

# THE LITERATURE

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## INCIDENCE OF POSTOPERATIVE ENDOPTHALMITIS FROM 1990 TO 2009 USING POVIDONE-IODINE BUT NO INTRACAMERAL ANTIBIOTICS AT A SINGLE ACADEMIC INSTITUTION

*Nentwich MM, Ta CN, Kreutzer TC, et al<sup>1</sup>*

### ABSTRACT SUMMARY

Nentwich et al performed an extensive retrospective chart review of all the intraocular surgeries performed at one institution over a 20-year period to evaluate the incidence of postoperative endophthalmitis with respect to changing preoperative prophylaxis protocols. During the time period between 1990 and 2009, three different preoperative prophylaxis regimens using povidone-iodine 1% were administered. In the first period (1990-1992), the preoperative protocol with povidone-iodine was variable according to the surgeons' preference (ie, no protocol was in place other than that of using povidone-iodine prior to surgery). The second period (1993-1998) consisted of cleansing the periorbital area with 10% povidone-iodine and a cotton swab and then subsequently placing one drop of povidone-iodine 1% into the conjunctival sac at least 1 minute before surgery. The third period (1999-2009) consisted of copious irrigation with 10 mL of povidone-iodine 1% of the conjunctival sac along with the prior periorbital cleansing with 10% povidone-iodine. Of note, all patients in the second and third periods received polymyxin, neomycin, and dexamethasone drops before surgery.

According to the study, the rate of postoperative endophthalmitis declined for all intraocular surgeries as well as cataract surgeries alone over the 20-year period. For cataract surgery, the overall rate of postoperative endophthalmitis was 0.338% in period one, 0.224% in period two, and 0.041% in period three.

### DISCUSSION

Preventing postoperative endophthalmitis has recently become a highly discussed topic owing to the increasing use of intracameral antibiotics in the United States and abroad. Depending on the study, endophthalmitis rates can range from 0.07% to 0.35%.<sup>2-5</sup> In recent years, the introduction of different pre- and intraoperative regimens, including the use of different techniques with povidone-iodine and the use of intracameral antibiotics,

has led to a significant reduction in the rates. Still, debate continues over the optimal prophylaxis, and certain factors in some countries such as the lack of an approved intracameral antibiotic can limit the available options.

For surgeons unsure of or uncomfortable with the routine use of intracameral antibiotics due to the possible side effects or risk factors, the data for the effectiveness of a thorough povidone-iodine preparation are encouraging. Research has proven that the preoperative use of povidone-iodine can decrease the bacterial load on the conjunctival surface.<sup>6-8</sup> Although it may be an assumption that lower bacterial loads decrease rates of endophthalmitis, this study suggests that the method of povidone-iodine 1% prophylaxis used preoperatively can affect the rate of postoperative endophthalmitis. Based on the study results, a longer exposure time of the conjunctiva to povidone-iodine (ie, 10-mL irrigation of povidone-iodine to the conjunctiva vs one drop placed) appears to help reduce the rate of endophthalmitis.

Studies have also shown that most of the causative bacteria in culture-proven endophthalmitis are the patient's own flora (eyelid, conjunctiva, nose).<sup>9</sup> A recent study demonstrated that 59% of all patients undergoing cataract surgery have blepharitis.<sup>10</sup> Therefore, it could be reasonable to conclude that eradicating the bacterial flora with povidone-iodine before surgery should yield low endophthalmitis rates. In this study, the lowest rate of endophthalmitis with the use of povidone-iodine alone was 0.041% compared to 0.062% with the use of intracameral cefuroxime in the European Society of Cataract and Refractive Surgeons study.<sup>5</sup> Confirmatory studies are required to elucidate whether optimizing the method of povidone-iodine administration is as effective as intracameral antibiotics for reducing the risk of endophthalmitis.

## CORNEAL ENDOTHELIAL CHANGES AFTER INTRACAMERAL VANCOMYCIN INJECTION IN CATARACT SURGERY

*Perez-Canales JL, Perez-Santonia JJ, Campos-Mollo E, et al<sup>11</sup>*

### ABSTRACT SUMMARY

Perez-Canales et al examined the effects of intracameral vancomycin on the corneal endothelium. The prospective comparative case series included 60 eyes to receive either intracameral vancomycin (1 mg/0.1 mL; n = 30) or cefuroxime (1 mg/0.1 mL; n = 30) at the end of cataract

surgery. The investigators evaluated the outcomes of visual acuity, corneal clarity, pachymetry, anterior chamber reaction, endothelial cell density (ECD), coefficient of variance (CoV), and hexagonality 1 week and 1 and 3 months after surgery with specular microscopy.

The endothelial cell changes were similar between the two groups. For both groups, the ECD decreased 1 week after surgery and stabilized by 3 months. There were no statistically significant differences between ECD, CoV, and hexagonality between the vancomycin and cefuroxime groups at the end of the study. The results suggest that intracameral vancomycin is safe for use in cataract surgery.

## DISCUSSION

Due to the devastating effects of endophthalmitis, much investigation has been done to examine the safety and efficacy of intracameral antibiotics. Although the European Society of Cataract and Refractive Surgeons study established that cefuroxime was both safe and effective during cataract surgery,<sup>5</sup> no randomized controlled studies have been performed on the commonly used alternatives moxifloxacin or vancomycin.

Currently, vancomycin is used as a common alternative to cefuroxime when a patient is allergic to moxifloxacin or cefuroxime.<sup>12</sup> The use of intracameral vancomycin has not been given formal approval in Europe due to the lack of a randomized clinical trial and the concern over the development of resistance.<sup>13</sup> Although animal studies and in vitro human corneal studies examining the effects of vancomycin have been performed,<sup>14,15</sup> this study is the first to report in vivo corneal endothelial changes with the use of intracameral vancomycin. Because both age and cataract surgery are already causes for decreasing ECD, there is always concern about causing further endothelial damage via other solutions or medications injected into the eye during cataract surgery.<sup>16</sup>

Perez-Canales et al also analyzed cell shape uniformity (hexagonality) and the variation of cell surface area (CoV), as both the cell count and morphology are considered to be a more reliable index of the cornea's overall health.<sup>17</sup> Injury to the corneal endothelium will result in an increase in the CoV and a decrease in hexagonality.

This study revealed that in both the vancomycin and cefuroxime groups, there was a significant decrease in ECD from the preoperative baseline, but the difference in ECD between the two groups was not statistically significant. One week postoperatively, there was a statistically significant difference in the CoV between the vancomycin and cefuroxime groups (the vancomycin group was worse), but this difference resolved by 3 months. There was no significant difference in hexagonality between the study groups at any time.

Based upon the study's results, it can be concluded that both cefuroxime and vancomycin have similar effects on the corneal endothelium, and both can be safely tolerated when used for endophthalmitis prophylaxis with cataract surgery. ■

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