

Oral Medications in Optometry

Marc R. Bloomenstein, OD, FAAO
Schwartz Laser Eye Center

Disclosure

- Presenter is on speakers panel of Alcon, Allergan, J&J, Bausch + Lomb, Reichert, OcuSoft, Sun Pharm, TearLab
- President of MRB Eye Consultants
- Past-President of the Optometric Council on Refractive Technology (OCRT)
- Presenter has NO financial interest in any products mentioned

Precautions....

- Do they need it?
- Have you discussed allergic response?
- Do they have systemic conditions that may affect the medications?
-
- Prescribing for the women and children..

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NAME _____ AGE _____

ADDRESS _____ DATE _____

Rx

REFILLS-- _____
Dispense As Written Substitution Permissible

ABBREVIATIONS

- ad-daily
- bid-twice daily
- tid-three times daily
- qid-four times daily
- qod-every other day
- 5X daily
- 9X daily
- gtt-drop
- ung-ointment
- po-by mouth
- IV-intravenous
- IM-intramuscular
- SQ-subcutaneous

ABBREVIATIONS

- wc-with food
- tud-take as directed
- ud-as directed
- ac-before meals
- pc-after meals
- qhs-every bedtime
- prn-as needed for
- UAT-until all taken
- achs-before meals and at bedtime
- sx-surgery
- tx-treatment/therapy
- NKDA-no known drug allergies
- N/V-nausea & vomiting

MEASUREMENTS

- mg-milligram
- kg-kilogram
- 1 kg=2.2 lb
- 1cc=1ml
- 1 tsp=5 ml
- 1 tbsp=15 ml
- 1 ml=20 drops



ANTI-BIOTIC



ORAL ANTIBIOTICS

- Is an oral antibiotic truly needed?
- Check allergy information
- Use less expensive antibiotics when possible
- Consider covering for *Haemophilus influenzae* in pediatric patients
 - Less Hflu since Hib vaccine became widespread
- Take full course of therapy?

– Pathogenesis, St George's, University of London
 • "course of antibiotics might make antibiotic resistance less likely."

OCULAR ANTIBIOTIC USES

- Preseptal cellulitis
- Dacryocystitis
- Dacryoadenitis
- Canaliculitis
- Chlamydia
- Dry eye/posterior blepharitis/ocular rosacea
- Posterior toxoplasmosis activation
- Endophthalmitis prevention

ALLERGIC REACTIONS

- Hypersensitivity reaction mediated by IgE
 -
- Skin rash, hives, or itching
- Wheezing or trouble breathing
- Swelling of the face, lips, or throat
- Nausea, vomiting, diarrhea
 -
 -

AMOXICILLIN

- Penicillin antibiotic (aminopenicillin)
- Extended coverage over standard PCN
- Good for staph infections because resistant to beta lactamases
- Also has some gram negative coverage
 -
 -

ORAL ANTIBIOTICS

- Controversial whether antibiotics and birth control truly interact-still counsel and document
- Can cause thrush, vaginal yeast infections
 -
- Stop antibiotic if patient reports severe diarrhea/blood in stool
 -

AMOXICILLIN DOSAGE

- Skin and soft tissue infections
- Adults
 -
- Children
 -

AUGMENTIN

- Amoxicillin + Clavulanic acid
- Contraindicated in penicillin allergic
- Clavulanic acid is a “suicide inhibitor”
 -
 -
- Allows increased coverage with less destruction by beta-lactamases
- Also covers anaerobes
 -

AUGMENTIN INFO

- Category B
- Can use in children
- Can cause nausea/vomiting/diarrhea
- Take with food/yogurt
- Few drug interactions
 - Allopurinol/probenecid (both for gout)
- Adult recommended dosage: 875mg bid
- Generic available

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NAME <u>Henry Bemis</u>	AGE _____
ADDRESS _____	DATE <u>6/17/14</u>
Rx <i>Amoxicillin 875mg</i> <i>1 po bid x 10 days #20</i>	
REFILLS <u>0</u>	_____
Dispense As Written	Substitution Permissible

CEPHALOSPORINS

- Beta-lactam antibiotic class
- Increased coverage over penicillin class
- 3-10% cross-sensitivity to penicillin class in regards to allergic reactions
- Four generations of cephalosporins
 -
- First and second generations better for ocular conditions (more likely gram positive)

CEPHALEXIN

- Brand name KEFLEX®
- First generation cephalosporin
- Good gram positive coverage (Staph/Strep)
- Good for children/Pregnant females
- Cheap
- Adult dose is 500mg bid
- Also available in suspension for children
 - 20-40mg/kg/day divided q8h

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NAME _____ Jackie Payton _____ AGE _____
ADDRESS _____ DATE 6/12/14
Rx *Keflex 500mg*
1 po bid UAT #20

REFILLS—0 _____ _____
Dispense As Written Substitution Permissible

ALLERGIC TO PENICILLIN?

