Grand rounds:  
A string of pearls

Nathan Lighthizer, O.D., F.A.A.O.  
Assistant Professor, NSUOCO  
Chief of Specialty Care Clinics  
Chief of Electrodiagnostics Clinic  
lighthiz@nsuok.edu

Case #1

Recurrent Corneal Erosions  
(RCE’s)

• Tendency for minor trauma to cause significant corneal epithelial disturbances  
• Pathophysiology  
  – Abnormally weak attachment between the basal cells of the corneal epithelium and their basement membrane  
• Most common causes of the weak attachment  
  – Mechanical trauma**  
  – Corneal dystrophy**  
  – Corneal surgery

Recurrent Corneal Erosions  

• Sx’s:  
  – Acute, severe pain**  
  – Photophobia**  
  – Redness  
  – Blepharospasm  
  – Tearing

***Usually sx’s present first thing in the morning upon opening the eyes.***
And often this is recurrent

Recurrent Corneal Erosions

• Signs:  
  – Epithelial defect may be present, usually in the inferior interpalpebral area

Recurrent Corneal Erosions

• Signs:  
  – If no defect is present, look for loose, irregular epithelium  
    (pooling of NaFl, rapid TBUT)  
  – Signs of corneal dystrophies (will be bilateral)
Recurrent Corneal Erosions

• Tx:
  – Acutely:
    • Lubrication**
    • Topical Ab (Polytrim QID, erythro or bacitracin ung)
  • Pain control:
    – Cycloplegic (Homatropine BID)
    • Muro 128 drops or ung
  • Bandage lens???
    – Alleviates pain, does not improve healing

Recurrent Corneal Erosions

• Tx:
  – After the epithelium heals (recalcitrant RCE’s):
    • Fresh Kote TID (15ml bottle $25)
    • Muro 128 ung qhs (3.5g tube $10)
    • Lotemax QID X 2 weeks, BID X 6 weeks
    • Doxycycline 20-50mg BID
      – Azasite BID (2.5ml bottle $78)

**Avoid chronic long-term AT ung**

Recurrent Corneal Erosions

• Surgical Tx:
  – Anterior stromal micropuncture
  – Debridement of epithelium with polishing of Bowman’s membrane with a diamond burr or excimer laser (PTK)

Eyelid abscess vs. Preseptal Cellulitis vs. Orbital Cellulitis

• Preseptal Cellulitis
  – Usually upper eyelid swelling
  – Pain, tenderness, redness
  – Usually caused by adjacent infection (hordeolum, dacryocystitis)

• Orbital Cellulitis
  – All the same signs of preseptal with
  – Proptosis
  – EOM restrictions/pain with eye movements
  – Pupillary involvement
  – Usually an extension from an ethmoid sinusitis

Case #2
**Oral Antibiotic Paradigm**

**Penicillins**
- Augmentin 875mg BID or 500mg TID

**Cephalosporins**
- Keflex 500 mg TID
- Zithromax “Z-pak”
- Levaquin or Cipro

**Macrolides**
- Zithromax
- "Z-pak"

**Fluoroquinolones**
- Levaquin
- Cipro

**Sulfa**
- Bactrim DS 800/160 BID

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**Preventing Resistance**

- Just one organism, methicillin-resistant Staphylococcus aureus (MRSA), kills more Americans every year (~19,000) than emphysema, HIV/AIDS, Parkinson’s disease, and homicide combined
  - most serious MRSA infections, an estimated 25%, are associated with a healthcare exposure, but nearly 14% of the infections are community-associated
- Almost 2 million Americans per year develop hospital-acquired infections (HAIs), resulting in 99,000 deaths—virtually all of which are due to antibiotic-resistant pathogens
  - CDC: *Get Smart: Know When Antibiotics Work*

- Teaches both the provider and the patient when antibiotics should be used.
  - The IDSA suggests five to seven days is long enough to treat a bacterial infection, without encouraging resistance in adults, though children should still get the longer course.

