

Incidence of Endophthalmitis After Extra Capsular Cataract Surgery During Period from 2003-2004 in Ibn Al Haithem Hospital

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الخلاصة

تهدف هذه الدراسة إلى تحديد حدوث التهاب محتويات العين بعد إجراء عمليات إزالة الساد من خارج محفظة العدسة خلال الفترة المدددة بين 2003-2004 بهدف هذه الدراسة أيضاً إلى كشف العوامل المساعدة على حدوث التهاب محتويات العين ومقارنة نسبة حدوثه في دول أخرى . تم مراجعة حالات 8479 مريضاً ممن أجروا عملية إزالة الساد من خارج محفظة العدسة خلال الفترة المحددة بين 2003-2004 وقد تم تحليل النتائج وتحديد العوامل الخطرة المساعدة على حدوث المرض .

بشكل كلي عُنِجَ كَانَتْ نِسْبَةُ دَوْتِ التَّهَابِ مَحْتَوِيَّاتِ العَيْنِ هِيَ 11:1000 لِحَالِ فَتْرَةِ الدَّرَاسَةِ حَيْثُ أُجْرِيَتْ عَمَلِيَّاتُ إِزَالَةِ السَّادِ مِنْ خَارِجِ مَحْفَظَةِ العَدْسَةِ مَعَ زَرْعِ العَدْسَةِ فِي الحِجْرَةِ الخَلْفِيَّةِ أَوْ أَلَمَامِيَّةِ، أَوْ بِدُونِ زَرْعِ العَدْسَةِ . اِرْتَفَعَتْ هَذِهِ النِّسْبَةُ إِلَى 13.5:1000 فِي مَرْضَى دَاءِ السُّكْرِيِّ فِي حِينِ كَانَتْ هَذِهِ النِّسْبَةُ 20.8:1000 فِي المَرْضَى الَّذِينَ كَانَتْ لَدَيْهِمْ عَمَلِيَّاتُ لِدَاءِ الزَّرْقَاءِ سَابِقَةً ثُمَّ تَمَّ إِجْرَاءُ عَمَلِيَّةِ إِزَالَةِ السَّادِ مِنْ خَارِجِ مَحْفَظَةِ العَدْسَةِ . أَكْثَرُ حَالَاتِ التَّهَابِ مَحْتَوِيَّاتِ العَيْنِ كَانَتْ فِي المَرْضَى المَسْنِينِ (أَكْثَرُ مِنْ 60 سَنَةً) كَمَا أَنَّ دَوْتِ أَكْثَرِ حَالَاتِ التَّهَابِ مَحْتَوِيَّاتِ العَيْنِ كَعَرَّضَ أُولَى بِنِسْبَةِ 76.76% .

أَنَّ المَلْتَهَبَاتِيَّاتِ مَحْتَوِيَّاتِ العَيْنِ بَعْدَ إِجْرَاءِ عَمَلِيَّةِ إِزَالَةِ السَّادِ مِنْ خَارِجِ مَحْفَظَةِ العَدْسَةِ لَا يَزِيدُ فِي مَجْتَمَعِنَا وَهِيَ وَتَسَدُّ بِبِأَكْثَرِ مَنْ نِسْبَةُ حُدُوثِهَا فِي مَجْتَمَعَاتِ الدُّوَلِ المَتَقَدِّمَةِ وَتُخْتَلِفُ نِسْبَةُ حُدُوثِهَا تَبَعاً لِلعَمْرِ، كَمَا أَنَّ جِنْسَ المَرِيضِ لَيْسَ بِعَامِلٍ مُؤَثِّرٍ فِي حُدُوثِ المَرَضِ . يَجِبُ تَوْجِيهُ عَنَايَةَ خَاصَّةً إِلَى المَخْطِاطِ المَسْاعِدَةِ عَلَى دَوْتِ المَرَضِ مِنْ أَجْلِ إِذْهَابِ الحَسَبِ بَانَ سِوَا كَانَتْ قَبْلَ أَوْ خَلَالَ أَوْ بَعْدَ العَمَلِيَّةِ مِنْ أَجْلِ تَقْلِيلِ نِسْبَةِ حُدُوثِ المَرَضِ .

