Clinical Evaluation of Ocular Foreign Bodies

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Abstract

Background : Ocular foreign body can affect at any age as well as in both genders. Foreign body introduction in eye leads to various disturbances which can create significant health related problem. The study of the ocular foreign body gives unparalleled opportunities in reducing morbidity as well as for realizing significant savings for both financial as well as human terms.

Material and Method: This prospective study was conducted in ophthalmology department at of Krishna hospital, Karad, Hundred patients with ocular foreign bodies were included in study with consideration of inclusion and exclusion criteria.

Results : A study of 100 subjects showed that incidence of extraocular foreign bodies is very common compared to intraocular foreign bodies. Amongst that, corneal foreign bodies found to be have highest incidence. Commonest foreign body observed -iron particle (43%) and thorn/vegetative material (38%). Average age-40 years. Males are having higher incidence than females. Average interval between incident and intervention – 2.6 days (day 0 to day 10). Amongst the affected population, farmers and welders are maximum in number.

Conclusion : Though incidence of intraocular foreign body is very less, it has bad prognosis in relation with vision as well as progresses to endophthalmitis. Early visit to ophthalmologist showed better prognosis and thus visual outcome specially in cases of vegetative foreign body in which delayed treatment lead to further complications.

Key words : *ocular trauma, ocular foreign bodies, incidence, visual outcome.*

Introduction

An ocular foreign body can be any abnormal object or substance or material that doesn't belong to the eye.[1] The highest incidence of ocular foreign body found in the industrial towns. Ocular foreign body can affect at any age as well as in both genders. Effects caused to the eye by foreign bodies are either mechanical effects or by introduction of secondary infection or by reactions due to specific materials.[1] Foreign body introduction in eye leads to various disturbances which can create significant health related problem. The study of the ocular foreign body gives unparalleled opportunities in reducing morbidity as well as for realizing significant savings for both financial as well as human terms.[2-4]

Superficial corneal foreign bodies can reduce the quality of vision either by causing scars / opacities in the visual axis or by causing secondary infections which may range from keratitis to endophthalmitis.[5] Though Classification of Ocular Trauma states that injuries due to superficial foreign bodies are graded as mild one, based on severity of trauma, these foreign bodies tend to be very much uncomfortable leading to redness, watering, gritty sensation with pain in eye which increases every time with eye opening or closing.[6] These injuries are responsible for various health care issues and thus they create an economic burden. Prevention of these FB accidents and potential serious consequences

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caused by them is certainly possible. The investment in prevention of these problems can be easily justifiable. Use of appropriate protective goggles can prevent these accidents in large number. In addition to this use of glasses, personal protective measures can be added. It is very important to improve standards of workplace as well as to provide proper training for the supervisors

Inclusion Criteria:

- All cases of ocular foreign bodies attending OPHTHALMOLOGY OPD

Exclusion Criteria

- H/o previous ocular foreign body with or without surgical intervention
- Blast injuries
- Age less than 5 years

Materials and Method

- The study was conducted in department of ophthalmology at of Krishna institute of medical sciences, Karad between October 2017 to May 2019 after obtaining clearance from ethical committee. Hundred patients with ocular foreign bodies were included in study with consideration of inclusion and exclusion criteria.
- Informed consent was taken from the patients
- A detailed history regarding nature of injury, nature of foreign body, time lapse between incidence and presentation, history of any prior intervention and previous ocular disease etc was taken
- Visual acuity was checked by using Snellen's chart, with pinhole improvement
- Thorough examination of adnexa and anterior segment was done using slit-lamp biomicroscopic and fluorescein staining was done wherever necessary
- Posterior segment examination by Indirect and Direct ophthalmoscopy after dilatation with 0.8% tropicamide and 5% phenylephrine eye drops (if not contraindicated)
- Radiological investigations were done in selective cases
- Necessary treatment was given.
- In our study most of the patients were having superficial surface foreign bodies (cornea or conjunctiva) which were managed on OPD basis only.
- These foreign bodies removed by using forceps, foreign body spud , 26 no. needle on slit lamp.
- In some cases of large epithelial defect in above mentioned cases, eye pad was given with plenty of eye ointment.
- All cases of OPD basis were called to OPD on immediate next day for follow up.
- Rest cases were admitted to ward and managed either by medical or surgical means depending on their need.
- Visual acuity on first follow up in OPD patients and at time of discharge in IPD patients were noted.
- It is taken as final visual acuity for statistics purpose.
- In cases of posterior segment complications, visual acuity also repeated after 1 month.

