

Effect of ofloxacin eye drop on bacterial culture of the conjunctival sacs in cataract patients

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Abstract

• **AIM:** To investigate the effect of ofloxacin eye drop on bacterial culture of the conjunctival sac in senile cataract patients.

• **METHODS:** Thirty cases (60 eyes) with senile cataract were randomized into two groups: the control group (15 cases, 30 eyes) and the ofloxacin group (15 cases, 30 eyes). The ofloxacin group received 3g/L ofloxacin eye drop five times per day and one drop per time. Bacterial culture was done before treatment and at day 1, 2 and 3 of treatment.

• **RESULTS:** The cumulative score of bacterial colonies in the conjunctival sac for the control group was 51, 51, 33, and 42 respectively, and for the ofloxacin group, 51, 30, 9 and 0 respectively. Paired *t*-test showed a *P* value of 0.043 at day 3 of treatment. The positive rate of bacteria in the conjunctival sac for the control group was 60%, 60%, 40%, and 50% respectively, and for the ofloxacin group, 60%, 30%, 10%, and 0% respectively. The Chi-squared test showed *P* < 0.01 at day 3 of treatment.

• **CONCLUSION:** Using ofloxacin eye drop for 3 days before surgery can eliminate the bacterial flora of the conjunctival sac in senile cataract patients.

• **KEYWORDS:** conjunctival sac; bacterial culture; ofloxacin

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INTRODUCTION

The conjunctival sac of the human eye communicates with the external environment and consequently airborne

microbes may directly lodge in the conjunctival sac. In addition, microbes on the skin surface can enter the conjunctival sac via the eyelid or hand. Meanwhile, the conjunctival sac contains the appropriate temperature and humidity and an abundant blood supply that offer an appropriate environment for microbe growth. The microbe population together with the conjunctival sac thus forms a complex microbiological system^[1,2]. The human eye carries approximately one gram of microbes by weight^[1]. The microbiological system in the conjunctival sac will change as a result of surgical manipulation of the eye^[3]. Bacterial infection of the eye is subjected to multiple determinants^[4], including age, ingrown eyelashes, wearing of contact lenses, diabetes mellitus, and use of immunosuppressants. Sterilization before surgery of the inner eye is very important. In the current study, we investigated the effect of ofloxacin eye drop on bacterial culture of the conjunctival eye in senile cataract patients with normal outer eye.

MATERIALS AND METHODS

Subjects Thirty senile cataract patients (60 eyes) who received treatment at the First Hospital of China Medical University were included in the study. They included 16 males and 14 females and the mean age was 61.5 ± 0.2 years. The outer eye of these patients was normal. There was no acute conjunctivitis, dacryocystitis and blepharitis. The cases were randomized into two groups: the control group (15 cases, 30 eyes), which did not receive any antibiotic eye drop, and the ofloxacin group (15 cases, 30 eyes), which received 3g/L ofloxacin eye drop (Santen Pharmaceutical Co. Ltd., Japan) 5 times per day on average and one drop per time.

Methods Conjunctival sac swap samples were obtained before ofloxacin treatment and at day 1, 2 and 3 of treatment. The examination room was sterilized by ultraviolet (UV) and the patients were asked to be in the sitting position and look in the upper outer direction while the lower eyelid was gently pulled down using a sterile Q tip. A sterile Q tip was used to swap the exposed conjunctival surface from the lateral to the medial canthus. The conjunctival swap samples were then put into a small vial containing 0.2mL broth media and were agitated for 1 minute. A sterile loop of platinum wire was then used to streak the bacterial broth media on plain agar plates and blood agar plates. The remaining broth media was brought up to 0.5mL

Table 1 The cumulative score and positive rate of conjunctival sac bacterial culture in senile cataract patients

Group	Before treatment	Day 1 post treatment	Day 2 post treatment	Day 3 post treatment
Cumulative score:Control	51	51	33	42
Ofloxacin	51	30	9	0 ^a
Positive rate:Control	60	60	40	50
Ofloxacin	60	30 ^b	10 ^b	0 ^b

^a*P* = 0.043 vsControl, ^b*P* < 0.01 vsControl.

in volume. The three types of bacterial culture were placed into an incubator at 37°C for 48 hours. The number of bacterial colonies was counted. If the number of colonies on the agar plates was zero, it was “-”; if between 1 and 5, it was “+”; if within 10, it was “++”; if above 11, it was “+++”. For broth media, if there was no turbidity, it was “-”; if it was lightly turbid, it was “+”; if moderately turbid, it was “++”; if severely turbid, it was “+++”. The cumulative score was calculated by the number of colonies^[1]. Bacterial smears were routinely prepared and Gram stained. Bacteria were identified according to the morphology of the bacteria under the microscope.

Statistical Analysis The cumulative score of conjunctival sac bacterial culture use paired *t*-test to do the analysis. And Chi-squared test was used in the detection rate of bacteria.

RESULTS

In control group, the positive detection rate was 60%. There was no significant difference in the spectrum of bacteria detected. Among them, the most commonly seen bacteria were *Staphylococcus epidermidis* (30%), followed by group C *Streptococcus* (23%), *Catarrhalis diplococci* (17%), and *Bacillus xerosis conjunctivae* (11%). *Staphylococcus aureus*, fungi and micrococci were isolated in a small proportion of patients. In ofloxacin group, the cumulative score of the bacterial culture of the conjunctival sac gradually decreased with increased length of ofloxacin use and the cumulative score at day 3 of ofloxacin treatment stood at zero (Table 1).

