Original Article

Role of Operative Subconjunctival Antibiotic in Preventing Postoperative Endophthalmitis

Khalid Iqbal Talpur, Mohammed Muneer Quraishy, Arshad Ali Lodhi, Sajjad Ali Surhio, Mohammad Memon, Shahzad Memon, Arslan Hassan Rajper

Pak J Ophthalmol 2009, Vol. 25 No. 3

See end of article for authors affiliations

Correspondence to:
Khalid Iqbal Talpur
Liaquat University Eye Hospital
Hyderabad-71000

Received for publication
December' 2008

Purpose: To determine whether operative subconjunctival antibiotic is an effective method to prevent postoperative endophthalmitis after Cataract and Glaucoma surgeries.

Material and Methods: The study was conducted in the Department of Ophthalmology at Liaquat University of Medical and Health Sciences, Jamshoro, from 1st July 2006 to 31st December 2007. In this study evaluation of 1200 eyes listed for Senile Cataract surgery or Trabeculectomy for Primary Glaucoma were randomized into two groups, one received subconjunctival gentamicin at the end of the surgical procedure and the other group did not receive any subconjunctival antibiotic. All other methods of sterilization and prophylaxis were standardized for both the groups. All patients received antibiotic-steroid combination eye drops postoperatively and were followed up for six weeks. Patients with any major intraoperative complication or who were lost to follow-up were excluded.

Results: A total of 1140 eyes were included in the study. Females were 50.6% of cases, and the mean age of patients was 59.44 years. Conventional extracapsular cataract extraction with IOL was performed in 52.2% of cases, phacoemulsification with IOL in 40.7% of cases and Trabeculectomy in 7.1% of cases. Subconjunctival gentamicin injection was given in 53.6% of eyes at the end of the procedure, while 46.4% of eyes were not injected. Only 01 case developed postoperative endophthalmitis, and this case was given subconjunctival antibiotic injection during phacoemulsification with IOL.

Conclusion: Operative subconjunctival gentamicin does not always protect against endophthalmitis. Endophthalmitis did not occur even when operative gentamicin was not administered.

Endophthalmitis is an infection of the interior of the eye that frequently results in visual loss despite prompt and often aggressive therapeutic and surgical intervention[1]. The infectious agent generally enters the eye during intraocular surgery (postoperative), following a penetrating injury of the globe (posttraumatic) or from hematogenous spread of bacteria to the eye from a distant anatomical site (endogenous). Although uncommon, endophthalmitis can also result from infective keratitis if left untreated[2].

Postoperative endophthalmitis is a rare but devastating complication following intraocular surgery. The incidence of postoperative endophthalmitis varies from 0.05 to 0.2% (1/2000 to 1/500 cataract operations) [3-7]. At present there is no clear robust evidence with regards to, which prophylactic methods to use to prevent postoperative endophthalmitis after cataract surgery. Most surgeons empirically use a variety of prophylactic techniques including preoperative topical antibiotics, povidone-

iodine preparation for periocular skin and conjunctival instillation, intraoperative antibiotics both intracameral and subconjunctival and postoperative antibiotics topical or systemic[8,9].

We in the department of Ophthalmology, Liaquat University of Medical and Health Sciences have been routinely using injection Gentamicin 20 mg / 0.5 ml subconjunctivally during Cataract and Glaucoma surgeries since last so many years. Our aim of this study was to determine whether subconjunctival antibiotic injection is an effective method of preventing endophthalmitis presuming that not using this method will increase the occurrence of endophthalmitis.

MATERIAL AND METHODS

Patients listed for Senile Cataract surgery or Trabeculectomy for Primary Glaucoma were randomized into two groups. One received subconjunctival gentamicin injection 20 mg / 0.5 ml at the end of the surgical procedure and the other group did not receive any subconjunctival injection. All the methods of sterilization were standardized for both the groups. These methods included:

1. Pre-operative moxifloxacin eye drops single drop every half an hour starting two hours before surgery.
2. Povidone–iodine 10% over and around the eyelids.
3. Povidone – iodine 5% eye drops for conjunctival instillation.
4. Proper draping, covering the eye lashes and lid margins.
5. Standard sterilization of surgical instruments.
6. Standard scrubbing of the surgeon and assistant.
7. Single drop of moxifloxacin eye drops at the end of surgery.

