The Good, The Bad, and The Orals for Optometry
COPE#42218-PH

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Goals for this Course

• Review commonly prescribed oral medications used in eye care

• Review ocular side effects of commonly used oral medications

• Discuss co-management considerations

Recent Optometric Legislation

• April 2013 – Florida
  – Rx oral drugs
  – Comanagement
  – Minor procedures

• May 2013 – Georgia
  – Oral steroids
  – Hydrocodone
  – Use appropriate drug distribution modalities

• April 2014 – Tennessee
  – Injectable anesthetics
  – Hydrocodone Update

Ocular ER: Big 5 Do Not Miss

• Herpes simplex keratitis
• Intraocular foreign bodies
• Orbital blow-out fracture
• Endophthalmitis
• Temporal arteritis
Prescribing Considerations

- Coverage / Indications
- Brand vs. generics
- Does the insurance cover prescriptions?
- Costs of medications
- Compliance

Patient Assistance Programs

- Alcon (800)222-8103
- Allergan (800)433-8871
- B&L (800)323-0000
- Merck (800)727-5400
- www.rxhope.com
- www.RxOutreach.org
- www.NeedyMeds.org
- www.pparx.org
- www.goodrx.com

Barriers to Compliance

- Literature review of 76 studies show
  - Compliance increases with decreased dosage regimen and complexity
  - 79% compliance with QD regimen vs 51% for QID regimens (p=0.001)
  - Simpler, less-frequent dosing results in better compliance in a variety of therapeutic classes

Patient Compliance and Dosing

- Literature review of 76 studies show
  - Compliance increases with decreased dosage regimen and complexity
  - 79% compliance with QD regimen vs 51% for QID regimens (p=0.001)
  - Simpler, less-frequent dosing results in better compliance in a variety of therapeutic classes

Prescription Considerations

- Review medical history
- Review current medications
- Side effect vs. true allergies
- Pregnant or nursing
- Rx for children
What About Allergic Reactions?

Prescribing for Women

- Certain medications are OK in pregnancy
- Breast feeding
- Consult OB-GYN if necessary

Prescribing for Children

- Children 12 years old and older can be dosed as adults unless otherwise noted
- Look up dosage for child (mg/kg/day)
- Determine how many kg child weighs
  - $1 \text{ kg} = 2.2 \text{ lbs}$
Prescribing for Children

• Clarks rule
  – Adult Dose X (Weight ÷ 150) = Child’s Dose

• Example
  – 9 year old girl 50 lbs
  – 500mg X (50 ÷ 150) = Child’s Dose
  – 500mg X .33 = 165mg
  – Child’s Dose = 165mg
  – Rx: 175 mg po tid

Case #1

• 42 year old, AA, female presents with swelling OS
• Started 3 days prior
• Hx of allergies and sinus problems but this episode different than normal symptoms
  – Redness, tenderness, and warmth of LLL
• VA Sc OD 20/20 OS 20/30
• All entrance tests normal

What is Our Likely Diagnosis?

1) Chalazion
2) Hordeolum
3) Dacryocystitis
4) Preseptal cellulitis
5) Does it really matter???

Which Antibiotic Would You Choose?

1) Keflex 500 mg BID po X 10 days
2) Z-Pak UD po
3) Augmentin 500 mg TID po X 7 days
4) Avelox 400 mg QD po x 10 days
5) Does it really matter???

Augmentin (amoxicillin / clavulanate)

• Penicillinase-resistant penicillin
• Disrupts the synthesis of peptidoglycan in bacterial cell walls
• Bactericidal
• 500 mg TID or 875 mg, 1000mg BID for one week
• Can be used in kids and pregnancy category B
• Side Effects/Contraindications:
  – Cannot be taken if penicillin allergy
  – GI upset
  – Liver injury

Diflucan (fluconazole)

• Effective against candidiasis, cryptococcal meningitis
• Interferes with fungal cytochrome P450 activity (lanosterol14-α-demethylase) decreasing ergosterol synthesis
• Pregnancy Category C
• 150 mg as a single oral dose
• Side effect
  – Headache
Case #2 My Eyes Are Blurry

- 44yo Asian American c/o blurred VA, redness, tearing, peri-orbital edema starting 2-3 days prior
- Med Hx: Uncontrolled DM (Dx in 1998)
- Vasc: OD 20/60 PH 20/30
  OS 20/80 PH 20/40
- IOP: 21 / 18

What is Your Treatment?

