ORIGINAL ARTICLE

INCIDENCE AND VISUAL OUTCOME OF ACUTE POSTOPERATIVE ENDOPHTHALMITIS

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Objectives: To assess the incidence and visual outcome of acute post operative endophthalmitis treated by intravitreal antibiotics. **Methods:** This Prospective study was conducted at Department of Ophthalmology, Liaquat University Eye Hospital Hyderabad from November 2002 to October 2010. One hundred and nine patients of acute post operative endophthalmitis were treated with intravitreal antibiotics. The inclusion criteria of the patients was the clinical diagnosis of acute post operative endophthalmitis within 14 days of post operative period and visual acuity better than or equal to hand movement close to face. After enrolment, vitreous tap was carried out followed by intravitreal antibiotics injection. The outcome was measured in terms of clinical resolution of endophthalmitis and post resolution best corrected visual acuity. **Results:** Of the 109 patients 97 meet the criteria and followed completely were included. Sixty patients (61.9%) had extracapsular cataract extraction (ECCE) with posterior chamber intraocular lens implantation while phacoemulsification done in 37 (38.1%) patients. The visual acuity at presentation was 6/60 or worse in 80 (82.5%) patients. Vitreous tap was done in 86 (88.7%) patients. Vitreous biopsy yields an organism in 32 (33%) patients. Coagulase positive were the most common organism. 75 (77.3%) patients received single dose of intravitreal antibiotic. Forty five (46.4%) patients received single antibiotic, ceftazidime while two antibiotics given in 52 (53.6%) patients. Twenty five (25.8%) patients also had oral steroids. Ninety one (93.8%) patients responded to intravitreal antibiotics. Seventy five (77.32%) patients achieved final visual outcome better than 6/60 in meantime of 54.08 days. Six (6.2%) patients developed no perception of light and another six patients (6.2%) referred for vitrectomy. **Conclusion:** The final visual outcome of the patients with acute postoperative endophthalmitis is strongly associated with the visual acuity at presentation as well as type of infective organisms.

Keywords: Endophthalmitis, visual outcome, intravitreal antibiotics

INTRODUCTION

Endophthalmitis, in all forms, is a serious pathological condition in which the internal eye's structures are invaded by pathogens that cause serious irreversible anatomic and functional damage. The incidence of endophthalmitis after cataract surgery varies considerably from 0.02–0.56% in the medical literature[2]. Concerns regarding the increased risks associated with clear corneal incisions and topical anesthesia has also been noticed.[3,4] Because of the limited immune response of eye, a wide range of micro organisms can cause endophthalmitis with wide spectrum of symptoms and signs.[5] Reaction of endophthalmitis ranges from a relatively painless anterior chamber inflammation by staphylococcus epidermidis, to an indolent and protracted intraocular infection caused by Propionibacterium acnes and explosive ocular and periorbital infection caused by Bacillus Cereus.[6-8] The most causative agents introduced in the eye during surgery usually originate from the ocular surface are Staphylococcus epidermidis and Staphylococcus aureus. Several prophylactic techniques has been implemented for the prevention of postoperative endophthalmitis, but only preoperative sterilization with povidine-iodine solution has been shown to be moderately important. All other reported prophylactic interventions, like preoperative eye lashes trimming, saline irrigation, topical antibiotic and postoperative sub-conjunctival antibiotic injection has received the lowest clinical recommendation.[9] Historically, the postoperative endophthalmitis has been treated with the systemic antibiotics and pars plana vitrectomy, neverthless more recent studies has shown that the prior intravitreal antibiotic is more efficient when compared with the systemic antibiotics and pars plana vitrectomy.[10] In endophthalmitis mainly two drugs are used intravitreously to cover both gram positive and gram negative bacteria.[11] However macular infarction after intravitreal injection of aminoglycoside such as amikacin or gentamicin has been reported. Another draw back occurs by the combination of two drugs is precipitation due to physicochemical incompatibility of two drugs, vancomycin and ceftazidime.[11] Single drug ceftazidime has bactericidal activity against the wide range of gram negative, gram positive and anaerobe organisms.[12] Also it is observed that ceftazidime has not predictable retinal toxicity and uncertainty of the efficacy due to precipitation.[13–15] Typically a single dose

is sufficient, though some cases require repeated dose for virulent or slow replicating organisms.[16]

