

Commentary: Intracameral antibiotic reduces the risk of post-cataract surgery endophthalmitis but does not eliminate it

The routine use of intracameral antibiotics in cataract surgery has increased after intracameral cefuroxime was first recommended by the 2007 ESCRS Study. Haripriya *et al.* has also shown that routine intracameral moxifloxacin prophylaxis is effective in causing a 3.5-fold reduction in overall rates of endophthalmitis following cataract surgery (3-fold for manual SICS and nearly 6-fold for phacoemulsification).^[1] Sharma *et al.* has recommended the use of prophylactic intracameral cefuroxime only in high-risk cataract surgeries in situations like posterior capsule rupture, vitreous loss, prolonged surgery, etc.^[2] The recent AIOS survey in 2017 showed that only less than 40% respondents used intracameral antibiotics, out of which 36.6% used in all cases and 46.2% used in high-risk cases only.^[3] Moxifloxacin was the most preferred intracameral antibiotic (preferred by 78% surgeons) followed

by gatifloxacin.^[3] There is no randomized control trial which can suggest an optimal intracameral antibiotic of choice, comparing all the alternatives like cefuroxime, vancomycin, and moxifloxacin. There are also various concerns regarding the routine use of intracameral antibiotics like commercial availability of formulations, dilution errors, emergence of drug resistance, safety (like hemorrhagic occlusive retinal vasculitis with vancomycin, macular edema, and retinal infarction due to cefuroxime), risk of anaphylaxis, toxic anterior segment syndrome and cost.^[4]

The present study has described the beneficial effect of intracameral antibiotics in preventing endophthalmitis without the need of postoperative antibiotics.^[5] This conclusion holds true in cases of routine uncomplicated cataract surgeries only. There are various issues related to the intensive postoperative drug regimen involving multiple drugs. Compliance and affordability become important in resource-limited countries like ours. Complex treatment schedules and difficulty in self-administration of drugs can lead to non-compliance. An *et al.* has found that 92.6% of cataract patients show improper technique of eye drop administration.^[6] They also reported that the patients usually contaminate the eye drops, fail to

wash hands before putting them, and instill incorrect number of drops. The situation worsens in high volume settings due to lack of proper patient education and can result in increased number of postoperative complications. The observations made by the present study will help to address the above problem. However, the present study did not intend to study high-risk cases in great detail to draw any conclusion regarding the need for postoperative antibiotics. Further randomized control trials should be conducted in future to confirm this trend. Till then, it is always prudent to combine intracameral antibiotics along with postoperative antibiotics in high-risk complicated cataract surgeries.

One of the important issues that need awareness is the rising number of endophthalmitis cases following cataract surgeries in patients who had received prior prophylactic intracameral antibiotics.^[7,8] These can occur due to emergence of antibiotic resistance, lack of adequate concentration of drug in anterior chamber, and delayed wound healing.^[9] Fewer cases of endophthalmitis have been reported after intracameral use of moxifloxacin as compared to other antibiotics.^[8] Moxifloxacin, being a 4th generation fluoroquinolone offers distinct advantages of both gram-positive and gram-negative bacterial coverage and dose-dependent activity. It means that a bacterium is still susceptible even if it is resistant to topical concentration as anterior chamber strength is 10 times more than the topical concentration of antibiotic. The reported safe concentration of intracameral moxifloxacin is 500 µg/mL or less, which do not cause endothelial cell loss or toxic anterior segment syndrome.^[10] Still, cases of endophthalmitis caused by moxifloxacin-resistant microbial flora like *Staphylococcus epidermidis* have been reported in the literature.^[8,11] These cases are more likely to be associated with poorer visual prognosis.^[12] Prompt aggressive treatment involving early vitrectomy and intravitreal injection of new generation antibiotics should be undertaken in such cases.^[7] Special precautions like preoperative assessment/optimization of immunosuppression, proper surgical wound closure, and good control of postoperative inflammation can help in preventing such complications.^[8] If used alone, intracameral antibiotics do not offer an extended period of protection against late-onset endophthalmitis, especially due to fungal organisms. Thus, adequate intracameral concentration of antibiotics exceeding the minimum inhibitory concentration of pathogenic organisms should always be achieved to prevent infections.