- Prednisolone acetate 1% vs. difluprednate 0.05% vs.
  loteprednol etabonate .5%
- Homatropine 5% vs. Scopolamine 0.25% vs. Atropine 1%
- Would you consider lab testing?
- Would you prescribe an oral medication?

Case #2

- Acute, non-granulomatous, anterior uveitis OS
- Cause???
- Treatment
  - Ordered labs – CBC w/diff, ESR, SMA-12, HLA-B27,
    Urinalysis, FTA-ABS, RPR, Lyme Western Blot
  - Difluprednate q2h OS
  - Homatropine 0.5% TID OS
  - Doxycycline 100 mg BID po

Pulse Therapy

- QID to Q 1 Hour for 7 to 10 Days
- Zero Tolerance for AC Cells
- Avoids Surface Toxicity
- Quick & Dirty
- Hit It Hard and Fast: Aggressive

Adoxa (Doxycycline)

- Inhibits bacterial protein synthesis
- Cannot be used for kids <8 and pregnancy/nursing
  – Category D
- Anti-infective dose: 100 mg BID for 10 days
- Anti-inflammatory dose: 50 mg BID for one month
  then qd 1-3 months
- Side effects/Contraindications:
  – GI upset: caution patient to take this with food
  – Photosensitivity
  – Pseudotumor cerebri

Ocular Uses for Antibiotics

- Bacterial keratitis
- Canaliculitis
- Chalazion/Hordeolum
- Chlamydia
- Dacryocystitis
- Dacryoadenitis
- Lyme disease
- Eyelid lacerations
- Ocular surface disease
- Orbital blow-out fracture
- Preseptal cellulitis
Oral Antibiotics

• Is an oral antibiotic truly needed?
• Coverage
• Check allergy information
• Consider generics
• Take full course of therapy

Keflex (Cephalexin)

• First generation cephalosporin
• Caution in those with PCN allergy
• Disrupts the synthesis of peptidoglycan in bacterial cell walls
• Bactericidal but less susceptible to penicillinase
• Pregnancy Category B
• 500 mg BID for one week
• 5-10% cross-sensitivity with PCN
• Side Effects/Contraindications:
  — Renal dysfunction
  — GI disease

Zithromax (Azithromycin)

• Inhibit bacterial protein synthesis
• Z pak: 500 mg Day 1, 250 mg Day 2-5 or 1g dose
• Pregnancy Category B
• Side Effects/Contraindications:
  — GI upset
  — Headache
  — Rash
  — May worsen myasthenia gravis symptoms
  — Kidney or liver dysfunction
• Consider risk of fatal heart rhythms

Weekend Call

• 64 yowm c/o decreased VA OS, watery eye, no pain
• Hit head on corner of the bed last night
• Went to sleep hoping it gets better
• Used ATs for relief
• Ocular Hx: Cataract surgery OU, PKP OS 2005

Levaquin (levofloxacin)

• Broad spectrum antibiotic
• Can be used in patients with PCN allergy
• Not to be used in children, pregnancy, nursing
• Dosage: 500 mg qd for one week
Case #4

- Two week f/u – Finished Zylet with No Improvement
- K – Microcysts in affected area, (-) stain
- IOP – 40 mmHg
- Referred for second opinion

Case #4

- No change in SLE
- IOP improved to 32 mm Hg
- Dx: HSV Iridocyclitis OD
- Tx:
  - Valacyclovir 500 mg tid
  - Loteprednol x qid
  - Timolol 0.5%/l bid

