Original Article

Clinical and Demographic Characteristics of Intraocular Foreign Body Injury in a Referral Center: 3 Years Experience

Ibraheem Waheed Ademola, Nazmum Naha, Ibraheem Anifat Boladale

Pak J Ophthalmol 2016, Vol. 32 No. 4

See end of article for authors affiliations

Correspondence to:
Ibraheem Waheed Ademola
Retina Fellow (2016)
Ispahani eye Institute,
Dhaka, Bangladesh
Consultant
Department of Ophthalmology
LAUTECH Teaching Hospital
Ogbomoso Oyo State Nigeria
Email:
hanny4demmy@gmail.com

Purpose: To describe clinical and demographic features of patients with intraocular foreign body (IOFB) injuries in a referral center.

Study Design: Retrospective case review

Place and Duration of Study: From January, 2013 to December, 2015 at Department of Vitreo-retinal Surgery, Ispahani Islamia Eye Institute and Hospital, Dhaka, Bangladesh

Materials and Methods: We retrospectively reviewed 64 case files of patients who were treated for IOFB injuries between January, 2013 and December, 2015. Data on age, sex, ocular laterality, nature of foreign body, entry point/ visual acuity, injury to surgery time, presence of endophthalmitis and siderosis bulbi were extracted and evaluated.

Results: Case files of 64 patients consisting 64 eyes were analyzed. The age of the patients ranged between 2-55 years. Males were mostly affected accounting for 95.3% of all cases. Left eye was slightly more affected (33, 51.6% versus 31, 48.4). The commonest entry site was cornea accounting for (60.9%). Majority (81.1%) of the cases had entry visual acuities which were equal or worse than 6/60. Intraocular foreign bodies were identified to be metallic (Iron) in 63 (98.4%) of the cases.

Conclusion: Intraocular foreign body injury is common among male working age group. There is need to formulate appropriate policy to reduce this cause of avoidable blindness.

Key Words: Intraocular, Foreign body, Entry site, Endophthalmitis, Evisceration.

Ocular trauma is a major public health issue[1]. Most commonly, it occurs at work, at home, during sport activities, motor vehicle crashes or interpersonal trauma. Reported risk factors are male gender, workplace, road accidents, alcoholism and lower socioeconomic class[2,3]. It is a significant but preventable cause of blindness worldwide[4].

Ocular trauma has an impact on the healthcare system and also the wider economy due to time off work. Negrel and Thylefors reported that worldwide 1.6 million people are blind secondary to ocular injuries, 2.3 million have low visual acuity bilaterally and another 19 million people are with unilateral blindness[5].

This study was conceived and conducted with a view of providing useful information and insight into epidemiology of ocular trauma in our community. It is anticipated that the information that will be provided by this study will enhance better understanding of the burden and the risk factors associated intraocular foreign body injury in our community. And with improved understanding, the policy maker will be much more equipped to design targeted campaigns and develop effective plans for disseminating eye

injury prevention material to the public in order to reduce the burden of avoidable blindness from this cause.

MATERIAL AND METHODS

We retrospectively reviewed the medical charts of 64 consecutive patients who presented with posterior segment intraocular foreign body over 3 years at our institution.

The following data were collected from the medical records: age and sex, time elapsed between initial injury and surgery, pre- and post-operative best corrected visual acuity (BCVA), entry wound, details of the surgical procedures, nature of the foreign body, presence of endophthalmitis and retina detachment.

Data was entered using Statistical Product and Service Solutions (SPSS) software version 15, (IBM Corp., Armonk, NY, USA). Categorical data are presented in mean, median and range while non-categorical data were represented in proportion and percentages and figures. A *p* value less than 0.05 was considered statistically significant.

RESULTS

Case files of 64 patients consisting 64 eyes were examined in the study. Their age ranged between 2 -55 years with a mean and median age of 25.1 ± 9.24 and 24.5 years respectively. Males were more affected than the female patients (95.3% versus 4.7%). Further details of the demographic characteristics of the cases were as shown in table 1.