Abstract

Aim : To determine the incidence of endophthalmitis in our population following extracapsular cataract extraction over time(2003-2004) and to explore possible contributing factors , and to compare with incidence of endophthalmitis in other countries .

Patients and method : 8479 patients who were operated on for cataract surgery during the period from January 2003 to December 2004 were reviewed and all cases of endophthalmitis were analyzed ,and possible risk factors identified

Results : During the study period ,as the technique of extra capsular cataract extraction (ECCE)with or without intraocular lens(IOL) implant whether posterior chamber(PC) intraocular lens or anterior chamber (AC) intraocular lens was performed .

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There was 11:1000 incidence of endophthalmitis in general , with more incidence among diabetes (13.5:1000) and among who had previous trabeculectomy and underwent cataract surgery (20.8 :1000).Most cases of endophthalmitis occur in elderly (over 60) and as an early onset (76.76%).

Conclusion: Post cataract surgery endophthalmitis is not uncommon in our population and it is relatively higher than developed center in the world , and its age dependent and sex has insignificant role in determining the incidence. Special attention to the risks contributing to this disease to be taken in consideration whether pre, per ,post operative to prevent endophthalmitis.

Patients and methods

A retrospective study was conducted on 8479 patients who were operated on for cataract surgery during the period from January 2003 to December 2004 at Ibn- Al-Haitham Eye hospital in Baghdad .

Total number of the patients admitted to the hospital for different reasons for these two years was recorded and also the number of patients that had cataract surgery out of the total number of admitted patients .

The number of patients with previous trabeculectomy that had cataract surgery was recorded .

For the purpose of This study ,endophthalmitis was defined as excessive postoperative intraocular inflammation after cataract surgery , irrespective of microbial culture results or steroids responsiveness.

Surgical and diagnostic data were obtained from the hospital admission , operating notes and ward diaries . For each case of endophthalmitis the surgical details were recorded , type of intraocular lens and operative complications and postoperative subconjunctival injection of antibiotics and steroids depended on operating surgeon , preoperative application of iodine to lid skin and irrigation of conjunctival sac was routine in all cases .

We consider the following data:

- 1- Gender of the patient
- 2- Age of the patient
- 3- If the patient was diabetic or not
- 4- Previous ocular surgery
- 5- Type of intraocular lens, or if the surgery was without lens
- 6- Time of surgery according to season
- 7- Type of anesthesia

Results

Over the two years (2003-2004) , 16,353 patients were admitted to Ibn Al-haitham hospital for different reasons ; 7571 of them were admitted at 2003 , where as 8782 patients were admitted at 2004 .

Out of the total number of admitted patients , 8979 patients for cataract surgery ; 3980 of them had this operation at 2003 , where as 4999 had this surgery at 2004 .

Ninety nine patients (11:1000) had postoperative endophthalmitis ; 48 patients of them at 2003 (12:1000) and 51 patients at 2004 (10.2:1000) .

Total number of male patients had cataract surgery was 4430 , out of that number 48 patients had endophthalmitis(10.8:1000), (27 patients at 2003 , and 21 patients at 2004) . Figure 3.11

Total number of female patients had cataract surgery was 4549 , out of that number 51 patients had endophthalmitis(11.2:1000), (21 patients at 2003 , and 30 patients at 2004) . Figure 3.11

Age distribution was shown in figure 3.12 demonstrating endophthalmitis occur more in the elderly (over 60 years old) .

Total number of diabetic patients had cataract surgery was 3250, out of that 44 patients had endophthalmitis (22 patients at 2003, and 22 at 2004) i.e. more incidence among diabetes(13.5:1000) .Table 3.2 Fig 3.13 shows diabetic patients with endophthalmitis out of total cases of endophthalmitis .

