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of OPTOMETRY

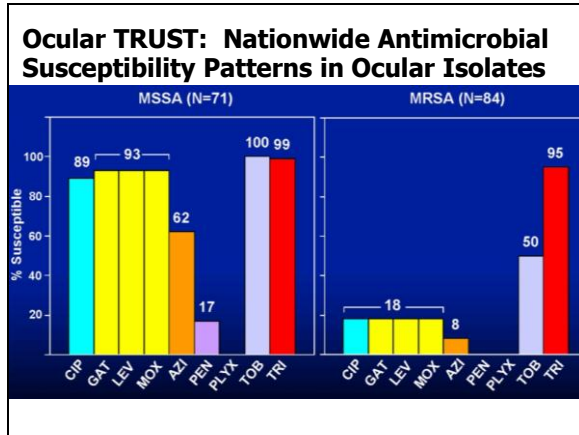
Current Trends in Medical Management

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ACADEMY 2012
PHOENIX

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Trimethoprim with Polymyxin B

- **Trimethoprim, a non-antibiotic antibacterial**
 - Bacteriostatic and broad spectrum
 - Inhibits bacterial dihydrofolate reductase
 - Effective against most common ocular pathogens, except pseudomonas species
 - Excellent for bacterial infections in children
 - Haemophilus influenzae and streptococcus pneumoniae
- **Available in solution only (Polytrim and generic)**

Bactrim or Septra

- **Drug of choice for MRSA infections**
- **Combination of 160 mg of trimethoprim and 800 mg of sulfamethoxazole**
- **Rule out true sulfa allergy**
- **Sig: Take 1 or 2 DS tabs p.o. bid x 7-10 days**
- **Note that the standard strength of these drugs is "double strength" (DS)**
- **If sulfa-allergic, then doxycycline 100 mg used bid for 7-10 days**
- **Both are old, generic, and highly-effective**

Cephalexin (Keflex)

- **Cephalexin - 1st generation cephalosporin**
- **Effective against most gram positive pathogens**
- **Most cephalosporins (especially 1st generation) may share a slight cross-allergenicity to PCN (if true allergy to PCN, oral fluoroquinolone or TMP-SMX are alternatives)**
- **Usual dosage: 500 mg bid x 1 week**
- **Useful in soft tissue staph infections, such as internal hordeola, preseptal cellulitis, etc.**

21st Century Perspective on Penicillin Allergy

- "About 90% of patients with documented IgE antibodies to penicillin tolerate cephalosporins with identical or very similar side chains."
- "Many patients with histories of penicillin or cephalosporin 'allergy' have actually had nonimmunologic drug-related side effects such as vomiting, diarrhea, and nonspecific rash."
- "First generation cephalosporins have the potential for cross-reactivity, but the risk is less than the 10% rate that has been presumed. Infact, the risk is closer to 0.5%." Most second or third generation cephalosporins, specifically cefuroxime (Ceftin), cefpodoxime (Vantin), ceftriaxone* (Rocephin), and cefdinir (Omnicef) are unlikely to be associated with cross-reactivity." (*I.V. only)

Reference: "Safe Use of Selected Cephalosporins in Penicillin-allergic Patients: A Meta-Analysis." Otolaryngology-Head and Neck Surgery. March 2007.

Penicillin and Cephalosporin Cross-Sensitivity

- Both possess a beta-lactam ring
- “Cephalosporins are first-line treatment for many infections and are widely in ophthalmology.”
- “More than 90% of patients who report a history of penicillin allergy lack penicillin-specific IgE and can tolerate the antibiotic safely.”
- Penicillin allergy “should not prevent the use of second- and third-generation cephalosporins with distinct side-chains.” These are: cefuroxime, cefprozil, ceftazidime, and cefpodoxime.

Reference: AJO, January 2011

Options for True Penicillin Allergy Patients

- 2nd or 3rd generation cephalosporin
- Sulfamethoxazole/trimethoprim (Bactrim or Septra)
- A fluoroquinolone (Levofloxacin)
- Doxycycline
- Erythromycin

Azithromycin 1% Ophthalmic Solution

- Topical eyedrop solution of azithromycin
- Only macrolide eyedrop formulation
- Spectrum coverage is similar to erythromycin
- Good tissue penetration; viscous vehicle
- Dosage: BID for 2 days then QD for 5 days
- Avoid use if patient is allergic to erythromycin
- Pregnancy category B; approved down to age 1
- Marketed as AzaSite 1% ophthalmic solution in a 2.5 ml opaque bottle by Merck Pharmaceuticals
- Ongoing Phase III studies azithromycin 1% / dexamethasone .1% combination

Off label

- “An estimated 50 percent of medications used routinely in ophthalmic practice are used off-label.”
- “Clinical practice should be guided by the best interest of the patient.”
- “In many instances, off-label treatments may be the best , or the only, available treatment, and withholding treatment would be unethical.”

