.O. 1997). Children suffer a higher percentage of open globe injuries than adults, comprising 19%-58.3% of all cases ocular trauma (Niiranen and Raviasi, 1981). Males are more vulnerable to injuries (68%) than females (32%). This is probably due to nature and type of occupation in which they are involved and more risk of exposure to environmental and outdoor hazards; Striking observation of the study is that the non-occupational injuries (70.83%) are about 2.5 times more common than occupational injuries (29.87%). Injuries at the work place had a seasonal peak during summer months as noted by Dr. Sanjoy Choudary *et al*. (1999) in ocular work injury study in Bokaro Steel plant, which coincides with our study (29.17%). Commonest object causing penetrating injury is stone (22.22%) followed by stick (19.44%) and thorn (15.28%).

The chief structure involved was cornea in 48 cases (66.67%) with a wide spectrum of involvement including pinprick to major corneal tears associated with iris prolapse, foreign body incarceration. This is similar (80%) to proceedings of AIOS – 1999, Dr Sanjoy Chaudury *et al*. (1999), proceedings of AIOS Lt Col. Parihar *et al*. (1999). There are 24 cases (33.33%) of injuries to iris and ciliary body resulting in iris prolapse, iridodialysis, ciliary body tear manifested as hyphema and angle recession glaucoma. In about 14 cases (19.44%) lens was involved. These are supported by a series reported by proceedings of AIOS 1999 by Lt Col Parihar *et al*. (1999) and Chuang and Lai *et al*. (2005). Corneal opacity is the commonest of sequelae observed in 48 cases (66.67%) with associated adherent glaucoma.

Visual acuity in the majority of the cases is 6/60 to Hand moments i.e. 40 cases (55.56%) and this was due to sequelae like corneal opacities, pigment dispersion, lenticular opacities. The results were identical with the observations made by Dr. Sanjoy Choudary *et al*. (1999) Karandikar *et al*. (2013) and Dr. Sharma *et al*. (2005).

Conclusion

The incidence of penetrating ocular injuries is high in the age group of 21-40 years; Males are more vulnerable to injuries; Non occupational injuries are 2.3 times more common; Common ocular structure involved is cornea, followed by iris and lens. The objects causing injury are organic in nature in most of the cases and the commonest object is stone. Corneal opacity is the leading complication observed followed by lens.

In conclusion the incidence of eye trauma is fairly frequent in this region and constitutes a major health problem. Efforts to prevent ocular injury should particularly be directed towards improving safety measures at work places, Improvement in the domestic habits such as chopping and gathering wood, agricultural work would prevent farm related injuries. The importance of seeking professional medical help soon after injury and the danger in delaying treatment should be stressed.

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