Total number of trabeculectomy patients that had cataract surgery was 480 , out of those only 10 patients had endophthalmitis i.e. the incidence is (20.8 : 1000) , (6 patients at 2003 , and 4 patients at 2004) .

Total number of patients that had cataract surgery without IOL (plain) was 2101 patients , only 14 patients out of total number had endophthalmitis (i.e. 6.66 : 1000) . While the number of patients that had cataract surgery with posterior chamber IOL was 6050 patients , only 65 patients had endophthalmitis (i.e. 24.1: 1000) . In the contrary, number of patients that had cataract surgery with vitreous loss and anterior chamber IOL was 828 patients , only 20 patients had endophthalmitis (i.e. 24.1: 1000) . Tables 3.10 , 3.11

Total number of patients with early onset endophthalmitis was 76 patients , While only 23 patients had late onset of endophthalmitis .Table 3.5 Fig 3.15

Seasonal distribution of total number of patients with endophthalmitis is shown in Table 3.7 , Figure 3.17.

Total number of patients that had cataract surgery under general anesthesia was 6419 patients, 72 patients out of total number had endophthalmitis (i.e. 11.2 : 1000) . While the number of patients that had

cataract surgery under local anesthesia was 2560 patients , only 27 patients had endophthalmitis (i.e. 10.5 : 1000) . Table 3.6, Fig 3.16
 These results are shown in the following tables and figures :

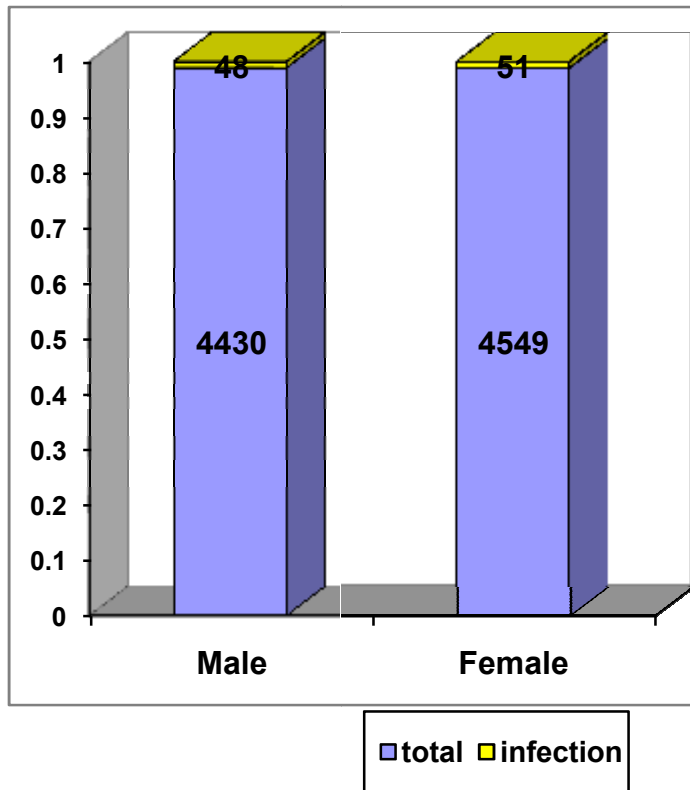
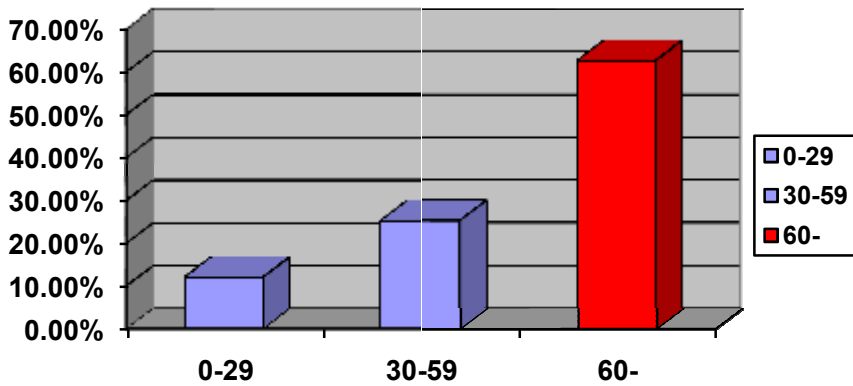