Reference: EyeNet. April 2011.

Off label

“Ophthalmologists must be aware of potential conflicts of interest with the use of off-label medications, including financial gain, notoriety or recognition, advancement of a personal research program or promotion of a third party interest, and carefully assessing whether those interests are affecting treatment recommendations.

Reference: EyeNet. April 2011.

Aminoglycosides

- Bactericidal
- Inhibits protein synthesis
- Effective against most commonly encountered gram positive and gram negative bacteria
- Available in both solution and ointment form
 - Gentamicin - toxic/allergic reactions do occasionally occur (Category C)
 - Tobramycin - resistance, toxic and allergic reactions rare (Category B)

Gatifloxacin

- Inhibits topoisomerase types 2 and 4
- Highly effective against Gram+ and Gram- bacteria
- FDA-approved for bacterial conjunctivitis
- Pregnancy category C; pediatric to age 1
- BAK preserved
- Available from Allergan as 0.5% Zymaxid
- Systemically: Tequin (removed from market)

Moxifloxacin 0.5%

- Actions: Inhibits topoisomerase type 2 (DNA gyrase) and topoisomerase type 4
- Highly effective against G+ and G- bacteria
- Pregnancy category C
- Pediatric indication:
 - Vigamox - age 1
 - Moxeza - age 4 months
- Xanthan gum prolongs ocular surface contact time, thus a decreased dosing frequency
- Dosing:
 - Vigamox 0.5% tid x 7 days (pH 6.8)
 - Moxeza 0.5% bid x 7 days (pH 7.4)
- Vigamox and Moxeza 3ml – available by Alcon
- Systemically available as Avelox

Antibiotic Use Causes Multidrug Resistance

- “Conjunctival *S. epidermidis* repeatedly exposed to fluoroquinolone or azithromycin antibiotics rapidly develop resistance.”
- Gentamicin, Polytrim, doxycycline, and vancomycin remain very highly effective medicines in eradicating *S. epidermidis*.
- The fluoroquinolones and macrolide antibiotics exhibit high levels of resistance
- “These findings indicate the need for greater thought and more rational use of ophthalmic antibiotics to reduce the epidemic of antimicrobial resistance.”

Oph. October 2011

Preventing Eye Infections (Intravitreal Injections)

- Kill time for Betadine (povidone iodine) 15-120 seconds!at any concentration
- Anaphylaxis to iodine does not exist!
- “Topical moxifloxacin .5% had no additional effect on reducing conjunctival bacterial counts beyond the effect of 5% povidone iodine alone.”
- “Preinjection antibiotics either before the day of injection or immediately prior to injection are not generally recommended.”
- Gentamicin was vastly more effective than fluoroquinolones

AJO, November 2011

Antimicrobial Resistance

- Staph. Epi. was the most common pathogen in this study
- 97% of all isolates were sensitive to gentamicin
- Fluoroquinolone resistance ranged from 32% to 40%
- “The high prevalence of fluoroquinolone-resistant organisms among ocular and nasal flora in our patient population raises concern with regards to the usefulness of topical fluoroquinolones as the best first-line agent in the setting of ophthalmic prophylaxis and for empiric use in acute ophthalmic infectious processes.”

Reference: AJO, December 2011

Besifloxacin A Novel Chloro-fluoroquinolone

- New chemical entity: An 8-chloro-fluoroquinolone
- NOT used systemically – only available in U.S.
- Relative resistance-proof: No oral counterpart
- FDA-approved medication: Bacterial conjunctivitis
- FDA-approved treatment protocol: tid for 7 days
- Pediatric approval: ages 1 and older
- Preserved with 0.01% BAK (Durasite vehicle)
- Marketed as Besivance 0.6% ophthalmic suspension by B&L Pharmaceuticals – 5 ml

Surgical Perspective on Besifloxacin

"Preoperative treatment with povidone-iodine is now more important than ever. I still think that topical fluoroquinolones are our best option for surgical prophylaxis and also for treating post-surgical infections. But now I rely almost exclusively on besifloxacin, because ARMOR has demonstrated that it is the most effective of the fluoroquinolones against resistant organisms, particularly MRSA."