Results

Age and sex

It was observed that majority of patients were in age group 31-40 (44%) followed by 41-50 years (18%) and 21-30(17%) respectively. The mean age of the patients was 40 years. Majority of patients were male (80%) and females were 20%

Laterality of eye

It was observed that in 60% of cases left eye is involved while right eye involvement seen in 40% of subjects

Occupation

It was observed that commonest population affected by ocular foreign body belongs to welder (33%) followed farmers (27%) by their occupation.

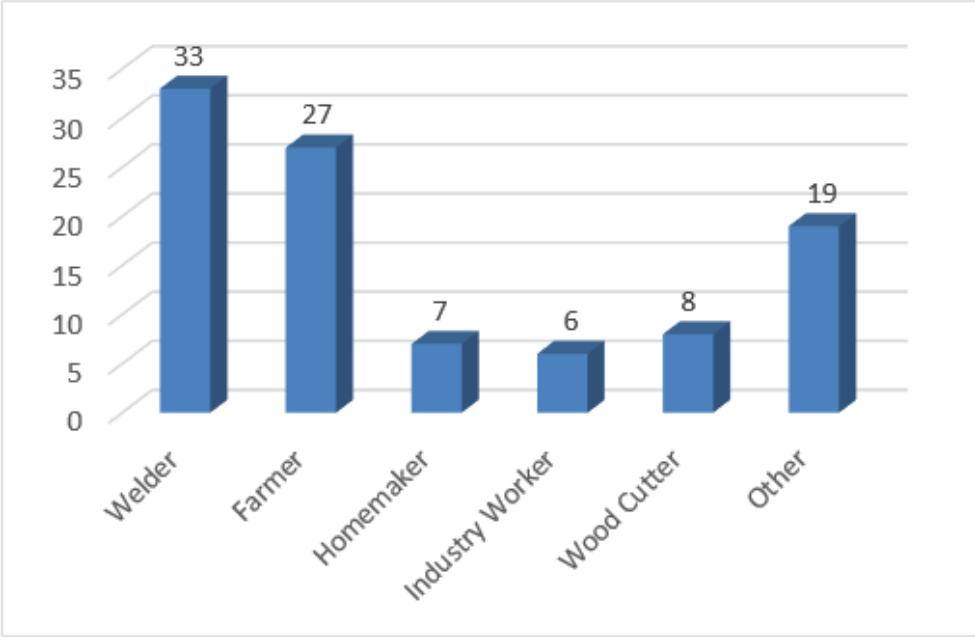

Figure no. 1 : Distribution according to incidence in various occupation.

Type of foreign body

It was observed that commonest foreign body observed in this study is metal (43%) followed by vegetative material (38%). Both together forms major portion.

