بسم الله الرحمن الرحيم

Treatment of infections of peripheral nervous system

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Treatment of ophthalmic Infections

1- Herpes zoster ophthalmicus

➢ It is a reactivated latent varicella-zoster virus (VZV) infection involving the eye (eyelid, cornea, conjunctiva) & the ophthalmic division of the trigeminal nerve (V).

❑ treatment should be **started as early as possible** (within 72 hours but up to 7 days after onset of rash).

❑ Oral aciclovir (800mg 5 times per day) or oral valaciclovir 1g three times per day for **7 days duration**.

N.B: Topical anti-viral drugs are NOT routinely required.

❑ If recommended by ophthalmologist: **Ganciclovir eye gel** 5 times daily (risk of teratogenicity).

2- Blepharitis (eyelid bacterial infection)

Treatment:

1- **Good hygiene** and treating associated seborrheic dermatitis or rosecia.

2- **Topical Chloramphenicol** or **fusidic acid**

3- For severe cases **oral azithromycin.**

3- Corneal Ulcers (Microbial Keratitis)

Empirical Treatment:

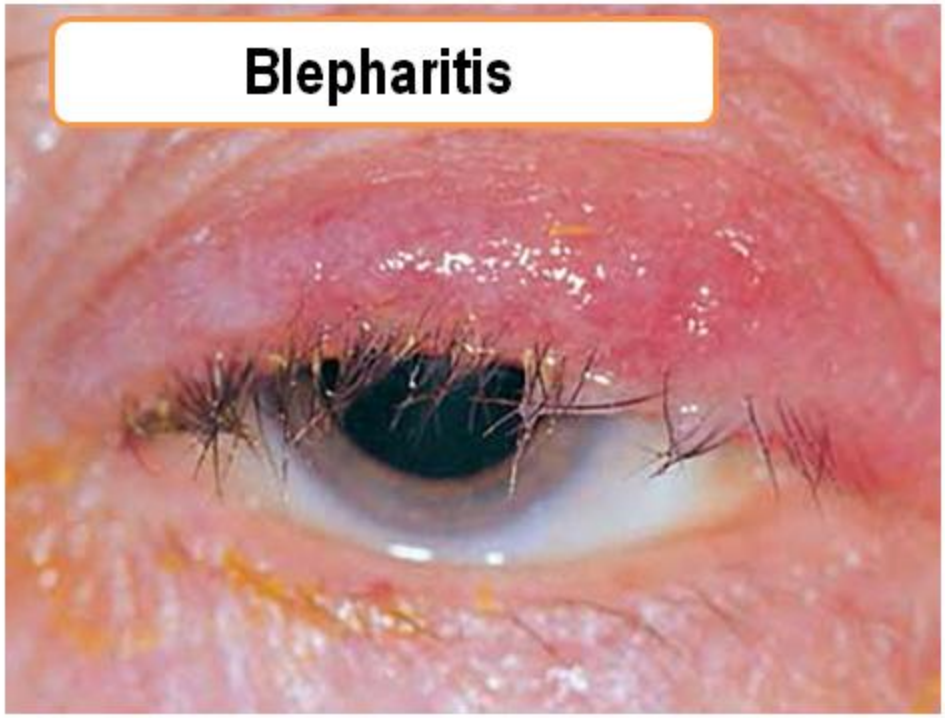
Ulcer <1mm: **Ofloxacin eye drops**

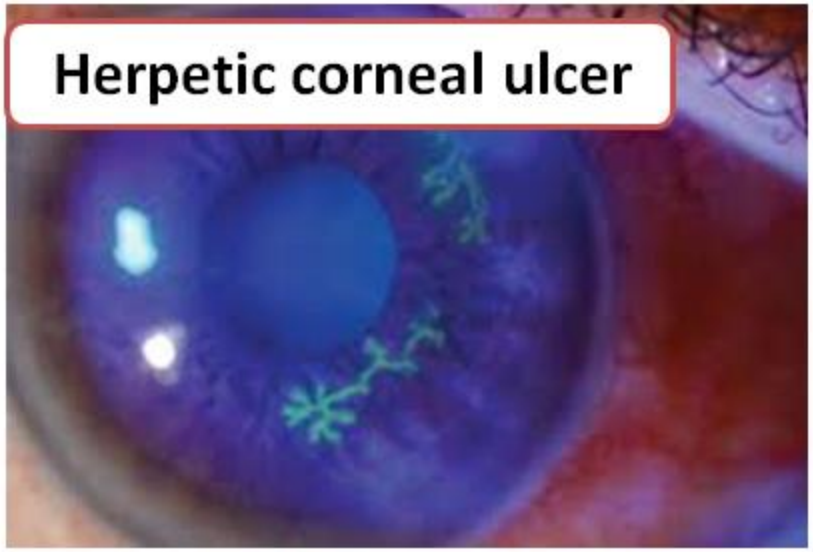
Ulcer ≥1mm: **Gentamicin + Cefuroxime** eye drops or **Ofloxacin eye drops**

Specific Treatment:

- Bacterial (according to culture and sensitivity).
- **Herpes simplex keratitis (dendretic ulcer)** Ganciclovir eye gel 5 times daily until healing then 3 times daily for 7 days (Maximum duration 2 weeks).
- Fungal : **Amphotericin** eye drops.