Reference: M. McDonald, *Refractive Eyecare*, September 2011

2009 ARMOR Surveillance All *S. aureus* (n= 200)

Antibiotic	MIC Range	MIC ₅₀	MIC ₉₀
Vancomycin	0.25 – 2	0.5	1
Besifloxacin	≤0.008 – 4	0.03	1
Moxifloxacin	≤0.008 – 64	0.06	8
Ciprofloxacin	≤0.06 – 256	0.5	256
Tobramycin	≤0.06 – >256	0.5	256
Azithromycin	≤0.25 – >512	128	>512

39% of ocular *S. aureus* isolates were MRSA
38% of ocular *S. aureus* isolates were FQ-resistant

Haas et al. Presented at ARVO, Fort Lauderdale, FL, May 2-6, 2010. Abstract #D965, % resistance based on oxacillin and ciprofloxacin breakpoints.

ARMOR Study Methodology

- "Two things – the strength of ARMOR's methodology and the number of isolates tested – make it an extremely trustworthy study."
- "Among the fluoroquinolones tested, besifloxacin proved to be the most potent against staphylococci, particularly ciprofloxacin-resistant staphylococci; it was followed by moxifloxacin and gatifloxacin."

Reference: M. McDonald, *Refractive Eyecare*, September 2011

The Tetracyclines

- Tetracycline, doxycycline, minocycline
- Doxycycline is most commonly used
- Advantages over tetracycline
 - Maintenance dose 20 - 100 mg daily
 - Can be taken without regard to meals
- Contraindicated in pregnancy, nursing mothers, under age 8; photosensitivity warning
- Indication in primary eye care
 - Meibomianitis (chronic inspissated glands)
 - Adult inclusion conjunctivitis (chlamydia)
 - Recurrent corneal erosion

Oracea

- Doxycycline 30 mg immediate release and 10 mg delayed release beads (once daily 40 mg capsule)
- First and only oral therapy approved by FDA to treat rosacea
- Works by controlling inflammation
- Recommended to take in morning with a full glass of water
- Contraindications and side effects similar to tetracyclines (photosensitivity and yeast infections not observed in clinical trials).
- Marketed by Galderma

Oral Doxycycline and Pterygial Angiogenesis

- UV light is a known trigger for pterygenesis and progression
- Doxycycline (and corticosteroids) can inhibit neovascularization
- Perhaps pterygium management can be augmented with 50 mg P.O. doxycycline daily for many weeks or many months after (or concurrent with) topical loteprednol q.i.d. for 1 month, the b.i.d. for 2 months

Reference (in part): *Oph. April*, 2011

Drugs and Pregnancy - Antibiotics

- “No known congenital defects have been reported with the use of erythromycin and polymyxin B.”
- “Systemic tetracycline can cause the discoloration of primary teeth in the offspring of mothers who receive the antibiotic after the third month of pregnancy.”
- “Regarding the use of fluoroquinolones, no teratogenic effects have been noted in animal studies.”
- “The AAP has classified erythromycin, gentamicin, tetracycline, and ciprofloxacin as maternal medications usually compatible with breast-feeding.”

Reference: AAO Focal Points, September 2007

Difluprednate 0.05% (Durezol)

- “There is increased bioavailability and dose uniformity resulting from the formulation of difluprednate as an emulsion, rather than a suspension.”
- Steroid-induced hypertension seen in 8% of the normal population, and is more common in patients with glaucoma.
- Steroid-induced hypertension is “generally not seen until 3 to 6 weeks of corticosteroid use.”
- “Difluprednate was shown to provide better results compared with prednisolone acetate...”
- “We believe the effects seen are the result of the greater anti-inflammatory potency of difluprednate.”