Oral Antivirals

- Inhibit viral DNA polymerase without inhibiting normal cellular activity
- Works best if treatment initiated within 72 hours
- Pregnancy category B
- Caution in patients with renal disease

<table>
<thead>
<tr>
<th>Antiviral Drug</th>
<th>HSV</th>
<th>HZO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acyclovir</td>
<td>400 mg 5x/day for 1 week</td>
<td>800 mg 5x/day for 1 week</td>
</tr>
<tr>
<td>Valacyclovir</td>
<td>500 mg TID for 1 week</td>
<td>1000 mg TID for 1 week</td>
</tr>
<tr>
<td>Famciclovir</td>
<td>250 mg TID for 1 week</td>
<td>500 mg TID for 1 week</td>
</tr>
</tbody>
</table>

Herpetic Eye Disease Study I

- Herpes Stromal Keratitis, Not on Steroid Trial
  - Pred Phosphate faster resolution and fewer treatment failures
  - Delaying treatment did not affect outcome
- Herpes Stromal Keratitis, on Steroid Treatment
  - No apparent benefit in the addition of oral acyclovir to the treatment of topical corticosteroid and topical antiviral
  - HSV Iridocyclitis, Receiving Topical Steroids
    - Trend in the results suggests benefit in adding oral acyclovir

Herpetic Eye Disease Study II

- HSV Epithelial Keratitis Trial
  - No benefit from oral ACV with topical trifluridine in preventing the development of stromal keratitis / iritis
- Acyclovir Prevention Trial
  - Reduced by 41% the probability of recurrence
  - 50% reduction in the rate of return of the more severe form
- Ocular HSV Recurrence Factor Study
  - No results available

Orals for Simplex???
Oral Antihistamines

- Central acting antihistamines
  - Benadryl (diphenhydramine)
  - ChlorTrimeton
- Peripherally acting antihistamines
  - Selective peripheral histamine H1 receptor blockade
  - Less CNS and anticholinergic effects
  - Less sedating but also less effective
  - With / without a decongestant

Common OTC Allergy Meds

- Inhibits action of histamine by blocking H1 receptors preventing symptoms of allergy
  - Cetirizine (Zyrtec) 5 or 10mg qd
  - Desloratadine (Clarinex) 5mg qd
  - Fexofenadine (Allegra) 60mg bid; 180mg qd
  - Loratadine (Claritin) 10 mg qd
- Pregnancy category C
- Side Effects/Contraindications:
  - Hypersensitivity reactions
  - Dry mouth
  - Headache
  - Nervousness

Benadryl (diphenhydramine)

- Temporarily relieves these symptoms due to hay fever or other upper respiratory allergies
  - Runny nose
  - Sneezing
  - Itchy, watery eyes
  - Itching of the nose or throat
- Pregnancy Category B
- 25-50 mg q6-8 hours
- Side effects
  - Blurred VA, Diplopia
  - CNS depression / somnolence

What About Products with Pseudoephedrine?

- Single ingredient pseudoephedrine products are available only at our pharmacy counter
Most Prescription Treatment Options Have a Limited Effect on the Inflammatory Cascade

Singulair (montelukast sodium)
- Leukotriene receptor antagonist
- Indications:
  - Prophylaxis and chronic treatment for asthma
  - Acute prevention of exercise-induced bronchoconstriction
  - Relief of symptoms of allergic rhinitis
- 10 mg tablet qd
- Side effects
  - Behavior or mood changes, URI, fever, headache, sore throat, cough, stomach pain, diarrhea, ear ache or ear infection, flu, runny nose, and sinus infection