MATERIAL AND METHODS

This, eight years prospective hospital based study was conducted from November 2002 to October 2010 at the Department of Ophthalmology Liaquat University of Medical and Health Sciences, Eye Hospital Hyderabad. The patients were enrolled with data including name, age, sex, associated systemic disease, interval between surgery and onset of symptoms and signs. Ocular evaluation included the best corrected visual acuity, slit lamp biomicroscopic examination, indirect ophthalmoscopy and ultrasonography for posterior segment evaluation. The inclusion criteria was best corrected visual acuity of better than or equal to hand movement close to face (HMCTF), reaction in the anterior chamber, hypopyon, reduced / absent fundal glow and exudates in the vitreous with presentation within 14 days of cataract surgery. The exclusion criteria was patients with chronic post-operative endophthalmitis, post traumatic endophthalmitis, previously treated endophthalmitis following intraocular surgery other than cataract and acute post-operative endophthalmitis with visual acuity of light perception or worse, retinal detachment, one eyed. All patients were operated in the same department by different surgeons with same local anesthesia (peribulbar technique) through clear corneal incision.

The intravitreal injection was given under topical anesthesia in the operation theatre under operating microscope after completing aseptic measures. The tap site was measured by caliper 3.5mm behind the limbus at 10 'O clock position. A 25 gauge needle on 1cc disposable syringe was used to aspirate 0.1 ml to 0.2 ml of the vitreous. Keeping the needle in place the syringe was replaced by another 1cc syringe containing prepared intravitreal antibiotic (ceftazidime 2mg/0.1ml or vancomycin 2mg/0.1ml and amikacin 0.4mg/0.1ml) injected into the vitreous cavity with the bevel of the needle facing away from the macula. If the eye showed no improvement or worsening of the signs and symptoms after an interval of 48 hours, the intravitreal injection was repeated. In addition all patients received fortified topical antibiotic therapy (ceftazidime 50mg/ml, vancomycin 50mg/ml,) at 1 hour interval along with cycloplegics (atropine 1% three times a day). Patient having less severe features and negative culture also treated with low dose oral steroids prednesolone. A decrease in symptoms and reaction in the anterior chamber and vitreous cavity and increase in best corrected visual acuity was the criteria taken as a response to intravitreal antibiotic injections. The patients whose condition further deteriorates in spite of maximal tolerated medical therapy were referred for pars plana vitrectomy. The patients were evaluated daily until discharged, once per week for one month and then every month until the end of third month. The data was analysed on SPSS-16.

RESULTS

In our study the overall incidence of acute postoperative endophthalmitis following cataract extraction was 0.65% in the last eight years. Of the total 109 patients, 97 (89.9%) had followed completely, the remaining 12 (10.1%) has lost the follow up and they were excluded from the study. There were 63 (65%) males and 34(35%) females with a mean age of 43.5 years (Table-1).

Table-1: Age of patients

Age (years)	Frequency	Percentage
10–20	2	2.1
21–30	4	4.1
31–40	17	17.5
41–50	15	15.5
51–60	28	28.9
61–70	23	23.7
71–80	6	6.2
>80	2	2.1
TOTAL	97	100.0

In 60 (61.9%) patients conventional extracapsular cataract extraction (ECCE) with posterior chamber intraocular lens implantation (PCIOL) was done, while (PCIOL) with phacoemulsification was done in 37 (38.1%) patients. The uneventful surgery was done successfully in 93 (95.9%) patients while rent in posterior capsule was happened in 4 (4.1%) patients. At the end of surgery all patients' received sub-conjunctival injection gentamycin 20mg/0.5ml and dexamethasone 2mg/0.5ml. Post operatively all the patients were treated by combined tobramycin 0.3% and dexamethasone 0.1% eye drops. The mean time from surgery to presentation with endophthalmitis was 3.2 days (ranged 1–14 days). The visual acuity of patients at presentation was 6/60 or worse in 80 (82.5%) patients, 6/36 -6/12 in 14 (14.4%) patients and better than 6/12 in 3 (3.1%) patients (Table-2).

Table-2: Best corrected vision present with endophthalmitis (BCVpwE)

Visual Acuity	Frequency	Percentage
HM-3/60	57	58.8
4/60-6/60	23	23.7
6/36-6/12	14	14.4
6/9-6/6	03	3.1
TOTAL	97	100.0

The vitreous was tapped out easily in 86 (88.7%) patients and in 11 (11.3%) patients it was not tapped out due to thick organized vitreous. The vitreous biopsy showed micro organisms in 32 (33%) patients as follows: staphylococcus aureus in 10 (10.3%) patients, staphylococcus epidermidis 9 (9.3%) patients, streptococcus pneumonia 6 (6.2%), pseudomonas 5 (5.2%) and E-coli 2 (2.06%) patients. In 54 (55.7%)

patients vitreous biopsy showed no growth of micro organisms.