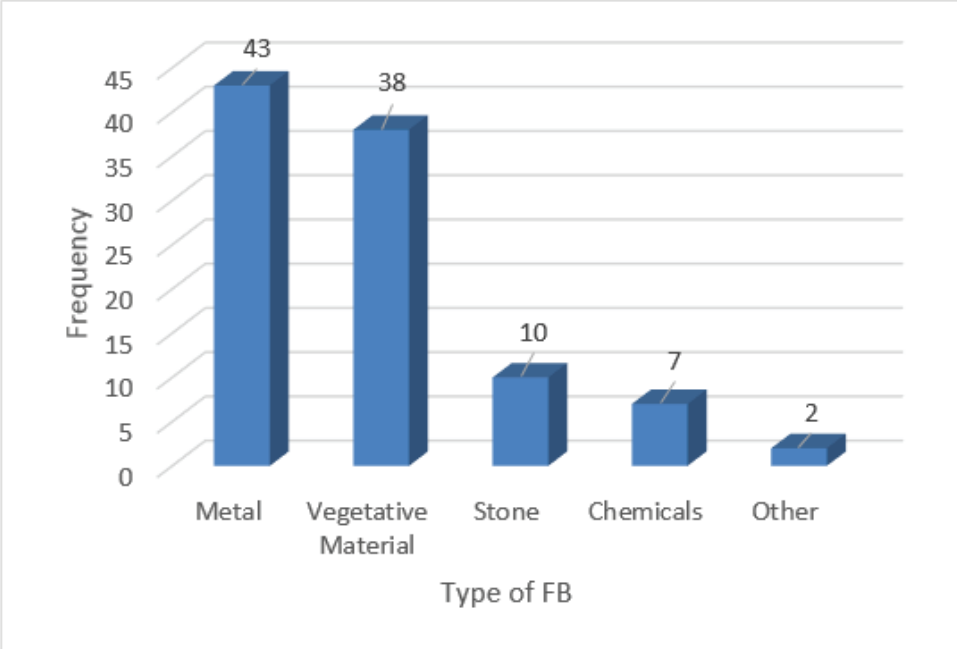

Figure no. 2: Distribution according to type of Foreign Body

Site of lodgement

It was observed that commonest site for lodgement of foreign body is cornea (67%) followed by conjunctiva (22%)

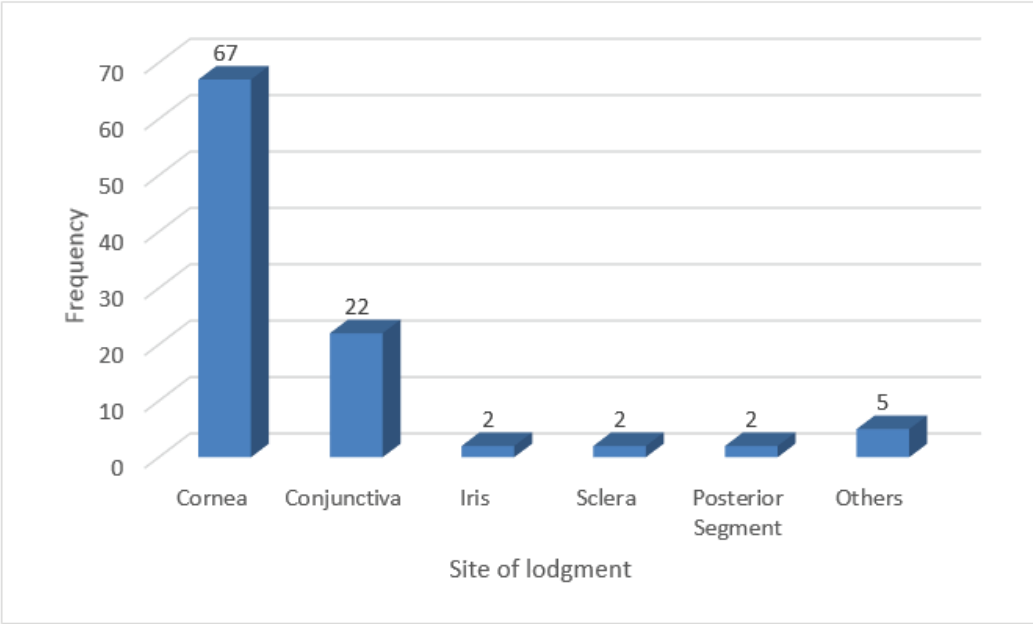

Figure no. 3: Distribution according to site of lodgement of FB

Number of foreign bodies

It was observed that 90% of the patients have single ocular foreign body, while only in 10% patients multiple foreign bodies found

Comparison Between Initial Visual Acuity and Final BCVA

In table no.1, there is comparison between initial visual acuity and final best corrected visual acuity. It was observed that this comparison is statistically significant with $p<0.05$.

Table no. 1 : Comparison Between Initial Visual Acuity and Final BCVA

visual acuity	Initial		Final		Chi-square	P-value
	Frequency	Percent	Frequency	Percent		
6/6 to 6/9	19	19.0	58	58.0	32.198	<0.0001
6/12 to 6/18	44	44.0	22	22.0		
6/24 to 6/60	23	23.0	13	13.0		
FC at 3mt	10	10.0	5	5.0		
FC < 3mt	4	4.0	2	2.0		
Total	100	100.0	100	100.0		

Comparison between Time Period from Onset to presentation to OPD and Final BCVA

In table no.2, there is comparison between time period from onset to presentation to OPD and final BCVA. It was observed that this comparison is statistically significant with $p<0.05$.