- 10/1/18

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**Ocular TRUST 3: Ongoing Longitudinal Surveillance of Antimicrobial Susceptibility in Ocular Isolates**

- **Background:**
  - Ocular TRUST is an ongoing annual survey of nationwide antimicrobial susceptibility patterns of common ocular pathogens.
  - To date, more than 1,000 isolates from ocular infections have been submitted to an independent, central laboratory for in vitro testing.
  - Ocular TRUST, now in its third year, remains the only longitudinal nationwide susceptibility surveillance program specific to ocular isolates.

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**Ocular Trust 3**

- Antimicrobials tested represent six classes of drugs:
  - fluoroquinolones (ciprofloxacin, gatifloxacin, levofloxacin, moxifloxacin);
  - dihydrofolate reductase inhibitors (trimethoprim);
  - macrolides (azithromycin);
  - aminoglycosides (tobramycin);
  - polypeptides (polymyxin B); and
  - β-lactams (penicillin).

- Staphylococci were classified as methicillin-resistant (MRSA) or methicillin-susceptible (MSSA) based on susceptibility to oxacillin.

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**Ocular Trust 3: Results**

- most antimicrobials, except penicillin and polymyxin B, continue to be highly active against MSSA (azithromycin shows only moderate activity)
  - with the exception of trimethoprim and tobramycin, less than one-third of MRSA strains are susceptible to ophthalmic antimicrobials
  - susceptibility profiles remain virtually identical for the fluoroquinolones, regardless of methicillin phenotype
  - *S. aureus* is more susceptible to the fluoroquinolones than to macrolides, as represented by azithromycin
Case #3

Acanthamoeba keratitis

- History of CL wear w/ poor lens hygiene
- Often a history of hot tub/swimming pool/swimming in the river
- Symptoms:
  - Severe pain out of proportion to clinical picture
  - Redness & photophobia
  - All over the course of several weeks
- Signs:
  - Early -> Pseudodendrites
  - Late -> Ring-shaped stromal infiltrate

Acanthamoeba keratitis

- Sx's:
  - Severe pain**
  - Redness
  - Tearing
  - Decreased vision
  - Photophobia
  - Minimal discharge
  - These sx's tend to develop over a period of weeks.**
  - H/O CL hygiene problems and swimming in lenses**

Acanthamoeba keratitis

- Signs:
  - Epithelial or subepithelial infiltrates appearing as pseudodendrites early
  - Patchy anterior stromal infiltrates can also appear early

Acanthamoeba keratitis

- Signs:
  - Radial keratoneuritis**
    - Perineural infiltrates seen during the first 1-4 weeks
  - Gradual enlargement and coalescence of the infiltrates to form a ring infiltrate**
  - Inflammation in the cornea doesn't look that bad**

Acanthamoeba keratitis

- Tx:
  - Topicals:
    - PHMB 0.02% drops q1h
    - Chlorhexidine 0.02% q1h
    - Fine line agents can be given separately or together
    - Propamidine 1% (Brolene) q1h
  - Orals:
    - Voriconazole 200 mg BID
    - Itraconazole 200-400 mg QD
  - Cycloplegics (homatropine BID)
  - Topical steroids??
  - Pain control
  - Surgery
Fungal keratitis

- Often a history of vegetative trauma, CL wear
- \( \text{H/O} \) poor response to topical Ab's
- Symptoms:
  - Pain, photophobia, tearing, FB sensation
  - Pain often less than what the clinical picture would indicate
- Signs:
  - Stromal infiltrate w/ a feathery border
  - Satellite lesions surrounding the primary infiltrate

Fungal Keratitis

- \( \text{Sx's:} \)
  - Gradual onset of pain
  - Irritation/grittiness
  - Photophobia
  - Blurred vision
  - Watery or mucopurulent discharge

\( \text{H/O} \) cornea infection diagnosed as bacterial**
\( \text{H/O} \) vegetative trauma, CL abuse, chronic steroid use

Fungal Keratitis

- Signs:
  - Gray-white stromal infiltrate with indistinct "fluffy" or "feathery" borders/margins
  - Often surrounded by fingerlike satellite lesions in the adjacent stroma

Fungal Keratitis

- Signs:
  - Epithelial defect overlying the ulcer
  - However can be quite small and sometimes is not present
  - Infiltrates may progressively enlarge and extend

Which topical antibiotic is your "go-to" choice for a suspected MRSA infectious bacterial ulcer?

