

The Effect of Preoperative Eyelash Trimming on Periocular Bacterial Flora

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Abstract

Purpose: To evaluate the effect of preoperative eyelash trimming on periocular bacterial flora.

Methods: One hundred patients divided into two groups. Fifty cases (group 1) had eyelash trimming prior to phacoemulsification and other fifty patients (group 2) did not. None of the study participants had been diagnosed as having an active ocular infection prior to surgery. Patients taking topical and systemic medications were excluded from the study. Eyelid and inferior conjunctiva cultures were obtained during the preoperative visit. Phacoemulsification was done through a temporal clear corneal incision. At the end of operation, cultures were retaken.

Results: The culture results showed that *Staphylococcus epidermis* was the most commonly isolated bacterial species from eyelids and fornix prior and following the operation. There were no statistically significant differences for eyelid cultures testing positive for any of isolated organisms between eyelash trimmed and not trimmed before and after surgery. There were also no statistical differences in the proportion of conjunctiva cultures testing positive for any of isolated organisms in before-after surgery as well as cultures of anterior chamber specimen.

Conclusion: In this study, it is shown that eyelash trimming - as a common preoperative technique for endophthalmitis prophylaxis in patients undergoing cataract surgery - may not be effective.

Keywords: Endophthalmitis, Prophylaxis, Eyelash Trimming

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Introduction

Endophthalmitis remains one of the most devastating complications of ophthalmic surgery for both physicians and patients. In the past two decades, several studies have suggested that the incidence of endophthalmitis was approximately 1 case in 1000 procedures, but several recent large-scale international studies have reported significantly higher rates of endophthalmitis: as many as 3 cases in 1000 procedures.¹

Several possible causes may contribute to the development of endophthalmitis, including incision type, surgical technique, IOL type,

reuse of disposable material, and emerging bacterial resistance to existing antibiotic agents. It has been postulated that the patient's own flora is the most common source of infections.^{2,3} Some studies confirmed that the periocular microbial flora serve as a potential causal agent for postoperative endophthalmitis.⁴

Considering the hypothesis that the most common sources of postoperative endophthalmitis are the patient's external flora, sterilization has become a priority in preventive measures.

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Prophylactic measures have also been studied, like the use of topical povidone-iodine in the conjunctiva before the surgery, preoperative topical antibiotics, eyelash trimming, saline irrigation; intracameral antibiotics or heparin and postoperative subconjunctival antibiotics.

Regarding there has been little known about the effect of eyelash trimming as a sterilization method to reduce of rate of endophthalmitis after phacoemulsification, we carried out a randomized controlled study to evaluate this method.

Methods

A total of 100 patients whom underwent cataract surgery (phacoemulsification), participated in this study. After obtaining approval from the Hospital Review Board at Iran Medical Sciences University, appropriate informed consent for the study was obtained from each patient. Randomly fifty of patients had eyelash trimming with non sterile scissors and tetracycline ointment applied on the scissor blades prior to surgery and other 50 patients did not. None of the study participants had been diagnosed as having an active ocular infection prior to surgery. Patients taking topical and systemic medications were excluded from the study. Cultures were obtained just preoperatively using a sterile cotton swab expressed firmly on eyelid and inferior conjunctiva and immediately inoculated onto plates containing 5% sheep blood, chocolate, and blood culture broth for bacteria. After this procedure, eyelids and eyes were prepped with 5% povidone iodine and draped. We didn't use any disposable adhesive drape. Few minutes later eye was irrigated with 20 cc of normal saline,

phacoemulsification was done through a 3.2 mm temporal clear corneal incision. After that intraocular lens was implanted through a 4.1 mm incision. At the end of operation, for a second time, cultures from eyelid and inferior conjunctiva were obtained using a sterile cotton swab in the same manner as well as 0.1 cc of anterior chamber liquid was taken for microbial culture. All cultures were incubated at 37 0 C for at least 3 days with a laboratory worker masked for patient assignment.

Statistical analysis was performed using the Chi-square test with SPSS program.

Results

The Culture results in eyelash trimmed and not trimmed eyes showed that there was not statistically significant difference between specimen derived from eyelids ($P=0.6$) and conjunctiva ($P=1.0$) preoperative as well as postoperative (table:1). Also it has been shown that there was not any significant difference in specimen culture derived from anterior chamber just postoperatively in two groups ($P=0.49$) (Table 1).

