Common Eye Infections: Adult Patients

Julie D. Meier, MD

Assistant Professor of Ophthalmology

OSU Eye and Ear Institute

Dermatitis: HZV and HSV

- Redness of periocular skin can be allergic (if associated with prominent itching) or bacterial (if associated with open sores/wounds)
- Both HZV and HSV can have devastating ocular sequelae if not treated promptly

General Categories of Eye Infections

- Dermatitis of Lids (HZV, HSV)
- Cellulitis of Lids (pre- vs post-septal)
- Blepharitis
- Conjunctivitis
- Keratitis

Herpes Zoster Ophthalmicus

- Symptoms: Skin rash and pain, may be preceded by headache, fever, eye pain or blurred vision
- Signs: Vesicular skin rash involving CN V distribution; Involvement of tip of nose can predict higher rate of ocular involvement

Herpes Zoster Ophthalmicus

- Work-up
  - ✓ Duration of rash; Immunocompromised?
  - ✓ Complete ocular exam, including slit lamp, IOP, and dilated exam
    - Can have conjunctival or corneal involvement, elevated IOP, anterior chamber inflammation, scleritis, or even involvement of retina and optic nerve.

Herpes Simplex Virus

- Symptoms:
  - ✓ Red eye, pain, light sensitivity, skin rash
  - ✓ Fever, flu-like symptoms
- Signs:
  - ✓ Skin rash: Clear vesicles on erythematous base that progress to crusting

Herpes Zoster Ophthalmicus

- Treatment:
  - ✓ If present within 3 days of rash's appearance: oral Acyclovir/ Valacyclovir
  - ✓ Bacitracin ointment to skin lesions
  - ✓ Warm compresses
  - ✓ TOPICAL ANTIVIRALS (e.g. Viroptic) HAVE NO ROLE

Herpes Simplex Virus

- Work-up:
  - ✓ Previous episodes?
  - ✓ Previous nasal, oral or genital sores?
  - ✓ Recurrences can be triggered by fever, stress, trauma, UV exposure
  - ✓ External exam: More suggestive of HSV if lesions centered around eye and no involvement of forehead/scalp
  - ✓ Slit Lamp Exam, IOP check, dilated exam

Herpes Simplex Virus

- Treatment:
  - ✓ Bacitracin ointment to skin lesions
  - ✓ Any lid margin, conjunctival, or corneal involvement needs topical antivirals (e.g. Viroptic) and close care with ophthalmologist

Preseptal Cellulitis

- Signs:
  - ✓ Eye is quiet, no pain or restriction of eye movement
  - ✓ May be a history of recent trauma or chalazion (stye) or recent infection such as dacryocystitis
- Organisms:
  - ✓ Usually S. aureus or strep species

Cellulitis Preseptal vs Postseptal

- Orbital septum: membrane separating lids from orbital contents
- Symptoms:
  - ✓ Both: Tenderness of lids, swelling, redness
  - ✓ Orbital cellulitis: Pain on eye movement, fever, double vision, eye itself is also red, decreased vision

Preseptal Cellulitis

- Work-up:
  - ✓ Sinus congestion or discharge? Trauma?
  - ✓ Full eye exam, especially checking motility and any evidence of proptosis
- Treatment:
  - ✓ If afebrile, Augmentin PO X 10 days
  - ✓ Follow every 1-2 days until definite improvement
  - ✓ If febrile, or no improvement after a few days, hospitalize for IV antibiotics

Orbital Cellulitis

- Signs:
  - ✓ Pain on eye movement or restriction, decreased vision, proptosis, eye itself red
- Organisms:
  - ✓ Staph and strep species, bacteroides, gram negative rods
  - ✓ Mucomycosis must be considered in all diabetic or immunocompromised patients

Blepharitis

- Inflammation of anterior or posterior lid margins
- Symptoms: Itching, burning, crusting
- Signs: Crusts to lashes, mucous discharge, swollen lids, may have corneal infiltrates

