

Review Article

Intracameral Antibiotics as Prophylaxis in Cataract Surgery; a Mini-Review of Literature

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Abstract

Purpose: To conduct a mini-review of intracameral antibiotics usage as prophylaxis for post cataract surgery endophthalmitis.

Materials and Methods: We conducted a brief search of English literature regarding the recent developments in use of various intracameral antibiotics as anaphylaxis for post cataract surgery endophthalmitis.

Results: The effect of prophylactic intracameral antibiotics in reducing post cataract surgery endophthalmitis is still a controversial subject. Randomized clinical trials (RCTs) are great sources to confirm benefits from prophylactic intracameral antibiotics. Several recent surveys have reported higher rates of endophthalmitis among cataract patients not receiving prophylactic intracameral antibiotics compared with those receiving antibiotics.

Conclusion: Based on the latest findings it seems that more surgeons should set aside their doubts and use intracameral antibiotics as routine prophylaxis to reduce the rate of post cataract surgery endophthalmitis.

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Introduction

One of the most vision-threatening complications after cataract surgery is postoperative endophthalmitis; although the incidence rate of this complication is very low. Postoperative endophthalmitis can occur after several types of intraocular surgery with the highest prevalence reported after cataract surgery ¹. Postoperative endophthalmitis after cataract surgery might cause permanent vision loss; which highlights the need for a prompt treatment for this condition. The growing rate of intracameral antibiotics' usage as prophylaxis for postsurgical endophthalmitis might lead to a notable reduction in incidence of this serious complication after cataract surgery worldwide. The European Society of Cataract and Refractive Surgery (ESCRS) reported that the use of intracameral antibiotics caused a 5-fold reduction in incidence of endophthalmitis after cataract surgery ². Also, several other surveys by Lalitha et al., ³, Moshirfar et al., ⁴, and others have reported higher rates of endophthalmitis among patients not receiving prophylactic intracameral antibiotics compared with those receiving antibiotics.

Postoperative endophthalmitis treatments

Due to changes in life expectancy and age structure of the population, cataract surgery has been reported as the main cause of postoperative infections in Iran ⁵. Patients with postoperative endophthalmitis undergo different kinds of treatments. In culture negative cases, the injection of intravitreal or intracameral antibiotics appears to be an effective treatment; while in culture positive cases, aggressive approaches such as vitrectomy might yield higher cure rates ⁶.

Prophylactic antibiotics

Cefuroxime

Cefuroxime is a second-generation cephalosprin antibiotic, which is mostly applied in bacterial

infections. Cefuroxime has been widely used in several studies as a robust prophylaxis agent to prevent postoperative endophthalmitis following cataract surgery. A partially masked randomized placebo-controlled multinational clinical study found Cefuroxime as a highly beneficial prophylaxis for postoperative endophthalmitis compared with perioperative Levofloxacin eyedrops ⁷. Patients with cataract surgery well-tolerate the recommended doses of Cefuroxime. There is always a great concern about the risk of contamination when using this antibiotic; also the two-step dilution process might lead to dilution errors in intracameral injection of Cefuroxime ⁸. With regards to above mentioned limitations, a 2013 study by Keating et al., employed Aprokam as an intracameral Cefuroxime, which did not require any further dilution ⁸. Commercial FDA-approved intracameral Cefuroxime is unavailable in many countries such as USA ⁹. Also, due to lack of Cefuroxime ideal efficacy against gram-negative germs, an alternative antibiotic might be needed.

Vancomycin

Vancomycin is a broadly-active antibiotic against most gram-positive organisms, which has been used as the drug of choice in treatment of postoperative endophthalmitis for many years ¹⁰. Vancomycin covers methicillin-resistant *Staphylococcus aureus* (MRSA) responsible for postoperative endophthalmitis. Endophthalmitis Vitrectomy Study (EVS) examined the Vancomycin concentrations in the vitreous after intravenous and intravitreal administration for treatment of postoperative endophthalmitis and concluded that the intravenous administration of Vancomycin could not reach the proper therapeutic doses after a single injection ¹¹. Vancomycin correlation with hemorrhagic occlusive retinal vasculitis is a marked obstacle towards the prophylactic use of this antibiotic.

Moxifloxacin

Moxifloxacin is a fourth generation, broad-spectrum fluoroquinolone, which is widely used to treat infections of the ocular surface, due to its well toleration in anterior segment ¹². Haripryia et al. conducted a study to evaluate the effect of intracameral Moxifloxacin as prophylaxis against endophthalmitis development following cataract surgeries and concluded that routine intracameral Moxifloxacin prophylaxis reduced the overall endophthalmitis rate by 3.5 folds ¹³. Moxifloxacin is recommended as a beneficial available antibiotic regimen to decrease post cataract surgery endophthalmitis in developing countries, which are more susceptible to endophthalmitis development due to cost-saving surgery procedures and instrumentation.

Moxifloxacin represents several benefits over Cefuroxime and Vancomycin. There is no significant toxic effect regarding the intracameral injection of Moxifloxacin at a concentration of 150 µg/mL for 24 hours ¹⁴. Also, the time dependent activity of Vancomycin can be substituted by biphasic behavior of Moxifloxacin, which includes a primary concentration-dependent elimination resulting in a significant eradication of microorganisms ¹².

Conclusion

Based on the latest findings it seems that more surgeons should set aside their doubts and use intracameral antibiotics as routine prophylaxis to reduce the rate of post cataract surgery endophthalmitis.

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Footnotes and Financial Disclosures

Conflict of Interest:

The authors declare no conflict of interest with the subject matter of the present manuscript.

