

staphylococci; keratitis and endophthalmitis may be bacterial, viral, or fungal.

Bacterial blepharitis is treated by lid hygiene and application of antibacterial eye drops to the conjunctival sac or to the lid margins. Systemic treatment may be required and may be necessary for 3 months or longer.

Most cases of acute bacterial conjunctivitis are self-limiting; where treatment is appropriate, antibacterial eye drops or an eye ointment are used. A poor response might indicate viral or allergic conjunctivitis or antibiotic resistance.

Corneal ulcer and keratitis require specialist treatment, usually under inpatient care, and may call for intensive topical, subconjunctival, or systemic administration of antimicrobials.

Endophthalmitis is a medical emergency which also calls for specialist management and requires intravitreal administration of antimicrobials; concomitant systemic treatment is required in some cases. Surgical intervention, such as vitrectomy, is sometimes indicated.

See reference to the treatment of *crab lice of the eyelashes*.

Antibacterials for eye infections

Bacterial eye infections are generally treated topically with eye drops and eye ointments. Systemic administration is sometimes appropriate in blepharitis.

Chloramphenicol p. 729 has a broad spectrum of activity and is the drug of choice for *superficial eye infections*. Chloramphenicol eye drops are well tolerated and the recommendation that chloramphenicol eye drops should be avoided because of an increased risk of aplastic anaemia is not well founded.

Other antibacterials with a broad spectrum of activity include the quinolones, ciprofloxacin p. 728, levofloxacin p. 728, moxifloxacin p. 729, and ofloxacin p. 729; the aminoglycosides, gentamicin below and tobramycin p. 728 are also active against a wide variety of bacteria. Gentamicin, tobramycin, quinolones (except moxifloxacin), and **polymyxin B** are effective for infections caused by *Pseudomonas aeruginosa*.

Ciprofloxacin eye drops are licensed for corneal ulcers; intensive application (especially in the first 2 days) is required throughout the day and night.

Azithromycin eye drops p. 728 are licensed for trachomatous conjunctivitis caused by *Chlamydia trachomatis* and for purulent bacterial conjunctivitis. *Trachoma* which results from chronic infection with *Chlamydia trachomatis* can be treated with azithromycin by mouth [unlicensed indication].

Fusidic acid is useful for staphylococcal infections.

Propamidine isetonate p. 729 is of little value in bacterial infections but is used by specialists to treat the rare, but potentially sight-threatening, condition of *acanthamoeba keratitis* [unlicensed indication].

Other antibacterial eye drops may be prepared aseptically in a specialist manufacturing unit from material supplied for injection.

With corticosteroids

Many antibacterial preparations also incorporate a corticosteroid but such mixtures should **not** be used unless a patient is under close specialist supervision. In particular they should not be prescribed for undiagnosed 'red eye' which is sometimes caused by the herpes simplex virus and may be difficult to diagnose.

Administration

Frequency of application depends on the severity of the infection and the potential for irreversible ocular damage; antibacterial eye preparations are usually administered as follows:

- *Eye drops*, apply 1 drop at least every 2 hours in severe infection then reduce frequency as infection is controlled

and continue for 48 hours after healing. For less severe infection 3–4 times daily is generally sufficient.

- *Eye ointment*, apply *either* at night (if eye drops used during the day) or 3–4 times daily (if eye ointment used alone).

Antifungals for eye infections

Fungal infections of the cornea are rare. Orbital mycosis is rarer, and when it occurs it is usually because of direct spread of infection from the paranasal sinuses. Debility or immunosuppression can encourage fungal proliferation. The spread of infection through blood occasionally produces metastatic endophthalmitis.

Many different fungi are capable of producing ocular infection; they can be identified by appropriate laboratory procedures.

Antifungal preparations for the eye are not generally available. Treatment will normally be carried out at specialist centres, but requests for information about supplies of preparations not available commercially should be addressed to the Strategic Health Authority (or equivalent in Scotland or Northern Ireland), or to the nearest hospital ophthalmology unit, or to Moorfields Eye Hospital, 162 City Road, London EC1V 2PD (tel. (020) 7253 3411) or www.moorfields.nhs.uk.

Antivirals for eye infections

Herpes simplex infections producing, for example, dendritic corneal ulcers can be treated with aciclovir p. 730. Aciclovir eye ointment is used in combination with systemic treatment for ophthalmic zoster.

Also see systemic treatment of CMV retinitis.

Antibacterials for eye infections in neonates

Antibacterial eye drops are used to treat acute bacterial conjunctivitis in neonates (ophthalmia neonatorum); where possible the causative microorganism should be identified. Chloramphenicol eye drops are used to treat mild conjunctivitis; more serious infections also require a systemic antibacterial. Failure to respond to initial treatment requires further investigation; chlamydial infection is one of the most frequent causes of neonatal conjunctivitis and should be considered.

Azithromycin eye drops are licensed to treat trachomatous conjunctivitis caused by *Chlamydia trachomatis* and purulent bacterial conjunctivitis in neonates. However, as there is a risk of simultaneous infection at other sites in neonates and children under 3 months presenting with conjunctivitis caused by *Chlamydia trachomatis*, systemic treatment with oral erythromycin p. 355 is required.

Gonococcal eye infections are treated with a single-dose of parenteral cefotaxime p. 342 or ceftriaxone p. 343. Gentamicin eye drops together with appropriate systemic antibacterials are used in the treatment of *pseudomonal eye infections*; high-strength gentamicin eye drops (1.5%) [unlicensed] are available for severe infections.

3.1 Bacterial eye infection

ANTIBACTERIALS > AMINOGLYCOSIDES

F 332

Gentamicin

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● INDICATIONS AND DOSE

Bacterial eye infections

▶ TO THE EYE

- ▶ Child: Apply 1 drop at least every 2 hours in severe infection, reduce frequency as infection is controlled and continue for 48 hours after healing, continued →