- Small percentage of patients will also be allergic to cephalosporins
- Literature suggests anywhere from 3-10% cross-sensitivity
- Could use a –mycin, –cycline, –quinolone
- Could use Septra if not sulfa allergic

MACROLIDES

- Inhibit bacterial protein synthesis
- Erythromycin, clarithromycin, azithromycin
- Use with caution in liver disease
- Drug interactions increased (next slide)
- Great for penicillin allergic patients

SELECT MACROLIDE DRUG INTERACTIONS

- Theophylline (asthma, COPD)
- Dilantin, Tegretol, Depakote (epilepsy)
- Digoxin (Congestive heart failure)
- Coumadin (anticoagulant)
- Zocor, Mevacor, Lipitor (cholesterol)
- Norpace (antiarrhythmic)
- Many antiretroviral (HIV) medications
- Ergot derivatives (migraines)

ZITHROMAX (Azithromycin)

- Macrolide antibiotic
- Dosing regimen increases compliance
- OK in pregnancy and children
- Less GI effects than erythromycin
- Less drug interactions than other macrolides
- Drug of choice for chlamydial conjunctivitis

ZITHROMAX

- Z-pack
 -
 -
 -
- Treatment of chlamydia with 1 g dose
 -
 -

Mr. Henry Bemis

- *Witness Mr. Henry Bemis, a charter member in the fraternity of dreamers. A bookish little man whose passion is the printed page but who is conspired against by a bank president and a wife and a world full of tongue-cluckers and the unrelenting hands of a clock.*
- *But in just a moment Mr. Bemis will enter a world without bank presidents or wives or clocks or anything else. He'll have a world all to himself, without anyone. Imagine if you will a man, a very slight man who loved to read...*



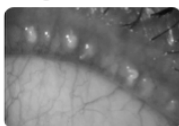
Mr. Henry Bemis

- Patient H. Bemis presents to your office for an exam.
- He is becoming contact lens intolerant and hates the notion of wearing his glasses
 - “it’s just not fair, it’s just not fair..” is all he says
 - He also hates people and driving at night
 - He only loves reading!



Mr. Henry Bemis

- 57 y.o. male
- UCVA 20/ CF OD and OS
 - +7.75 DS 20/25
 - +8.50-1.25X32 20/25
- CF, Motilities, EOM's are normal
- Slit Lamp Exam
 - 2+ posterior blepharitis
 - Trace NSC
- Fundus
 - Normal with mild drusen and RPE's



Br J Ophthalmol. 2015 Feb;99(2):199-204. doi: 10.1136/bjophthalmol-2014-305415. Epub 2014 Aug 19.

Oral azithromycin versus doxycycline in meibomian gland dysfunction: a randomised double-masked open-label clinical trial.

Keshkoul MB¹, Farrel AJ¹, Klawnsch V¹, Noor M², Ghassian L³.

© Author information

Abstract

BACKGROUND/AIMS: To assess the efficacy and safety of oral azithromycin compared with oral doxycycline in patients with meibomian gland dysfunction (MGD) who had failed to respond to prior conservative management.

METHODS: 110 patients (>12 years old) with MGD were randomly assigned to receive either oral 5-day azithromycin (500 mg on day 1 and then 250 mg/day) or 1-month doxycycline (200 mg/day). They also continued eyelid warming/cleaning and artificial tears. A score comprising five symptoms and seven signs (primary outcome) was recorded prior to treatment and at 1 week, and 1 and 2 months after treatment. Total score was the sum of both scores at each follow-up. Side effects were recorded and overall clinical improvement was categorised as excellent, good, fair or poor based on the percentage of change in the total score.

RESULTS: Symptoms and signs improved significantly in both groups ($p=0.001$). While improvement of symptoms was not different between the groups, bulbar conjunctival redness ($p=0.004$) and ocular surface staining ($p=0.01$) were significantly better in the azithromycin group. The azithromycin group showed a significantly better overall clinical response ($p=0.01$). Mild gastrointestinal side effects were not significantly different between the groups except for the second visit, when the doxycycline group had significantly more side effects ($p=0.002$).