The positive detection rate of bacteria from the conjunctival sac in ofloxacin group gradually decreased and the detection rate was zero at day 3 of ofloxacin treatment (Table 1). The positive detection rate of bacteria from conjunctival swap samples in these patients showed in Table 1. The positive detection rate in control group did not show apparent changes. The positive detection rate in the ofloxacin group gradually decreased with increased length of ofloxacin use. At day 1 of treatment, $\chi^2 = 17$; day 2, $\chi^2 = 22$; day 3, $\chi^2 = 64$.

DISCUSSION

Literature review indicates that the predominant gram positive bacteria among the bacteria cultured from the normal conjunctival sac are *Staphylococcus* and the predominant anaerobes are *Propionibacterium* spp^[5-8]. Moreover, more

bacteria are cultured than fungi. The results of this study are consistent with those reported. However, our results still remain to be further supplemented with data from anaerobic culture and mycological culture^[9]. It has been reported that sensitive antibiotics or iodine tincture can prevent postoperative or iatrogenic ocular infection^[10,11]. Our study demonstrated that 3g/L ofloxacin eye drop can effectively kill the bacteria in the conjunctival sac and preoperative use of ofloxacin for 3 days could achieve sterilization in the conjunctival sac and prevent postoperative ocular infection. In conclusion, in senile cataract patients, application of 3g/L ofloxacin eye drop for 3 days could achieve sterilization of the conjunctival sac.

REFERENCES

- Zeng SS, Wu XM. Bacterial flora of the normal conjunctiva. *Int J Ophthalmol(Guoji Yanke Zazhi)* 2006;6(4):854-856
- Redfern RL, Reins RY, McDermott AM. Toll-like receptor activation modulates antimicrobial peptide expression by ocular surface cells. *Exp Eye Res* 2011;92(3):209-220
- Graham JE, Moore JE, Jiru X, Moore JE, Goodall EA, Dooley JS, Hayes VE, Dartt DA, Downes CS, Moore TC. Ocular pathogen or commensal: a PCR-based study of surface bacterial flora in normal and dry eyes. *Invest Ophthalmol Vis Sci* 2007;48(12):5616-5623
- Miño De Kaspar H, Ta CN, Froehlich SJ, Schaller UC, Engelbert M, Klauss V, Kampik A. Prospective study of risk factors for conjunctival bacterial contamination in patients undergoing intraocular surgery. *Eur J Ophthalmol* 2009;19(5):717-722
- Zeng SS, Wu XM, Song J, Zeng CH, Liu SC. Analysis of bacterial culture results in 397 normal conjunctiva. *Int J Ophthalmol(Guoji Yanke Zazhi)* 2007;7(1):117-120
- Sun SY, Zhai HL, Xie LX. Analysis of bacterial culture results in conjunctival sacs of cataract patients before operation. *Zhongguo Shiyong Yanke Zazhi* 2005;23(5):509-513
- Chen Q, Zhang JH, Zheng L, Wang HY, Ju Y, Gao P. Conjunctiva sac and palpebral margin bacterial culture and drug sensitive test before LASIK. *Int J Ophthalmol(Guoji Yanke Zazhi)* 2005;5(3):481-484
- Xia GL, Luan J. Analysis of bacterial culture in normal conjunctival sac. *Journal of Southeast University (Medical Science Edition)* 2010; (5):535-538
- Sun XG, Wang ZX, Wang ZQ, Luo SY, Li R. Ocular fungal isolates and antifungal susceptibility in northern China. *Am J Ophthalmol* 2007; 143(1):131-133
- Cardillo JA, Paganelli F, Melo LA Jr, Silva AA Jr, Pizzolitto AC, Oliveira AG. Subconjunctival delivery of antibiotics in a controlled-release system: a novel anti-infective prophylaxis approach for cataract

surgery. *Arch Ophthalmol* 2010;128(1):81-87

11 Carrim ZI, Mackie G, Gallacher G, Wykes WN. The efficacy of 5% povidone-iodine for 3 minutes prior to cataract surgery. *Eur J Ophthalmol* 2009;19(4):560-564

白内障术前滴用氧氟沙星滴眼液对结膜囊细菌培养的影响

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摘要

目的:观察老年性白内障患者术前应用氧氟沙星滴眼液对

结膜囊细菌培养的影响。

方法:老年性白内障患者30例60眼,随机分成两组:对照组15例30眼,3g/L氧氟沙星点眼组15例30眼,平均点眼5次,1滴/次。观察点药前,点药1,2,3d,结膜囊内细菌的变化。

结果:点药前,点药1,2,3d,结膜囊内细菌落积分的变化:对照组,51,51,33,42;3g/L氧氟沙星点眼组,51,30,9,0。配对 t 检验统计分析,点药3d, $P=0.043$ 。结膜囊内细菌检出率的变化:对照组,60%,60%,40%,50%;3g/L氧氟沙星点眼组,60%,30%,10%,0。 χ^2 检验,点药3d, $P<0.01$ 。

结论:老年性白内障患者术前应用氧氟沙星滴眼液点眼,3d可以达到结膜囊内无细菌。

关键词:结膜囊;细菌培养;氧氟沙星

Letter from Prof. G. O. H. Naumann, Immediate Past-President of ICO

Dear President and Chief Editor!

Dear Colleague Prof. Xiu-Wen Hu!

Thank you so much for your kind email of February 25, 2011. I congratulate you that your Journal was accepted for coverage by the SCIE.

Following your request I send you for your new section "Introduction to the World Leading Ophthalmologists" as attachment

1. Abbreviated curriculum vitae

2. 10 pictures outlining the contributions from our group. Thank you so much for your interest.

We also cherish the memories of our meeting at the WOC 2010 in Berlin.

Looking forward to the next opportunity to meet again, I remain

Sincerely Yours

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