A. Zymaxid/Zymar
B. Polytrim
C. Besivance
D. Moxeza/Vigamox
E. Ciloxan
F. Tobramycin
G. Vancomycin

Fungal Keratitis

- Tx:
  - Pts may require hospitalization
  - Topical meds:
    - Natamycin 5% (for filamentous fungi)*
    - Amphotericin B 0.15% (for Candida)*
    - Both q1h around the clock initially and then tapered over 6-12 weeks
  - Orals meds:
    - Voriconazole 200 mg BID
    - Itraconazole
    - Fluconazole
  - Cycloplegics (homatropine BID)
  - Surgical (PKP or DALK)
Bacterial Keratitis

- Tx:
  - Hospitalization???
  - No CL’s***
  - Pain relief
  - Topical Ab’s: (amount & strength depends on the ulcer)
    - Besivance, Moxeza, or Zymaxid q1h around the clock for 24-48 hours & tapering according to clinical progress
    - Besivance (or Moxeza or Zymaxid) & Tobramycin (or Gentamicin) q1h alternating around the clock
    - Fortified Ab’s?? (large ulcers, visual axis, hypopyon)
      - Fortified Vancomycin, cephalosporins and/or gentamicin

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Bacterial Keratitis

- Tx:
  - Steroids???
    - Reduce inflammation, improve comfort, and minimize corneal scarring… but evidence that they improve final visual outcome is limited
    - Will make herpes, fungal, acanth much worse
    - Epithelialization may be slowed by steroids
    - Can cause corneal thinning (but not usually)
    - DO NOT USE until clinical improvement is seen with Ab’s alone
  - Pred Forte QID
  - Doxycycline or Azasite???
    - Inhibit MMP-9

Case #4

Scleritis

- Rare disorder of inflammation & necrosis centered on the sclera
- 30-60 year olds, female > male
- Bilateral 40-80% of time
- Pathophysiology is poorly understood
- Etiology
  - 50% of cases are idiopathic
  - 50% of cases are associated with systemic disease
    - Connective tissue diseases
      - RA most common
    - Infections
      - HZO, HSV, syphilis

Scleritis

- Types of Scleritis
  1. Diffuse anterior scleritis
  2. Nodular anterior scleritis
  3. Necrotizing anterior scleritis w/ inflammation
  4. Necrotizing anterior scleritis w/o inflammation (scleromalacia perforans)
  5. Posterior scleritis
Scleritis

- Symptoms
  - Severe, boring, deep eye pain*** (80%)
    - Can radiate to the forehead, brow, jaw
    - May awaken pt from sleep
  - Diffuse red eye
  - Photophobia
  - Tearing

- Signs
  - Sectoral or diffuse inflammation of conj, episcleral, and scleral vessels
    - Scleral vessels do not move at all and do not blanch w/ phenyl
  - Bluish hue to sclera***
  - Scleral nodules
  - Corneal changes (peripheral infiltrates/keratitis)

- Differential Diagnosis
  - Episcleritis
  - Uveitis

- Diagnosis
  - Clinical picture
  - If underlying systemic disease is not known, systemic workup is indicated (refer to PCP or internist)***
    - CBC
    - ANA/RF/HLA-B27
    - ESR
    - RPR/FTA-ABS
    - Fasting blood sugar
    - ACE
    - C-ANCA, P-ANCA

- Treatment – depends on severity and type
  - Oral NSAIDs
    - Indomethacin 25-50 mg TID
    - Ibuprofen 400-600 mg QID
    - Naproxen 250-500 mg BID
  - Oral Steroids
    - Prednisone 60-100 mg QD X 1 week with taper down to 20 mg QD over next 2-3 weeks, slow taper after that as well
  - Immunosuppressive therapy
    - Cyclophosphamide, methotrexate, cyclosporin

