Abstract:

Aim: To report the prognostic indicators and visual outcomes of 58 cases treated for endophthalmitis following cataract surgery.

Material & methods: A retrospective analysis of fifty eight cases treated for post-cataract surgery endophthalmitis during the period from January 2005 through December 2009. All the cases underwent a complete ophthalmic evaluation including baseline visual acuity recording, slit lamp biomicroscopic examination, dilated fundus examination, ultrasound B-scan evaluation of posterior segment, and visual acuity recording at follow up. The cases were treated with either intravitreal antibiotic injections alone or along with pars plana vitrectomy prior to which either anterior chamber tap or vitreous tap was performed.

Results: Forty four out of fifty eight eyes (75.86%) showed visual improvement. Twenty two out of thirty three cases (66.66%) that received only intravitreal antibiotic injection had improvement of vision as compared to twenty one out of twenty five (84.0%) cases that underwent vitrectomy. Of the diabetic cases 63.60% as opposed to 83.33% non-diabetic cases showed visual improvement.

Conclusion: The modes of initial treatment, diabetic status, and visual acuity at presentation are some of the prognostic indicators in cases of post-cataract surgery endophthalmitis.

Keywords: Endophthalmitis, Post Cataract Surgery

Introduction

Endophthalmitis is the most dreaded complication that may occur after an uneventful cataract surgery as the visual prognosis is generally very guarded. The incidence of post cataract surgery endophthalmitis varies from 0.074 to 0.189 for scleral incision and corneal incision surgery respectively. The incidence of post cataract surgery endophthalmitis in the Indian scenario is 0.05%. The visual outcome after treatment of post cataract surgery endophthalmitis is influenced by various factors and the aim of this study was to analyse some of the factors which would help to determine the visual prognosis in such cases.

Material & methods

The files of all cases of post-cataract surgery endophthalmitis that had undergone treatment at a tertiary ophthalmic referral centre during the period of January 2005 through December 2009 were retrieved from the medical records department. A total of 64 cases were found. Six cases were excluded as the files had incomplete essential data needed. A total of 58 cases were studied. Factors studied included the type of cataract surgery performed (phacoemulsification or other methods), the period between development of symptoms to presentation at the referral centre, the diabetic status of the patients, the presenting symptoms mainly pain and deterioration of vision, the visual acuity at presentation, the salient anterior segment signs at presentation (corneal edema and hypopyon), the positivity of microbiological testing, the type of treatment administered, and the follow up visual acuity at the last visit. Visual acuity was recorded in Snellen form and converted to LogMAR units based on the ICO conversion system. Treatment administered were intravitreal antibiotic injection only or intravitreal antibiotic injection followed by vitrectomy, or immediate vitrectomy and intravitreal antibiotic injection. All cases received concurrent treatment with topical fortified tobramycin drops hourly, fortified cefazolin drops hourly, moxifloxacin drops hourly, atropine drops every hour, dexamethasone drops six hourly and oral ciprofloxacin 750 mg twice hourly.

All cases, after initial vision recording and slit lamp examination, underwent ultrasound B-scan followed by anterior chamber tap +/- vitreous tap and intravitreal antibiotic injection or vitreous biopsy and core vitrectomy with intravitreal antibiotic injection. The aqueous and vitreous samples were sent for Gram staining, KOH mount, and routine culture and sensitivity test. In cases that did not respond to treatment, aqueous samples were taken and sent for PCR test for Propionobacterium acnes, fungi, and other bacteria.

The main outcome parameter taken into account was the final visual acuity at the last follow up visit.

The data obtained from the case files was statistically analysed using the SPSS version 11 software.

Observations and results

Table 1 summarizes the salient patient characteristics and the visual outcomes. Of the 58 cases studied, 27 were male patients. The patients were 37 years to 85 years in age (Mean age 63.89 yrs). Of them 22 were diabetic of varying duration. Nine cases had undergone phacoemulsification and the rest had undergone extracapsular cataract extraction by the small incision technique or the routine method with posterior chamber intraocular lens (IOL) implantation.
cases had developed posterior capsular rent during cataract surgery and had anterior chamber IOL implanted. One case had posterior capsular rent with dislocated lens fragments in vitreous with posterior chamber IOL implanted. None of the cases had presented with associated retinal detachment. Two cases developed retinal detachment after vitrectomy and were subjected to further surgery. IOL explantation was required in two cases. The cases were followed up for periods varying from 1 week up to 196 weeks with a median follow up of 18.50 weeks. Of the 3 cases which lost vision completely, 2 were found to have Pseudomonas and 1 had Citrobacter (Gram negative organisms) on culture.

Overall 44 out of 58 cases (75.86%) showed visual improvement to variable degrees. 23 out of 58 cases (39.66%) recovered vision to 6/12 (0.3 LogMAR) or better.