Figure 3.11 represents the sex distribution among patients with endophthalmitis
Incidence of endophthalmitis among male 10.8:1000
Incidence of endophthalmitis among female 11.2:1000
Incidence of endophthalmitis among both sexes 11:1000

Table 3.1 shows the age groups involved in endophthalmitis cases

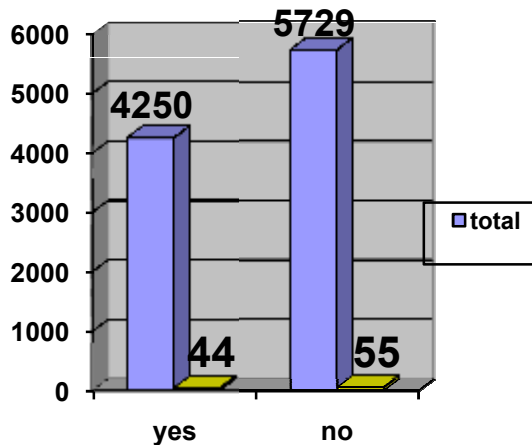
Age	No.	%
0-29	12	12.1 %
30-59	25	25.25 %
60- more	62	62.62 %
Total	99	100 %



**Figure 3.12 represents the age groups involved in endophthalmitis cases
Incidence of endophthalmitis occur more in elderly**

**Table 3.2 shows diabetics had postcataract surgery endophthalmitis
Versus non diabetics had postcataract surgery endophthalmitis**

	Patients with infection		Total studied patients	
	No.	%	No.	%
Diabetic				
Yes	44	44.4%	4250	36.1
No	55	55.5%	5729	63.9
Total	99	100%	8979	100%



**Fig 3.13 represents diabetics had postcataract surgery endophthalmitis
Incidence of endophthalmitis among diabetics 13.5:1000**

Table 3.3 shows patients with previous ocular history who had endophthalmitis

Previous history	No.	%
Yes	37	37.3%
No	62	62.6%
Total	99	100%

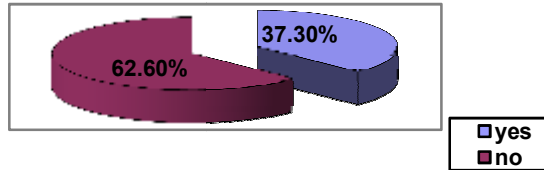


Fig 3.14 represents patients with previous ocular history who had endophthalmitis

Table 3.4 shows criteria of patients with previous ocular history who had endophthalmitis

With previous ocular history had infection	No.	%
Trab	10	27 %
Phaco	1	2.7 %
RD	1	2.7 %
trauma	2	5.4 %
Vitrectomy	1	2.7 %
DCR	1	2.7 %
Others	21	56.75 %
Total	37	100 %

Table3. 5 shows the time of onset of endophthalmitis

Time of onset	No.	%
Early (less than 6weeks)	76	76.76 %
Late(more than 2months)	23	23.23 %
Total	99	100%

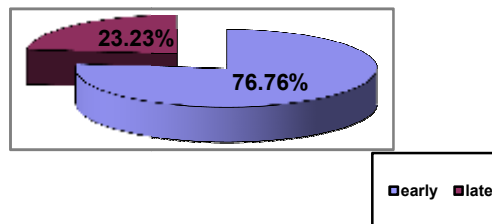
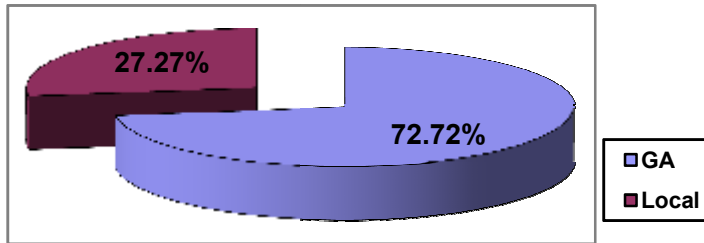