Herpes Zoster

- Nearly 1 million Americans develop shingles each year
- Ocular involvement accounts for up to 25% of presenting cases
- Over 50% incur long term ocular damage
Herpes Zoster

***Varicella-Zoster Virus***

- Herpes DNA virus that causes 2 distinct syndromes
  1. Primary infection – Chicken pox (Varicella)
     - Usually in children
     - Highly contagious***
     - Very itchy maculopapular rash with vesicles that crust over after ≈ 5 days
     - 96% of people develop by 20 years of age
     - Vaccine now available

- Reactivation – Shingles (Herpes Zoster)
  - More often in the elderly and immunosuppressed (AIDS)
    - Systemic work-up if Zoster in someone < 40
  - Can get shingles anywhere on the body
  - Herpes Zoster Ophthalmicus (HZO)
    - Shingles involving the dermatome supplied by the ophthalmic division of the CNV (trigeminal)
      - 15% of zoster cases

**Symptoms:**
- Generalized malaise, tiredness, fever
- Headache, tenderness, paresthesias (tingling), and pain on one side of the scalp***
  - Will often precede rash
- Rash on one side of the forehead
- Red eye
- Eye pain & light sensitivity

**Signs:**
- Maculopapular rash — vesicles — pustules — crusting on the forehead
- Respects the midline***
- Hutchinson sign
  - Rash on the tip or side of the nose***
  - Classically does not involve the lower lid
  - Numerous other ocular signs

**Other Eye Disease (Acute):**
- Acute epithelial keratitis (pseudodendrites)
- Conjunctivitis
- Stromal (interstitial) interstitial keratitis
- Endothelitis (disciform keratitis)
- Neurotrophic keratitis

- Episcleritis
- Scleritis
- Anterior uveitis
- IOP elevation
- Retinitis
- Choroiditis
- Neurological complications (nerve palsies)
- Vascular occlusion

- Treat the complications just like as if they were
Herpes Zoster

- **Treatment:**
  - Treat the complications just like as if they were primary conditions
  - Oral antivirals – must be started within 72 hours of symptoms
    - Acyclovir 800mg 5x/day x 7-10 days
    - Valtrex 1000mg 3x/day X 7-10 days
    - Famciclovir 500mg 3x/day X 7-10 days
  - Topical ointment to skin lesions to help prevent scarring
    - Bacitracin, erythromycin

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Herpes Zoster

- **Prevention:**
  - **Zostavax vaccine**
    - Live attenuated herpes virus
    - Only given to people who know they had chicken pox as a child
    - Only studied in patients > 60 yo
    - 51% reduction in incidence of HZ
    - 60% reduction in symptom severity in those who got HZ
    - 66.5% reduction in post-herpetic neuralgia

- **Prevention:**
  - **Shingrix vaccine**
    - Non-live vaccine given intramuscularly in two doses.
    - 36,000 patients in a phase III clinical trial
    - > 90% efficacy sustained over 4 years

Shingrix Vaccine

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* Shingrix Vaccine

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Shingrix vs. Zostavax

- **Shingrix:**
  - Efficacy in preventing shingles:
    - 96.6% effective in 50-59 year olds
    - 97.4% effective in 60-69 year olds
    - > 70 year olds
      - 99.6% in year 1
      - 94.7% in years 2-4
  - Efficacy in preventing PHN
    - 91.2% in > 50 year olds
    - 88.8% in > 70 year olds
  - More cost effective
  - Lasts longer

- **Zostavax:**
  - Efficacy in preventing shingles:
    - 70% effective in 50-59 year olds
    - 64% effective in 60-69 year olds
    - > 70 year olds
      - 38%
  - Efficacy in preventing PHN
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**Herpes Zoster**
- Post-herpetic Neuralgia
  - Constant or intermittent pain that persists for more than one month after the rash has healed
  - Older patients with early severe pain and larger area are at greater risk
  - Can be so severe that it leads to depression & suicide
  - Improves with time
    - Only 2% of pts affected 5 years out
  - Tx:
    - Cool compresses
    - Topical capsaicin ointment or lidocaine