Orbital Cellulitis

- Work-up:
  - ✓ Trauma, diabetes/immunocompromised, systemic symptoms?
  - ✓ Complete eye exam (motility, proptosis, optic nerve abnormality)
  - ✓ CT scan of orbits
  - ✓ CBC, blood cultures
- Treatment: Hospitalize for IV antibiotics and close follow-up

Blepharitis

- If woman, ask about eye make-up hygiene.
  - ✓ Should be throwing away every 3-4 months, removing each night, washing hands before application and not sharing products'
  - ✓ Poor make-up related hygiene can lead to blepharitis, conjunctivitis and even corneal infection
  - ✓ Products contaminated after first use

Blepharitis

- Treatment:
  - ✓ Warm compresses for 10-15 minutes twice daily, followed by lid scrubs with baby shampoo
  - ✓ Lubrication with artificial tears 3-4 times daily
  - ✓ If moderate to severe, can add erythromycin ophthalmic ointment at bedtime

Bacterial conjunctivitis

- Etiology (acute presentation)
  - ✓ Gonococcus
  - ✓ Staph species
  - ✓ Strep pneumonia
  - ✓ Hemophilus influenzae (kids)

Bacterial conjunctivitis (acute)

- Signs:
  - ✓ Purulent discharge of varying degree
  - ✓ Chemosis (swelling of the conjunctiva)
- Symptoms:
  - ✓ Redness, foreign body sensation

Gonococcal vs other bacterial agents

Bacterial Conjunctivitis

- If hyperacute presentation wiith copious amounts of purulent drainage, concern is mainly for gonococcal infection
  - ✓ Immediate referral to ophthalmology for exam as there is a risk for corneal perforation

Treatment

- Gonococcal
  - ✓ If only conjunctiva involved, one dose of ceftriaxone IM
  - ✓ If corneal involvement, patient needs hospitalization and ceftriaxone IV Q12-24 hours
  - ✓ Treat for possible coinfection with chalmydia with doxycycline or azithromycin and treat sexual partners
  - ✓ Follow daily until definite improvement

Bacterial Conjunctivitis

- Work-up:
  - ✓ Conjunctival swab for culture and sensitivities and Gram stain
  - ✓ Complete eye exam, excluding any corneal involvement
- Treatment: (other than gonococcal)
  - ✓ Topical fluoroquinolone drops QID
  - ✓ Follow-up every 1-2 days until improvement

Viral Conjunctivitis

- Symptoms:
  - ✓ Itching, burning, foreign body sensation, history of recent URI or sick contact
  - ✓ Usually starts in one eye and involves second eye a few days later
- Etiologies:
  - ✓ Usually adenovirus, unless specific evidence of HSV or HZV involvement otherwise

Viral Conjunctivitis

- Signs:
  - ✓ Watery mucous discharge
  - ✓ Red, swollen lids
  - ✓ Inferior conjunctival follicles
  - ✓ Tender, palpable preauricular node

Infectious Keratitis

- Infection within the cornea
- Can be bacterial or viral, more commonly, and less commonly fungal or parasitic
- Particularly dangerous in settings of contact lens wearers or with recent trauma

Viral Conjunctivitis

- Work-up:
  - ✓ History and eye exam only (no cultures needed unless has become chronic)
- Treatment:
  - ✓ Artificial tears and cool compresses
  - ✓ Strict handwashing
  - ✓ Contagious for 10-12 days from day of onset: may need to restrict school and work

Infectious Keratitis

- Symptoms:
  - ✓ Red eye
  - ✓ Mild to severe pain
  - ✓ Decreased vision
  - ✓ Photophobia, discharge
- Signs:
  - ✓ Injection
  - ✓ Focal white opacity in cornea or area that stains with fluorescein