Herpes zoster ophthalmicus


Blepharitis


Herpetic corneal ulcer


Bacterial corneal ulcer

4-Infecious Conjunctivitis

- The most common types of infectious conjunctivitis are non-herpetic viral (**adenovirus**) & **bacterial** (muco-purulent) **conjunctivitis.**
- Most cases are viral and usually self limiting.
- Advise **good hand washing** and avoid sharing of personal items.

- Contact lenses should be avoided until 24 hours after treatment completed.
- Bacterial conjunctivitis is usually unilateral and self limiting in many cases.
- The most common pathogens implicated in acute bacterial conjunctivitis are *Haemophilus influenzae* in children and *Staphylococcus aureus* in adults.

- Transmission is assumed to be via contaminated fingers, but bacteria can also reach the skin from the nasopharynx or infected fomites (e.g., **contact lenses, makeup).**

The use of topical steroids for the treatment of bacterial conjunctivitis **should be avoided** as there is an increased risk of potentiating the infection and prolonging the duration of the disease.

Treatment of bacterial conjunctivitis

1- Eye hygiene: washing regularly to remove crusts and pus.

2-**Chloramphenicol eye drops** or ointment applied four times daily.

➢For severe infections **Chloramphenicol eye drops every 2 hours** initially then reduce frequency 4 times daily.

❑Continue treatment for 48 hours after resolution.

❑Treatment should not exceed 5 days, to avoid adverse effects of Chloramphenicol (optic neuropathies, blood dyscriasis and aplastic anemia).

3- If no response to Chloramphenicol (bacteriological investigation should be requested); one of the followings can be prescribed:

1. **Fusidic acid eye drops** **twice daily** (for *gram positive only*).
2. **Aminoglycoside** eye drops or ointment (e.g. **tobramycin**, **neomycin**) for gram negative only (like *pseudomonas*)

Both Fusidic acid and aminoglycoside causes burning sensation and hypersensitivity.

3-Fluoroquinolone eye drops (ciprofloxacin and gatifloxacin) have a broad spectrum of activity, however they are not first line agents due to the possibility of resistance developing.

Adverse effects are common and include burning, eye discomfort, conjunctival hyperaemia, crusting, and a bad taste. In rare cases **allergic reactions**, lid edema, **keratitis**, light sensitivity, tearing and visual disturbances.

4- Bacitracin/polymyxin B eye ointment

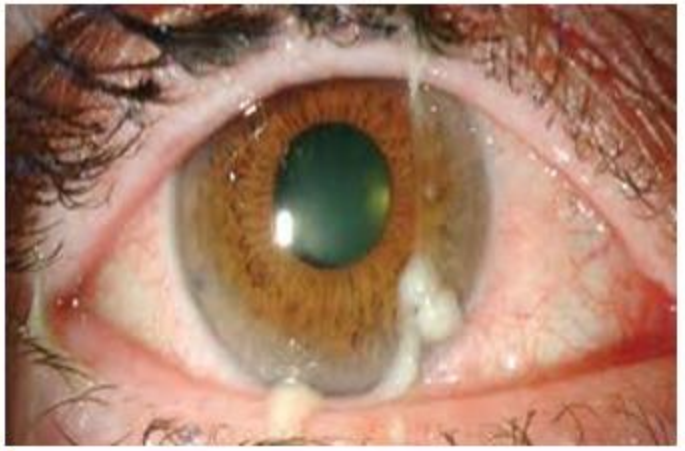
- Stinging and burning have been reported after administration.

- **Continue treatment for 48 hours after resolution.**

- Finally: Consider *Chlamydia trachomatis* or *gonococcal infection* in sexually active patients (need specific oral treatment).

Instructions for applying eye drops

- Place one drop at a time at the **lower conjunctival sac** followed by closure of the eyelids for several seconds.
- If more than one medication is being applied, wait 3 to 5 minutes between applications.
- Excessive blinking and placing more than two drops at a time, regardless of the medication type, can cause **spillage and waste**.
- Contact lenses should be avoided during symptom flare-ups. However, if wear is necessary, drops should be administered 15 minutes before lenses are placed or after lenses are removed.



Mucopurulent *conjunctivitis*

Chlamydial conjunctivitis (*Chlamydia trachomatis)*

1. *Inclusion conjunctivitis (in adults and neonates)*
2. *Trachoma*

❑ Trachoma predominantly effects children and occurs mostly in developing countries with low socioeconomic status and poor hygiene.