Symptoms of Dry Eye

<table>
<thead>
<tr>
<th>Dry Eye Severity Level</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Symptoms</td>
<td>Mild Symptoms</td>
<td>Moderate Symptoms</td>
<td>Severe Symptoms</td>
<td>Severe Symptoms</td>
</tr>
<tr>
<td>Symptoms: Itchy, Sandy, Gritty, Dry</td>
<td>Never to Seldom</td>
<td>Sometimes</td>
<td>Frequent</td>
<td>Always</td>
</tr>
<tr>
<td>Discomfort: Stinging, Burning, Pain</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Vision: Blurring, Interrupted</td>
<td>No</td>
<td>No</td>
<td>Sometimes</td>
<td>Usually</td>
</tr>
<tr>
<td>Use of Artificial Tears</td>
<td>Less than 2X per day</td>
<td>Several times per day</td>
<td>Several times per day</td>
<td>Several times per day</td>
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</table>

Signs of Dry Eye

<table>
<thead>
<tr>
<th>Dry Eye Severity Level</th>
<th>1</th>
<th>2</th>
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<tbody>
<tr>
<td>General Symptoms</td>
<td>Mild Symptoms</td>
<td>Moderate Symptoms</td>
<td>Severe Symptoms</td>
<td>Severe Symptoms</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Conjunctival Staining</td>
<td>Corneal Staining</td>
<td>Tear Film</td>
<td>Other</td>
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<tr>
<td>Conjunctival Staining</td>
<td>Mid</td>
<td>Moderate</td>
<td>Marked</td>
<td>Visual signs</td>
</tr>
<tr>
<td>Corneal Staining</td>
<td>Mild punctate</td>
<td>Marked punctate</td>
<td>Central erosions</td>
<td></td>
</tr>
<tr>
<td>Tear Film</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Example Staining</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Tear Film Breakup Time</td>
<td>&lt; 12</td>
<td>&gt; 2 &lt; 7</td>
<td>&lt; 3</td>
<td>&lt; 3</td>
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<tr>
<td>Schirmer Score</td>
<td>&gt; 10</td>
<td>&gt; 5 &lt; 10</td>
<td>&lt; 5</td>
<td>&lt; 2</td>
</tr>
</tbody>
</table>

Dry Eye International Task Force: Therapeutic Recommendations

**Level 1**
- Patient education
- Environmental modifications
- Control systemic medications
- Preserved tears
- Allergy control
- If no improvement, add level 2 treatments

**Level 2**
- Unpreserved tears
- Gasping times ointments
- Topical corticosteroids
- Cyclosporine
- Secretagogues
- If no improvement, add level 3 treatments

**Level 3**
- Punctal plugs (once inflammation is controlled)
- If no improvement, add level 4 treatments

**Level 4**
- Acetylcysteine
- Moisture goggles
- Surgery (punctal cautery)

Oral Medications for Dry Eye
- Nutritional supplements
  - 1,000 mg BID of Omega-3 Fish Oil
- Lovaza (Rx fish oils)
  - 4g per day po
  - Indicated as an adjunct to diet to reduce triglyceride levels in adult patients with severe hypertriglyceridemia
- Oral pilocarpine
  - Salugen®: 5 mg qid for dry mouth
  - Evoxac®: 30 mg tid for dry mouth

OSDI Results

<table>
<thead>
<tr>
<th>Time (weeks)</th>
<th>% Benefit OSSE Score</th>
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<tr>
<td>Baseline</td>
<td>34</td>
</tr>
<tr>
<td>4</td>
<td>21</td>
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<tr>
<td>12</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
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</table>

† p=0.004

n = 19/group

HLA-DR Results

<table>
<thead>
<tr>
<th>Time (weeks)</th>
<th>% Staining normalized to Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>115</td>
</tr>
<tr>
<td>12</td>
<td>130</td>
</tr>
<tr>
<td>24</td>
<td>140</td>
</tr>
</tbody>
</table>

† p=0.001

Overall power of the study = 85%

CD-11c Results

<table>
<thead>
<tr>
<th>Time (weeks)</th>
<th>% Staining normalized to Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>24</td>
<td>100</td>
</tr>
</tbody>
</table>

* p<0.001
† p=0.004

Overall power of the study = 85%

Case #5

- 38 year old, African American, Female presents with red, painful, and photophobic OS
- Started 3 weeks ago / similar episode 10 years ago
- Tried dexamethasone 0.1% but no relief
- BCVA OD 20/25 OS 20/20
- IOP: 17 mmHg
Differentials

• Conjunctivitis
• Episcleritis
• Scleritis
• Uveitis

When Should Lab Tests Be Ordered?