CONCLUSIONS: Although both oral azithromycin and doxycycline improved the symptoms of MGD, 5-day oral azithromycin is recommended for its better effect on improving the signs, better overall clinical response and shorter duration of treatment.

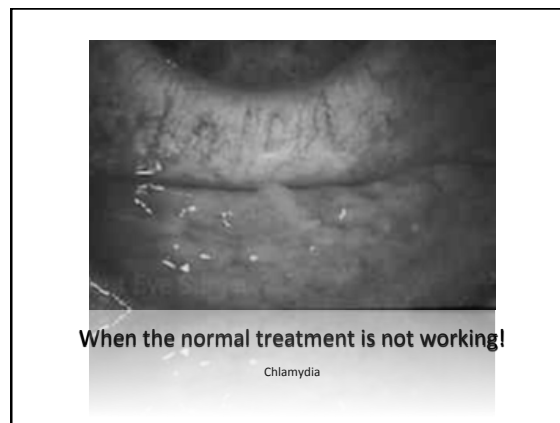
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NAME Brandon Flowers AGE _____

ADDRESS _____ DATE 6/18/14

Rx **Z-pack**
 Use as directed

REFILLS-- _____
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NAME Steve Ferrucci AGE OLD

ADDRESS _____ DATE 6/18/14

Rx **Zythromax 250 mg #4**
 Take all (4) pills at once

REFILLS—0 _____
 Dispense As Written Substitution Permissible

-CYCLINES

- Inhibits bacterial protein synthesis
- Effective in blocking enzymes
- Tetracycline, Doxycycline, Minocycline
- Cannot use in children younger than 8
- Cannot use in pregnancy/nursing
- Causes photosensitivity and photophobia
- Long-term therapy associated with pseudotumor cerebri (rare)

DOXYCYCLINE

- Good broad spectrum activity
- Acts as a antibiotic
- Acts as a anti-inflammatory
- DO NOT Rx



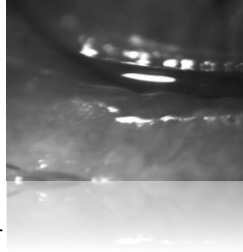
Rules of Thumb with Doxy

- Do NOT take before lying down
- Do NOT take with calcium
- Do NOT take with dairy foods
- Do take with food



OCULAR USES

- Antibiotic use
 -
- MGD and Dry eye
 - 1000mg 1 dose
 -
 - then
 - 50mg qd x 3-6 months or indefinitely



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NAME _____ William Clinton _____ AGE _____

ADDRESS _____ DATE 6/12/14

Rx

Doxycycline Hyclate 100mg #60
1 po bid with food

REFILLS ~ 3 _____

Dispense As Written Substitution Permissible

LEVAQUIN

- A fluoroquinolone
- Can be used for patients allergic to PCN and/or cephalosporin
- OK for hordeolum/preseptal cellulitis
- Has some coverage against MRSA
- 500mg qd x 7-10 days
- No in children/pregnancy/breast feeding

ANTIBIOTIC USAGE

- Use the full course of treatment??
- Counsel and document discussion about birth control
- Watch for thrush or yeast infections
 - use with yogurt
- Watch for intestinal distress:
 - diarrhea
 - blood in stool



DRY EYE USES

DRY EYE ORAL AGENTS

- Salagen® (oral pilocarpine HCl)
 - 5 mg qid for dry mouth
- Evoxac®
 - 30 mg tid for dry mouth
- Oral meds approved for dry mouth associated with Sjogren's patients and head/neck radiation
- Can consider for DES

GLAUCOMA

DIAMOX (Acetazolamide)

- Treatment of acute angle closure glaucoma
- Treatment of less acute increased IOP
- Treatment of post-surgical IOP spikes
- Treatment of pseudotumor cerebri
- Controversial treatment of serous retinal detachments
- Also used to prevent "altitude sickness"

DIAMOX (Acetazolamide)

- Nonbacteriostatic sulfonamide
- Decreases carbonic anhydrase
 - Decreases hydrogen and bicarb ion formation
- Results in decreased aqueous production in the ciliary body
- Results in alkaline diuresis in the kidney but tolerance develops quickly
- Contraindicated in renal, hepatic, or respiratory disease

DIAMOX (Acetazolamide)

- Decreases carbonic anhydrase in the ciliary body which decreases aqueous humor formation
- Decreases IOP by 40-60%
- Starts to work in 1 hour, peak effect at 4 hours
- Comes in 125mg, 250mg, 500mg sequels
- Angle closure dose: (2) 250mg tablets initially —needs PI

