

Perioperative Prophylaxis for Endophthalmitis after Cataract Surgery in Iran

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Abstract

Purpose: To describe prophylactic patterns employed against endophthalmitis after cataract surgery in Iran.

Methods: This cross-sectional study included 486 ophthalmologists filling in a self-administered questionnaire during the 20th Annual Congress of the Iranian Society of Ophthalmology in December 2010, Tehran, working in both private and academic medical centers. Prophylactic measures used preoperatively, intraoperatively and postoperatively and self-reported rates of endophthalmitis were assessed as the main outcome measurements.

Results: In the preoperative phase, 75.5% of surgeons used povidone-iodine in the conjunctival sac and 71.4% of them did not use antibiotics. The rate of intraoperative prophylaxis was 61.9% either in the form of intracameral antibiotics or subconjunctival injection (mostly cephazolin or gentamicin). Only 7.8% of participants used intracameral cephalosporins. Postoperative antibiotics [mostly chloramphenicol (57%) and ciprofloxacin (28%)] were used by 94.2% of surgeons. On average, ten years of practice were required to observe one case of endophthalmitis.

Conclusion: The surgeons in present setting used various prophylactic regimens against endophthalmitis after cataract surgery. Setting a local and evidence-based clinical practice guideline seems necessary.

Keywords: Antibiotic Prophylaxis; Cataract Extraction; Endophthalmitis

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INTRODUCTION

Postoperative endophthalmitis (POE), although rare, is one of the most serious complications of intraocular surgery due to severe visual morbidity and negative impacts on vision-related quality of life.^[1] Surgeons have tried to develop methods to reduce this complication through studying its pathogenesis. The ocular surface flora has been shown to be the main source of infection.^[2] Therefore, it is not surprising that various prophylaxis regimens have been proposed aiming to reduce the bacterial load of the ocular surface and external tissues.

Prophylaxis for POE has been an area of much debate and controversy in ophthalmology.^[3,4] The reason is that there are not adequate prospective studies evaluating the effect of different prophylactic measures for POE as it is a rare condition. Although the protocols and guidelines dominate medical practice, major authorities leave the details of antibiotic prophylaxis to the surgeon's discretion.^[5] However, there have been major changes in this trend owing to recommendations of the European Society of Cataract and Refractive Surgeons (ESCRS).^[6]

In the present study, we aim to describe the patterns of prophylactic measures practiced by ophthalmologists

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in Iran for the first time in the aftermath of recent trend shifts in practice.

METHODS

This cross-sectional survey was conducted during the 20th Annual Congress of the Iranian Society of Ophthalmology (IrSO) held in December 2010, Tehran, Iran. The study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences and adhered to the tenets of the Declaration of Helsinki. Informed consent was obtained from all participants.

The study included 486 ophthalmologists out of 1,500 IrSO members who attended the meeting. Three research assistants providing an introduction asked the surgeons to fill in a self-administered questionnaire. To preserve anonymity, the names were entered in a separate database and checked with an up-to-date list provided by the IrSO in order to prevent redundancy and also to insure that a wide range of ophthalmologists from all around the country, working in both private and academic medical centers, entered the study.

The questionnaire was prepared according to a comprehensive literature review and consultation with four experienced ophthalmologists and included questions regarding the demographics and practice patterns of the surgeons, prophylactic measures used preoperatively, intraoperatively and postoperatively, and the rate of endophthalmitis. Preoperative measures included the methods of antisepsis and antibiotic prophylaxis. Intraoperative measures regarded the use of intracameral antibiotics or antibiotics at the end of surgery. Postoperative prophylaxis included time duration and use of antibiotics and/or anti-inflammatory agents.

We calculated the number of practice years required to observe one case of endophthalmitis by dividing the number of endophthalmitis cases stated by all participants by their total practice years.

RESULTS

The questionnaires were filled in by 486 out of 500 surgeons who were asked to attend the study (response rate = 97.2%) including 395 male (81.3%) and 91 female (18.7%) subjects. The characteristics of the study participants are detailed in Table 1.