On the other hand it was shown that *Staphylococcus epidermis* was the most commonly isolated bacterial species from eyelids (Table 2) and fornix (Table 3) before and after operation as well as postoperative anterior chamber (Table 4). There were no statistically significant differences for eyelid cultures testing positive for any of isolated organisms between eyelash trimmed and not trimmed before ($P=0.62$) and after surgery ($P=1.00$) (Table 2). There were also no statistical differences in the proportion of conjunctiva cultures testing positive for any of isolated organisms in before ($P=0.60$) and after ($P=1.00$) surgery (Table 3).

Table 1. Culture results in eyelash trimmed and not trimmed eyes

		Eyelash trimmed/Not trimmed	P
Positive eyelid culture	Preoperative	36/42	0.62
	Postoperative	13/13	0.603
Positive conjunctiva culture	Preoperative	6/7	1.00
	Postoperative	3/4	1.000
Anterior chamber positive culture	Postoperative	0/2	0.495

Table 2. Eyelid culture results

	Preoperative	Postoperative
	Trimmed/Not trimmed	Trimmed/Not trimmed
Staphylococcus epidermidis	30/36	13/13
Staphylococcus aureus	0/1	0/0
Propionibacterium acne	2/2	0/0
Staphylococcus epidermidis and aureus	2/1	0/0
Staphylococcus epidermidis and Propionibacterium acne	2/2	0/0
Negative	14/8	37/37
P values	0.62	1.0

Table 3. Conjunctiva culture results

	Preoperative	Postoperative
	Trimmed/Not trimmed	Trimmed/Not trimmed
Staphylococcus epidermidis	6/6	3/4
Staphylococcus aureus	0/0	0/0
Propionibacterium acne	0/1	0/0
Staphylococcus epidermidis and aureus	0/0	0/0
Staphylococcus epidermidis and Propionibacterium acne	0/0	0/0
Negative	44/43	47/46
P values	0.60	1.0

Table 4. Postoperative anterior chamber culture results

	Trimmed/Not trimmed
Staphylococcus epidermidis	0/2
Staphylococcus aureus	0/0
Propionibacterium acne	0/0
Staphylococcus epidermidis and aureus	0/0
Staphylococcus epidermidis and Propionibacterium acne	0/0
Negative	50/48
P values	0.49

Discussion

Strategies for preventing postoperative endophthalmitis begin with the adoption of universal prophylactic measures like preparation of the operative site with povidone iodine, preoperative hand scrubbing by the surgical team, maintenance of a sterile operative field and material, and strict hospital policies regarding infection deterrence. The fundamental principle behind prophylaxis is to decrease the chance that any pathogen will enter the eye and eradicate the pathogens that gained access to the eye during or after surgery.⁵ Several studies have suggested that the patient's external tissues represent the major sources of infection, and evidence has been presented that surface flora routinely gain entry to the anterior chamber during cataract surgery.^{2,6} Although in some centers they use disposable adhesive drapes that

covers the eyelashes, these drapes cannot separate eyelashes from operating area, hence they are not able to eradicate micro organisms of eyelash roots from the operative field.

On the other hand, as we know the base of cilia is the main source of periocular bacterial flora, in regard of the fact, trimming of eyelashes seems meaningless.

Perry and colleagues evaluated the effect of topical preoperative antibiotics and eyelash trimming on reducing the periocular bacterial flora prior to surgery. They found that eyelash trimming prior to surgery did not alter the periocular bacterial flora present on the morning of surgery or at any time during the first four postoperative days. While multiple preoperative topical antibiotics may reduce the incidence of postoperative endophthalmitis

through suppression of periocular bacterial flora.⁷

Ciulla and colleagues in a systematic review assessed the commonly used cataract surgery bacterial endophthalmitis prophylaxis techniques. They concluded that using the preoperative povidone iodine antisepsis is most effective technique to reduce the bacterial endophthalmitis in cataract surgery.⁸

In agreement with prior studies, our results also show that there is no statistical difference in the overall percentage of eyes with positive preoperative eyelids and conjunctiva cultures among patients who had eyelash trimming compared with those did not eyelash trimming

undergoing cataract surgery. Also, postoperative culture of anterior chamber did not show significant difference between the two groups; therefore based on our study eyelash trimming is not recommended as a common perioperative technique for endophthalmitis prophylaxis in patients undergoing cataract surgery.

Conclusion

In this study, eyelash trimming has no significant effect on periocular bacterial flora as well as anterior chamber postoperative flora.

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