DIAMOX (Acetazolamide)

- Treatment of pseudotumor cerebri
- Need CBC with differential as baseline
- Start 500mg sequels bid
- Often results in tingling, "pins and needles" in extremities
 - Can lower dose to 250mg bid
 - Can try Neptazane 50mg tid

DIAMOX SIDE EFFECTS

- Rare with short term use
- Paresthesias ("pins and needles")
- Kidney stones
- Acute respiratory failure
- Acid-base imbalances
- Blood dyscrasias (aplastic anemia)
- Induced myopia
- Metallic taste

SULFA ALLERGY

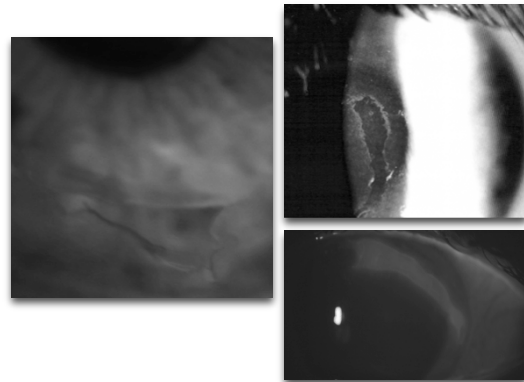
- Sulfa allergy not sulfur allergy
- Rash is common sign; usually seen in the antibiotic class of sulfonamides (like Septra® or sulfacetamide ointment)
- Less likely to see in non-antibiotic meds
- Diamox®, Neptazane®, Azopt®, Trusopt®, Cosopt®
- Even less likely to see with topical medications
- Sulfites and sulfates are chemically different-no cross reactivity with sulfa allergies

OSMOGLYN®

- Glycerin 50% oral solution
- An osmotic diuretic
- Decreases IOP quickly; but lasts only 1-2 hrs
- 1-2 g/kg orally for initial dose
- Avoid in diabetics due to high caloric load
- Risk of dehydration in elderly and those with kidney disease
- Causes nausea and vomiting
- Worsens congestive heart failure



PAIN MEDS



PAIN CONTROL

- Schedule II, III and IV analgesics
- Non-scheduled pain meds
- Corneal abrasions, post-op PRK, post-op pterygium surgery, etc.
- Do not use in infectious processes, will mask pain of worsening infection
- Short term therapy only recommended
- Need DEA # to prescribe scheduled meds

CODEINE

- Naturally occurring substance
- From the opium poppy
- 1/12 the strength of morphine
- Rarely used alone
 - Tylenol #3® (APAP and codeine)
 - Empirin #3® (ASA and codeine)
- Also used as an antitussive in cough syrups

CODEINE COMBINATIONS

- Tylenol #3® and Tylenol® #4
- Increasing codeine amount from #3 to #4
- APAP amount is 325mg in each
- #3-30mg codeine + 325mg APAP
- #4-60mg codeine + 325mg APAP
- Tylenol with codeine® elixir is APAP 120mg/5cc with 12mg codeine/5cc

TYLENOL #3

- Schedule II
- Central acting narcotic analgesic
- 325mg acetaminophen (APAP)+ 30mg codeine
- Avoid in liver disease/alcoholism
- No extra Tylenol® in addition
- No alcohol
- GI distress and sedation are main side effects

ALLERGIC TO CODEINE?

- Most internists still use hydrocodone because it is a synthetic form of codeine
- Most codeine “allergies” are just GI side effects
- True IgE mediated allergic reaction low

HYDROCODONE COMBINATIONS

- Effective as Class II narcotics
- Significantly more pain relief and duration of action compared to codeine
- Induces euphoria
- Highly addictive
- Also has antitussive properties

HYDROCODONE PRODUCTS

- Vicodin (APAP w/hydrocodone)
 - 300mg APAP + 5mg hydrocodone
 - Schedule II
- Vicodin ES (APAP w/hydrocodone)
 - 300mg APAP + 7.5mg hydrocodone
 - Schedule II
- Vicoprofen
 - 200mg ibuprofen + 7.5mg hydrocodone
 - When Tylenol® is contraindicated/liver disease
 - Schedule II

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NAME <u>Tylor Durden</u>	AGE _____
ADDRESS <u>420 Paper St. Wilmington, DE</u>	DATE <u>10/22/87</u>
Rx <i>Vicodin 5/300 #30 (thirty)</i> <i>1-2 q4-6h prn pain</i>	
REFILLS-- <u>0</u>	_____
Dispense As Written	Substitution Permissible