Fig 3.15 represents the time of onset of endophthalmitis

Table 3.6 shows the type of anesthesia in patients with endophthalmitis

Type of anesthesia	infection		total	
	No.	%	No.	%
General anesthesia	72	72.72 %	6419	71.1
Local anesthesia	27	27.27 %	2560	28.9
Total	99	100%	8979	100%

**Fig 3.16 shows type of anesthesia in patients with endophthalmitis****Table3. 7 shows number of patient had endoph thalmitis distributed among months**

Months	No.	%
1-3	27	28.28 %
4-6	23	23.23 %
7-9	24	24.24 %
10-12	24	24.24 %
Total	99	100 %

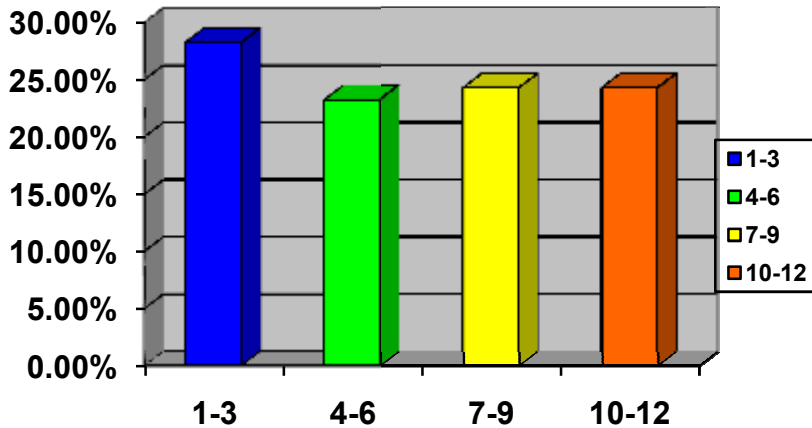


Fig 3.17 represents endophthalmitis cases distributed among months

- 1) the incidence of endophthalmitis in 2003 was 1.2% = 12 :1000
- 2) 52% of the patients had cataract surgery with or without intraocular lens implant out of total admitted patients.
- 3) the incidence of endophthalmitis In 2004 was 1.02% = 10.20 : 1000
- 4) 56.9% of the patients had cataract surgery with or without intraocular lens implant out of total admitted patients.

Table 3.8 shows previous trabeculectomy cases who had infection postcataract operation

	infection	total	Incidence /1000
Trab	10	480	20.8 : 1000

Table3.9 shows total plane cataract operation and its incidence of infection

	infection	total	Incidence /1000
plain	14	2101	6.66 : 1000

Table 3.10 shows total cataract operation with posterior chamber intraocular lens and its incidence of infection

	infection	total	Incidence /1000
PC IOL	65	6050	10.7 : 1000

Table3. 11 shows total cataract operation with anterior chamber intraocular lens and its incidence of infection

	infection	total	Incidence /1000
AC IOL	20	828	24.1 : 1000

Table 3.12 shows total cataract operation with local anesthesia and its incidence of infection

	infection	total	Incidence /1000
local	27	2560	10.5: 1000

Table 3.13 shows total cataract operation with general anesthesia and its incidence of infection

	infection	total	Incidence /1000
GA	72	6419	11.2 : 1000

Over all incidence of endophthalmitis of these two years was 11: 1000 .