Table 1: Demographic characteristics

Factors	**Years/Frequency**
Age	YEARS
Minimum	2
Maximum	55
Median	24.5
Mode	35
	Number (%)
Gender	
Male	61 (95.3)
Female	3 (4.7)
Occupation	
Student	
Artisans	64 (100.0)
Affected Eye	
Right	31 (48.4)
Left	33 (51.6)

Right and left eyes were involved in 33, 51.6% and 31, 48.4% respectively. Entry visual acuity was worse or equal to 6/60 in 81.1% of the cases. Other details are as shown in table 2.

Table 2: Visual acuities of the patients

	Number of Subjects (%)	
Visual Acuity	**At Presentation**	**After First Intervention**
6/6 -6/12	3	5
6/18-6/36	16	11
≤ 6/60	81	84

As shown in table 2, over 80% of cases remained with uncorrected visual ≤ 6/60 after first intervention.

The entrance wound sites in descending order were cornea (39, 60.9%), undetermined (13, 20.3%), Sclera (11, 17.2%) and sclera cornea (1, 1.6%).

Intraocular foreign bodies were identified to be metallic (Iron) in 63 (98.4%) cases while plastic object was found in one eye.

Of all the cases reviewed, 1 eye (1.7%) was eviscerated due to extensive injury and 1 had initial endophthalmitis which was treated with intra-vitreal antibiotics along with intraocular foreign body removal. Eighteen (18, 28%) of the eyes were aphakic as the time of review.

DISCUSSION

Studies on epidemiology of ocular trauma including intraocular foreign body injury are essential ingredient for attainment of vision 2020; elimination of avoidable

blindness. This is because such studies provide data that help stake holder / policy makers to either adjust ongoing interventional policies or design appropriate new program.

Consistently, most previous studies showed that ocular trauma is most frequent in young men[6, 7]. For example Napora et al. evaluated the intraocular and intra-orbital foreign bodies characteristics in 62 patients with IOFB injury. The authors found out that majority of the patients were male with a mean age of 38.1 years[8]. In another large retrospective cohort study carried out at Moorfields Eye Hospital by Wickham et al., a mean age of 34.6+/-12.4 years was reported[9]. Also, Maneschg et al. examined the prognostic factors and visual outcome for open globe injuries with intraocular foreign bodies. They reported all their patients to be male with mean age of 28 ± 12.3 years[10]. In concordance with these previous authors, majority of the patients in our study were also young males with mean age of 35 years. Reasons have been advanced to justify this observation. Koo et al. posited that this occurrence might be due to higher occupational exposure, higher involvement in dangerous sports and hobbies, alcohol use and risk taking behaviour in young men[11]. We attribute this finding to the fact that young men are usually more active and adventurous. Additionally, men are the major breadwinners in most family settings in the studied population and as such they are more prone to occupational eye injury.

In intraocular foreign body injury (IOFBI), the entry wound is of significance. This is because to a certain extent the visual outcome is dependent on it. Demircan et al. examined 70 cases of ocular injuries with intraocular foreign bodies to determine the results of surgical management. In their report, cornea was the site of penetration in over 3/5th of the studied population accounting for 82.9% while sclera was involved in only few cases[12]. In our study, the most frequent entrance wound site was cornea (60.9%). This value is lower when compared with some previous report[13, 14] but similar to others[8].

In this retrospective study, final (last visit) visual acuity was worse or equal to 6/60 in over 80% of the cases. We found this to be similar to that reported by Naporal et al.[8], but in contradistinction to the report of Ehlers et al[6]. We ascribe the poor entry visual acuity in majority of the cases to long injury to surgery time due to the late presentation. Our position was well corroborated by several studies wherein delayed removal of IOFB was found to be associated with poor visual and anatomical outcomes including the development of infectious endophthalmitis and retinal detachment[15-17]. Contrarily, there are authors who posited that delayed IOFB removal does not have negative impact on the final visual outcomes of intraocular foreign body injury[18-20]. Alternatively, our finding could also be a symbol that the initial injuries in most of the cases were very severe as evidenced by the poor entry visual acuities. Poor visual acuity at presentation has been shown to be a negative prognostic factor in the visual outcome of IOFB injury[3, 21]. However, it is noteworthy that certain significant numbers of the cases are aphakic and have not presented for further visual rehabilitation.