• Bilateral cases
• Atypical age group
• Recurrent uveitis
• Scleritis
• Recalcitrant cases
• Hyperacute cases
• Worsens with tapering
• VA worsens
• Immunosuppressed

Treatment for Scleritis

• NSAIDS
• Systemic steroids
• Immunosuppressive therapy
• Topical steroids???

Advil (Ibuprofen)

• Analgesic, antipyretic, anti-inflammatory properties
• Suppresses inflammatory cascade by inhibiting COX pathway
• Pregnancy Category
  – C – Prior to 30 weeks gestation
  – D – After 30 weeks gestation
• OTC 200 mg tablets/capsules
• Analgesic dosage - 1,200 mg / day
• Anti-inflammatory dosage – 3,200 mg / day
• Generics available

Oral Anti-inflammatory Indications

Case #6 Broken Glasses

• 74 yowm with blurred VA OS>OD X 1 month / + HA
• Oc Hx: NPDR OU / AMD – dry OU / Cat Sx
• Med Hx: DM x 10 yrs, Back Pain, Coronary Artery Disease, Chronic Kidney Disease, Anemia, Sensorineural hearing loss, Cardiomyopathy - Ischemic, Cardiomyopathy - Congestive
• BCVA
  – OD: 20/40-2 PH 30-2
  – OS: 20/60-1 PH 40-2
• (-) APD
Prednisone
• Suppresses inflammatory cascade and immune response
• Optic neuritis
  – Methylprednisolone 1g/day i.v. for 3 days
  – 60-100mg qd p.o. for 11 days
  – Only after initial IV steroid treatment per ONTT to decrease risk of recurrence
• AION: 60-100mg qd
• Scleritis/Uveitis
  – Not responding to topical treatment
  – 40-80 mg as an initial dose with taper

SIDE EFFECTS/CONTRAINDICATIONS
• Increased IOP
• Cataract formation
• Fluid retention (moon face, buffalo hump)
• Increase blood sugar levels in diabetics
• Gastric ulcers
• Not to be used if pregnant
• Mood changes

ADVANTAGES
• Widely available
• Inexpensive

Oral Corticosteroid Considerations
• Accurate diagnosis is essential
• Indicated for acute inflammatory eye, orbital and eyelid conditions
• Pregnancy category C
• Dosepaks available
  – 24 mg, 30 mg, 60 mg with taper
• Best taken with meals
• Short term rarely has ocular side effects

Case #7
• 73 yowf presents with eye pain OD
• Tearing, photophobic, hard to keep eye open
• Previously Dx with DES
• Cataract Sx OD one month prior
• Uses ATs PRN
• BCVA OD 20/70  OS 20/25+

Differentials
• Corneal abrasion
• Dry eye syndrome
• Recurrent corneal erosion
• Rebound iritis
Oral Analgesics

- Hydrocodone/acetaminophen is the most frequently prescribed oral medication in the U.S.
- Indicated for:
  - Corneal abrasions
  - Recurrent corneal erosions
  - Severe keratitis
  - Severe iritis
  - Refractive surgery

Ecotrin (Aspirin)

- Pain, inflammation, fever, anti-platelet
- Pregnancy Category D
- OTC 325-650mg every 4-6 hours
- Avoid aspirin 1-2 weeks prior to surgery
- Consider in patients with CRVO, retinal emboli
- Side effects
  - Hypersensitivity
  - Rhinitis
  - Bleeding disorders
  - Reye’s syndrome
  - Pregnancy

Extra Strength Tylenol (Acetaminophen)

