

CORRESPONDENCE

Intraoperative antibiotics and bacterial contamination of the anterior chamber

Dear Editor,

We read with great interest the recent article by Sobaci and colleagues (Sobaci G., Tuncer K, Tas A, et al. "The effect of intraoperative antibiotics in irrigating solutions on aqueous humor contamination and endophthalmitis after phacoemulsification surgery." *Eur J Ophthalmol* 2003; 13: 773-8). The authors demonstrated that the rate of aqueous humor contamination was significantly decreased when the irrigating solution contained antibiotics throughout the surgery.

However, the authors tested a concentration of antibiotics (20 mg/ml vancomycin and 8 mg/ml gentamicin), which is 1000 times higher than the concentration clinically recommended in irrigating solutions (20 µg/ml vancomycin and 8 µg/ml gentamicin) (1); this factor might have distorted the results and should have been discussed. The efficiency of vancomycin in this study, which contrasts with reports in the literature as the authors noted, is therefore easily explained. Intracameral vancomycin used in irrigating liquids shows a postoperative half-life of less than 2 hours (2, 3). Therefore, with a classical 20 µg/ml vancomycin solution, its concentration becomes theoretically inferior to the minimal inhibitory concentration (MIC) after 4 to 6 hours (4) (the estimated MIC for most bacteria responsible for postoperative endophthalmitis is about 2 - 4 µg/ml

(3). However, vancomycin antibacterial activity is slow, time-dependent, and is reported to begin *in vitro* only after 6 hours, becoming complete after 24 to 48 hours (5). With a concentration such as 20 mg/ml, vancomycin should remain in the anterior chamber long enough to develop any bactericidal effect. But, on the other hand, a potential retinal toxicity has to be taken into account, since vancomycin in concentrations above 10 µg/ml significantly increases the risk of cystoid macular edema and visual loss (4, 6). Furthermore, such high concentrations might change pH and osmolality of aqueous humor, and therefore might be toxic for endothelial cells (7). It would therefore be noteworthy for the authors to report long term visual function, endothelial and macular status of their patients. Due to the above mentioned arguments, we cannot follow the conclusion of the authors to use such fortified antibiotic concentrations daily practice until supplementary data and studies on efficacy, safety and toxicity of this protocol are available.

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REFERENCES

- Gills JP Filters and antibiotics in irrigating solution for cataract surgery. *J Cataract Refract Surg* 1991; 17: 385.
- Ferro J, De-Pablos M, Logrono M Postoperative contamination after vancomycin and gentamycin during phacoemulsification. *Arch Ophthalmol* 1997; 115:165-70.
- Mendivil Soto A, Mendivil MP The effect of topical povidone-iodine, intraocular vancomycin, or both on aqueous humor cultures at the time of cataract surgery. *Am J Ophthalmol* 200; 131:293-300.
- Gordon YJ. Vancomycin prophylaxis and emerging resistance: Are ophthalmologists the villains? The heroes? *Am J Ophthalmol* 2001; 131: 371-6.
- Feys J, Salvanet-Bouccara A, Emond JP, Dublanchet A. Vancomycin prophylaxis and intraocular contamination during cataract surgery. *J Cataract Refract Surg* 1997; 23: 894-7.
- Axer-Siegel R, Stiebel-Kalish H, Rosenblaff I, et al. Cystoid macular edema after cataract surgery with intraocular vancomycin. *Ophthalmology* 1999; 106:1660-4.
- Barron B Corneal toxicity from acidic vancomycin solution. (Letter) *Arch Ophthalmol* 1993; 111:18.

Author Reply

Thanks for Kodjikian and colleagues' interest in our article entitled "The effect of intraoperative antibiotics irrigating solutions on aqueous humor contamination and endophthalmitis after phacoemulsification surgery". *Eur J Ophthalmol* 2003; 13: 773-8.

Kodjikian and colleagues were very kind to notify us about these incredibly high doses of antibiotics, 20 mg/ml and 8 mg/ml of vancomycin and gentamycin respectively. This is simply a typographical error (involuntary mistake). They should have been 20 mg/l and 8 mg/l as was indicated in the references 15-18.

It is understandable that these doses can not be practical in regard to dose calculation, and cost effectiveness if we use these dosages (20 mg/ml and 8 mg/ml). Moreover, toxicity would be a real concern to us at these dosages. The use of vancomycin in this study was based on the clinical result shown in the EVS, current literature, and our experiences with post-

operative endophthalmitis. As indicated in the discussion section, our study design does not permit us to conclude on the antibacterial efficacy of vancomycin in the early postoperative hours and the causal relationship between the aqueous humor contamination and postoperative endophthalmitis. However, we found that intraoperative antibiotic irrigation decreases aqueous humor contamination during phacoemulsification significantly, and the significance of posterior capsular rupture in the development of postoperative endophthalmitis should be sought in future studies.

Sincerely

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