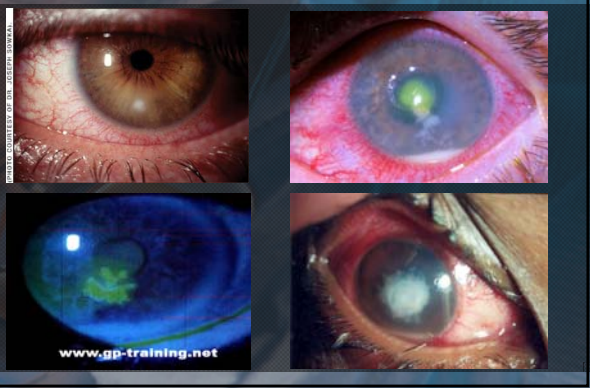
Infectious Keratitis

- Etiology:
  - ✓ Staph, strep species
  - ✓ Pseudomonas (particularly in contact lens wearers)
  - ✓ HSV/HZV
  - ✓ Fungal (especially after trauma with vegetable matter)
  - ✓ Acanthomeoba (especially in contact lens wearers with poor lens hygiene or recent swimming)

Infectious Keratitis

- Work-up:
  - ✓ History: contact lens wear and care regimen, recent trauma, previous eye diseases or surgery
  - ✓ If associated skin lesions, may be more concerned for herpetic infection
  - ✓ Full eye exam, including likely culture of infiltrate
  - ✓ Immediate referral for contact lens wearers

Infectious Keratitis



Infectious Keratitis

- Treatment:
  - ✓ Topical cycloplegic drops (e.g. scopolamine) for comfort
  - ✓ Topical antibiotics of varying frequency depending on:
    - Whether the patient is a contact lens wearer
    - Size of infiltrate and proximity to visual axis
  - ✓ Daily follow-up

Infectious Keratitis

- HZV related corneal changes
  - ✓ Intensive lubrication, but no topical antivirals
- HSV Corneal Ulcers (Dendrites)
  - ✓ Topical Viroptic 1 drop nine times daily
  - ✓ Close follow-up to monitor for toxicity to cornea and improvement in dendrite

Summary:

- Primary Care Physician will be the first provider to see a wide range of eye problems
- Among those that require immediate referral to ophthalmology include:
  - ✓ HSV/HZV infection
  - ✓ Red eye with restricted eye movements (orbital cellulitis)
  - ✓ Conjunctivitis with abrupt onset of copious discharge (gonococcal)
  - ✓ Red, painful eye in a contact lens wearer

Infectious Keratitis

- Fungal Keratitis:
  - ✓ Not getting better with antibiotics, feathery borders
  - ✓ Need Intensive topical antifungals
- Acanthomoeba:
  - ✓ Pain out of proportion to exam in a contact lens wearer
  - ✓ Long term treatment with multiple agents, may even need corneal transplant for medical failures

Neonatal Conjunctivitis

David L. Rogers, M.D.
Nationwide Children's Hospital

Neonatal Conjunctivitis

Ophthalmia Neonatorum

- Purulent ocular drainage
- Chemical irritation or a pathogenic organism
- Diagnosis made clinically and confirmed with lab testing

Bacterial Infections

- Usually Acquired from infected mother during passage through birth canal.
- Chlamydia ophthalmia is the most common cause

Chemical Conjunctivitis

- Generally from silver nitrate prophylaxis

Chlamydial Ophthalmia

- Occurs in 2-4% of births
- Causes 30-50% of conjunctivitis in neonates.
- Prevalence of maternal chlamydial infection is 2-20%
- 30-50% of neonates born to infected mother will develop conjunctivitis
- 5-20% will develop pneumonia

Chlamydial Ophthalmia

- May range form mild conjunctivitis with minimal mucopurulent discharge to severe eyelid edema with copious drainage and pseudomembrane formation.
- Follicles are not present in the conjunctiva as they are in older children and adults.