All patients received antibiotic-steroid combination eye drops postoperatively, and were followed up for six weeks to assess for onset of postoperative endophthalmitis. Patients were seen on 1st day, one week and then six weeks postoperatively. Patients were asked to contact urgently if they develop any redness, pain or blurring of vision.

The software SPSS version 11 was used for analysis of descriptive statistics and for graphical presentation.

RESULTS

A total of 1200 eyes of 1027 patients were initially included in the study. We excluded 60 eyes due to either an intraoperative complication or due to loss of follow-up. The mean age of our patients was 59.44 years. Females constituted 50.6% of cases.

Graph 1 shows that, the conventional extracapsular cataract extraction with IOL was performed in 52.2% of cases. Subconjunctival gentamicin injection was given in 53.6% of eyes at the end of the procedure, and this group included different types of surgeries as shown in Graph 2.

Only one case developed postoperative endophthalmitis, and this case was given subconjunctival antibiotic injection during phacoemulsification with IOL. The endophthalmitis was diagnosed clinically; culture was negative on vitreous tap. It was treated with intravitral ceftazidime and the vision recovered to 6/18.

The incidence of postoperative endophthalmitis in our study was 0.088% (1/1140).

Fig. 1: Type of surgery

Fig. 2: Subconjunctival antibiotics in different type of surgery

DISCUSSION

Postoperative endophthalmitis is one of the most feared complications following intraocular surgery and it is the second common cause of endophthalmitis after trauma in Pakistan with poor visual outcome.[10, 11] However, due to the low incidence of postoperative endophthalmitis, it has been difficult to assess the efficacy of various prophylactic measures. There are two approaches for prophylaxis; the first is to reduce ocular surface flora by using topical antiseptic preparation or antibiotics and the second is, to eradicate bacteria that enter the eye during surgery, by the use of antibiotics through intracameral, subconjunctival, topical or systemic route[12].

The most common source of organisms in postoperative endophthalmitis is the patient's own ocular surface flora, so it is recommended to instill preoperative 5% povidone – iodine in the conjunctival sac[13,14]. A review by Ciulla et al[15] has found that povidone – iodine antisepsis of skin, lids and conjunctiva to be the only recommended practice on the basis of the current evidence. Ciulla TA et al had also reported that, all other prophylaxis interventions (including preoperative lash trimming, preoperative saline irrigation, preoperative topical antibiotics, antibiotic-containing irrigating solutions and postoperative subconjunctival antibiotic injection) are possibly relevant but not definitely related to clinical outcome.

The European Society of Cataract and Refractive Surgeons (ESCRS) guideline on prevention of postoperative endophthalmitis recommend intracameral cefuroxime and does not encourage subconjunctival antibiotics[16,17] for three reasons;

1. Intracameral cefuroxime achieves higher aqueous concentration after surgery than subconjunctival cefuroxime.
2. The use of subconjunctival antibiotics has been questionable in their affectivity in preventing postoperative endophthalmitis.
3. The potential complications caused by subconjunctival injections like subconjunctival haemorrhage and penetration of sclera & the extraocular muscles.

However subconjunctival antibiotics have been a standard method used to prevent postoperative endophthalmitis all over the world, including Pakistan and the great majority of United Kingdom surgeons routinely gives subconjunctival antibiotics at the end of cataract surgery, and that is due to the concerns regarding ocular toxicity from intracameral antibiotics[18,19]. Lehmann OJ et al[20] and Ng JQ et al[21] in their studies had favoured the use of subconjunctival antibiotics as prophylaxis against endophthalmitis and reported that it reduces the risk by 50%.

To change our routine practice we did this study, which showed no case of endophthalmitis in 529 cases that were not given subconjunctival injections. This group included not only cataract surgeries but also 33 trabeculectomies. Though the number of trabeculectomies was low, nevertheless it had proved that not using subconjunctival antibiotics did not put patients on extra risk of getting endophthalmitis.

