EVALUATION OF OCULAR INJURIES IN POLYTRAUMA

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ABSTRACT

BACKGROUND

The objective of this study is to evaluate the clinical presentation of ocular injuries in polytrauma cases who attended to OPD of Govt. Regional Eye Hospital, Andhra Medical College, Visakhapatnam.

MATERIALS AND METHODS

It is a hospital based prospective interventional study from Sep. 2015 to Aug. 2016, in patients who attended emergency or Ophthalmology outpatients department at Regional Eye Hospital. Approval from local ethics committee was obtained to conduct this study. In the present study, total no. of cases of ocular trauma reported to Regional Eye Hospital in this study period were 435 cases, out of which 136 cases (31.26%) were due to polytrauma & 299 cases (68.7%) of ocular trauma were due to other causes. The patient's initial complaints, mode of injury, type of injury as well as the interval between the time of injury and time of presentation, were recorded. The examination findings of the injured eye, the visual acuity, diagnostic tests, investigations and final diagnosis were obtained and recorded according to the standardised classification of ocular trauma.^(1,2)

RESULTS

A total of 145 eyes with ocular injuries in polytrauma cases were analysed, commonest age group involved in accidents was in the age group of 21-30 years. Males were predominantly affected. Most of the patients had sustained subconjunctival haemorrhages, ecchymoses and ocular adnexal injuries rather than penetrating globe injuries involving posterior segment of the eye. The eye ball is protected by bony socket and periorbital structures, which are the first structures to take the impact of the injury during road traffic accidents, so they are more frequently injured rather than posterior segment.

CONCLUSION

In conclusion, in the current study initial visual acuity after trauma, mode of the injury, presence of RAPD, posterior extent of the wound, presence of vitreous loss adversely affect the final visual outcome. Two wheeler accident is common and an important cause for loss of vision following RTA. In this study out of 145 eyes, most common type of clinical presentation seen was SCH in 73 eyes (50-34%) followed by ecchymosis in 47 eyes (32.41%), traumatic cataract in 12 eyes (8.27%). Cranial nerve involvement was observed in 12 eyes in which traumatic optic neuropathy was seen in 9 eyes (6.2%), followed by multiple cranial nerve palsy in 2 eyes (16.7%) and oculomotor nerve palsy in 1 eye (3.3%). Orbital fractures observed in 35 eyes (24.13%). Loss of vision due to optic nerve injury had poor visual prognosis. Immediate medical attention and appropriate surgical or nonsurgical conservative medical management will aid in quick visual rehabilitation of the patient especially in open globe injuries.

KEYWORDS

Ocular Injuries, Polytrauma, Comparative Study.

HOW TO CITE THIS ARTICLE: Bharathi NR, Kumar BU, Rao VR, et al. Evaluation of ocular injuries in polytrauma. J. Evolution Med. Dent. Sci. 2017;6(22):1812-1816, DOI: 10.14260/Jemds/2017/398

BACKGROUND

Trauma to eye can cause severe and permanent visual impairment owing to its delicate and complex architecture.⁽³⁾ It is one of the common causes of ophthalmic morbidity and mono-ocular blindness.⁽⁴⁾ Worldwide there

are approximately 6 million blind people because of eye injuries. 2.3 million are bilaterally visually impaired & 19 million are with unilateral visual loss. These facts make ocular trauma the most common cause of unilateral blindness.⁽⁵⁾ The most common causes documented for total ocular trauma were motor vehicle accidents.⁽⁶⁾ Thus, there is a great need for more active interest in the prevention and immediate treatment of ocular injuries caused by RTA.

Ocular trauma may involve the eye lids, lacrimal canaliculi, orbital wall, periorbital structures, conjunctiva, cornea, sclera, extraocular muscles. In some instances there may be prolapse of uveal tissue, vitreous haemorrhage, choroidal haemorrhage, globe rupture.⁽⁷⁾

Financial or Other, Competing Interest: None.

Submission 21-02-2017, Peer Review 07-03-2017,

Acceptance 10-03-2017, Published 16-03-2017.

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DOI: 10.14260/jemds/2017/398

Figure 1. Ecchymosis of Lids

Figure 2. Lateral Orbital Wall Fracture with Intact Globe and Vision

Objective

To evaluate the clinical presentation of ocular injuries in Polytrauma cases who attended to OPD of Govt. Regional Eye Hospital, Andhra Medical College, Visakhapatnam for a duration of one year.

MATERIALS AND METHODS

Exclusion Criteria

1. Occupational Injuries.
2. Domestic Injuries.

Inclusion Criteria

Patients who were conscious and unconscious due to head injuries, sports injuries, RTA & assaults.