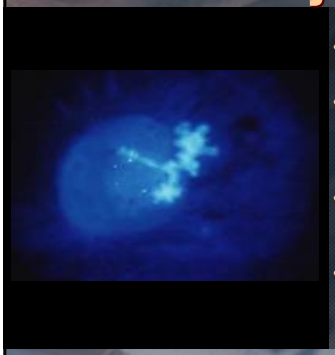
Other bacterial causes:

- Streptococcus pneumoniae and nontypeable Haemophilus influenzae cause 15% of cases.

Gonorrheal Ophthalmia

- Conjunctivitis due to Neisseria gonorrhoeae
- Incidence in the US is 2 to 3/10,000 births.
- Severe eyelid edema, chemosis and profuse purulent exudate.
- If untreated, corneal ulcerations and blindness may occur.

Viral Conjunctivitis



- Major viral causes are HSV1 and HSZ2
- HSV keratoconjunctivitis can be isolated or with disseminated or CNS infection.
- Can be mistaken for bacterial or chemical conjunctivitis
- Presence of dendritic keratitis is pathognomonic.

Signs and Symptoms

- Because of overlap in presentation and onset, causes are difficult to distinguish clinically.
- Conjunctivae are injected, and discharge (watery or purulent) is present.

Diagnosis

- Conjunctival material is Gram stained, cultured for gonorrhea and tested for chlamydia.
- Viral culture is obtained only if viral infection is suspected by skin lesions or maternal infection.

Timing can be a Clue

- Chemical: usually appears within 6 to 8 h after instillation of silver nitrate and disappears spontaneously within 48 to 96 h
- Chlamydial ophthalmia usually occurs 5 to 14 days after birth.
- Gonorrheal ophthalmia: acute purulent conjunctivitis, 2 to 5 days after birth or earlier with premature rupture of membranes.
- If caused by other bacteria: variable onset, ranging from 4 days to several weeks.

Treatment - General Tips

- Neonates with conjunctivitis and maternal gonococcal infection or with gram-negative intracellular diplococci should be treated with ceftriaxone before results of confirmatory tests.
- Corticosteroid-containing ointments may seriously exacerbate eye infections due to C. trachomatis and HSV and should be avoided.

Treatment
Chlamydial Ophthalmia

- Systemic therapy is treatment of choice due to risk of nasopharyngeal infection and chlamydial pneumonia.
- Erythromycin 12.5 mg/kg po q 6 h for 2 wk is recommended. Efficacy of Tx is 80%.
- Second treatment course may be needed.

Treatment
Other Bacteria

- Conjunctivitis due to other bacteria usually responds to topical ointments containing polymyxin plus bacitracin or erythromycin.

Treatment
Gonorrheal Ophthalmia

- Hospitalized to observe for possible systemic gonococcal infection.
- Give a single dose of ceftriaxone 25 to 50 mg/kg IM to a maximum dose of 125 mg.
- Frequent saline irrigation of the eye prevents secretions from adhering.
- Topical antimicrobial ointments used alone are ineffective.

Treatment
Herpetic Keratoconjunctivitis

- Treated with systemic acyclovir 20 mg/kg q 8 h for 14 to 21 days
- Add topical 1% trifluridine ophthalmic drops or ointment with a maximum of 9 doses/24 h.
- Systemic therapy is important, because dissemination to the CNS and other organs can occur.

Prevention

- 1% silver nitrate drops or 0.5% erythromycin ophthalmic ointments or drops instilled into each eye after delivery effectively prevents gonorrheal ophthalmia.
- These agents do not prevent chlamydial ophthalmia; povidone iodine 2.5% drops may be effective against chlamydia and is effective against gonococci but is not available in the US.

Take Home Message

- Neonatal Conjunctivitis can cause permanent impairment of vision.
- Refer to an ophthalmologist for "eye" specific therapy

Prevention

- Neonates of mothers with untreated gonorrhea should receive a single injection of ceftriaxone 50 mg/kg IM or IV, up to 125 mg.
- Both mother and neonate should be screened for chlamydia infection.