Preoperative Prophylaxis

The majority of surgeons (75.5%) used 5% povidone-iodine in the conjunctival sac. Most surgeons [347 (71.4%)] did not administer preoperative antibiotics and among those who did [139 (28.6%)], the most commonly used antibiotic was topical chloramphenicol drops [(58 out of 139 surgeons (42%)]. Approximately an equal percentage of surgeons administered preoperative antibiotics 3 days (44%) or 1 day (39%) before the procedure.

Table 1. Characteristics of ophthalmologists participating in the survey

Variable	Number (%)
Area of activity	
Capital city	182 (38.7)
Other cities	288 (61.3)
Highest degree	
General ophthalmologist	274 (56.7)
Cornea fellowship	90 (18.6)
Retina fellowship	79 (16.4)
Glaucoma fellowship	13 (2.7)
Strabismus fellowship	27 (5.6)
Workplace	
Academic center	155 (32.1)
Non-academic center	328 (67.9)
Number of cataract surgeries per week	
<7	206 (43.9)
7 and more	263 (56.1)
Duration of practice (years)	
≤10	187 (41.7)
11-20	163 (36.4)
>21	98 (21.9)

Intraoperative Prophylaxis

A large number of surgeons (61.9%) used a method of intraoperative prophylaxis; either intracameral antibiotics [104 out of 486 participants (21.4%)] or subconjunctival injections [225 out of 486 surgeons (46.3%)]. The distribution of intracameral antibiotics used either directly or in the irrigation bottle is shown in Figure 1.

Postoperative Prophylaxis

Only a minority of surgeons [28 (5.8%)] did not use postoperative antibiotics. In the majority who administered a postoperative antibiotic, 222 ophthalmologists (48%) continued the treatment for one week or less. Overall, 443 surgeons (91.2%) reported the type of postoperative antibiotics they used and the most common types were chloramphenicol (57%), ciprofloxacin (28%), gentamicin (5%), and sulfacetamide eye drops (3%).

We used logistic regression analysis to demonstrate the relationship between certain characteristics of the participants and the use of antiseptic, intraoperative and postoperative antibiotics. Significant associations were only observed between the number of cataract surgeries and the use of subconjunctival antibiotics and also between years of practice (less than 10 years vs. more than 21 years) and the use of postoperative antibiotics [Table 2].

As the final question, participants were asked "How many POE cases have you ever had during your career?" and a sum of 605 cases of POE were reported by 219 out of 486 surgeons (45.1%); more details are presented in Table 3. The direct relationship between the number of practice years and the number of POE was weak,

although statistically significant (Spearman's rho = 0.12, P value = 0.011); similarly the relationship between the number of cataract surgeries per week and POE was also weak (Spearman's rho = 0.19, P value < 0.001). In our survey, ten years of practice were required on average to observe one case of endophthalmitis.

DISCUSSION

The first and only recommended prophylactic measure which effectively reduces the rate of POE is povidone-iodine antiseptics of the conjunctival sac.^[7,8] In our study, 75.5% of surgeons used povidone-iodine 5% in the conjunctival sac which is lower than rates employed by ophthalmologists practicing in Canada,^[9] Australia and New Zealand^[10] and the United Kingdom,^[11] in

these countries, more than 90% of surgeons used povidone-iodine antiseptics for both the conjunctiva and skin.

In the current survey, only 7.8% of participants used intracameral cephalosporins (either by direct injection or as infusion). Other recent studies in this field have also reported that intracameral cephalosporin is not commonly used as a prophylactic method for POE. This is in contrast with findings and recommendations of the ESCRS study showing a fivefold reduction in the incidence of POE by using intracameral cefuroxime.^[6] In a survey on the members of the American Society of Cataract and Refractive Surgery (ASCRS), only 6% reported that they inject intracameral cefuroxime.^[12] In the United Kingdom, 10% of consultant ophthalmologists reported that they used a bolus injection of intracameral cefuroxime or vancomycin during cataract surgery.^[11] In another study on 95 Yemeni ophthalmologists, no one reported the use of intracameral antibiotics.^[13]

In our study, in surgeons who used intracameral chemoprophylaxis the most common administered antibiotic was vancomycin (12%). This pattern resembles the practices being performed in the United States,^[12] Canada^[9] and Germany.^[14]