AJO, October, 2011

Loteprednol Etabonate

- Only ester-based, site-specific steroid
- Works at target tissues, and then is quickly metabolized into inert compounds
- LE has high intrinsic activity when applied locally
- 0.5% loteprednol similar in therapeutic equivalence on the ocular surface to 1% prednisolone acetate, yet causes little, if any, increase in IOP
- Available as 0.5% (Lotemax) and 0.2% (Alrex) ophthalmic suspensions

Loteprednol Ophthalmic Ointment

- The only ester-based steroid ointment available
- It is a 0.5% concentration and preservative-free
- FDA-approved: Post-operative inflammation and pain
- Numerous “off-label” clinical uses: dry eye, allergy, corneal transplant protection, blepharitis, GPC, chronic uveitis, stromal immune herpetic keratitis, Thygeson’s SPK, RCE, augmentation of steroid eyedrop therapy in acute, advanced uveitis or episcleritis, following Betadine EKC Tx, contact dermatitis, and other inflammatory conditions as indicated
- Available in a 3.5 gm ophthalmic tube as Lotemax 0.5% ophthalmic ointment by B&L

Fluorometholone Alcohol

- A progesterone-based steroid
- Useful in treating mild to moderate ocular conditions
- Has a reduced potential to increase IOP
- Available as FML 0.1% suspension and ointment (Allergan) and generic suspensions
- Also available as FML-Forte, a 0.25% suspension (no increase in efficacy beyond the 0.1% concentration)

Long-Term FML Use After PKP

“In summary, we found that the prolonged use of 0.1% fluorometholone was beneficial for the prevention of rejection after PKP. Because no adverse consequences associated with the use of the eye drops were noted, we recommend continuing the use of low-dose corticosteroids, even in non-high-risk cases.” Reference: Oph, April 2012

M & T: If such prolonged use of a ketone-based steroid is safe and effective, it would stand to reason that long-term use of loteprednol would be even safer. This has clear implications for long-term use in dry eye-related ocular surface inflammation.

Systemic Prednisone

- Most common systemic corticosteroid rx'd
- Common initial dosage 40-60 mg
- Available generically in both tablets and DosePaks (4, 5, 10 mg)
- Questions to ask before prescribing?
 - Diabetic?
 - Peptic Ulcer Disease?
 - Tuberculosis?
 - Pregnant?

Non-Ophthalmic Steroid Ointments/Creams

- Triamcinolone – high to medium potency steroid
- Available in cream, ointment and lotion

Reference: Drug Facts and Comparisons

Dry Eye Syndrome

- Common presenting problem
- Symptoms: burning, gritty-sandy feeling, foreign body sensation, and/or tearing or watering
- Diagnosis: Good History, decreased lacrimal lake, decreased BUT, Lissamine Green staining, InflammDry
- Treatment: Frequent use of lipid-based artificial tears; anti-inflammatory medications, punctal plugs, oral doxycycline, oral omega-3 fatty acids
- Patient education is vitally important to maximize care.

RPS InflammDry Detector

- Detects presence of MMP-9 (cytokine – a reliable marker for ocular surface inflammation)
- MMP-9 not found in normal eye
- May predict response to cyclosporin, doxycycline, and steroids
- Procedure is simple, taking 10 minutes
- Cost approximately \$15

Reference: "Inflammation Check: A New Test for Dry Eye." Review of Ophthalmology. July 2011.

Inflammation and Dry Eye Disease (DED)

- "Inflammation has a prominent role in the development and amplification of the signs and symptoms of DED."
- "Regardless of the origin, a self-perpetuating cycle of inflammation develops that is central to the pathogenesis of DED."
- "Doxycycline ameliorates DED by inhibiting the activity of MMPs, primary MMP-9, promoting ocular surface integrity."

Archives of Ophthalmology, January 2012

Supplemental Therapeutic Approaches in Dry Eye Disease (DED)

- "Most of the available evidence suggests that administration of omega 3 EFAs can lessen DED severity."
- Regarding omega 3 EFAs, "... more evidence is needed to identify the most efficacious forms and doses."
- "The evidence implicating inflammation in pathogenesis of DED has opened new avenues for the treatment of this complex disorder. The successful application of anti-inflammatory medications in the treatment of DED provides hope for the millions of individuals who daily experience this deleterious condition."

Archives of Ophthalmology, January 2012

Perspective on Therapeutic Approaches

- "... it is clear that many patients with DED do not show a consistent therapeutic response to topical cyclosporin A, and . . . some patients experience bothersome adverse effects (eg, burning or irritation) that impair medication tolerability."
- Clinical trials have demonstrated the efficacy of topical corticosteroid treatment at diminishing symptom severity and minimizing ocular surface staining."
- "Repetitive short-term pulsatile administration of topical corticosteroids is a promising method of harnessing their beneficial effects, while minimizing the risk of adverse events."

