Pharmaceutical Kitchen part TWO

Into the inflammatory fire of the eye

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The Many Faces of PEE

Dry eye, reduced corneal sensation
Prolonged contact lens
Entropion
Drop toxicity
Lagophthalmos

Dry Eye Option #1
How many different types of Visine on shelf?
What doesn't belong?

Some statistics

• One recent study demonstrates a self-reported prevalence of dry eye in 14.5% of subjects.
  • The disease is more common in women (17.9%) than men (10.5%)

• But wait! One recent study found that up to 60% of patients with clinically significant dry eye are asymptomatic.

• A recent Harris Interactive study showed that only 29% of patients with true dry eye disease felt their optometrist provided adequate care and knowledge of their disease

Is dry eye infectious or inflammatory?

• Anterior blepharitis (debris base of eyelashes)
  • Posterior blepharitis (inspissated meibomian glands)
  • Exposure keratopathy secondary to lagophthalmos
  • Entropion (mechanical)
  • Sjogren’s, other autoimmune (ex. rheumatoid arthritis)

BOTH!!!

Getting beyond artificial tears

• In-office procedure (MiboFlow & BlephEx)
  • FDA Approved drugs
  • Compounding pharmacy
  • Amniotic Membrane

57 yo female presents with eye itchiness, eyelids are red. Constantly rubbing her eyes. Also feels burning and stinging in eyes throughout day.

I say “Collarette”

You say ___________!!!

What’s your diagnosis and treatment?
Demodex

Tea tree oil
Eyelid hygiene

Getting beyond artificial tears

• Name two FDA approved drugs for the treatment of dry eye???
  • Restasis (2003) and Xiidra (2016)

New Multidose Bottle

How aggressively should I treat?

• 60 yo female with dry eye, taking artificial tears bid. Still reports gritty, sandy feeling in eyes. New to your clinic seeking relief
  • Baby steps? Warm compress and fish oils
  • Call patient two weeks later – she’s feeling great!! (You’re an awesome doc, right?...Wrong!!)
  • “Yeah, I went to the eye doc down the street and he prescribed albumin eye drops, it’s working great – thanks for the call!” (But never gonna see her again)

• Compounding pharmacy
  • 5% Albumin eye drops 3-4 x’s daily
  • Compare to autologous serum eye drops

How’d we get here?
Too aggressive? Maybe.
60 yo female with dry eye secondary to Sjogren's syndrome.
Decreased VA 20/40 OD > OS, significant NaFl staining and PEE. Eyes feel terrible.

First things first, what's a filament? And how do we treat it?
- Filament: short strand of epithelial cells and mucus attached at one end to anterior surface of cornea.
- Management:
  - Bandage contact lens (protect from shearing action of lids)
  - Lubrication: PF artificial tears and ointment qhs
  - Removal of filaments with forceps
  - Acetylcysteine 10% qid (back to the compounding pharmacy)

What is filamentary keratitis, and how will you treat it?

Next step???
Amniotic membrane - Prokera (Freezer section)

Had two incredibly successful treatments with amniotic membrane. Asked, "How soon can we do it again!?"
- After two days of third Prokera treatment developed incredibly red, painful, swollen right eye
- Cultured – Strep pneumoniae
- Strep Keratitis
- Treated with oral and topical antibiotic
- Also added topical steroid for corneal edema

38 yo Indian male, red eyes OD > OS, blurry vision. Painful, light sensitive, difficulty opening eyes. Crusting of eyelids and lashes.

Possible Diagnosis??

What is staph hypersensitivity, and how will you manage it?

Staph Hypersensitivity
- What's an infiltrate?
  - Noninfectious reaction of the host's antibodies to bacterial antigens in the setting of staphylococcal blepharitis (antibody response to exotoxins)
  - Ocular rosacea may also be contributing factor
- Treatment of staph hypersensitivity
  - Mild
    - Warm compresses, hygiene, fluoroquinolone antibiotic qid and bacitracin ointment qhs
  - Moderate to Severe
    - Add low dose topical steroid with an antibiotic
38 yo radiologist, works at dental institute. Started taking Claritin one week ago for allergies (runny nose). But eyes are still red and itchy.

Papillary reaction
Allergic conjunctivitis

Also discussed topical Anti-Allergy

Ketotifen fumarate 0.025%
(Equivalent to 0.035%)

Olopatadine

How 'bout dem contacts?

38 yo Hispanic female (head optician). Was fit for contacts two weeks ago. Returns with itchy, watery eyes, OS worse. Does she have glasses? NO!

What's your diagnosis, and how will you treat it?

Giant Papillary Conjunctivitis

- Giant papillae on superior tarsal conjunctiva
- EVERT upper eyelid
- Other causes?
  - Atopic/vernal conjunctivitis
  - Exposed suture
  - Ocular prosthesis
- Steroid?
- Mast cell stabilizer?
  - Alamast (pemirolast potassium)
  - Alocril (nedocromil sodium)
  - Alomide (lodoxamide tromethamine)
  - Opticrom (cromolyn sodium)

What's the difference?
Allergy to medications: Neomycin causes visit to Emergency Room?

- Patient put on Maxitrol for conjunctivitis on Thursday.
- ER doc called late Saturday night 11pm, said patient presented with worsening redness and pain in eye
- He switched patient to erythromycin (was concerned with allergy)
- 1 in 6 have neomycin allergy
- 2010 Allergen of the Year

Similar problem with different drug What’s in Combigan?

Brimonidine (Alphagan) & Timolol

Another similar problem?

24 yo female, calls emergency line on Saturday morning (while doctor is enjoying a wonderful bike ride of course). Says she woke up with very swollen eyelid, NO pain, NO redness

Can I send you a pic?

What’s a possible diagnosis and management?

Called patient later that day for update What was she doing? SLEEPING!

What do you want to recommend? Benadryl? 1-2 tablets every 4-6 hours

Later that evening

Next morning glamour shot

Can open eye in 36 hours!!

Man vs Wild Bees
Switching gears to **Keratoconus**

41 yo keratoconic female, wears scleral lenses. Reports sudden decrease in vision OD, (-) pain
Says her “eye changed color, looks blue now”

**Corneal hydrops**
Acute disruption in Descemet’s membrane with subsequent corneal edema

What’s your diagnosis, and how will you treat it?

**Corneal hydrops treatment**
- Cycloplegic agent (cyclopentolate 1%)
- Sodium chloride 5% (Muro 128)
- Prednisolone topical qid in some cases
- Bacitracin ointment qid
- Brimonidine 0.1% bid to tid (treat the ocular hypertension caused by reactive inflammation)

**75 yo female** with gradually decreasing vision, worsening glare and haloes, especially while driving at night; (-) pain

**Corneal guttata**
“beaten bronze”

Specular Reflection, who cares!?

Another one for 5% sodium chloride (Muro 128)??

Fuch’s Dystrophy

1 day post- DSAEK

Edge of graft

Shallow
32 yo female calls the emergency line on Saturday, says she felt terrible pain upon awakening and opening eye. Has had similar episodes in past, causes anxiety when waking up. Hx of corneal abrasion

What’s your diagnosis and initial management?

Recurrent corneal erosion

• Cycloplegic (cyclopentolate 1% qid for pain)
• Antibiotic ointment (erythromycin or polymyxin B/bacitracin)
• Sodium chloride 5% (Muro 128 ointment at bedtime)
• May improve epithelial adhesion
• Bandage contact lens

22 yo male, red, light sensitive, painful left eye upon awakening. Hx of corneal abrasion. Worker’s comp case. States while at work, “a napkin hit his eye one month ago”

Surgical approaches
- PTK (phototherapeutic keratectomy)
- Anterior stromal puncture
- Epithelial debridement

27 yo male, hit in right eye with nerf gun dart two days ago. Eye throbbing, painful, and red. Vision slightly blurry

How do you want to treat traumatic iritis?
Instant Cure??  
Is phenylephrine the miracle cure????

Dilated with phenylephrine and tropicamide

Not really, sorry....

Cycloplegics (Dilate Pupil) and Anterior uveitis

- **Cycloplegics** serve three purposes in the treatment of anterior uveitis
  - To relieve pain by immobilizing the iris
  - To prevent adhesion of the iris to the anterior lens capsule (posterior synechia), which can lead to iris bombe and elevated IOP
  - To stabilize the blood-aqueous barrier and help prevent further protein leakage (flare)

Cycloplege synechiae

Initial  
2 days  
2 weeks

Cholinergic vs Adrenergic

- **Phenylephrine, 2.5%**, is an adrenergic agonist that causes dilation by direct stimulation of the iris dilator muscle.
- All cycloplegic agents are **cholinergic antagonists** which work by blocking neurotransmission at the receptor site of the iris sphincter and ciliary muscle. (ex. Tropicamide 1%)
- Two iris muscles: sphincter and dilator

Phenyl’s role in anterior uveitis?

- **Phenylephrine, 2.5%**, is an adrenergic agonist that causes dilation by direct stimulation of the iris dilator muscle
- Because phenylephrine has neither a cycloplegic nor anti-inflammatory effect and may cause a release of pigment cells into the anterior chamber, it is generally not recommended as an initial part of the therapeutic regimen
- Phenylephrine may, however, help break recalcitrant posterior synechia
What agent should you use to cycloplegic?

<table>
<thead>
<tr>
<th>Cholinergic Antagonist</th>
<th>Mydriasis Duration of Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximal (*minutes)</td>
</tr>
<tr>
<td>atropine</td>
<td>35</td>
</tr>
<tr>
<td>scopolamine</td>
<td>25</td>
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<td>50</td>
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<tr>
<td>cyclopentolate</td>
<td>45</td>
</tr>
<tr>
<td>tropicamide</td>
<td>25</td>
</tr>
</tbody>
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Steroids and Anterior Uveitis

- The role of **corticosteroids** is to decrease inflammation
  - by reducing the production of **exudates**
  - stabilizing cell membranes
  - inhibiting the release of **lysozyme** by granulocytes
  - suppressing the circulation of lymphocytes

- Sometimes dose steroid as high as every hour initially
  - TAPER: every hour, then every two hours, 6x’s/day, qid, tid, bid, qd, etc.

Steroid responder

- **1 in 3** may experience an increase in IOP in response to the local or systemic use of corticosteroids
- Specifically, the IOP rose
  - from a mean of 16.9 to 32.1 mm Hg in patients diagnosed with glaucoma,
  - from a mean of 17.1 to 28.3 mm Hg in glaucoma suspects
  - from a mean of 12.6 to only 18.3 mm Hg in control subjects without glaucoma.
- Most patients with elevated IOP in steroid-response glaucoma experience a return to pretreatment IOP levels within 10 days to 3 weeks after the discontinuation of steroid therapy
- IOP spikes may occur hours to weeks after the initiation of steroid therapy

24 yo healthy male (body builder) with red eye x 3 days. Light sensitive, a little watery, ( ) mucous. Decreased vision 20/40

- **Fibrinous exudate** (more common in HLA-B27)

What’s your first thought about veil?

- Topical steroids (Pred Forte 1% q1hr) and cycloplegic

Cycloplegia in iritis

- Before cyclopentolate
- After cyclopentolate in-office

50 yo AA female called colleague at 3:00am on emergency line, said eye is throbbing, red and very light sensitive, and she sees a “Veil” in vision!

- What’s your first thought about sell?

- Another Fibrinous exudate
34 yo male of Iranian descent. Bilateral red eye x 3 days, light sensitive. (+) ulcerative colitis.

**Pred Forte vs Generic**

*What does Allergan say?*

- **Pred Forte** molecules are smaller compared to generic, penetrate better.

- Micro-fine suspension is:
  - more uniform
  - remains longer in the conjunctival sac
  - minimizes mechanical irritation to the eye

**Patient Instruction for Suspension??**

**Before cataract surgery**

Irving Gass

**After cataract surgery**