Endophthalmitis prophylaxis: My perspective

Endophthalmitis is a dreaded complication following cataract surgery. Surgeons are striving to find methods to prevent its occurrence. The prospective ESCRS study[1] did not find evidence that topical antibiotic therapy lowered the rate of endophthalmitis. The jury is still out on whether or not to use intracameral (IC) antibiotics. Vancomycin is associated with hemorrhagic occlusive retinal vasculitis.[2] Cefuroxime has been studied in a randomized controlled trial,[1] but a formulation indicated for IC use is not available in many countries including India. Recently, Haripriya *et al*.[3] have stated the impracticability of conducting a randomized prospective trial and presented a retrospective analysis comparing the postoperative endophthalmitis rate before and after initiation of IC moxifloxacin prophylaxis for both phacoemulsification and sutureless, manual small-incision cataract surgery (M-SICS), as well as in patients with posterior capsular rupture (PCR) in all 617,453 cataract surgeries performed during a 29-month period from January 2014 to May 2016 at the ten regional Aravind Eye Hospitals. The study concluded that IC moxifloxacin prophylaxis is effective with a 3.5-fold reduction in the overall rate of endophthalmitis. The study acknowledges that while this does not constitute Level 1 evidence and that there is no consensus that IC antibiotic prophylaxis should be the standard of care, IC moxifloxacin prophylaxis should be considered for high-risk eyes experiencing PCR with vitreous loss.

However, Schwartz *et al*.[4] claim that the role of IC antibiotics remains controversial in the United States and in many other nations. They argue on the basis of additional costs, increased risks, and that antibiotic stewardship programs aim to improve practices by reducing the unnecessary or inappropriate use of antibiotics. Relhan *et al*.[5] state that, despite the results from the large retrospective study of Haripriya *et al*.,[3] the role of off-label prophylactic IC moxifloxacin still has to be validated by a prospective randomized controlled trial.

I congratulate Kelkar *et al*.[6] for their paper "Antibiotic prophylaxis practice patterns for cataract surgery in India – Results from an Online Survey." The survey was perfectly timed to gather information on preferred practices on the use of IC antibiotics for endophthalmitis prophylaxis among cataract surgeons in India across various clinical settings. Amidst the controversy on the appropriateness of the use of IC antibiotics, IC moxifloxacin became commercially available in India. India and the developing world are unique in many ways, and practices differ considerably from the developed world. In India, M-SICS is frequently practiced, the number of high volume surgeons and centers is significant, and there are no laid down preferred practice patterns with respect to the use of IC antibiotics. It would be expected that both users and nonusers of IC antibiotics would be interested in the outcome of the survey. The total number of members of All India Ophthalmological Society (AIOS) is over 20,000 (AIOS website), and there are currently more than 15,000 active cataract surgeons in India who perform approximately 6 million cataract surgeries annually.[7] It is disheartening to note that, despite the ease of responding to an online survey, out of 15,041 potential respondents, only 1228 respondents (8.2%) completed the survey. The authors are encouraged to identify the barriers so that future surveys elicit a larger number of responses making them more meaningful. While the small number of responses may not be truly representative of the prevalent practices among cataract surgeons in India, it does provide insights into an important aspect of postoperative endophthalmitis prevention.

It is interesting to note that a large number of respondents still used preoperative antibiotics despite the fact that the ESCRS study[1] did not find evidence that topical antibiotic therapy lowered the rate of endophthalmitis.

Since current literature,[8] most strongly supports the use of preoperative povidone-iodine antisepsis with regard to bacterial endophthalmitis prophylaxis in cataract surgery, it would be expected that 100% of respondents (instead of 94%) would have adopted this practice by now.

Nearly 38% of respondents reported using IC antibiotics routinely after cataract surgery, and that majority of respondents (68%) believe that it is important to have a commercially approved drug for IC use, suggests a growing demand. Yet, the most common reason that respondents gave for not using intraocular antibiotics was being unconvinced of the need (48%). The study by Haripriya *et al*.[3] will probably help in convincing many of these responders.

It is not unexpected that a greater proportion of high volume surgeons (>500 cases/year) reported using IC antibiotics (45%) compared to lower volume surgeons (<500 cases/year) (33%). It is hoped that the additional security offered by the use of IC moxifloxacin will not lead surgeons to lower their guard and reduce the precautions taken to prevent postoperative endophthalmitis.

Although self-reported endophthalmitis rates were statistically significantly greater in those not using IC antibiotics (0.045% vs. 0.036, $P = 0.04$), this is probably one place where "effect size" statistics would provide a better interpretation. It may be noted that self-reported endophthalmitis rate was 0.036% despite the use of IC antibiotics.

Respondents reported toxic anterior segment syndrome (TASS) and transient endothelial injury in about 5% of eyes and attributed this to the IC antibiotics they used. However, the analyzed data and Table 6 do not clearly mention if there was an incidence of TASS or endothelial injury following use of commercially available moxifloxacin for IC use. Haripriya *et al*.[3] have reported specifically that no instances of TASS or corneal decompensation were thought to be caused by the brand of IC moxifloxacin used in their study.

It may be noted that, in the study by Haripriya *et al*.,[3] each sterile 1 ml vial provided sufficient drug for six different patients using a fresh needle and syringe to withdraw 0.1 ml from the vial for each case. The availability of an economical single-dose prefilled "ready to inject" packing of IC moxifloxacin would further encourage surgeons to adopt this practice.

A preferred practice pattern based on available evidence, formulated by the AIOS on the use of IC antibiotics in general

and moxifloxacin in particular, would be helpful for cataract surgeons.

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