Discussion

In the present study , the incidence of endophthalmitis was 11 : 1000 over time between 2003 and 2004 in a series of patients that had extracapsular cataract extraction surgery . This incidence is higher than it was shown in other comparable studies , in department of ophthalmology Taunton and Somerset hospital in a single U.K eye department over 1999 - 2001 , the incidence was 1.6 : 1000²⁴ ,

while in recent years in the United States, the incidence of endophthalmitis after ECCE with IOL has been less than 2 : 1000.²⁵

In addition the incidence of endophthalmitis in U.K at 1970 was 3.2 : 1000 , while at 1980 was 2.5 : 1000.²⁶ Incidence rate of postoperative endophthalmitis was 1.79 per 1000 procedures over the 21-year period From the School of Population Health, The University of Western Australia, Crawley, Western Australia, Australia; and the Department of Ophthalmology, Royal Perth Hospital, Perth, Western Australia, Australia.²⁷

Generally the incidence of endophthalmitis varies greatly according to the population ; An epidemiological investigation by the Thai Field Epidemiology Training Program included a retrospective review of hospital records of all patients who had had cataract operations (predominantly ECCEs) in 1992 in Thailand was 5 : 1000 , comparing with Canada in 1993 , it was 3.5 : 1000 .²⁸

Its important to emphasize that this incidence occurs worldwide with variably reported incidence that reflects a combination of difference in this rate on the bases of age , gender , previous ocular history , previous history of diabetes mellitus , environmental factors , type of cataract surgery , clinical criteria to make the diagnosis ,the ability to examine and detect early stages and/or more subtle manifestation of the disorder and thorough examination .²⁹

Age distribution in our endophthalmitis cases points to the following facts :

- 1 -this disorder is rarely seen in patient below 4 years.
- 2-it shows more occurrence in the elderly(over 60 years).
- 3-its age dependent and increased with age.

On reviewing the literature ,there is a clear association with age as a risk factor , in Western Australia elderly patients has increasing rates of endophthalmitis from 1999-2004 with incidence of 4.3:1000 ;So older age groups is an important risk factor.²

Cataract surgery was more commonly performed among female ,as in our study with more incidence in the female comparing to male ,but some center in the world (Jianghong, Li, Nigel Morlet, Jonathon Q. Ng, James B. Semmens, and Matthew W. Knuiman for Team EPSWA) state that there is no significant association was found between gender,⁵⁶ other centers said that cataract surgery was more commonly performed among female with slightly more incidence in the female comparing to male.²⁹

Regarding environmental characteristics that affect our study, endophthalmitis cases occur more commonly in the winter season comparing to other study which find that season was a risk factor(more in winter),and it is consistent with existing literature on seasonal patterns of morbidity and mortality.²⁸ Hippocrates observed over 2000 years ago that "spring is the most healthy, and least mortal." Research has shown seasonal variation in the occurrence of infectious diseases, with the highest incidence during winter.²⁸ These patterns may reflect greater exposure to infectious diseases in winter and human responsiveness to changes in photoperiod, temperature, and rainfall.²⁸ Although the seasons were a significant risk factor, they did not account for the temporal fluctuation in endophthalmitis we have described elsewhere. Season may be a de facto marker of other environmental indices, and therefore further study is required to clarify this association between endophthalmitis and weather.²⁸

The important goal of this study was to focus that patients with diabetes and underwent cataract surgery are more prone to have endophthalmitis ,as in our study .Supported evidence for the later finding is found in one united state center with incidence of endophthalmitis about 2.6 :1000 in diabetes relative to 1.3 :1000 in non diabetes;² So its an important risk factor to be taken in consideration.

Majority of our cases shows acute endophthalmitis cases more than late endophthalmitis cases(76.76%acute versus 3.23%late) , which relatively less

than other comparable study in Australia which shows 90% early occurrence of endophthalmitis.²

Our finding regarding patients that had previous trabeculectomy and underwent cataract surgery shows significant increasing results of endophthalmitis (20.8:1000);but no enough information was found in other literatures ,some state that Late infections in patients with filtering blebs have been estimated to occur with an incidence of (2.5-4.1:1000).² These figures, however, were obtained on the basis of clinical appearance in most series , and cases not actually infected may have been included in a manuscript of early and late endophthalmitis after glaucoma surgery.

Increase incidence of endophthalmitis after AC IOL was found in our study ,supported by Asian patients study (1996-2001)with rupture posterior capsule, silicon IOL associated with high incidence of endophthalmitis in Singapore national eye center .²⁹

Regarding cases with different type of anesthesia that had endophthalmitis ,the supporting evidence is lacking .although we found more incidence in patient with general anesthesia .

