Ocular and periocular infections for the primary care physician

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Course outline

- Review basic anatomy of eye and orbit
- Review vision threatening signs
- Review orbital danger signs
- Infections
  - Blepharitis
  - Conjunctivitis
  - Corneal infections
  - Periorbital vs. orbital cellulitis
  - Endophthalmitis

Eye anatomy
Eye anatomy

Orbital anatomy

Vision-threatening signs

- Decreased visual acuity
- Afferent pupillary defect
- Opacity on the cornea
- Anything in the anterior chamber
- Absence of red reflex
Orbital danger signs

- Decreased visual acuity
- Afferent pupillary defect
- Proptosis
- Limited motility

Afferent pupillary defect

Ocular and periocular infections

- Blepharitis
- Conjunctivitis
- Corneal infections
- Periorbital vs orbital cellulitis
- Endophthalmitis
Blepharitis

- Inflammation/infection of eyelid margins and Meibomian glands
- Staphylococcus aureus, Staphylococcus epidermidis, Propionibacterium acnes colonization and infection of eyelid margin
- Chronic burning, itching, irritation, dryness of eyes
- Eyes sticky, worse in the AM.
- Debris on lids and lashes
- Inspissation of Meibomian glands

Meibomitis

http://www.contactlens.org.nz
http://www.mastereyeassociates.com
Hordeola (styes)

- Hot compresses
- Eyelid hygiene
- Bacitracin ophth ointment to lashes bid x 10 days
- Artificial tears
- Meibomitis associated with rosacea: doxycycline PO or azithromycin PO

Chalazia
**Chalazia – surgical treatment**

**Ocular and periocular infections**
- Blepharitis
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**Conjunctivitis, viral**
- Red eye(s), discharge, sticky eyelids, mild itching, mild pain, foreign body sensation.
- Sick contact
- Begins in one eye, then goes to other eye
- Eyelid edema, conjunctival injection, conjunctival edema (chemosis), conjunctival follicular reaction, watery and mucous discharge. Preauricular node.
- Can last 2-3 weeks.
- Treat with: artificial tears, cold compresses, handwashing, contact precautions.
Conjunctivitis, bacterial

- Eye redness, foreign body sensation, copious discharge
- Conjunctival injection, conjunctival chemosis, purulent discharge
- Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus pneumoniae, Haemophilus influenzae, Neisseria gonorrhoeae, Chlamydia trachomatis
- Treat with: topical antibiotic (polymyxin trimethoprim, ciprofloxacin)
- Systemic antibiotic for Neisseria gonorrhoeae (ceftriaxone IM/IV) and Chlamydia trachomatis (azithromycin PO/erythromycin PO)
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Distinguish conjunctivitis from keratitis

http://www.optometric.com/archive

Bacterial corneal ulcer
Bacterial corneal ulcer

- Infection of the corneal stroma (overlying epithelial defect)
- Risk factors: contact lens wear, corneal trauma, previous ocular or eyelid surgery, abnormalities in eyelid closure, decreased corneal sensation
- Diagnosis: corneal Gm stain and culture
- Treatment: hourly broad-spectrum antibiotic (moxifloxacin or gatifloxacin) or fortified topical antibiotics (vancomycin + tobramycin or gentamycin)

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Periorbital cellulitis
Periorbital cellulitis

- Infection that is anterior to the orbital septum involving the periorbital soft tissue and the eyelids
- Edema, erythema, tenderness affecting eyelids/periorbita
- Quiet eye (noninjected conjunctiva)
- Associated sinusitis, hordeolum, violation of the skin

Treatment:
- PO antibiotics: no fever, age >1 year
- Oral clindamycin in community MRSA-prevalent area
- Oral cephalexin with close follow up if low likelihood of MRSA, mild infection
- IV antibiotics: fever, elevated WBC/neutrophil count, infant, worsening

Orbital cellulitis
Orbital cellulitis

- An infection posterior to the orbital septum with involvement of orbital structures (can affect extraocular muscles, sensory and motor nerves and the optic nerve)
- Decreased vision
- Afferent pupillary defect
- Proptosis
- Limited motility, pain with motility, diplopia
- Conjunctival injection/chemosis
- Associated sinusitis, bacteremia, antecedent periocular cellulitis, dental infection

Treatment
- Hospital admission
- IV antibiotics (vancomycin + piperacillin/tazobactam)
- Orbital imaging (orbital CT with contrast)
- Surgery (drainage of orbital abscess, sinus drainage)

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Endophthalmitis

- Infection involving the vitreous cavity (+other parts of the eye)
- Pain, decreased vision, conjunctival injection, hypopyon, poor red reflex

Endophthalmitis, post trauma

Endophthalmitis, post surgical

Endophthalmitis, endogenous

Bacterial endophthalmitis management/treatment
- Vitreous culture (anterior chamber culture)
- Intravitreal injection(s) of antibiotics (vancomycin + ceftazidime if organism unknown), and occasionally steroids
- Vitrectomy surgery (occasionally)
- Intravenous antibiotics
  - Endogenous endophthalmitis
  - Post traumatic endophthalmitis
  - Not generally used for post surgical endophthalmitis
- If endogenous, blood culture(s) and work-up for source of infection

When to refer ocular and periocular infections to ophthalmology
- Vision threatening signs
  - Decreased visual acuity
  - Afferent pupillary defect
  - Opacity on the cornea
  - Anything in the anterior chamber
  - Absence of red reflex
- Orbital danger signs
  - Decreased visual acuity
  - Afferent pupillary defect
  - Proptosis
  - Limited motility
- History of prior eye surgery