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# OCULAR DISEASE

## Endophthalmitis



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# Introduction

- Endophthalmitis is defined as an inflammation of the inner structures of the eyeball i.e., uveal tissue and retina associated with pouring of exudates in the vitreous cavity, anterior chamber and posterior chamber.



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# Etiology

- Etiologically endophthalmitis may be
- Infectious or
- Non-infectious



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# ***A. Infective endophthalmitis***

## ***Modes of Infection***

1. *Exogenous infections. Purulent inflammations are generally caused by exogenous infections following perforating injuries, perforation of infected corneal ulcers or as postoperative infections following intraocular operations.*



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- 2. *Endogenous or metastatic endophthalmitis.*** It may occur rarely through blood stream from some infected focus in the body such as caries teeth, generalised septicaemia and puerperal sepsis.
- 3. *Secondary infections from surrounding structures.*** It is very rare. orbital cellulitis, thrombophlebitis and infected corneal ulcers.



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# *Causative organisms*

1. ***Bacterial endophthalmitis.*** *The most frequent acute bacterial endophthalmitis gram positive cocci i.e., staphylococcus epidermidis and staphylococcus aureus.*
  - Other causative bacteria include streptococci, pseudomonas, pneumococci and corynebacterium.
2. *Fungal endophthalmitis is comparatively rare. It is caused by aspergillus, fusarium, candida etc.*



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## **B. *Non-infective (sterile) endophthalmitis***

- Sterile endophthalmitis refers to inflammation of inner structures of eyeball caused by certain toxins/toxic substances.
  1. *Postoperative sterile endophthalmitis may occur as toxic reaction to:*
    - Chemicals adherent to intraocular lens (IOL) or Chemicals adherent to instruments.
  2. *Post-traumatic sterile endophthalmitis may occur as toxic reaction to retained intraocular foreign body, e.g., pure copper.*



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3. *Intraocular tumour necrosis may present as sterile endophthalmitis (masquerade syndrome).*
4. *Phacoanaphylactic endophthalmitis may be induced by lens proteins in patients with Morgagnian cataract.*





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# Clinical picture of acute bacterial endophthalmitis

- ***Symptoms:***
- Acute bacterial endophthalmitis usually occurs within 7 days of operation and is characterized by severe ocular pain, redness, lacrimation, photophobia and marked loss of vision.

# Signs



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1. *Lids become red and swollen.*
2. *Conjunctiva shows chemosis and marked circumcorneal congestion.*
3. *Cornea is oedematous, cloudy and ring infiltration may be formed.*
4. *Edges of wound become yellow and necrotic and wound may gape in exogenous form.*
5. *Anterior chamber shows hypopyon; soon it becomes full of pus.*
6. *Iris, when visible, is oedematous and muddy.*
7. *Pupil shows yellow reflex due to purulent exudation in vitreous*



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# Postoperative acute endophthalmitis





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# Treatment

## ***A. Antibiotic therapy:***

- ***1. Intravitreal antibiotics and diagnostic tap:*** It is performed transconjunctivally under topical anaesthesia from the area of pars plana (4-5 mm from the limbus).
- The vitreous tap is made using 23-gauge needle followed by the intravitreal injection using a disposable tuberculin syringe and 30-gauge needle.



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- Usually a combination of two antibiotics – one effective against gram positive coagulase negative staphylococci and the other against gram-negative bacilli.
- **First choice:** *Vancomycin 1 mg in 0.1 ml plus ceftazidime 2.25 mg in 0.1 ml.*
- **Second choice:** *Vancomycin 1 mg in 0.1 ml plus Amikacin 0.4 mg in 0.1 ml.*
- **Third choice:** *Vancomycin 1 mg in 0.1 ml plus gentamycin 0.2 mg in 0.1 ml.*



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**2. Subconjunctival injections of antibiotics should be given daily for 5-7 days to maintain therapeutic intraocular concentration :**

- **First choice : Vancomycin 25 mg in 0.5 ml plus. Ceftazidime 100 mg in 0.5 ml**
- **Second choice : Vancomycin 25 mg in 0.5 ml plus Cefuroxime 125 mg in 0.5 ml**





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- **3. *Topical concentrated antibiotics* should be started immediately and used frequently (every 30 minute to 1 hourly).**
- To begin with a combination of two drugs should be preferred, one having a predominant effect on the gram-positive organisms and the other against gram-negative organisms.
- Vancomycin (50 mg/ml) or cefazoline (50mg/ml) plus.
- Amikacin (20 mg/ml) or tobramycin (15 mg%).



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## **4. Systemic antibiotics:**

- *Ciprofloxacin intravenous infusion 200 mg BD for 3-4 days followed by orally 500 mg BD for 6-7 days, or*
- *Vancomycin 1 gm IV BD and ceftazidime 2 g IV 8 hourly, or*
- *Cefazoline 1.5 gm IV 6 hourly and amikacin 1 gm IV three times a day.*





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## ***B. Steroid therapy***

- ***Intravitreal injection of dexamethasone 0.4 mg in 0.1 ml.***
- ***Subconjunctival injection of dexamethasone 4 mg (1ml) OD for 5-7 days.***
- ***Topical dexamethasone (0.1%) or predacetate (1%) used frequently.***
- ***Systemic steroids. Oral corticosteroids should preferably be started after 24 hours of intensive antibiotic therapy.***
- A daily therapy regime with 60 mg prednisolone to be followed by 50, 40, 30, 20 and 10 mg for 2 days each may be adopted.



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## ***C. Supportive therapy***

- 1. Cycloplegics.** *Preferably 1% atropine or alternatively 2% homatropine* eyedrops should be instilled TDS or QID.
- 2. Antiglaucoma drugs.** *In patients with raised intraocular pressure* drugs such as oral acetazolamide (250 mg TDS) and timolol (0.5% BD) may be prescribed.



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## ***D. Vitrectomy***

- operation 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 light perception.
- Vitrectomy helps in removal of infecting organisms, toxins and enzymes present in the infected vitreous mass.