The cases of endophthalmitis caused by Coagulase-negative *Staphylococcus* resistant to moxifloxacin have increased from 22% (1995–1999) to 57% (2010–2016).^[11] Hence, we feel that strict pre-operative asepsis including use of 5% povidone-iodine over the conjunctival sac area along with aseptic measures during surgery and postoperative antibiotics play an indispensable role in preventing ocular infections.^[4,13] Intracameral antibiotics can also be best avoided in such a aseptic setting, in an uncomplicated cataract surgery.

Divya Agarwal, Atul Kumar

Dr. Rajendra Prasad Centre for Ophthalmic Sciences,
All India Institute of Medical Sciences, New Delhi, India

Correspondence to: Dr. Atul Kumar,
Dr. Rajendra Prasad Centre for Ophthalmic Sciences,
All India Institute of Medical Sciences, Ansari Nagar,
New Delhi - 110 029, India.
E-mail: atul56kumar@yahoo.com

References

1. HariPriya A, Chang DF, Ravindran RD. Endophthalmitis reduction with intracameral moxifloxacin prophylaxis: Analysis of 600 000 surgeries. *Ophthalmology* 2017;124:768-75.
2. Sharma S, Sahu SK, Dhillon V, Das S, Rath S. Reevaluating intracameral cefuroxime as a prophylaxis against endophthalmitis after cataract surgery in India. *J Cataract Refract Surg* 2015;41:393-9.
3. Maharana PK, Chhablani JK, Das TP, Kumar A, Sharma N. All India Ophthalmological Society members survey results: Cataract surgery antibiotic prophylaxis current practice pattern 2017. *Indian J Ophthalmol* 2018;66:820-4.
4. Agarwal D, Kumar A. Commentary: Role of antibiotics in cataract surgery. *Indian J Ophthalmol* 2020;68:825-6.
5. Rathi VM, Sharma S, Das T, Khanna RC. Endophthalmitis Prophylaxis Study, Report 2: Intracameral antibiotic prophylaxis with or without postoperative topical antibiotic in cataract surgery. *Indian J Ophthalmol* 2020;68:2451-5.
6. An JA, Kasner O, Samek DA, Lévesque V. Evaluation of eyedrop administration by inexperienced patients after cataract surgery. *J Cataract Refract Surg* 2014;40:1857-61.
7. Mesnard C, Beral L, Hage R, Merle H, Farès S, David T. Endophthalmitis after cataract surgery despite intracameral antibiotic prophylaxis with licensed cefuroxime. *J Cataract Refract Surg* 2016;42:1318-23.
8. Chang VS, Schwartz SG, Davis JL, Flynn HW. Endophthalmitis following cataract surgery and intracameral antibiotic: Moxifloxacin resistant staphylococcus epidermidis. *Am J Ophthalmol Case Rep* 2019;13:127-30.
9. Slean GR, Shorstein NH, Liu L, Paschal JF, Winthrop KL, Herrinton LJ. Pathogens and antibiotic sensitivities in endophthalmitis. *Clin Experiment Ophthalmol* 2017;45:481-8.
10. Matsuura K, Miyoshi T, Suto C, Akura J, Inoue Y. Efficacy and safety of prophylactic intracameral moxifloxacin injection in Japan. *J Cataract Refract Surg* 2013;39:1702-6.
11. Stringham JD, Relhan N, Miller D, Flynn HW. Trends in fluoroquinolone nonsusceptibility among coagulase-negative staphylococcus isolates causing endophthalmitis, 1995-2016. *JAMA Ophthalmol* 2017;135:814-5.
12. Chiquet C, Maurin M, Altayrac J, Aptel F, Boisset S, Vandenesch F, et al. Correlation between clinical data and antibiotic resistance in coagulase-negative Staphylococcus species isolated from 68 patients with acute post-cataract endophthalmitis. *Clin Microbiol Infect* 2015;21:592.e1-8.
13. Agarwal D, Kumar A. Commentary: Role of sterile air in ophthalmic surgery operation theater. *Indian J Ophthalmol* 2020;68:1126.

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