❑ It is caused by *Chlamydia trachomatis (subtypes* A–C) and can result in **blindness** if left untreated.

➢ **Adults:**

• Oral **azithromycin** (**single 1 g oral dose**) or Oral doxycycline (21–28 days) or Oral erythromycin for (21–28 days).

➢ **Children:**

• Oral **azithromycin** (20 mg/kg maximum 1 g) **single dose.**

➢ **Pregnant women, infants< 6 months or patients allergic to macrolides:**

• **Topical tetracycline** (**eye ointment** 2 times daily for **6 weeks**)

Trachoma

Normal eye

Eyelid Inflammation

Eyelid scarring

It is a bacterial eye infection.
It is the main cause of irreversible blindness due to infection that can however be prevented.

Antibiotics for trachoma

Azithromycin tablets

Azithromycin paediatric oral suspension

Tetracycline eye ointment

Drugs used in treatment of leprosy

1- Dapsone & other sulfones

- **Dapsone** (diaminodiphenylsulfone) is closely related to the sulfonamides.
- It inhibits folate synthesis.
- **Resistance** can emerge in lepromatous leprosy, if low doses are given.

- Therefore, the combination of **dapsone, rifampin** and **clofazimine** is recommended for initial therapy of lepromatous leprosy.

- A combination of **dapsone plus rifampin** is commonly used for leprosy with a lower organism burden (pausibacillary).

- Dapsone may also be used to prevent and treat Pneumocystis jiroveci **pneumonia** in persons with AIDS and other types of immunocompromise.
- Dapsone is used also for treating other conditions including **dermatitis herpitiformis, acne vulgaris** and **neutrophilic dermatoses including behcet's disease.**

Pharmacokinetics

- Dapsone is well absorbed orally and widely distributed in tissues.
- Dapsone is metabolized by hydroxylation (yielding **toxic metabolite** to Blood cells) and by acetylating (non-toxic metabolite).
- The half-life is 1–2 days, dapsone accumulates in **skin** (more in skin infected with M. leprae), muscle, liver, and kidney.
- Dapsone is excreted into **bile** and reabsorbed (enterohepatic recycling).
- **Excretion into urine**. In renal failure, the dose may have to be adjusted.
- Dapsone is **Category C** (can be used in pregnancy).

Adverse effects of dapsone

1-**Hemolysis**, particularly in **G6PD deficiency.**

2- **Methemoglobinemia** is common but usually is not clinically significant.

3- Rarely: leukopenia, Neuropathy and nephrotic syndrome

4- Dapsone hypersensitivity syndrome.

5- During therapy of lepromatous leprosy, **erythema nodosum leprosum** (immune-mediated inflammatory reaction) often develops.

➢ Erythema nodosum leprosum may be suppressed by thalidomide.

2- Rifampin

- **Rifampin** (U.S) or **rifampicin** (Europe) is one of the Rifamycins (drug group which includes Rifampin and rifabutin)

- Rifamycins **Inhibit RNA polymerase** in the bacteria leading to inhibition of RNA formation.

- Clinical uses of rifampin

1- Treatment of **Mycobacterium tuberculosis** infection (used in combination with other drugs). Monotherapy rapidly leads to resistance.

2- Treatment of **leprosy** (Rifampin delays resistance to dapsone when used for leprosy).

3-Used for **meningococcal prophylaxis** and chemoprophylaxis in contacts of children with H. influenzae type b.

Adverse effects of rifampin

1-Minor hepatotoxicity. However, serious hepatic injury rarely occur.

2-Drug interactions: Rifampin **induces cytochrome P-450** leading to accelerated metabolism of other drugs including warfarin, hormonal contraceptives, theophyllin and others.

N.B: Rifampin causes nonhazardous orange body fluids.

- Rifampin may change the color of urine, sweat, saliva, or tears to (yellow, orange, red, or brown).
- This effect is harmless and will disappear when the medication is stopped. However, teeth and contact lens staining may be permanent.

Remember
Rifampin's 4 R's

1. **R**NA polymerase inhibitor.
2. **R**amps up microsomal cytochrome P-450.
3. **R**ed/orange body fluids
4. **R**apid resistance if used alone

N.B. Rifapentine is an antibacterial drug similar to Rifampin but has longer half-life than

Clofazimine

- Clofazimine is a phenazine dye used for treating **multibacillary leprosy.**
- Its mechanism of action has not been clearly established.
- Absorption of clofazimine from the gut is variable, and **a major portion of the drug is excreted in feces.**
- Clofazimine is stored widely in reticuloendothelial tissues and skin, and its **crystals** can be seen inside phagocytic reticuloendothelial cells.
- It is slowly released from these deposits, so the serum **half-life may be 2 months.**
- The most prominent adverse effect is discoloration of the skin and conjunctivae. Gastrointestinal side effects are common.


Thank You!
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