Archives of Ophthalmology, January 2012

Tear Dysfunction Perspectives

- Encompasses changes in tear composition rather than tear volume
- In dry eye, tear osmolarity is 20 to 40 mOsm/L greater than normal: 314-364 mOsm/L
- MMP-9 is increased in dry eye, and regulates epithelial shedding
- "Over the past decade there has been a trend towards increased use of anti-inflammatory therapies to improve comfort, corneal smoothness, and barrier function."
- Corticosteroids, doxycycline, and EFA's have been found to decrease production of a variety of inflammatory mediators and improve corneal epithelial disease.

AJO, December 2011

"Ocular surface disease, including dry eye, blepharitis/meibomian gland dysfunction and ocular allergy, compromises the most common diagnosis encountered on a daily basis by the comprehensive ophthalmologist."

"The pathophysiology of each of the three ocular surface diseases includes inflammation. While classical teaching is to begin treatment with palliative therapy such as artificial tears for ocular surface disease, I favor treating these patients more aggressively when I initiate therapy."

"I have suggested we use the term 'ocular surface inflammatory disease' to remind us that the core issue in these diseases is inflammation and to lead us to consider more aggressive initial therapy."

Reference: Ocular Surgery News. February 10, 2012

Lipid-Based Artificial Tears (For Evaporative Dry Eye)

- Vast majority of dry eye patients have MGD
- Meta-stable emulsions are optimum Tx
- Rapidly provides a protective lipid barrier
- Reduces harmful evaporation to prevent tear loss
- Replenishes the complete tear film
 - ≈ *Soothe XP* emulsion (15 ml) - B+L
 - ≈ *Systane Balance* emulsion (10 ml) – Alcon
 - ≈ *Refresh Optive Advanced* (10 ml) – Allergan
 - ≈ *Freshkote* (15 ml Rx) – Focus Labs

Aqueous-Based Artificial Tears (For Aqueous Deficient Eye)

- Relatively uncommon cause of dry eyes
- Aqueous-based solutions are optimum Tx
- Rapidly provides ocular surface hydration
- Main ingredients commonly include
 - Cellulose
 - Glycerin
 - Polyethylene Glycol
 - Propylene Glycol
- ≈ *Soothe Xtra Hydration* (15 ml) – B&L
- ≈ *Systane Ultra* (15 ml) – Alcon
- ≈ *Optive* (15 ml) - Allergan
- ≈ *Blink* (15 ml) - AMO

Physician Care of Dry Eye Patients

"Surprisingly, the cornea specialists did not show better conformance (to established Preferred Practice Patterns) than other ophthalmologist subtypes because they received special training in the diagnosis and management of dry eye syndrome."

(Reference: Archives of Ophthalmology, May, 2010)

- It is our opinion that an attentive, compassionate doctor of optometry should be the best at caring for patients with dry eye disease!

Lacrisert

- A sterile, translucent, rod-shaped, water-soluble, ophthalmic insert (1.27 mm x 3.5 mm) made of hydroxypropyl cellulose 5 mg
- For moderate to severe dry eye sufferers
- Insert into inferior cul-de-sac of eye beneath base of tarsus
- Supplied by Valeant Pharmaceuticals in packages containing 60 unit doses, two reuseable applicators and a plastic storage container for applicators after use.

Tobramycin and Dexamethasone

- Excellent coverage against most ocular pathogens with minimal concern of aminoglycoside toxicity
- Effective suppressor of inflammation
- Guard against prolonged use with dexamethasone
- Marketed as TobraDex Suspension and Ointment (tobramycin 0.3% and dexamethasone 0.1%) by Alcon, (Suspension available generically)
- Also available as TobraDex ST (tobramycin 0.3% and dexamethasone 0.05%) by Alcon

Neomycin, Polymyxin B, and 0.1% Dexamethasone

- Excellent coverage against most bacteria
- Effective suppressor of inflammation
- Has been a time honored work horse in medical eye care
- Guard against aminoglycoside reactions and IOP increase by limiting use to 1-2 weeks
- Marketed as Maxitrol and generically

Tobramycin 0.3% and Loteprednol etabonate 0.5%

- Excellent coverage against most ocular pathogens with minimal concern of aminoglycoside toxicity
- Safe, effective suppressor of inflammation
- Marketed as Zylet Ophthalmic Suspension by B&L Pharmaceuticals
- Available in 5 and 10 ml bottles

Treatment of Blepharitis-Related Dry Eye

- "Antibiotic/steroid combination agents can play an important role in a rational, stepwise dry eye treatment plan."
- "These drugs do not appear to alter meibomian gland secretions. However, they can effectively reduce both bacterial proliferation and inflammation of the lid margins."
- Treat with "...combination antibiotic/steroids as needed on a pulsed basis as part of a long-term treatment plan for recalcitrant or recurrent blepharitis."