Evidences from many previous studies are unanimous in indicting ferromagnetic object as the most frequent object involved in intraocular foreign body injuries. Values such as 91%, 85.3%, and 85.5% were previously reported by Woodcock et al.[22], Feghhi et al[10] and Napora et al[8] respectively. Similarly, the results of our study showed over 4/5th (98.4%) of the objects to be ferromagnetic in nature. We believe this finding is related to the type of occupation of the studied population who are mostly artisan workers involved in iron/steel rod modifications. According to Napora et al. tool-related activities, particularly hammering, were more likely to cause IOFB injuries[8].

Among others, the injury to surgical intervention time (IST) has been shown to be paramount in the clinical outcome of intraocular foreign body injury. And the earlier the foreign is removed, the better[23]. However, in many developing nations including the index study site, factors such as ignorance, poor accessibility to health care facility, high hospital cost and poverty to mention but a few often militate against appropriate/short IST. In this study, the mean IST was 66.5 ± 1.14 days (range, 1 – 653 days). This value is dissimilar to that reported by many earlier investigators such as Erakgun and Egrilmez and Falavarjani et al who reported a mean IST of 5.3 days (range, 1 day to 240 days) and 24 ± 43.1 days respectively[23,24].

Infectious endophthalmitis is one of the most dreadful complications of intraocular foreign body injury. An incidence of 0 – 13.5% has been previously reported[25]. In this study we had 3 (4.7%) cases of endophthalmitis associated with the injury. While our value is lower than that reported by some previous investigators[7,12], it is higher than some others[24]. We opine that the development of endophthalmitis in the 4 cases may be due to long injury to surgical

intervention time. It could also be due to unhealthy eye care practices though this was not examined in this study.

Limitations of the study include its retrospective nature and the small sample size Despite these limitations, our results revealed some useful information related to intraocular foreign body injury in our country.

CONCLUSION

There is need for increase awareness about wearing safety glasses at work to reduce the burden of this avoidable blindness.

ACKNOWLEDGEMENT

Thanks to the entire staff of the Ispahani Islamia Eye institute and Hospital for making this work a success.

Author's Affiliation

Ibraheem Waheed Ademola
Retina Fellow (2016)
Ispahani eye Institute,
Dhaka, Bangladesh.
Consultant
Department of Ophthalmology
LAUTECH Teaching Hospital
Ogbomoso Oyo State Nigeria.

Nazmum Naha
Consultant
Department of Vitreoretina Surgery
Ispahani Islamia Eye Institute and Hospital
Dhaka, Bangladesh

Ibraheem Anifat Boladale
Consultant
Jericho Specialist Clinic Ibadan Oyo State
Nigeria

Role of Authors

Dr. Ibraheem Waheed Ademola
Conception, Literature research, Data Collection, Analysis, Manuscript Write-up