Of the 97 patients, 75 (77.3%) received intravitreal antibiotic for single time while 22 (22.7%) patients received same intravitreal antibiotics for second time. Among the 97 patients, 45 (46.4%) patients received single intravitreal antibiotic (ceftazidime), while two antibiotics (vancomycin and amikacin) given in 52 (53.6%) patients. Also all patients treated by intensively topical fortified antibiotics and steroids, cycloplaegics. Oral antibiotic ciprofloxacin 500 mg two times a day for one week and oral analgesic, flurbiprofen 100 mg two times until patient pain free. Twenty five (25.8%) patients also had oral steroids. In the result 91 (93.8%) patients responded clinically well to intravitreal antibiotics while 6 (6.2%) patients not responded and were referred for vitrectomy. The best corrected visual acuity (BCVA) achieved to 6/6-6/9 in 13 (13.4%) patients, 6/12-6/36 in 22 (22.7%) patients, 6/24-6/60 in 40 (41.23%) patients, less than 6/60 in 16 (16.5%) patients and no perception of light in 6 (6.2%) patients (Table-3).

Table-3: Best corrected vision Final (BCV Final)

Visual Acuity	Frequency	Percentage
HM–3/60	16	16.5
4/60–6/60	40	41.2
6/36–6/12	22	22.7
6/9–6/6	13	13.4
NPL	6	6.2
TOTAL	97	100.0

The mean time of achieving final visual outcome was 54.08 days. There was statistically significant (p=0.00) relationship between poor vision at presentation and good visual out come. The mean visual acuity before treatment was 1.62 and the mean visual acuity after treatment was increased to 2.52.

Similarly type of organisms (p=0.002) and intravitreal dose (p=0.002) had statistically significant association with better final visual outcome. Complicated surgery (p=0.178), systemic disease (p=0.500), oral steroid (p=0.099), intravitreal regime (p=0.307), time of presentation (p=0.551), positive vitreous biopsy (p=0.34) not found to be statistically significant

DISCUSSION

Postoperative endophthalmitis is the most devasting complication following cataract surgery. In our study, incidence of post operative endophthalmitis is 0.65% which is higher than Kamala rajah S[14] and Desai P studies[17]. A number of studies have raised concern about the higher incidence of endophthalmitis in the clear corneal incisions than scleral tunnel incisions[18]. Infective endophthalmitis is usually appeared with rapid loss of vision and intense intraocular inflammation particularly in the early post operative period. In our study 17(17.53%) patients showed acute low grade endophthalmitis with negative microbial growth in vitreous tap, which reflect the difficulty in distinguishing between toxic anterior segment syndromes with infective endophthalmitis. The microbiological culture growth profile has regional variation. In our study vitreous tap was done in 86 (88.7%) patients, of which 32 (37.21%) showed positive microbial growth, while Carrim *et al*[19] in their study reported 55% of positive results. Gram positive are the 78.13% of total positive microbial growth having 50% Coagulase negative type. These findings are consistent with studies of Mayer *et al*[20] he has reported gram positive organisms in 76% patients.[14] and of Kamala rajah S *et al*[14] he has reported 49% of gram positive and coagulase negative microorganisms. In our study 75(77.3%) patients responded well to single dose of intravitreal antibiotic while 22 (22.7%) patients required second time injection, while Kamala rajah S *et al*[14] reported, repeated second time intravitreal injections in 20% of patients. In our study the visual acuity at presentation was 6/60 or worse in 80 (82.50%) of patients which was consistent to the survey of British Ophthalmological Surveillance Unit (BOSU) survey seen in 85% of patients. The visual outcome seen in this study is strongly proportional to the visual acuity before starting the treatment. Like Endophthalmitis Vitrectomy Study Group (EVSG)[21], visual outcome in this study has also strongly associated with the type of infective microorganism. Patients with gram negative and coagulase positive organisms showed poor outcome than coagulase negative. This was seen in vitreous tap of 15 patients which showing pseudomonas in 5 patients and staphylococcus aureus in 10 patients. Out of 6 patients with visual acuity (VA) of no perception of light (NPL) 4 (4.1%) patients vitreous tap showed gram negative organisms, nearly same organisms on culture are seen by Desai P[22] in 5% patients. One more thing observed in this study was the strong association between the numbers of doses of intravitreal antibiotics. A patient with single dose has fewer outcomes irrespective to the symptoms, than those who received two doses.[23]

CONCLUSION

The final visual outcome of the patients with acute postoperative endophthalmitis is strongly associated with the visual acuity at presentation as well as type of infective organisms.

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