WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 13, Issue 9, 2110-2115. Review Article ISSN 2277–7105

POST OPERATIVE ENDOPHTHALMITIS: A CONCEPTUAL REVIEW

Bhagyashri S. Nagapurkar[1]* and Jaydeep Gangal[2]

[1]Final Year Post Graduate Scholar, Department of Shalakya Tantra, Tilak Ayurved Mahavidyalay, Pune 411011, Maharashtra, India.

[2]Assistant Professor, Department of Shalakya Tantra, Tilak Ayurved Mahavidyalay, Pune 411011, Maharashtra, India.

Article Received on
22 March 2024,

Revised on 12 April 2024,
Accepted on 02 May 2024

DOI: 10.20959/wjpr20249-32315

***Corresponding Author**
Dr. Bhagyashri S. Nagapurkar
Final Year Post Graduate Scholar, Department of Shalakya Tantra, Tilak Ayurved Mahavidyalay, Pune 411011, Maharashtra, India.

ABSTRACT

Postoperative endophthalmitis is a serious complication that can happen after cataract surgery. It occurs mainly due to invasion of the globe by microbial flora, bacteria, or fungi from the adnexa and environment during the time of surgery. All patients undergoing cataract surgery should be evaluated for any risk factors that are responsible for the development of postoperative endophthalmitis; timely detection and management of postoperative endophthalmitis can save vision of patient. Current article elaborate pathogenesis, diagnosis and management of Acute and delyed postoperative endophthalmitis along with prophylaxis.

KEYWORDS: Postoperative endophthalmitis, acute and delayed postoperative endophthalmitis, pathogenesis, differential diagnosis, management, prophylaxis.

INTRODUCTION

Postoperative endophthalmitis is the most devastating complication after any intraocular surgery, which is commonly associated with a poor prognosis. However 90% of postoperative endophthalmitis occurs following cataract surgery as cataract surgery is most frequently performed globally. Fortunately postoperative endophthalmitis occurs rarely clinical occurrence but it often causes severe visual impairment or even the loss of an eye. Hence detailed knowledge of signs and symptom, investigations, diferential diagnosis helps in early diagnosis. Appropriate management can save the eye.

AIM AND OBJECTIVE

1. To review the concept of Post operative endophthalmitis.
2. To understand prophylaxis and management of post operative endopthalmitis.

MATERIAL AND METHOD

Material has been collected from modern text books, research articles, electronic database.

What is Post operative endophthalmitis?

Endophthalmitis is defined as an inflammation of the inner structures of the eyeball that is uveal tissue and retina associated with pouring of exudates in the vitreous cavity, anterior chamber and posterior chamber. Etiologically endophthalmitis may be infectious or non-infectious (sterile). Current study mainly elaborate post operative endophthalmitis. Post operative endophthalmitis are of two types:

1. Acute post operative endophthalmitis
2. Delayed onset post operative endophthalmitis.

1. Acute post operative endophthalmitis

The incidence of acute endophthalmitis following cataract surgery is reported as 0.1%. Toxins produced by infecting bacteria and the host inflammatory responses cause rapid and irreversible photoreceptor damage and effects can continue long after the ocular contents have been sterilized.

Risk factors

Operative complications such as posterior capsule rupture, prolonged procedure time, combined procedure (e.g. with vitrectomy), clear corneal sutureless incision, temporal incision, wound leak on the first day, delaying postoperative topical antibiotics until the day after surgery, topical anaesthesia, adnexal disease and diabetes.

Pathogens

Gram-positive (90%) and gram negative (10%). Most common pathogen is Staphylococcus epidermidis.

Source of infection

1. Usually flora of the eyelids and conjunctiva, lacrimal sac are the most frequent source.
2. Other potential sources include contaminated solutions and instruments, environmental air and the surgeon, and other operating room personnel.

Clinical features

A. Symptoms: Pain, redness and visual loss.

B. Signs: vary according to severity.

- Eyelid swelling, chemosis, conjunctival injection and discharge.
- A relative afferent pupillary defect is common.
- Corneal haze.
- Fibrinous exudate and hypopyon
- Vitritis with an impaired view of the fundus
- Severe vitreous inflammation and debris with loss of the red reflex.

Differential diagnosis

- Retained lens material in the AC or vitreous causes severe uveitis, corneal oedema and raised IOP.
- Vitreous haemorrhage: Blood in the vitreous is depigmented.
- Postoperative uveitis: If signs of inflammation are mild a trial of topical steroid therapy and early review (6-24 hours) is appropriate. If there is no substantial improvement, management should be that of endophthalmitis.
- Toxic reaction: Due to contaminated irrigating fluid or viscoelastic. An intense fibrinous reaction with corneal oedema may develop without other signs of infectious endophthalmitis Treatment is with intensive topical steroids and a cycloplegic.
- Complicated or prolonged surgery: It result in corneal oedema and uveitis.

Investigation

- B scan ultrasound
- Aqueous sampling
- Vitreous sampling
- Conjunctival swab

Management

1. Intravitreal antibiotics should be administered immediately after culture specimens have been obtained. Antibiotics commonly used in combination are ceftazidime, which will kill most Gram-negative organisms (including Pseudomonas aeruginosa) and vancomycin to address Gram-positive cocci (including MRSA).The concentrations are ceftazidime 2 mg in 0.1 ml and vancomycin 2 mg in 0.1 ml. Amikacin 0.4 mg in 0.1 ml can be

used instead of ceftazidime in case of penicillin allergy but is more toxic to the retina.

