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Fusidic acid *vs* ofloxacin prophylaxis before cataract surgery

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PURPOSE. *To evaluate the safety and efficacy of two self-administrated antibiotics in eliminating conjunctival microbial flora.*
METHODS. *A total of 133 patients operated for cataract surgery were divided into three groups. The first group (A), 55 patients, received fusidic acid drops (1%) two times per day during the 3 days before the surgery; a second group (B), 55 patients, received ofloxacin (0.3%) four times per day during the 3 days before the surgery; and the third group (C), 23 patients, did not receive any topical antibiotic before the surgery. On the day of the surgery, cultures were taken from the lower fornix.*
RESULTS. *In Group A, 28 cultures (50.9%) were sterile, and 27 (49.1%) were positive for the presence of microbial agents. In Group B, 25 cultures (45.4%) were sterile, and 30 (54.5%) were positive for the presence of microbial agents. In Group C, 5 cultures (21.7%) were sterile, and 18 (78.2%) were not.* Staphylococcus epidermidis *was the most common micro-organism isolated in all the groups. Statistical analysis does not reveal a significant difference between Groups A and B for the sterile cultures (p=0.7) (chi-square test), but a statistically significant difference is present between the treated and not treated patients (p= 0.05) (chi- square test).*
CONCLUSIONS. *A preoperative antibiotic prophylaxis is useful in eliminating conjunctival micro-organism, and both antibiotics (fusidic acid and ofloxacin) are efficient. (Eur J Ophthalmol 2005; 15: 718-21)*

KEY WORDS. *Fusidic acid, Ofloxacin, Preoperative prophylaxis, Cataract*

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INTRODUCTION

Postoperative endophthalmitis is an important and potentially devastating complication of intraocular surgery and remains a difficult pathology to manage. The Endophthalmitis Vitrectomy Study (1) reported that 94% of patients with culture proven endophthalmitis have gram-positive organism. Infections are often due to normal eyelid or conjunctival bacterial flora (2, 3) such as the gram-positive bacteria *Staphylococcus epidermidis, Staphylococcus aureus, Streptococcus spp.*, and less commonly implicated are the gram-negative bacteria *Proteus spp*. and *Pseudomonas spp*. Patients receiving a preoperative prophylactic topical antibiotic administration have a reduced incidence of postoperative endophthalmitis (4) but it remains unclear which agents provide the most effective prophylaxis and whether some old agents are still efficient. In our study, we compared two different antibiotics, fusidic acid and ofloxacin, to investigate the efficacy of an older generation compared with a new generation antibiotic.

METHODS

Fusidic acid was first isolated in 1960 (5, 6), from the fermentation of *Fusidium coccineum*. It is a tetracyclic triterpenoid, structurally related to cephalosporin P1,

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available as oral tablet, oral suspension, intravenous, and topical preparations (7). Its action is related to the inhibition of elongation factor G at the level of ribosome, and has activity mainly on gram-positive organisms (5, 6, 8).

The ophthalmic preparation (Fucithalmic) is available as a viscous, 1% concentrated, microcrystalline suspension (8). Fusidic acid, to be effective, needs two administrations in 24 hours (9). After topical administration, fusidic acid penetrates the corneal aqueous barrier and has been identified in the aqueous humor (10). Ofloxacin is a second generation fluoroquinolone, and its progenitor is nalidixic acid (11).

Fluoroquinolone antibiotics are largely used and available in oral, intravenous, and topical preparations. They inhibit the DNA gyrase (11, 12).

They are effective on gram-positive and gram-negative organisms, and the ophthalmic preparation is available as eyedrops (Exocin) at 0.3% concentration and penetrates the corneal aqueous barrier (12).

Ofloxacin, to be effective, needs to be administrated four times per day. In this prospective study, 133 patients referred to our clinic with a diagnosis of cataract were enrolled and randomly divided into three groups. In Group A, 55 patients used fusidic acid (Fucithalmic) drops two times a day for 3 days before the surgery. In Group B, 55 patients used ofloxacin (Exocin) drops four times per day for 3 days before the surgery. In Group C (the control group), 23 patients did not use any topical antibiotic before the surgery.

Preoperative examination, before the enrollment of the patients, included slit lamp evaluation, best corrected visual acuity, intraocular pressure, and fundus. Patients with ocular inflammation or infections, history of recurrent ocular infections, use of antibiotics during the previous 3 months, diabetes, allergy, or renal or hepatic diseases were excluded. All patients were informed about the study and submitted a consent approved by our ethical committee. The day of the surgery, before povidone iodine instillation in the conjunctival fornices, cultures from the conjunctiva were obtained by rubbing a sterile cotton tipped swab. The specimens were incubated in trypticase soya for 24 hours at 37 °C degrees, then on six different plates (containing MAK, MSA, Sabouraud, Columbia, Agarsan, GTS for another 24 hours. Chi-square test was used to compare the different groups.