Approximately half of our respondents injected subconjunctival antibiotics at the conclusion of surgery. This figure has been 66.5% and 77% in UK surveys in 1999 and 2003, respectively;^[11] 44% in studies performed in Australia and New Zealand^[10] and 100% in the Yemen survey.^[13] Conversely, in surveys conducted by the American Academy of Ophthalmology^[12] and in Canada,^[9] the rate of this prophylactic technique was 11% and 13, respectively. Some studies have reported a

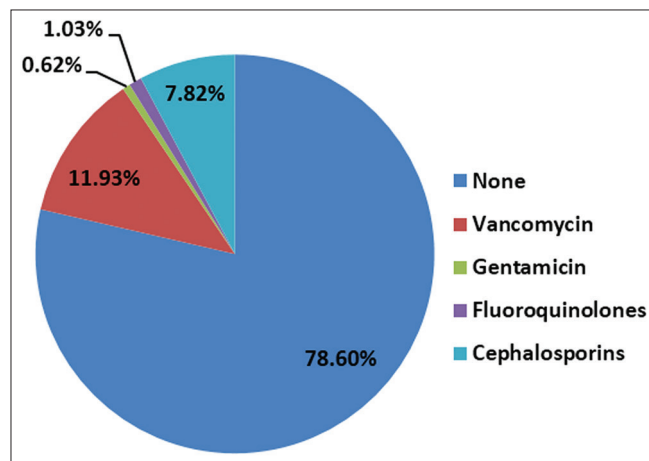


Figure 1. Distribution of intracameral antibiotics used by surgeons.

Table 2. Relationship between participant characteristics and prophylaxis patterns for POE

	Antiseptics	Intracameral antibiotic	Subconjunctival antibiotic	Postoperative antibiotic
Area				
Capital city	1.1 (0.7, 1.8)	1 (0.6, 1.6)	0.8 (0.5, 1.2)	1.5 (0.6, 4)
Other cities	Reference	Reference	Reference	Reference
Degree				
Fellowship trained	0.8 (0.5, 1.4)	0.7 (0.4, 1.3)	0.8 (0.5, 1.3)	0.7 (0.3, 2.1)
General ophthalmologists	Reference	Reference	Reference	Reference
Workplace				
Academic	Reference	Reference	Reference	Reference
Non-academic	1.2 (0.7, 2.1)	1 (0.6, 1.7)	1.1 (0.7, 1.7)	0.9 (0.3, 2.6)
Number of cataract surgeries per week				
<7	0.8 (0.5, 1.2)	0.8 (0.5, 1.3)	1.5 (1, 2.2)*	0.7 (0.3, 1.8)
7 and more	Reference	Reference	Reference	Reference
Duration of practice (year)				
≤10	1.4 (0.8, 2.6)	0.7 (0.4, 1.4)	0.8 (0.5, 1.5)	4.3 (1.3, 14.3)*
10-20	1.3 (0.7, 2.4)	0.7 (0.4, 1.4)	0.8 (0.5, 1.4)	2.5 (0.9, 7)
>21	Reference	Reference	Reference	Reference

Data presented in table is OR with its 95 % CI; * P <0.05; POE, postoperative endophthalmitis; Ref, reference group, OR, odds ratio; CI, confidence interval

Table 3. Number of endophthalmitis cases reported by 486 members of Iranian society of ophthalmology during their career

Endophthalmitis cases	Number of surgeons	Percentage
0	255	52.5
1	73	15.0
2	66	13.6
3	35	7.2
4	16	3.3
5	16	3.3
6	1	0.2
7	2	0.4
10	6	1.2
11	1	0.2
12	1	0.2
18	1	0.2
30	1	0.2
Non-response	12	2.5

considerably reduced risk of POE with subconjunctival antibiotics,^[10,15] however a multivariate analysis on 340,633 cataract procedures in which periocular antibiotics were injected showed a non-significant trend toward prevention of POE after cataract surgery.^[14]

The rate of endophthalmitis is estimated to be one to 7 cases per 1,000 cataract surgeries.^[5,12,14,16,17] We could not directly compare these rates with the results of our study because our method for estimating the rate of POE was different; however, a low rate of one case of endophthalmitis per ten years of practice shows that in our setting, POE is an extremely rare disorder. Meanwhile, as the surgeons self-estimated the rate of POE in their practice, these results should be interpreted with caution.

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