Incidentally endophthalmitis occurred in one case out of 611 eyes which were given subconjunctival gentamicin injection. This patient underwent phacoemulsification with IOL surgery. Despite this, the incidence of endophthalmitis in our study remained low which is 1/1140 cases (0.088%), and this is similar to what was reported from Canada by Hammoudi et al[22]. In his study regarding the patterns of endophthalmitis prophylaxis in Canada it was reported that only 26% of surgeons give intraoperative antibiotics intacamerally or subconjunctivally, while the majority of surgeons (74%) are using similar methods of prophylaxis as were used in our study like perfect draping technique and instillation of povidone – iodine 5% into the conjunctival sac prior to surgery.

The limitation of this study may be that we included only senile cataract and primary glaucoma surgeries. We excluded all other surgeries along with any eventful surgery such as posterior capsular tear or vitreous loss which carries a significant risk for the development of postoperative endophthalmitis. This was done to avoid any extra risk to be put on patients with high risk.

CONCLUSION

Operative subconjunctival gentamicin does not always protect against endophthalmitis. Endophthalmitis did not occur even when operative gentamicin was not administered.

Author's affiliation

Prof. Khalid Iqbal Talpur
Department of Ophthalmology
LUMHS, Jamshoro

Dr. Mohammed Muneer Quraishy
Department of Ophthalmology
DUHS, Karachi

Dr. Arshad Ali Lodhi
Department of Ophthalmology
LUMHS, Jamshoro

Dr. Sajjad Ali Surhio
Department of Ophthalmology
LUMHS, Jamshoro

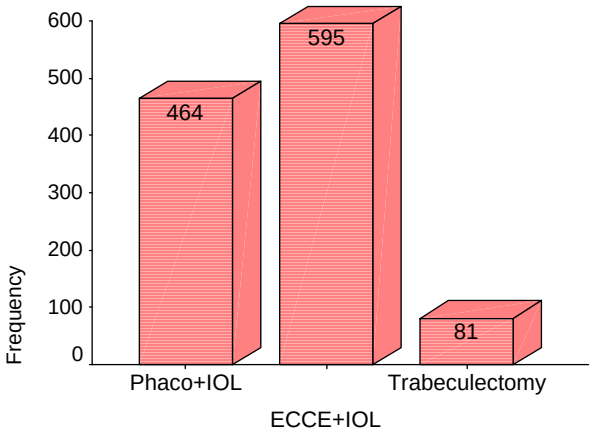
Dr. Mohammad Memon
Department of Ophthalmology
LUMHS, Jamshoro

Dr. Shahzad Memon
Department of Ophthalmology
LUMHS, Jamshoro

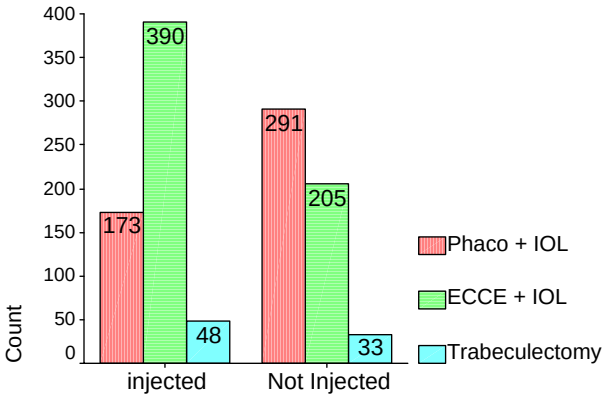
Dr. Arslan Hassan Rajper
Department of Ophthalmology
LUMHS, Jamshoro