Dr. Nazmum Naha
Conception, Data Collection, Supervision of manuscript write-up

Dr. Ibraheem Anifat Boladale
Analysis, Manuscript write-up supervision

REFERENCES

1. **Pandita A, Merriman M.** Ocular trauma epidemiology: 10-year retrospective study. N Z Med J. 2012; 125: 61-9.
2. **Thylefors B.** Epidemiological patterns of ocular trauma. Aust NZ J Ophthalmol. 1992; 20: 95-8.
3. **Cillino S, Casuccio A, et al.** A five-year retrospective study of the epidemiological characteristics and visual outcomes of patients hospitalized for ocular trauma in Mediterranean area. BMC Ophthalmol. 2008, 8: 6.
4. **Pandita A, Merriman M.** Ocular trauma epidemiology: 10-year retrospective study. N Z Med J. 2012; 125: 61-9.
5. **Negral AD, Thylefors B.** The global impact of eye injuries. Ophthalmic Epidemiology 1998; 5: 43-69.
6. **Kunimoto DY, Ittoop S, Maguire JI, Ho AC, Regillo CD.** Metallic intraocular foreign bodies: characteristics, interventions, and prognostic factors for visual outcome and globe survival. Am J Ophthalmol. 2008; 146: 427-33.
7. **De Souza S, Howcroft MJ.** Management of posterior segment intraocular foreignbodies: 14 years' experience. Can J Ophthalmol. 1999; 34: 23-9.
8. **Napora KJ, Obuchowska I, Sidorowicz A, Mariak Z.** Intraocular and intraorbital foreign bodies characteristics in patients with penetrating ocular injury. Klin Oczna. 2009; 111: 307-12.
9. **Wickham L, Xing W, Bunce C, Sullivan P.** Outcomes of surgery for posterior segment intraocular foreign bodies-a retrospective review of 17 years of clinical experience. Graefes Arch Clin Exp Ophthalmol. 2006; 244: 1620-6.
10. **Maneschg OA, Resch M, Papp A, Németh J.** Prognostic factors and visual outcome for open globe injuries with intraocular foreign bodies. Klin Monbl Augenheilkd. 2011; 228: 801-7.
11. **Koo L, Kapadia MK, et al.** Gender differences in etiology and outcome of open globe injuries. J Trauma. 2005; 59: 175-8.
12. **Demircan N, Soylu M, Yagmur M, Akkaya H, Ozcan AA, Varinli I.** Pars plana vitrectomy in ocular injury with intraocular foreign body. J Trauma. 2005; 59: 1216-8.
13. **Baba A, Zbiba W, Korbi M, Mrabet A.** [Epidemiology of open globe injuries in the Tunisian region of Cap Bon: Retrospective study of 100 cases]. J Fr Ophtalmol. 2015; 38: 403-8.
14. **Jonas JB, Knorr HL, Budde WM.** Prognostic factors in ocular injuries caused by intraocular or retrobulbar foreign bodies. Ophthalmology. 2000; 107: 823-8.
15. **Thompson JT, Parver LM, Enger CL, Mieler WF, Liggett PE.** Infectious endophthalmitis after penetrating injuries with retained intraocular foreign bodies. National Eye Trauma System. Ophthalmology. 1993; 100: 1468-74.
16. **Chaudhry IA, Shamsi FA, Al-Harthi E, Al-Theeb A, Elzaridi E, Riley FC.** Incidence and visual outcome of endophthalmitis associated with intraocular foreign bodies. Graefe's Arch Clin Exp Ophthalmol. 2008; 246: 181-6.

17. **Colyer MH, Weber ED, Weichel ED, Dick JS, Bower KS, Ward TP, et al.** Delayed intraocular foreign body removal without endophthalmitis during operations Iraqi freedom and enduring freedom. Ophthalmology, 2007; 114: 1439–47.
18. **Bai H, Yao L, Meng X, Wang YX, Wang DB.** Visual outcome following intraocular foreign bodies: A retrospective review of 5-year clinical experience. Eur J Ophthalmol. 2011; 21: 98-103.
19. **Ferrari TM, Cardascia N, Di Gesu I, Catella N, Recchimurzo N, Boscia F.** Early versus late removal of foreign bodies. Retina. 2001; 21: 92-3.
20. **Imrie FR, Cox A, Foot B, Macewen CJ.** Surveillance of intraocular foreign bodies in the UK. Eye (Lond). 2008; 22: 1141-7.
21. **Woodcock MG, Scott RA, Huntbach J, Kirkby GR.** Mass and shape as factors in intraocular foreign body injuries. Ophthalmology. 2006; 113: 2262-9.
22. **Erakgun T, Egrilmez S.** Prognostic factors in vitrectomy for posterior segment intraocular foreign bodies. J Trauma. 2008; 64: 1034-7.
23. **Falavarjani KG, Hashemi M, Modarres M, Parvaresh MM, Naseripour M, Nazari H, Fazel AJ.** Vitrectomy for posterior segment intraocular foreign bodies, visual and anatomical outcomes. Middle East Afr J Ophthalmol. 2013; 20: 244-7.
24. **Mester V, Kuhn F.** Intraocular foreign bodies. Ophthalmol Clin North Am. 2002; 15: 235-42.