Reference: Refractive Eyecare, December 2011

Obviously, in chronic conditions, an aminoglycoside combined with loteprednol would be the wisest choice

"Recent studies by Steve Lane, MD, have shown that the signs and symptoms of blepharitis and meibomian gland dysfunction almost universally respond within 1 week to treatment with an antibiotic/steroid drop combined with eyelid hygiene."

Reference: Ocular Surgery News. February 10, 2012

"Remissions and exacerbations (of ocular surface inflammatory disease) are common, and occasionally these require another short course of topical steroids. I believe ophthalmologists as a whole are relatively 'steroid shy' because of potentially serious complications including steroid-induced glaucoma and secondary cataract, but newer steroids such as loteprednol, which is now also available in an ointment form along with two strengths of suspension, reduce these risks significantly. For the patient who requires a generic alternative for economic reasons, I find fluorometholone is an effective drop with a similar safety profile."

Reference: *Ocular Surgery News*. February 10, 2012

Resistance and Unnecessary Antibiotic Use

- "Now that we know that unnecessary treatment fosters resistance, and resistance has become a significant threat to our patients, we cannot simply prescribe for any conjunctivitis on the grounds that it may be bacterial. Fortunately, there is now a test available that will detect adenovirus, the most common cause of viral conjunctivitis."
- Dr. McDonald is referring to the RPS Adenodetector (www.RPSdetectors.com)

Reference: M. McDonald. *Refractive Eyecare*, September 2011

Rapid Pathogen Screening via the RPS Adeno Detector

- Convenient in-office, 10 minute immunoassay
- Designed exclusively for adenoviral pathogens
- Clinical Laboratory Improvement Amendment (CLIA) waived
- Has sensitivity and specificity around 91-92%
- Adenoviral infection is commonly a clinical diagnosis
- Helpful for challenging cases, and for primary care physicians
- Cost: Approximately \$13.50/test
- CPT-4 for 2008: 87809 QW (Medicare reimbursement \$16.76)
- Contact: 570-327-6112, www.rps-tests.com
email: info@rps-tests.com

Source: *Ophthalmology*, October 2006

Ganciclovir 0.15% Gel: A new Treatment for EKC

- "36 patients beginning an acute EKC were treated QID with ganciclovir 0.15% gel. All eyes were culture positive on 1-3 days."
- "Ocular discomfort was alleviated in one week. No keratitis developed in any patient with this type 8 infection."
- "Ganciclovir 0.15% gel must be prescribed as soon as possible. It does not blur vision owing to its water miscible property."

Reference: Verin, et al. *Ophthalmic Research*, 1997; 29 (suppl. 1) 12-27 (France)

Ganciclovir Effects in EKC

- "Patients treated with topical ganciclovir 0.15% ointment showed resolution of EKC within 7.7 days (range 7-12 days) compared with 18.5 days (range 7-30 days) in the control group."
- "22% of cases developed subepithelial opacities in the treatment group compared to 77% in the control group."
- "Conclusions: Topical ganciclovir 0.15% ophthalmic ointment is safe and effective in the treatment of adenoviral keratoconjunctivitis"

Reference: Tabbara, KF. *The Eye Foundation For Research in Ophthalmology*. Riyadh, Saudi Arabia

Cost Analysis of Povidone-Iodine for Ophthalmia Neonatorum Prophylaxis

"Topical azithromycin is likely as effective for the important causes of ophthalmia neonatorum as its fellow macrolide erythromycin."

"A controlled clinical trial comparing erythromycin, 0.5%, povidone-iodine, 2.5%, and silver nitrate, 1%, for ophthalmia neonatorum prophylaxis demonstrated that povidone-iodine was more effective than the other agents for preventing infectious conjunctivitis, including chlamydial conjunctivitis."

"We believe povidone-iodine would be a suitable and perhaps preferable alternative to azithromycin for ophthalmia neonatorum prophylaxis."

Keenan J et al. *Research Letters*. *Archives of Ophthalmology*. January 2010

Treatment Options - