Commentary: Role of antibiotics in cataract surgery

Cataract remains the most common cause of blindness in India. Cataract surgery is one of the most common ocular surgeries performed anywhere in the world. Endophthalmitis is one dreaded complication which can have serious implications. With better instrumentation/techniques, ot sterilization, and prophylactic measures, incidence of post cataract surgery has drastically reduced to less than 0.1% all over the world. The rates of post cataract surgery culture-proven endophthalmitis range between 0.02% and 0.09% in India.[1] As compared to west, rates of manual small incision cataract surgery are more and intracameral moxifloxacin is also available as an alternative to intracameral cefuroxime in India.[2]

Intraoperative preparation of skin with 10% povidone iodine and conjuctiva with 5% povidine iodine still remains the most effective measure to prevent post-surgical endophthalmitis. Various other measures include the use of preoperative and postoperative topical and systemic antibiotics, intraoperative irrigating fluids with antibiotics, and subconjuctival injection of antibiotics at the end of surgery.[1] Evidence to prove definite efficacy of these measures is lacking in the literature. The routine use of intracameral antibiotics is increasing after it was first recommended by 2006 ESCRS Study. Haripriya *et al*. have found that routine intracameral moxifloxacin prophylaxis is effective in causing 3.5 fold reduction in overall rates of endophthalmitis following cataract surgery.[3] AIOS survey 2017 showed that less than 40% respondents used intracameral antibiotics, where 36.6% used in all cases and 46.2% used in high-risk cases only.[1] Sharma *et al*. have also recommended the use of prophylactic intracameral cefuroxime only in high-risk cataract surgeries like posterior capsule rupture, vitreous loss, etc.[4]

As compared to intracameral antibiotics, nearly all ophthalmologists prescribe postoperative antibiotic regimen. 97% of the respondents in ASCRS survey 2014 used postoperative antibiotics where 72% stopped them within a week.[5] 94.4% of respondents in AIOS survey 2017 also followed the same.[1] The purpose of postoperative topical antibiotics is to reduce the colonization of ocular surface and allow sufficient level of antibiotic in aqueous to inhibit the growth of pathogen. Recent studies have shown that there is no real benefit of using topical antibiotics.[6] Rudnisky *et al*. showed reduced rate of endophthalmitis after the use of topical fluoroquinolones in a study of 75,318 cataract surgeries.[7] Systemic antibiotics have no role due to limited ocular penetration. There are various issues with intensive postoperative drug regimen involving multiple drugs. Compliance and affordability become important in resource-limited countries like ours. An *et al*. found that 92.6% of cataract patients showed improper technique of eye drop administration.[8] 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 present study highlighted the efficacy of intracameral moxifloxacin and cefuroxime in reducing rates of endophthalmitis in rural settings.[9] Interestingly, the decision to administer postoperative antibiotics was left to the discretion of treating surgeon. Moxifloxacin, being a 4th generation fluoroquinolone offers distinct advantages of 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 topical concentration of antibiotic. A recent Cochrane review in 2017 has reported that there is moderate certainty of evidence showing benefit of combination of eyedrops and injection of antibiotics in reducing chance of endophthalmitis than either alone.[10] Prospective randomized control trials (RCTs) having adequate sample size are needed to confirm the findings and strengthen the evidence.

There are various concerns regarding the routine use of intracameral antibiotics such as commercial availability of formulations, dilution errors, emergence of drug resistance, safety (like cases of hemorrhagic occlusive retinal vasculitis with vancomycin), risk of anaphylaxis, TASS, and cost. Prospective RCTs in Indian settings can help to address this lacunae. Research is also going on antibiotic-soaked intraocular lenses and transzonular drug delivery during cataract surgery, which can help to avoid the need of postoperative drug regimen in future. Patient selection and preparation, ot sterilization, and surgeon related sterility still hold the key to prevent any untoward incident of endophthalmitis.

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