REFERENCE

1. **Zia-ul-Mazhry, Chaudhri SS, Amir M, et al.** Treatment of endothalmitis with intravitreal injection of antimicrobials. Pak J Ophthalmol. 2000; 16: 33-7.
2. **Callegan MC, Engelbert M, Parke DW, et al.** Bacterial endophthalmitis: epidemiology, therapeutics, and bacterium-host interactions. Clin Microbiol Rev. 2002; 15: 111-24.
3. **West ES, Behrens A, McDonnell PJ, et al.** The incidence of endophthalmitis after cataract surgery among the US Medicare population increased between 1994 and 2001. Ophthalmology 2005; 112: 1388-94.
4. **Kamalarajah S, Silvestri G, Sharma N, et al.** Surveillance of endophthalmitis following cataract surgery in the UK. Eye 2004; 18: 580-7.
5. **Schmitz S, Dick HB, Krummenauer F, et al.** Endophthalmitis in cataract surgery: results of a German survey. Ophthalmology. 1999; 106: 1869-77.
6. **Wong TY, Chee SP.** The epidemiology of acute endophthalmitis after cataract surgery in an Asian population. Ophthalmology. 2004; 111: 699-705.
7. **Lalitha P, Rajagopalan J, Prakash K, et al.** Postcataract endophthalmitis in South India incidence and outcome. Ophthalmology. 2005; 112: 1884-9.
8. **Gupta MS, McKee HD, Stewart OG.** Perioperative prophylaxis for cataract surgery: survey of ophthalmologists in the north of England. J Cataract Refract Surg. 2004; 30: 2021-2.
9. **Rosha DS, Ng JQ, Morlet N, et al.** Cataract surgery practice and endophthalmitis prevention by Australian and New Zealand ophthalmologists. Clin Experiment Ophthalmol 2006; 34: 535-44.
10. **Babar TF, Masud Z, Saeed N, et al.** A two years audit of admitted patients with the diagnosis of endophthalmitis. Pak J Med Res 2003; 42: 105-11.
11. **Hussain I, Kundi NK.** Visual outcome in infective Endophthalmitis. J Med Sci 2005; 13: 151-3.
12. **Ou JI, Ta CN.** Endophthalmitis prophylaxis. Ophthalmol Clin N Am. 2006; 19: 449-56.
13. **Speaker MG, Milch FA, Shah MK, et al.** Role of external bacterial flora in the pathogenesis of acute postoperative endophthalmitis. Ophthalmology 1991; 98: 639-49.
14. **Speaker MG, Menikoff JA.** Prophylaxis of endophthalmitis with topical povidone-iodine. Ophthalmology 1991; 98: 1769-75.
15. **Ciulla TA, Starr MB, Masket S.** Bacterial endophthalmitis prophylaxis for cataract surgery: an evidence – based update. Ophthalmology 2002; 109: 13-24.
16. **Barry P, Seal DV, Gettinby G, et al.** ESCRS Endophthalmitis Study Group. ESCRS study of prophylaxis of postoperative endophthalmitis after cataract surgery: Preliminary report of principal results from a European multicenter study. J Cataract Refract Surg. 2006; 32: 407-10.
17. **Yu-Wai-Man P, Morgan SJ, Hildreth AJ, et al.** Efficacy of intracameral and subconjunctival cefuroxime in preventing endophthalmitis after cataract surgery. J Cataract Refract Surg 2008; 34: 447-51.
18. **Dinakaran S, Crome DA.** Prophylactic measures prevalent in the United Kingdom. J Cataract Refract Surg. 2002; 28: 387-8.
19. **Ang GS, Barras CW.** Prophylaxis against infection in cataract surgery: A survey of routine practice. Eur J Ophthalmol. 2006; 16: 394-400.
20. **Lehmann OJ, Roberts CJ, Ikram K, et al.** Association between nonadministration of subconjunctival cefuroxime and postoperative endophthalmitis. J Cataract Refract Surg. 1997; 23: 889-93.
21. **Ng JQ, Morlet N, Bulsara MK, et al.** Reducing the risk for endophthalmitis after cataract surgery: Population-based nested case-control study: Endophthalmitis Population Study of Western Australia: sixth report. J Cataract Refract Surg. 2007; 33: 269-80.
22. **Hammoudi DS, Abdolell M, Wong DT.** Patterns of perioperative prophylaxis for cataract surgery in Canada. Can J Ophthalmol 2007; 42: 681-8.



Graph 1 Types of Surgery



Graph 2 Subconjunctival antibiotics in different types of surgery