**Viral conjunctivitis**
- Signs:
  - Red eye (conj hyperemia)
  - Watery discharge
  - Follicles in the inferior fornix & conj
  - (+) PA node***
  - Red/swollen eyelids
  - Petechial subconj hemes
  - SPK
  - SEI’s (sub-epithelial infiltrates)
  - Pseudomembranes/membranes

**EKC**
- Timecourse

**EKC conjunctivitis**
- Diagnosis
  - Based on clinical symptoms
- Treatment:
  - Cool compresses
  - Artificial tears
  - “get the red out drops”
    - Vasoconstrictors such as Visine
  - Hygiene***
  - Quarantine/Isolation
  - Betadine 5% solution???
  - Zirean???
Off-Label Adenoviral Treatments

- Povidone Iodine (0.4%) – Dexamethasone (0.1%)
  - 9 eyes of 6 patients with confirmed Adenovirus enrolled
  - 8/9 enrolled showed clinical resolution by day 4
  - 6/6 patients with significant reduced DNA copies by day 5
  - 5/6 cultures positives with no infectivity by day 5

Herpes Simplex

- Most common virus found in humans
  - 60-99% are infected by 20 years old
- Double stranded DNA virus
  - HSV type 1 (HSV-1)
  - HSV type 2 (HSV-2)

- Primary infection
  - Occurs in childhood via droplet exposure
  - Subclinical infection in most
- Secondary infection (recurrence)

Herpes Simplex

- Recurrent infection:
  - After primary infection the virus is carried to the sensory ganglion for that dermatome (trigeminal ganglion) where a latent infection is established.
  - Latent virus is incorporated in host DNA and cannot be eradicated
  - Stressors (trauma, UV light, fever, hormonal changes, finals week, etc) cause reactivation of the virus and it is transported in the sensory axons to the periphery -> clinical signs/symptoms

Herpes Simplex Keratitis

- **Epithelial Keratitis:**
  - Symptoms:
    - Ocular irritation, redness, photophobia, watering, blurred vision
  - Signs:
    - Swollen opaque epithelial cells arranged in a course punctate or stellate pattern
    - Central desquamation results in a dendrite***
      1. Central ulceration
      2. Terminal end bulbs
- ***Corneal sensation is reduced***

Herpes Simplex Keratitis

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      1. Central ulceration
      2. Terminal end bulbs
- ***Corneal sensation is reduced***

Herpes Simplex Keratitis

- **Epithelial Keratitis:**
  - Treatment:
    - Zirgan (ganciclovir gel 0.15%)
      - 5x/day until the dendrite disappears
      - 3x/day for another week
    - Viroptic ( trifluridine solution 1%)
      - 9x/day until the dendrite disappears
      - 5x/day for another week
    - Oral antivirals (if topical not well tolerated):
      - Acyclovir 400 mg 3x/day X 7-10 days
      - Valtrex 500 mg 3x/day X 7-10 days
      - Famvir 250 mg 3x/day X 7-10 days
Herpes Simplex Keratitis

**Epithelial Keratitis:**
- Treatment (con’t):
  - Debridement of the dendritic ulcer
  - Oral antivirals
  - IOP control
    - Avoid prostaglandins
  - Steroids

- Follow-up
  - Day 1, 4, 7

**Marginal keratitis:**
- Very rare

- Looks like a marginal infiltrate...but

- In HSV marginal keratitis:
  1. Much more pain
  2. Deep neovascularization
  3. No clear zone between infiltrate and limbus

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Herpes Simplex Keratitis

**Immune Stromal Keratitis (ISK):**
- 2% of initial ocular HSV presentations
- 20-61% of recurrent disease
- 88% non-necrotizing
- 7% necrotizing

- ***Can be visually devastating***

**Immune Stromal Keratitis:**
- Symptoms:
  - Gradual blurred vision
  - Halos
  - Discomfort/Pain
  - Redness

**Immune Stromal Keratitis:**
- Signs (non-necrotizing):
  - Stromal haze (inflammation & edema)
  - Neovascularization (deep)
  - Immune ring
  - Scarring and/or thinning
  - Intact epithelium