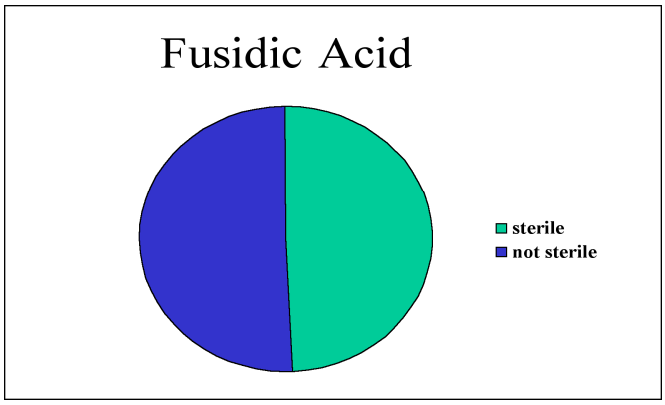

Fig. 1 - *Sterile (50.9%) and not sterile (49.1%) cultures in Group A.*

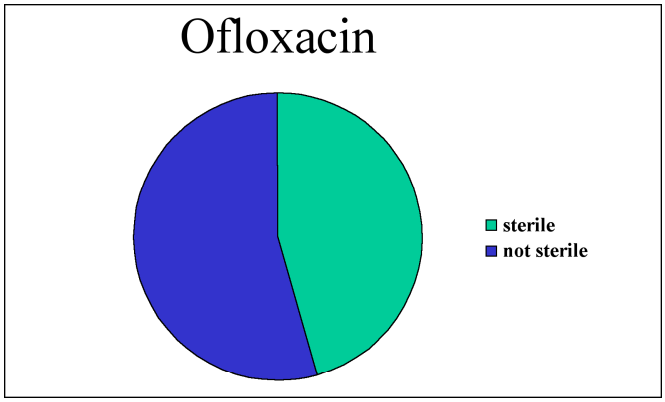

Fig. 2 - *Sterile (45.4%) and not sterile (54.5%) cultures in Group B.*

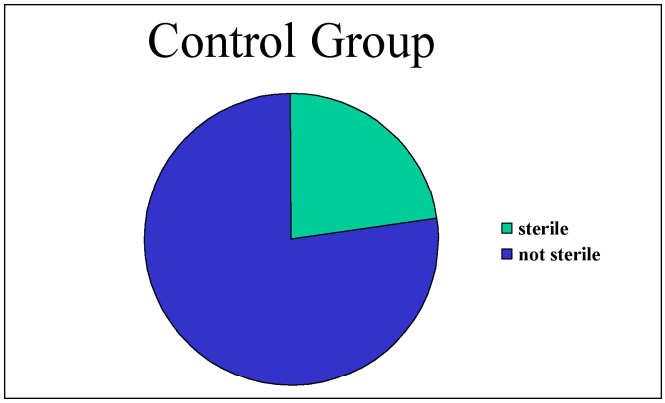

Fig. 3 - *Sterile (21.7%) and not sterile (78.2%) cultures in Group C.*

RESULTS

In Group A, 28 cultures (50.9%) were sterile, and 27 (49.1%) were positive for the presence of microbial agents: *S. epidermidis* was detected in 22 cultures, *Streptococcus hemolyticus* in 3 cultures, *S. aureus* and *Pseudomonas aeruginosa* in 1 culture (Fig. 1). In Group B, 25 cultures (45.4%) were sterile and 30 (54.5%) were positive for the presence of microbial agents: *S. epidermidis* was detected in 26 cultures, *S. hemolyticus* in 1 culture, *S. aureus* and *P. aeruginosa*, respectively, in 2 and 1 cultures (Fig. 2). In Group C, 5 cultures (21.7%) were sterile, and 18 (78.2%) were not: *S. epidermidis* was detected in 14 cultures, *S. hemolyticus* in 1 culture, *S. aureus* in 3 cultures (Fig. 3). A comparison between the culture positive and culture negative patients in Groups A and B did not show any significant statistical difference (p=0.7) (chi-square test). However, the comparison between Groups A and B and the control group revealed a significant statistical difference (p=0.05) (chi-square test).

DISCUSSION

Postoperative endophthalmitis is a potentially devastating complication of intraocular surgery and the most important emergency after cataract surgery (13-15). In order to prevent intraocular infections, one needs to minimize the risks before and during the surgical procedure and eliminate the possibility of micro-organism contamination of the operating room. Every instrument used in the surgery must be sterile. Ideally, the eye should be sterile also. In our study, we examined the efficacy of a preoperative prophylaxis with two topical antibiotics; the administration of a preoperative topical antibiotic, povidone iodine, and intraocular antibiotics have been discussed in the literature (4, 14, 16-18). The preoperative prescription of a topical antibiotic and a self-administrated medication is a first barrier against postoperative intraocular infections, as proven by our study with a statistical difference between the treated and untreated groups. In our practice, this first barrier is followed by topical administration of antibiotic 2 hours before the surgery. The use of povidone iodine to clean the eye preoperatively, an injection of vancomycin in the anterior segment at the end of the surgical procedure, and the use of postoperative topical antibiotics and corticosteroid eyedrops are also done (19). The goal of a preoperative prophylaxis should be the reduction of gram-positive bacteria responsible for 94% of endophthalmitis (1), and both antibiotics were effective in our series. Other researchers have shown that ofloxacin is efficient in reducing microorganisms in normal eyes (20, 21); our data suggest that the administration of fusidic acid is effective as well. In conclusion, the administration of ofloxacin or fusidic acid reduces the risk of postoperative infections.

None of the authors has financial interest in any product mentioned.

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