Methodology

It is a Hospital Based Prospective Interventional Study with a study period of 1 year duration, in polytrauma cases who attended to emergency or ophthalmology outpatient department at Regional Eye Hospital, Visakhapatnam with a sample size of 150 patients. Approval from local ethics committee was obtained to conduct this study.

All patients were examined according to the standardised protocol. Data was recorded in the Proforma. Demographic data and details of modes of injury were obtained. The patients' initial complaints, mode of injury, type of injury as well as the interval between the time of injury and time of presentation, were also recorded. The examination findings of

the injured eye, the visual acuity, diagnostic tests, investigations and final diagnosis were obtained and recorded according to the standardised classification of ocular trauma.⁽⁸⁾

Ophthalmological Examination Included

- Recording of Visual acuity.
- Slit-lamp examination.
- Indirect Ophthalmoscopy.
- Gonioscopy.
- B Scan Ultrasonography.
- HVF.
- OCT wherever needed.

Figure 3. Slit-lamp Examination

Figure 4. OCT Picture of Traumatic Optic Neuropathy

Routine investigations like Haematological investigations, RBC, Urine (Albumin and sugar), X-Ray of Orbits (AP & Lateral

View), CT scan (Brain & Orbit) & MRI of Brain wherever appropriate.

RESULTS

In the present study, most common type of injury was closed Globe injury seen in 62.75% followed by extraocular injury seen in 32.43% & Open Globe Injury in 4.82%.

Study	Mean age of Presentation
Present study	31.2
Abha et al	30.57
Kuhn et al	29
El Shtewi et al	32.5

Table 1. Mean Age

Study	Males	Females
Present study	91.9%	8.1%
Muralidhar et al	95%	5%
Kumaraswamy et al	90.3%	9.7%
EL Shtewi et al	75%	25%

Table 2. Gender

Study	Right Eye	Left Eye	Both Eyes
Present study	62.5%	30.9%	6.6%
Panagiotidis et al	46.3%	53.7%	-
Alam et al	52.1%	29.42%	18.48%
Ayşe Oner et al	51%	44%	5%

Table 3. Laterality

Study	Extra Ocular Injury	Closed globe Injury	Open Globe Injury
Present study	32.43%	62.75%	4.82%
Abha et al	32.79%	59.02%	8.19%
Kumaraswamy et al	-	95.13%	4.86%
Vasu et al	-	61.90%	38.10%
Smith et al	-	68.58%	31.41%

Table 4. Type of Injury

Study	Orbital Fractures (%)
Present study	24.13%
Kumaraswamy et al	22.22%
Cruz et al	54%
El Shtewi et al	1.1%

Table 5. Orbital Fractures

Visual outcome	Present Study (2016) 145 eyes	Abha et al (2015) 121 eyes	El Shtewi et al (1999)	Panagiotidis et al (2004)
Good (6/18)	113 (84.96%)	109 (89.34%)	169 (61.22%)	52.5%
Fair (6/18-6/60)	21 (14.48%)	3 (2.46%)	54 (19.59%)	13.1%
Poor (<6/60)	11 (8.27%)	10 (8.20%)	53 (19.22%)	29.5%

Table 6. Visual Outcome

In the present study, total no. of cases of ocular trauma reported to Regional Eye Hospital in this study period were 435 cases, out of which 136 cases (31.26%) were due to

polytrauma & 299 cases (68.7%) of ocular trauma were due to other causes.

In the present study, most common type of injury was closed Globe injury seen in 62.75% followed by extraocular injury seen in 32.43% & Open Globe Injury in 4.82%.

Distribution of Cases According to Incidence

Figure 5. Total Number of Cases

Figure 6. Distribution of Involved Eyes According to Type of Injury

Figure 7. Closed Globe Injury

Figure 8. Open Globe Injury

Figure 11. Late Post-operative

Figure 9. Lid Laceration with Globe Perforation

Figure 10. Early Post-operative

DISCUSSION

Ocular trauma is one of the main causes of blindness and ocular morbidity. It has been shown to be one of the major causes of mono-ocular vision loss, low vision and blindness worldwide with significant socio-economic consequences.

In the present study, it was found that the commonest age group involved in accidents was in the age group of 21-30 years (39.7%) and the mean age of ocular trauma was 31.2. Similar findings were reported by Abha et al where the mean age was 30.57, with more cases seen in the age group of 21-30 years (35%) & El Shtewi et al⁽⁷⁾ reported the mean age 32.5 & Kuhn et al in their study of the United States Eye Injury Registry over a seven-year period (1982-1989) found that 61% of cases between 16-35 years and had a mean age of 29 years. This may be attributed to fact that this is age group which spends most of the time outside.

