

## Commentary: Intravitreal moxifloxacin for acute postoperative endophthalmitis: Is it as safe and efficacious as the age-old recommended intravitreal vancomycin and ceftazidime?

Endophthalmitis is a devastating complication of ocular surgeries, both for the patient and the ophthalmologist. A delay in either diagnosis or treatment can potentially lead to blindness or even evisceration of the infected eyeball in worse case scenarios. Owing to its associated medicolegal consequences, every ophthalmologist is obliged to have an updated working knowledge of management of this notorious catastrophe.

By definition, endophthalmitis implies inflammation and infection of ocular coats. Even today, the management of endophthalmitis is largely influenced by the two-decades-old published endophthalmitis vitrectomy study (EVS).<sup>[1]</sup> The EVS study proposed three main guidelines for management.

1. Microbiological evaluation of intraocular fluid (vitreous and/or anterior chamber fluid)
2. Empirical use of intravitreal antibiotics (vancomycin and ceftazidime)
3. Presenting visual acuity decides the treatment strategy. Vitrectomy for poor visual acuity (less than hand movements) and intravitreal antibiotics with vitreous biopsy for relatively better presenting visual acuity (hand movement or more).

In short, while dealing with endophthalmitis we need to know the infecting organism and the severity of ocular involvement functionally (objective sign like visual acuity) to guide the aggressiveness of intervention.

We all are aware of the shortcomings of the EVS study in real-world practice. There were many flaws in EVS study like the study recruited only post-cataract surgery-related endophthalmitis and so its treatment protocols cannot be extended to other forms of endophthalmitis viz. traumatic endophthalmitis or fungal endophthalmitis. The European guidelines for the management of postoperative endophthalmitis recommend an immediate complete three-port vitrectomy as the “gold standard.”<sup>[2]</sup> The proposed rationale for this strategy being vitrectomy reduces the need for reoperation, provides a larger sample for culturing, and removes more pus from the vitreous (Barry *et al.* 2013) as opposed to presenting visual acuity being the objective guide suggested by EVS.

The global incidence of post-cataract surgery endophthalmitis can range from 0.02% to 0.26%. About 90% of postoperative endophthalmitis occurs following cataract surgery because it is the most frequently performed intraocular surgery in the world. The incidence of postcataract endophthalmitis reported in Indian eyes is more or less similar to the literature reported elsewhere in the world. Although there is a significant regional difference in the microbiological spectrum. In Asian countries like India, roughly around 70% of culture-positive postoperative endophthalmitis occurs secondary to gram-positive bacteria (commonest one being coagulase-negative staphylococci) while gram-negative organisms constitute up to 26% and remaining is contributed by fungal filaments.<sup>[3]</sup>

Since the outcome of treatment following endophthalmitis is usually not very visually rewarding, all the efforts are geared to prevent it. Prophylactic povidone-iodine application in the conjunctival cul de sac with a contact period of 1 min is recommended before starting any intraocular surgery. The European Society of Cataract & Refractive Surgeons (ESCRS) study suggested intracameral usage of cefuroxime (1 mg in 0.1 mL) for the reduction of postoperative endophthalmitis.<sup>[4]</sup> However, an Indian study by Sharma *et al.*

did not demonstrate a statistically significant reduction in the incidence of postoperative endophthalmitis following the usage of intracameral cefuroxime in Indian patients.<sup>[5]</sup> In a large multicentric study by Haripriya *et al.*, intracameral moxifloxacin at the end of cataract surgery was able to reduce the risk of postoperative endophthalmitis by 3 to 6 fold.<sup>[6]</sup> Hence, today in clinical practice intracameral moxifloxacin is the preferred antibiotic used for prophylaxis during cataract surgery.

The EVS study recommended two intravitreal antibiotics for treating postoperative endophthalmitis viz. vancomycin (coverage for gram-positive cocci) and ceftazidime (coverage against gram-negative bacilli). The same is recommended by the European and American guidelines. However, vancomycin is associated with a serious intraocular complication of hemorrhagic occlusive retinal vasculitis (HORV).<sup>[7]</sup> Furthermore, cultural sensitivity to both these recommended antibiotics has been reported on the lower side in Indian studies as compared to western studies suggesting a relatively higher possibility of microbial resistance to these antibiotics in Indian patients. The authors have addressed these shortcomings of recommended antibiotics by exploring the role of fourth-generation fluoroquinolone moxifloxacin which also happens to be the preferred prophylactic antibiotic for modern-day cataract surgery. There are many strengths of this prospective clinical study like currently there are only a couple of studies favoring the use of intravitreal moxifloxacin for the management of postoperative endophthalmitis. The authors have reported intravitreal moxifloxacin to be a 100% safe procedure and also they had a favorable outcome in 96.15% study patients appealing to its efficacy. At the backhand, it also raises a few unanswered questions like the issues of change in the spectrum of infesting organisms and the rise of microbial antibiotic resistance with routine use of these potent intravitreal antibiotics. We hope similar multicentric and larger prospective studies will throw more light on the use of intravitreal moxifloxacin in the future as the first-line antibiotic for the treatment of postoperative endophthalmitis.

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