Our study undoubtedly has limitation with respect to the sample size ,its retrospective in nature ,and potential difference of practice of different surgeon .However ,we hope that our finding may encourage others to look at this issue and report on it ,and perhaps even lead to a prospective multicenter study to test our hypothesis that our recommendation may associated with lower risk of endophthalmitis.

Unfortunately some cases of endophthalmitis treated in the private clinics or not reaching our hospital or from far area and so can not reach the hospital for different reasons i.e. not documented ,but endophthalmitis is sight threatening and most patient seek medical advise and try to return back to there surgeon ,despite of, the incidence of endophthalmitis in our population is relatively higher than other developed center possibly due to some contributing factors :

1-preoperative antibiotics not used routinely specially for higher risk groups (diabetes ,previous trabeculectomy, blephritis ,and elderly).

2- Irrigation fluid bottles not changed routinely for every patient had cataract surgery i.e. some times two patient share one bottle and the top of the bottle not sterilize with povidine iodine during opening .

3- No health educations about sterilization for our sub staff personnel .

4- Use of stored hyolourinc ampoule some times for more than one patients .

5- Heparin coated IOL not used routinely. Its proved to be associated with lower incidence of endophthalmitis.

6- Sub conjunctival injection of antibiotics uses depend on surgeon preference (i.e. not used by all surgeon) ; Its proved to have a protective role .²²

7- Health educations about hygiene for our patients is different from that in developed countries ,some times not all patient informed about how to use drops or no enough information was given by the surgeon to the patients about post operative care .

The above factors is depend on surgeons practice and preference ,so we find that incidence of endophthalmitis is more in the cases of some surgeon relative to others .

8-Self adhesive drape not used routinely.

9-Disfunctioning of air filtering and water filtering system in our theater .

Conclusions and Recommendations

From our work we conclude that postcataract surgery endophthalmitis is not uncommon in our population , and its aged dependent and sex has little role in determining the disease .The endophthalmitis is relevant to all the ophthalmologists whether specialist in glaucoma, cataract , cornea , neuroophthalmology or retina .

Some patients have more risk to develop postcataract surgery endophthalmitis including (elderly, diabetics , previous trabeculectomy surgery , rupture posterior capsule during cataract surgery) .

This disease in our country is relatively with higher incidence than other developed centers in the world .

Indeed , these risks may be reduced to an acceptable level if the surgeon is instructed on all possible pre- , peri- , and post-operative problems that may increase incidence of endophthalmitis , and is therefore in a position to avoid them .

We recommended the followings :

1- preoperative : thorough examination of both eyes for signs of blepharitis and to be treated accordingly and preoperative antibiotics should be used routinely specially for higher risk group (diabetes ,previous trabeculectomy, blephritis ,and elderly).

2- Per operative : topical povidone iodine 5% was proved to decrease ocular surface flora and decrease incidence of endophthalmitis and decrease risks of bacterial adherence to the IOL during insertion on the surface of the eye ball (to be used as irrigation for one minute and wait at least 4-5 minuets before commencing of the surgery) .

Use of sterile and new irrigation fluid for each patient with betadine irrigation of top of the bottle that had been used . Self adhesive drape should be used routinely .

Subconjunctival injection of antibiotics have a protective role and to be used routinely .

3- postoperative : After surgery, I usually recommend the brief use of a quinolone, due to its spectrum of activity and excellent penetration. If your patient has diabetes or has had previous trabelectomy surgery, he's at an increased risk for endophthalmitis. Therefore, it's prudent to put these patients on some form of oral antibiotic prophylaxis immediately after surgery. For my patients, this means a quinolone such as ciprofloxacin 750 mg PO bid for five days to a week postoperatively. If the patient had a capsule rupture or any vitreous manipulation during surgery, I recommend ciprofloxacin 500-700 mg PO bid for five to seven days.

4- Health education of patients and staff .

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