Table no. 2: Comparison between Time Period from Onset to presentation to OPD and Final BCVA

Final BCVA	Time period from Onset to presentation to OPD				Chi-square	P-value
	< 2 days		≥2 days			
	Frequency	Percent	Frequency	Percent		
6/6 to 6/9	47	70.14	11	33.00	12.713	0.0128
6/12 to 6/18	10	14.92	12	36.36		
6/24 to 6/60	7	10.44	6	18.18		
FC at 3mt	2	2.98	3	9.09		
FC < 3mt	1	1.49	1	3.03		
Total	67	100.00	33	100.00		

Comparison between site of lodgement of FB and Final BCVA

In table no.3, there is shows comparison between site of lodgement of FB and Final BCVA. It was observed that this comparison is statistically significant with $p<0.05$.

Table no. 3 : Comparison between site of lodgement of FB and Final BCVA

Final BCVA	Cornea	Conjunctiva	Iris	Sclera	Posterior Segment	Others	Chi-square	P-value
6/6 to 6/9	40	16	0	0	0	0	101.03	<0.0001
6/12 to 6/18	20	1	0	0	0	1		
6/24 to 6/60	5	3	0	0	1	4		
FC at 3mt	2	2	1	1	1	0		
FC < 3mt	0	0	1	1	0	0		

Discussion

Nowadays, Ocular trauma is one of the leading cause of vision impairment worldwide. Most of the ocular traumas are associated with ocular foreign bodies. Annual incidence of trauma cases of eye exceed 2 million cases. In which more than 40000 people had permanent vision impairment to a significant level. The place of injury can be anywhere from work place to recreational area /agricultural area /rural settings.

Younger individuals are commonly affected. The male to female ratio being around 9:1. Financial penalty to person and family is aspect of IOFB. Because of recent micro surgical technique and instrumentation prognosis of IOFB has improved for the past decades. Safety glasses use in work places and health education are the two important factors which helps to reduce

the incidence and thus ophthalmologists can play an important role in giving education to the population.

The present prospective study was conducted for calculating incidence of various types of ocular Foreign bodies and their various sites of lodgements with their relation to final best corrected visual acuity. The study was conducted in Ophthalmology Department of Krishna institute of medical sciences, Karad between October 2017 to May 2019. A total sample size of 100 patients with ocular foreign bodies taken into consideration

In present study, It was found that majority of our patients were in age group 31-40 (44%) followed by 41-50 years (18%) and 21-30(17%) respectively. The mean age of the patients was 40 years. Also, It was observed that majority of patients were male (80%) and females were 20%. Similar observation was observed by Napora et al in his study which shows majority of the patients were male with a mean age of 38.1 years. In another study, at Moorfields Eye Hospital done by Wickham et al. which was large retrospective cohort study a mean age observed was 34.6+/-12.4 years. Similarly, Maneschg et al. reported that all patients in their study were male with mean age of 28 ± 12.3 years. Koo et al. said that this occurrence of ocular FBs might be due to higher occupational exposure, higher involvement in dangerous sports and hobbies, alcohol use and risk taking behaviour in young men.

In present study it was found that commonest population affected by ocular foreign body belongs to welder (33%) followed by farmers (27%) by their occupation. This result is justified by fact that our locality constitutes both industrial as well as agricultural field. Most of the populations source of income depends on this only. That is why farmers and welders together constitute 60% of affected population.

In present study it was found that commonest foreign body observed in this study is metal (43%) followed by vegetative material (38%). Both together forms major portion. Evidences from many former studies are unanimous in proving metal object as the most frequent. Values of 91%, 85.3%, and 85.5% were reported previously by Woodcock et al. , Feghhi et al and Napora et al respectively. This difference of 43% metal FB in our study with 80- 90% in other studies is because of increased incidence of vegetative FB in our study. This quite high incidence of vegetative FB as compared with previous documentation is because of more population working in agricultural fields in our area.

In present study it was found that in 60% of cases left eye is involved while right eye involvement seen in 40% of subjects. Dominance of left eye involvement explained by reason that most of people are right handed. So while working force of impact goes in direction towards left eye causing it as commonly involved in ocular FB.

In present study it was found that commonest site for lodgement of foreign body is cornea (67%) followed by conjunctiva (22%). A study done by A.R. Nalgirkar[7] reported that Maximum number of foreign bodies were found in the cornea (41.6%) followed by conjunctiva (13.8 %) whereas only 1 patient had an intra-ocular foreign body. Studies done by C Chiquet et al[8] showed that corneal FB to be (58%), followed by the sclera (32%) and Zsuzsanna Suzijarto et al[9] 68% corneal and 32% sclera.