2. Subconjunctival antibiotic injections are vancomycin 50 mg and ceftazidime 125 mg (or amikacin 50 mg if penicillin-allergic).
3. Topical antibiotics are used only 4-6 times daily in order to protect the fresh wounds from contamination. Vancomycin 5% (50 mg/ml) or ceftazidime 5% (50 mg/ml) applied intensively may penetrate the cornea in therapeutic levels. Third or fourth generation fluoroqui- nolones achieve effective levels in the aqueous and vitreous, even in uninflamed eyes and may be considered.
4. Oral antibiotics. Fluoroquinolones penetrate the eye well and moxifloxacin 400 mg daily for 10 days is recommended. Clarithromycin 500 mg twice daily may be helpful for culture- negative infections. Evidence suggests these may attack bacterial biofilm.
5. Oral steroids: Prednisolone 1 mg/kg daily may be considered in severe cases after 12-24 hours provided fungal infection has been excluded from examination of smears.
6. Periocular steroids: Dexamethasone or triamcinolone should be considered if systemic therapy is contraindicated.
7. Topical dexamethasone: 0.1% 2-hourly initially for anterior uveitis.
8. Topical mydriatic such as atropine 1% twice daily.
9. Intravitreal steroids: Reduce inflammation in the short term but do not influence the final visual outcome.
10. Pars plana vitrectomy: should be performed if the patient does not improve with the above intensive therapy for 48 to 72 hours or when the patient presents with severe infection with visual acuity reduced to hand movement close to face. Vitrectomy helps in removal of infecting organisms, toxins and enzymes present in the infected vitreous mass.

2. Delayed-onset postoperative endophthalmitis pathogenesis

Delayed-onset endophthalmitis following cataract surgery develops when an organism of low virulence, such as P. acnes. It becomes trapped within the capsular bag (saccular endophthalmitis). Organisms can become sequestered within macrophages, protected from eradication but with continued expression of bacterial antigen. Onset ranges from 4 weeks to years (mean 9 months) postoperatively and typically follows uneventful cataract surgery. It may rarely be precipitated by laser capsulotomy release of the organism.

Clinical features

A. Symptoms: Painless mild progressive visual deterioration, floaters.

B. Signs:

- Low-grade anterior uveitis with medium-large keratic precipitates, vitritis.
- The inflammation initially responds well to topical steroids, but recurs when treatment is stopped and may eventually become steroid-resistant.
- An enlarging capsular plaque composed of organisms hidden sequestrated in residual cortex within the peripheral capsular bag is common.

Differential diagnosis

Anterior uveitis caused due to sterile post-surgical and chronic/recurrent viral infection.

Investigation

Sampling of aqueous and vitreous if oral antibiotics are ineffective. Anaerobic culture in case of P. acnes infection is suspected and isolates may take 10-14 days to grow.

Initial management

Prior to more invasive options, 10-14-day course of higher generation of fluoroquinolones, such as moxifloxacin as it penetrate the eye well and are concentrated within macrophages.

Treatment if persistent

Intravitreal antibiotics along with removal of the capsular bag, residual cortex and IOL, requiring pars plana vitrectomy. Secondary IOL implantation may be considered at a later date.

Intravitreal antibiotics are combined: (Vancomycin (1-2 mg in 0.1 ml) is the antibiotic of choice and can also be irrigated into any capsular remnant. P. acnes is also sensitive to methicillin, cefazolin and clindamycin.

Prophylaxis

- Instillation of 5% povidone iodine into the conjunctival fornices for at least 3 minutes prior to surgery.
- Proper preparation of the surgical site; redraping uncovered eyelashes.
- Treatment of pre-existing infections such as blepharitis, conjunctivitis, chronic dacryocystitis and infection in the contralateral eye or socket.

- Antibiotic prophylaxis should be done pre and post operative.
- Early resuturing of leaking wounds
- Reviewing personal surgical practice

DISCUSSION

Post operative endophthalmitis is an ophthalmic emergency. It is a dreaded complication of cataract surgery and should be suspected in case of patient with pain and red eye. It needs urgent treatment in the form of intravitreal antibiotics or vitrectomy. There is rapid progression of visual loss due to retinal toxicity if untreated. Prophylaxis is important in this disease as prevention is better than cure.

CONCLUSION

To avoid Post operative endophthalmitis risk factors should be minimize by following all prophylaxis like preoperative instilling 5% povidine iodine eye drop. If there is a doubt about diagnosis, treatment of infectious endophthalmitis should be started for better outcome. Sample for culture should be obtain from aqueous and vitreous for confirm diagnosis. Intravitreal antibiotics are the key to management of this disease. Contraction of fibrinous exudates and reduction in ac cellular activity and hypopyon are the signs of improvements. If the clinical signs are worsening after 48 hours of antibiotics virectomy should be considered.

REFERENCES

1. Brad Bowling, Kanski's Clinical Ophthalmology, Dry Eye, Elsevier publication eighth edition, 2016; 10: 328 – 331.
2. A. K. Khurana, Comprehensive Ophthalmology, Jaypee Publication seventh edition, 2019; 8: 176-178.
3. Althiabi S, Aljbreen AJ, Alshutily A, Althwiny FA. Postoperative Endophthalmitis After Cataract Surgery: An Update. Cureus, 2022; 8, 14(2): e22003. doi: 10.7759/cureus.22003. PMID: 35340495; PMCID: PMC8913541.
4. Ramanjit Sihots, Radhika Tendon, Parsons' Disease of Eye Elsevier Publication edition, 2020; 300: 23.
5. Verma, Lalit; Chakravarti, Arindam. Prevention and management of postoperative endophthalmitis: A case-based approach. Indian Journal of Ophthalmology, 2017; 65(12): 1396-1402. December 2017. | DOI: 10.4103/ijo.IJO_1058_17
6. www.pubmed.com