- Signs (necrotizing):
  - All of the above
  - More dense infiltration
  - Often w/ overlying epithelial defect
  - Necrosis and/or ulceration

**Immune Stromal Keratitis:**
- Treatment:
  - Topical steroids
    - Pred Forte QID-q2H
    - Durezol BID-QID
    - Lotemax QID
  - Topical anti-viral cover
    - Viroptic (trifluridine 1%) QID
    - Ziegan (ganciclovir 0.15%) QID
  - Topical cyclosporin (Restasis), AT’s, ung’s to facilitate epithelial healing if ulceration is present
**Herpes Simplex Keratitis**

- **Endotheliitis**: AKA Disciform Keratitis
  - Not considered a primary form of stromal keratitis
  - Stromal edema is present secondary to endothelial inflammation
  - Symptoms:
    - Blurred vision
    - Halos
    - Discomfort/Pain
    - Redness

- **Treatment**:
  - Topical steroids
    - Pred Forte QID-q2H
    - Durezol BID-QID
    - Lotemax QID
  - Topical anti-viral cover
    - Viroptic (trifluridine 1%) QID
    - Zirgan (ganciclovir 0.15%) TID
  - Topical cyclosporin (Restasis), AT’s, ung’s to facilitate epithelial healing if ulceration is present

**Neurotrophic Keratopathy**

- **Signs**:
  - Decreased corneal sensation***
  - Interpalpebral SPK
  - Persistent epithelial defects in which the epithelium at the edge of the lesion appears rolled and thickened, and is poorly attached
  - Advanced cases may have sterile ulceration, keratitis, and/or corneal melt
  - Pt may be surprisingly asymptomatic**

- **Tx**:
  - Find out the cause
  - D/C any meds that may be responsible
  - Lubricate, lubricate, lubricate***
    - Preservative free AT’s, gels, and ung’s q1h-QID
  - Topical Ab drops and/or ung (Polytrim QID, etc)
  - Taping the eyelids at night to ensure adequate closure
  - In severe cases:
    - Botox, tarsorrhaphy, Retro to induce ptosis
Neurotrophic Keratopathy

- Tx:
  - Healing an ulcer that won’t heal
    1. Autologous serum
    2. Prokera
      - Amniotic membrane in a CL skirt
    1. Also could use a scleral lens

Herpes Simplex Epithelial Keratitis

- My Regimen:
  - Zirgan 5x/day until the ulcer heals, then 3x/day for one week
  - Oral Valtrex 500 mg 3x/day for 7-10 days
  - Artificial tears
    - L-Lysine 2 grams daily?
    - Debride the ulcer?

  - RTC 1 day, 4 days, 7 days

Herpes Simplex Keratitis

- Prophylactic Treatment:
  - Reduces the rate of recurrence of epithelial and stromal keratitis by \( \approx 50\% \)
    - Acyclovir 400 mg BID
    - Valtrex 500 mg QD
    - Famvir 250 mg QD
    - L-lysine 1 gram/day
  - Frequent debilitating recurrences, bilateral involvement, or HSV infection in an only eye

Pediatric HSV Keratitis

- Pediatric herpes simplex keratitis has an 80% risk of recurrence, a 75% risk of stromal disease, and a 30% rate of misdiagnosis
- 80% of children with herpes simplex keratitis develop scarring, mostly in the central cornea
- Results in the development of astigmatism
- 25% of children have more than 2 D of astigmatism, most of which is irregular

Herpes Simplex

- Visual Prognosis:
  - 90% 20/40 or better after 12 years
  - 3% 20/100 or worse after 12 years
Case #5

Central Serous Chorioretinopathy (CSR)

- Demographics
  - 25-50 year old men, stressed/Type A personalities

- Symptoms
  - Unilateral, blurred vision
    - VA -> usually 20/20 - 20/80
  - Metamorphopsia