In the present study males constitutes about 91.9% (125 cases), females constitutes about 8.1% (11 cases) with M: F ratio of 13.1:1. These findings are consistent with studies done by Muralidhar et al⁽⁹⁾ & Kumaraswamy et al⁽¹⁰⁾ whereas study done by El Shtewi et al⁽⁷⁾ et al constitutes males about 75% (186 cases) and females constitute about 25% (62 cases) as El Shtewi et al is a US based study and males and females both were into driving. The higher incidence of male subjects in road traffic accidents is probably because our population has fewer female drivers/riders and males are more engaged in outdoor activities and are more prone for ocular injuries.

The present study reported involvement of Right Eye in 62.5%, Left Eye in 30.9% & Both Eyes in 6.6%. Panagiotidis et al at study showed Right Eye involvement in 46.3% and Left Eye involvement in 53.7%. In the study done by Alam et al,⁽¹¹⁾ involvement RE was 52.1%, LE 29.42% and both in 18.48%. A study done by Ayse Oner et al showed RE involvement in 51%, LE involvement in 44% & BE in 5%.

In the present study, subconjunctival haemorrhage was seen in 73 eyes (50.34%) of patients, in comparison to the study by El Shtewi et al⁽⁷⁾ in which it was seen in 42.4%. In our study, ecchymosis was seen in 47 eyes (32.41 %) while in the study by El Shtewi et al it was seen in 37.7%. 9.65% of patients in our study had lid laceration, while in the study by El Shtewi et al it was seen in 17.8%. In our study, corneal laceration was seen in 15 eyes (10.34%). Similar findings were seen in the studies

done by Abha et al & Kumar Swamy et al,⁽¹⁰⁾ while in the study by El Shtewi et al, it occurred in 30.4% as it has got more number of open globe injuries. In this study, hyphaema was seen in 2.06% patients whereas Alam et al reported hyphaema 3.36%. Traumatic cataract occurred in 8.27%, Vitreous haemorrhage was seen in 1.37% of our patients, RD was seen in 0.68%. In a study done by Sumeet Arora et al, injury to lens was seen in 20% and VH/RD seen in 9.33%.

The optic nerve was the most frequently injured of the cranial nerves associated with the eye. This is important, as optic nerve injuries carry a poor visual prognosis; one third of patients in the International Optic Nerve Trauma Study had a final visual acuity of hand movements or worse in the affected eye. Optic nerve injuries were associated with a facial fracture in two thirds of cases. A marked association between orbital fracture and optic nerve injuries in patients with major trauma has been reported previously.⁽¹²⁾ The incidence of optic nerve injury in patients with a facial fracture in this study was 6.2%, whereas Guly et al⁽¹⁾ showed incidence of 2.1% which is similar to that reported by Al-Qurainy et al⁽²⁾ in their series of patients with mid-facial fractures in the present study, Traumatic Optic Neuropathy was reported in 9 eyes.^(6.2%) Arora et al⁽¹³⁾ reported 18% of TON & Alam et al⁽¹¹⁾ reported 18.6% TON. Orbital fractures reported in the present study was seen in 35 eyes (24.13%). Similar finding was reported by Kumaraswamy et al (22.22%).⁽⁹⁾ In a study done by Cruz et al,⁽¹⁴⁾ orbital fractures accounted up to 54% while these accounted to 1.1% in a study done by El Shtewi et al.⁽⁷⁾

Most of the patients had sustained subconjunctival haemorrhages, ecchymoses and ocular adnexal injuries rather than penetrating globe injuries involving posterior segment of the eye. The eye ball is protected by bony socket and periorbital structures, which are the first structures to take the impact of the injury during road traffic accidents, so they are more frequently injured rather than posterior segment; this might be the probable explanation for the type and distribution of injuries seen in present study.

CONCLUSION

- In the current study, initial visual acuity after trauma, mode of the injury, presence of RAPD, posterior extent of the wound, presence of vitreous loss adversely affect the final visual outcome.
- Two wheeler accident is common and an important cause for loss of vision following RTA.
- In this study, out of 145 eyes most common type of clinical presentation seen was SCH in 73 eyes (50-34%) followed by ecchymosis in 47 eyes (32.41%), traumatic cataract in 12 eyes (8.27%). Cranial nerve involvement was observed in 12 eyes in which traumatic optic neuropathy was seen in 9 eyes (6.2%), followed by multiple cranial nerve palsy in 2

eyes (16.7%) & oculomotor nerve palsy in 1 eye (3.3%). Orbital fractures observed in 35 eyes (24.13%).

- Loss of vision due to optic nerve injury had poor visual prognosis.
- Immediate medical attention and appropriate surgical or nonsurgical conservative medical management will aid in quick visual rehabilitation of the patient especially in open globe injuries.

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