In present study, when comparison between initial visual acuity and final best corrected visual acuity done It was observed that this comparison is statistically significant with $p<0.05$ with chi-square value of 32.198. Similar results observed in studies done by C Chiquet et al [8] and Imtiaz A. Chaudhry et al[10] which shows that initial presenting visual acuity is significantly associated with final BCVA.

In present study, when comparison between time period from onset to presentation to OPD and final BCVA done. In our study, 67% patients presented to OPD before 24 hours. Out of them, 70% patients have Final BCVA better than 6/9. Amongst remaining 33% Patients who presented late to OPD, only 33% reached to visual acuity of 6/9. It was observed that this comparison is statistically significant with $p<0.05$ with chi-square value of 12.713. The study done by Tansu Erakguns , MD[11] and Zsuzsanna Szijarto, et al[9] states that if patient arrives late to the hospital, then it was significant association with poor vision outcome irrespective of age.

In present study, when comparison between site of lodgement of FB and Final BCVA is done, It was found that this comparison is statistically significant with $p<0.05$. this proves that corneal and conjunctival FB have better visual prognosis in comparison with other FBs. Iris FBs are not having good vision as there are posterior segment complications like vitreous haemorrhage and choroidal detachment due perforating nature of injury. Posterior segment FBs itself has bad prognostic value

in comparison with anterior segment FBs which is proven otherwise. In our study, scleral FBs also didn't show good Final BCVA. For one patient reason being late presentation to OPD i.e. after 10 days of incident with vegetative nature of FB (wood particle) and patient was non-compliant one. These multiple factors lead to deuteriation of patient's visual acuity from 6/24 to Fc at 3 meter when he developed scleral abscess. Later on due to continuation on negligence on patients part, he land up into endophthalmitis. In other case of scleral FBs, multiple FBs and posterior localisation of FB required multiple surgeries. This could be the reason for less final BCVA in this patient.

Conclusion

1. Incidence of ocular FB is maximum in 4th decade with male preponderance.

2. Incidence of FB is common in welders and farmers i.e. 33% and 27% respectively.

3. Commonest FB found are metal followed by vegetative material i.e. 43% and 38% respectively.

4. Anterior segment ocular FB are far common than posterior segment. Amongst that cornea (67%) is most common site of lodgement of FB followed by conjunctiva (22%)

5. Extraocular FB have better visual prognosis in comparison with intraocular FB.

6. Time period between onset of incident and initiation of treatment is major prognostic factor in degerming final visual outcome. Early visit to OPD have better visual prognosis than delayed visit and thus the treatment

Ethical Approval : All procedures performed on human participants were in agreement with ethical standards of the Institutional and/or National Ethics Committee.

Source of Funding : In this project , the cost of investigations of the studyparticipants was born by the institute research fundings**.**

Conflict of Interest : None

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References

1. Ocular trauma – Gupta
2. Agarwal PK, Kumar H, Srivastava PK (1993) Unusual Orbital Foreign Bodies. Indian J Ophthalmol 41: 125-127.
3. Angra SK, Mohan M (1980) Intralenticular foreign bodies. Indian J Ophthalmol 28: 145-149.
4. Boyd BF (1997) Highlights of Ophthalmology 3:186
5. Rajesh Gotekar: A Clinical Study of Extra Ocular foreign bodies in Prakash Institute of Medical Sciences and Research, Urun -Islampur, Maharashtra.. International Journal of current Medical and Applied sciences; 2017, 15(1),52-56.
6. Text book of Ophthalmology, Duke elder volume 6 pages 6125-6324
7. Indian journal of occupational and environmental medicine vol. 7, no. 2, may-august 2003 by Nargilkar
8. British Journal of Ophthalmology 1998 82: 801-806, by C Chiquet, P Gain, et al.
9. Graefes Arch Clin Exp Ophthalmology, 2008 246:161-165 by Zsuzsanna Szijarto, et al.
10. Graefes Arch Clinical Exp Ophthalmology, 2008 246:181-186 by Imtiaz A. Chaudhry et al
11. Tansu Erakgun, MD, and Sait Egrilmez, MD published in J Trauma. 2008; 64:1034-1037