- Analgesics and antipyretic
- Indications:
  - Pain relief associated with corneal abrasions, chemical burns, headaches associated with eye pain, scleritis
- Pregnancy Category B
- Side Effects/Contraindications:
  - Rash, Hives
  - Itching
  - Difficulty swallowing/breathing
  - Overdose may damage liver
  - Do not take with alcohol

Oral Narcotic Analgesics

- Centrally acting opioid receptor blockers
- Safe and effective for acute, short-term pain
- Clinically used in combination with acetaminophen
- Generally prescribed as one tablet po q4-6 hours prn
- Onset 20 minutes, peak 1 hour, duration 4-6 hours

Vicodin (hydrocodone/acetaminophen)

- Dosage:
  - Vicodin contains 5mg hydrocodone with 300 mg APAP
  - Vicodin ES contains 7.5mg hydrocodone with 300 mg APAP
  - Vicoprofen contains 7.5mg hydrocodone with 200 mg ibuprofen
  - Pregnancy Category C
- 1 tablet po q4-6 hours
- Indicate how many in writing
- Generics available

Case #8

- 52 yowf, Saturday call, extreme pain and laid up like a ball
- Seen earlier this week 3 times for K ulcer
- Lives 3 hours away
- Moxifloxacin 0.5% q1h OS
Controlled Drug Act

- **Schedule I** - drugs with a high abuse risk. These drugs have NO safe, accepted medical use in the United States. Some examples are heroin, marijuana, LSD, PCP, and crack cocaine.
- **Schedule II** - drugs with a high abuse risk, but also have safe and accepted medical uses in the United States. These drugs can cause severe psychological or physical dependence. Schedule II drugs include certain narcotic, stimulant, and depressant drugs.
- **Schedule III, IV, V** - drugs with an abuse risk less than Schedule II. These drugs also have safe and accepted medical uses in the United States. Schedule III, IV, or V drugs include those containing smaller amounts of certain narcotic and non-narcotic drugs, anti-anxiety drugs, tranquilizers, sedatives, stimulants, and non-narcotic analgesics.


Ultram (tramadol hydrochloride)

- Moderate to severe pain
- Non-narcotic opioid receptor agonist
- Pregnancy Category C
- 50-100mg q4-6 hours
- Side effects
  - Hallucinations
  - Fever
  - Nausea and vomiting
  - Seizure
  - Skin rash
  - Shallow breathing, weak pulse

Side Effects of Pain Meds

- Constipation
- Nausea and vomiting
- Sedation
- Dizziness
- Itching
- Respiratory depression
- Addiction

Rx Example

- Angle Closure Glaucoma
  - Fewer than 10% of US glaucoma cases
  - Anatomically narrow angle
  - Sex
    - 3 X higher in caucasian women
    - In blacks, men + women equally affected
  - Incidence increases with age

ACG Treatment Options

- **Surgical Care**
  - Laser iridotomy
  - Laser gonioplasty
- **Medication**
  - Alpha-adrenergic agonist
  - Beta-blockers
  - Miotic agents
  - Prostaglandins
  - Carbonic anhydrase inhibitors
**Diamox (Acetazolamide)**

- Carbonic Anhydrase Inhibitor
- Diuretic, interfering with conversion of bicarbonate and reducing aqueous formation
- Contraindicated in renal, hepatic, and respiratory disease
- Pregnancy Category C
- Decreases IOP by 40-60%
- 125 mg, 250 mg, 500 mg sequels

**Diamox (Acetazolamide)**

- Angle closure
  - 250mg X 2 plus topical glaucoma meds
  - Urgent LPI
- Chronic open angle glaucoma
  - Diamox sequels 500mg BID
- Pseudotumor cerebri
  - Must have labs performed prior to treatment
  - MRI
  - Spinal tap
  - Diamox Sequels 500 mg BID

**Diamox (Acetazolamide)**

- Side Effects/Contraindications:
  - Not for those with sulfa allergy
  - Kidney dysfunction
  - Metallic taste
  - Tingling and burning in hands/feet
  - Aplastic anemia
  - Diabetics susceptible to ketoacidosis