Co-relation of following factors to final visual outcome was analysed by Chi square test: gender, diabetic status, symptoms of deterioration of vision and pain, presence of hypopyon and corneal edema, type of cataract surgery, microbiological positivity, and the type of treatment for all the cases.

Of the 22 diabetic cases, 14 (63.60%) showed visual improvement as opposed to 30 out of 36 non-diabetics (83.33%). The Chi square test did not show statistical significance to this difference (p-value 0.40).

The subgroup of patients who presented with vision of only perception of light was analysed for correlation between the type of treatment and the final visual outcome. The following tables show the outcome in each category.
A) Cases treated with only intravitreal antibiotic injection attained a mean final vision of 1.82 LogMAR units.

B) Those treated with immediate vitrectomy attained a mean final vision of 0.53 LogMAR units.

C) Cases treated initially with intravitreal antibiotic injection and followed by vitrectomy attained a mean final vision of 0.96 LogMAR units.

The difference between the visual outcome in group A and B was statistically significant with p-value of 0.01. That between group A and C had a p-value of 0.02 and between group A and C had a p-value of 0.05.
Discussion
Several authors have analysed the risk factors for developing endophthalmitis after cataract surgery and several studies have looked into the factors that determine the outcome of treatment for post cataract surgery endophthalmitis. The Endophthalmitis Vitrectomy Study (EVS) which included 420 cases of post cataract surgery endophthalmitis, conducted in the early nineties has been regarded as a reference point for management of post cataract surgery endophthalmitis. In the present study, 3/22 (13.64%) became no light perception compared with 8% of the non-diabetic cases. A recent meta analysis of acute endophthalmitis after cataract surgery by Taban et al based on 3140650 cataract extractions has shown the changing trend in incidence of this complication over the decades from the sixties to recent times. In the present study an attempt has been made to analyse some of the factors which could influence the visual outcome of treatment of post cataract surgery endophthalmitis. Being a retrospective study of referred cases, certain factors like the intraocular lens material and type, have not been studied. Factors such as gender, age, laterality of eye, type of cataract surgery, the duration between surgery and onset of symptoms, symptoms of pain and visual deterioration, were taken into account. Statistical analysis of the above factors found them not to be significant in influencing the visual outcome (Table-2). A similar outcome of analysis was reported by Das et al in 2005. The clinical sign of hypopyon was not a statistically significant factor influencing the visual outcome. However, presence of corneal edema was noted to be statistically significant in the present study (p-value 0.02).

The diabetic status of patients has been reported to increase the risk of developing postoperative endophthalmitis. In the present study the cases that were diabetic had shown a poorer visual recovery (63.60%) in comparison to the non-diabetic cases (83.30%). In the EVS study also at every visual outcome threshold examined, and also along the entire range of visual function, diabetic patients did not have as good a final visual result as nondiabetics. Phillips and Tasman also reported worse visual outcomes in diabetic patients. In their study, 30% of diabetic patients with endophthalmitis became no light perception compared with 8% of the non-diabetic population. In the present study, 3/22 (13.64%) diabetic cases became no light perception as compared to 2/36 (5.56%) of non-diabetic cases. The type of organism isolated from aqueous and/or vitreous fluid was studied. In the present study a causative organism was detected in 15 of 58 cases by culture test or PCR test. Presence of Pseudomonas spp. was noted in 3 cases, Citrobacter spp. in 1 case, Klebsiella in 1 case, and other Gram negative bacilli in 1 case. Pseudomonas infection was associated with the worst visual outcome after treatment. A study done at Bascom Palmer Eye Institute specifically on endophthalmitis caused by Pseudomonas aeruginosa reported that of 28 cases only 2 recovered vision of 5/200 or better, 19 had no perception of light, and 7 had evisceration or enucleation. A report in 2009 where 20 eyes lost vision post cataract surgery due to Pseudomonas infection, has mentioned the emerging trend of multi-drug resistance of Pseudomonas. Though this factor was not found to be statistically significant in the present study, larger studies need to be conducted as there are reports of development of resistance by Gram negative bacteria to Ceftazidime and other higher antibiotics including newer quinolones and carbapenems.

In the present study, when all the cases were analysed based on the type of treatment administered, no statistically significant difference was noted between the cases subjected to vitrectomy and those treated with intravitreal antibiotic injection only. However, on analyzing the sub-group of patients who presented with PL only vision, statistically significant difference in the visual outcome was noted (Table-4a, 4b, 4c). This appeared to be in keeping with the EVS recommendation for vitrectomy in cases presenting with vision less than HM9.

Conclusion
Endophthalmitis cases presenting with very poor vision of perception of light only, should be treated with immediate vitrectomy and intravitreal antibiotics.

Cases with Gram negative organism tend to present very early after cataract surgery and should be treated aggressively with immediate vitrectomy to debulk the inoculum load and permit better distribution of antibiotics within the vitreous chamber.

Newer drugs need to be tried out in view of the increasing resistance to the standard intravitreal antibiotics.

References
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