

Birmingham and Midland Eye Centre

Authors: Lucy Titcomb; Conor Jamieson
Approved by: Directorate Governance Group – Ophthalmology
BMEC Antibiotic Advisory Group
Drugs and Therapeutic Committee
Updated: January 2018
Review date: January 2021

OPHTHALMIC INFECTIONS**Prevention and Management of Post-operative Endophthalmitis****1. Prevention**

- It is essential to identify blepharitis, naso-lacrimal obstruction or severe atopic disease at the first clinic visit and commence appropriate treatment prior to reviewing the patient. Once treated successfully the patient can then be listed for surgery. A date for surgery should not be set until these conditions have been managed.
- Practice meticulous, sterile periocular/ocular preparation regime before surgery:
- For antisepsis of the periocular skin, conjunctiva and cornea, povidone-iodine solution 5% is the chemical preparation of choice. The number of bacteria on the conjunctiva and cornea can be reduced by 1 log₁₀ count (10 fold) to a maximum of 2 log₁₀ count (100 fold) in the pre-operative phase by a 5% povidone-iodine solution left in place for a minimum of three minutes. In cases of iodine allergy use an aqueous solution of chlorhexidine 0.05%.
- It is therefore important that ALL patients undergoing intraocular surgery receive 5% povidone-iodine into the eye in the anaesthetic room to allow sufficient time for antisepsis to take place.
- It is important that the lashes are isolated from the operative field by the plastic drape.
- Proper drying of the lids after toilet is helpful. If the lashes are not adequately isolated consider re-draping.
- Post operative antibiotic injection – either subconjunctival or intracameral antibiotics may be administered:
 - Sub-conjunctival
Cefuroxime* 125 mg or
in true cephalosporin allergy or in patients who have had an anaphylactic reaction to penicillin, preservative-free **gentamicin*** (Genticin®, Amdipharm) 20 mg in 0.5ml
 - Intra-cameral
cefuroxime 1 mg in 0.1 ml or
in true cephalosporin allergy or in patients who have had an anaphylactic reaction to penicillin, discuss alternatives with microbiology
- Use and route of steroid is at the discretion of the surgeon

Drugs marked in **red** contain penicillin and are contra-indicated in penicillin allergy; drugs marked in **orange** should be used with caution in penicillin allergy and avoided if there is any history of anaphylaxis to penicillin; drugs marked in **green** are safe in penicillin allergy

- Post-operative eye drops: a combination of a steroid/non-steroidal anti-inflammatory drug + antibiotic e.g. betamethasone 0.1% with **neomycin** 0.5% eye drops or Maxitrol® eye drops.
- Clear instructions should be given to each patient as to the post-operative course. Each day the eye should become more comfortable and the vision slightly better. If it becomes more painful or the vision deteriorates, the patient should contact their local ophthalmic unit or the accident and emergency department at the Birmingham and Midland Eye Centre without delay.

2. Management of Acute Endophthalmitis

Full ophthalmic examination with careful documentation of:

- Visual acuities
- RAPD
- AC activity
- Vitreous activity and daily thereafter.

2.1 Aqueous and vitreous sampling

- This should be undertaken under local anaesthesia before the administration of any antibiotic therapy.
- LIAISE WITH THE MICROBIOLOGY LABORATORY (within hours) OR ON CALL MICROBIOLOGY BIOMEDICAL SCIENTIST (out of hours) BEFORE VITREOUS TAP as outlined in the Ophthalmic Operational Guidelines (Endophthalmitis) - Intraocular Fluid Sampling (BMEC/Ophth/038) (SWBH)
- The specimen must go to microbiology immediately after it has been taken as delay will reduce the chance of microbial isolation.
- Obtain informed consent before sampling emphasising that:
 - This is a potentially serious situation which could result in visual loss.
 - Therapy will proceed according to the best clinical practice as documented in the current literature.
- The dose of intravitreal injections is critical; mistakes can result in irreversible damage to the retina. Pharmacy prepared intravitreal injections for amikacin and vancomycin and ceftazidime should be available in A&E but confirm before starting the procedure
- The following intravitreal antibiotics give a good spread of antibacterial cover:
 - **vancomycin** 1000 micrograms in 0.1 ml (available in ready diluted form**)
 - **ceftazidime*** intravitreal injection 2 mg in 0.1 ml (is not available in a ready diluted form - see below for preparation) or in true cephalosporin allergy or in patients who have had an anaphylactic reaction to penicillin **amikacin** 400 micrograms in 0.1 ml * (available in ready diluted form**) is available as an alternative

To prepare ceftazidime intravitreal injection 2 mg in 0.1 ml:

- Reconstitute a vial of ceftazidime 500 mg with 4 ml Water for Injections
- Shake vial thoroughly to dissolve

- Withdraw the entire contents and make up to 5 ml with Water for Injections = 100 mg/ml
 - Shake syringe thoroughly to mix
 - Inject 1 ml back into the vial and add 4ml of sodium chloride 0.9% injection = 20 mg/ml
 - Shake vial thoroughly to mix
 - Withdraw approximately 0.2 ml (excess to facilitate priming) into a 1 ml syringe.
 - When ready to inject fit a 27 - 30 gauge needle of length 12-15 mm and discard all but 0.1 ml of the solution
 - Administer 2 mg in 0.1 ml.
- The administration of intravitreal corticosteroid, dexamethasone 400 micrograms in 0.1 ml, should only be considered after discussing with the on-call consultant. **Do not** mix dexamethasone with antibiotics, use a separate syringe and needle.
 - A Glaucoma consultant must be informed if a patient presents with endophthalmitis following a Glaucoma drainage procedure.
 - The use of sub-conjunctival injection of antibiotic is at the discretion of the surgeon.
 - Send samples for Gram stain, culture and sensitivity. A minimum of 0.2 ml vitreous sample and 0.1 ml aqueous sample is desirable.

2.2 Arrange admission.

2.3 Topical therapy

- There is no evidence to support the use of intensive topical antibiotic therapy. If topical therapy is to be prescribed, **chloramphenicol** eye drops 0.5% four times a day should be used.
- Consider using topical steroids. Further management depends on clinical response.

2.4 Systemic therapy

- Although there is no published evidence to support the use of systemic antibiotic therapy, administration of oral therapy is routine practice. If a systemic antibiotic is to be prescribed the following empirical therapy may be used: **ciprofloxacin** 750 mg by mouth every twelve hours, commenced immediately after sampling. Please contact the microbiology department if alternatives such as Linezolid are required.
- Consider prescribing systemic steroids; prednisolone 500 micrograms to 1 mg/kg/day in conjunction with an H₂-antagonist (ranitidine), or proton-pump inhibitor (lansoprazole).

In the case of an outbreak of post-operative endophthalmitis see the Royal College of Ophthalmologists' guidance 'Managing an outbreak of postoperative Endophthalmitis' (updated 2016 at <https://www.rcophth.ac.uk/wp-content/uploads/2016/07/Managing-an-outbreak-of-postoperative-endophthalmitis.pdf>)

* = unlicensed use; ** = unlicensed product