**AREDS 2 Update**

- Demonstrated positive results of dietary zeaxanthin and lutein in terms of reducing the progression to advanced AMD when added to original AREDS formula
- 18% decrease in progression
- No additional benefits of omega-3 FA
- No statistically significant affect on cataract surgery

**AREDS 2 Formulation**

- Vitamin C (500mg)
- Vitamin E (400IU)
- Lutein (10mg)
- Zeaxanthin (2mg)
- Zinc (80 mg zinc oxide)
- Copper (2mg cupric oxide)
Ocular Side Effects of Systemic Medications

<table>
<thead>
<tr>
<th>Drug</th>
<th>Use</th>
<th>Ocular Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alendronate</td>
<td>Osteoporosis</td>
<td>Episcleritis/scleritis/uveitis</td>
</tr>
<tr>
<td>Amiodorone</td>
<td>Ventricular arrhythmia</td>
<td>Optic Neuropathy</td>
</tr>
<tr>
<td>Antihistamines</td>
<td>Allergies</td>
<td>Decreased tear secretion</td>
</tr>
<tr>
<td>Chloroquine</td>
<td>Arthritis / Lupus</td>
<td>Bull’s Eye Maculopathy</td>
</tr>
<tr>
<td>Contraceptives</td>
<td>You know</td>
<td>Decrease lacrimation</td>
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<tr>
<td>Corticosteroids</td>
<td>Anti-inflammatory</td>
<td>Increased IOP / PSC</td>
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<tr>
<td>Coumadin</td>
<td>Anticoagulant</td>
<td>Retinal Heme / SCH</td>
</tr>
<tr>
<td>Digoxin</td>
<td>Congestive Heart Failure</td>
<td>Yellow vision</td>
</tr>
<tr>
<td>Isotretinoin</td>
<td>Recalcitrant acne</td>
<td>Dry eye / MGD</td>
</tr>
<tr>
<td>Gold Salts</td>
<td>Arthritis</td>
<td>Deposits on K / Lens</td>
</tr>
<tr>
<td>Sildenafil citrate</td>
<td>ED</td>
<td>NAION</td>
</tr>
<tr>
<td>Tamsulosin</td>
<td>Anti-cancer</td>
<td>Crystalline retinopathy</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>Antibacterial</td>
<td>Pseudotumor</td>
</tr>
<tr>
<td>Thorazine</td>
<td>Anti-psychotic</td>
<td>Pigmentary retinopathy</td>
</tr>
<tr>
<td>Topiramate</td>
<td>Migraines</td>
<td>Acute myopia / ACG</td>
</tr>
</tbody>
</table>

Sudden Decrease in VA

- 24 YOWF, decrease VA 5 minutes ago, OD temp VF
- Bitten by a spider 3 days prior
- Ohx: LASIK 3 months prior
- Mhx: Unremarkable
- Shx: PT smoker
- VA OOscl: 20/25 OSsc: 20/20
- (-) APD
- GAT: 7/10

Baseline VF 06/01/11

OD Visual Field

06/03/11 OD 06/08/11 OD

Oral Contraceptives

- You know what it’s for
- Ocular Side Effects
  - Optic neuritis
  - Pseudotumor
  - Dry eye
- Increase risk with smoking
  - Heart attack
  - Blood clots
  - Stroke
  - HTN
  - Migraines
What Medications Exacerbate Dry Eyes?