- Signs
  - Localized serous detachment of the neurosensory retina in the macula

Central Serous Chorioretinopathy

- DDx:
  - Optic disc pit
  - CNVM

Central Serous Chorioretinopathy

- Med associations:
  - Steroids
    - Nasal sprays, steroid creams, oral, injectable
  - Ephedra
    - Ephedrine & pseudoephedrine

- Treatment:
  - Observation/lifestyle change
  - D/C steroid if possible
  - Possible laser therapy
Case #6

Plaquinil Toxicity

- Antimalerials:
  - Chloroquine
  - Hydroxychloroquine (Plaquenil)

- Now used for RA, SLE, Sjogren’s, etc.

- Toxicity risk is low, but....
- Lots of different screening recommendations have been proposed

Plaquinil Toxicity

- Risk Factors:
  - Cumulative dose**
    - 1000 gram cumulative dose for Plaquenil
    - 6.85 years to reach that
  - Daily dose
  - Age
  - Liver or kidney dysfunction
  - Pre-existing retinal disease or maculopathy

Plaquinil Toxicity

- Symptoms:
  - Asymptomatic early
  - Paracentral visual field defects affecting reading
  - Color vision changes

- Signs:

Progression of Plaquinil maculopathy - early

Progression of Plaquinil maculopathy - moderate
**Plaquesenil Toxicity**

- Recommended Screening Guidelines:
  1. Baseline exam within the first year of starting Plaquesenil
     - Biomicroscopy exam, 10-2 VF, Fundus photos
     - After 5 years, annual screening exams
       - SD-OCT or mfERG or Fundus autofluorescence

**Progression of Plaquesenil maculopathy - advanced**

**Fundus Autofluorescence & mfERG**

- Tests not recommended for screening
  - Fundus photography
  - Time-domain OCT
  - FA
  - Full-field ERG
  - EOG
  - Color vision testing
  - Amsler grid
Plaquenil Toxicity

• Treatment:
  – No medical therapy is available to treat/cure the toxicity
  – D/C the med if possible
    • Work with the PCP

Pseudotumor Cerebri

• AKA
  – Idiopathic intracranial hypertension
• Elevated intracranial pressure
  – Not caused by tumor, infection, or obstruction of the ventricular system
  – Increased production vs. decreased absorption
• Etiology:
  – Idiopathic (young, obese females)
  – Medications
    • Oral contraceptives, Tetracyclines, too much vitamin A
  – Trauma

Pseudotumor Cerebri

• Symptoms:
  – HA’s (90%)
  – Visual disturbances (72%)
    • Transient visual obscurations (TVO’s)
  – Tinnitus (60%)
  – Diplopia (20%)
  – Blurred vision
  – Abnormal color vision
  – N&V

Pseudotumor Cerebri

• Signs
  – Papilledema – hallmark sign of PTC
  – Increased intracranial pressure -> slowing axonal transport -> accumulation of axonal contents in the NFL -> elevated ONH’s
  – Bilateral disc edema
  – Blurred disc margins
  – Obscuration of blood vessels*
  – Hyperemia of the disc
  – Venous dilation
  – Peripapillary hemorrhages & CWS

Pseudotumor Cerebri

• Other signs
  – Enlarged blind spot
  – 6th nerve palsy
    • Tends to subside as treatment is effective
Pseudotumor Cerebri

• Diagnosis:
  – Clean MRI/MRV
  – Lumbar puncture
    • Elevated ICP $> 250$mmHg in an obese pt
    • $> 200$mmHg in a non-obese pt
    • Normal CSF composition
  – No other neurological findings
    • Exception -> 6th nerve palsy
  – SVP
    • Yes -> not Pseudotumor
    • No -> ?????

• Treatment:
  – Weight Loss*
    • Papilledema resolution with weight loss of 6% of total body weight
  – Diamox (acetazolamide)
    • 500 mg Sequels BID-QID
    • Taper as the sx’s stabilize
  – Lumbar-peritoneal shunt
  – Optic nerve sheath decompression

Thank you for your attention!