SIDE EFFECTS OF PAIN MEDS

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

NSAIDS

- KETOPROFEN
 - Ketoprofen is a nonsteroidal anti-**inflammatory** drug (NSAID). Ketoprofen works by reducing hormones that cause inflammation and pain in the body. Ketoprofen is used to treat pain or inflammation caused by **arthritis**. The ketoprofen regular capsule is also used to treat mild to moderate pain, or menstrual pain.
 - TAKE WITH FOOD IN STOMACH

ORAL ANTIHISTAMINES

- Central acting antihistamines
 - Benadryl (diphenhydramine)
- Peripherally acting antihistamines
 - Selective peripheral histamine H1 receptor blockade
 - Less CNS and anticholinergic effects
 - Less sedating but also less effective
 - Claritin, Allegra, Zyrtec
 - All available with and without a decongestant
 - Zyrtec and Claritin available OTC

MY FIRST CHOICE

- ZYRTEC®
- Non-sedating antihistamine
- Less ocular surface damage
 - When compared to Claritin®
 - Still avoid in dry eye if possible
- Less drug interactions
- Less expensive

ZYRTEC (Cetirizine)

- Adult dosage: 10mg qd
- Pediatric >5 yo: 5-10 mg qd, 2-5 yo: 2.5-5mg qd
- Can be used down to 6 months of age
- Comes in 5mg, 10mg, and 1mg/ml syrup
- w/o regard to food
- Available with and without a decongestant

ORAL ANTIVIRALS

- Inhibit viral DNA polymerase without inhibiting normal cellular activity
- Well tolerated and safe
- Decrease dosage in renal disease
- All 3 drugs similar in efficacy--not in price
 - Acyclovir 7 day course = \$35.78
 - Famvir 7 day course = \$237.88
 - Valtrex 7 day course = \$243.36

ORAL ANTIVIRALS

- Found in tears
- Can use for epithelial disease if patient can't use Viroptic®/Zirgan® secondary to toxicity/severe dry eye/availability
- Does not help in the treatment of stromal disease
- Treat stromal disease with Pred Forte® 1%
- Cover steroid with Viroptic®/Zirgan® or oral antiviral

ORAL ANTIVIRALS

- Herpes simplex keratitis
- In place of topical treatment
 - Acyclovir 400mg 5x day x 10 days
 - Famvir® 250mg tid x 7 days
 - Valtrex® 500mg tid x 7 days
- For prevention of recurrences
 - Acyclovir 400mg qd-bid
 - Famvir® 250mg qd
 - Valtrex® 500 qd

ORAL ANTIVIRALS

- For Herpes Zoster (shingles) treatment
- For Bell's Palsy treatment
- Must start within 72 hrs for best effect; preferably within 24 hrs
- Acyclovir 800mg 5X day
- Famvir 500mg tid
- Valtrex 1 gram tid

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NAME _____	Steven Ferrucci	AGE _____
ADDRESS _____		DATE <u>6/6/66</u>
Rx	<i>Acyclovir 800mg #50</i> <i>1 po 5x day</i>	
REFILLS-- _____	_____	_____
	Dispense As Written	Substitution Permissible

MORE DRUGS

#GONNAVOMIT

ANTI-EMETIC

- Phenergan 25mg tablets or suppositories
- Phenergan 12.5mg tablets
- Also available in syrup and elixir
- 1 every 4-6 hours as needed for N & V
- Can cause increased sedation
- Also consider Zofran 8mg q8h

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NAME MARC BLOOMENSTEIN AGE _____

ADDRESS _____ DATE 6/22/14

Rx Phenergan 25mg #20
1 po q 4-6h prn NV

REFILLS-- _____

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SLEEP AIDS

- Consider Diphenhydramine 25-50mg (Benadryl) available OTC
- Ambien 5mg or 10mg qhs prn
 - Ambien CR 6.25mg or 12.5mg
 - All Ambien products are Schedule IV
- Rozerem 8mg qhs prn
 - Not a controlled substance

DEALING WITH OTHER PROFESSIONALS

- Pharmacists
 - DEA numbers
 - Calling in prescriptions
- Insurance companies
- Talking with PCP when necessary

KEEPING UP

- Rxlist.com
 - Search for drug information
 - Top 300 List
- Centerwatch.com
- Epocrates.com
- Drugs.com
- Lexi.com
 - Order Drug Information Handbook Pocket yearly
 - What's New
 - New Drug Section

THANK YOU

PEACE OUT