- Anti-hypertensive agents
- Antihistamine / Decongestants
- Hormonal Replacement Therapy
- Antidepressants
- Pain Relievers
- GI medications
- Chemotherapy
- Antipsychotics

Plaquenil (hydroxychloroquine sulfate)

- Indicated for the treatment of discoid and systemic lupus erythematosus, rheumatoid arthritis, and malaria
- Primary risk factors
  - Duration > 5 years
  - Cumulative dose > 1000g
  - Age
  - Systemic – High BMI, liver, kidney dysfunction
  - Ocular – retina or macular changes

Plaquenil Examinations

- Complete dilated examination
- Color vision / Amsler??
- Central visual field testing 10-2
- Fundus photography for co-existing retinal disease
- Spectral domain OCT, FAF, mfERG (if available)

Prozac (fluoxetine)

- Antidepressant
- Ocular side effects
  - Dry eye
  - Blurred VA
  - Mydriasis
  - Photophobia
  - Diplopia
  - Conjunctivitis
  - Ptosis

Thorazine (Phenothiazines)

- Indicated for depression and anxiety
- Ocular side effects
  - Night blindness
  - Anterior subcapsular cataracts
  - Salt and pepper fundus
**Synthroid (levothyroxine)**
- Indicated for hypothyroidism
- Ocular side effects
  - Diplopia
  - Ptosis
  - EOM paralysis
- Graves Diseases
  - SX W>M
- NOSPECS

**Lanoxin (digoxin)**
- Indicated for congestive heart failure
- Ocular side effects
  - R-G color defects
  - Flashing lights
  - Dimming of VA
  - Xanthopsia

**Myambutol (ethambutol)**
- Indicated for tuberculosis
- Used in combination:
  - Rifampin
  - Isoniazid
  - Pyrizaminide
- Ocular side effects
  - Optic neuropathy
  - SE dose dependent

**Viagra (sildenafil citrate)**
- Selective inhibitor of phosphodiesterase type 5
- Impairment of color discrimination (B/G)
- Non-arteritic ischemic optic neuropathy

**Flomax (tamsulosin)**
- Indication for the treatment of benign prostatic hyperplasia
- Alpha-1 blocker
- Intraoperative floppy iris syndrome
- Importance to communicate prior to cataract surgery

**Cordarone (amiodorone)**
- Indicated for the treatment of life-threatening recurrent ventricular arrhythmia
- Side Effects
  - Halos
  - Photosensitivity
  - Optic neuropathy
  - Optic neuritis
  - Disc swelling
Differentials for Vortex Keratopathy

- Drug induced
  - Amiodorone
  - Chloroquine
  - Tamoxifen
  - Ibuprofen
  - Indomethacin
- Stem cell deficiency
- Fabry’s disease

Fabry Disease

- X-linked disorder due to a deficiency of alpha-galactosidase resulting in the buildup of globotriaosylceramide
- Signs and symptoms include:
  - Severe pain in the extremities
  - Exercise intolerance
  - Renal involvement
  - Skin lesions – angiokeratoma corporis discum consists of clusters of superficial cutaneous dark-red angiokeratomas
  - Tortuosity of conjunctival and retinal vessels

Fosamax (alendronate)

- Osteoporosis in post-menopausal women, Paget’s disease
- Inhibitor of osteoclastic-mediated bone resorption
- Side Effects
  - Episcleritis
  - Scleritis
  - Uveitis

Accutane (Isotretinoin)

- Used in the treatment of recalcitrant nodular acne
- Dry eyes
- Keratitis
- Conjunctivitis
- Decreased night VA
- Cataracts
- Optic Neuritis
- Pseudotumor cerebri

Topamax (topiramate)

- Indicated for the prophylaxis of migraine headaches
- Choroidal effusions
- Acute myopia
- Acute angle closure
- Treatment cessation of drug, cycloplegics, and topical hypotensives

Nolvadex (tamoxifen)

- Anti-estrogen used as adjunctive therapy for the treatment or prophylactics of breast cancer
- Maculopathy with crystalline deposits and macula edema
Home Remedies, Herbal Supplements and Whatever MOM Told Me to Take

Herbal Medicine and Nutritional Supplements

Conclusions

- Many prescription options available to treat a variety of ocular condition
- Consider patient age, history, drug interactions, compliance, cost
- Important to treat and monitor
- Practice to the fullest extent of our education!

THANK YOU

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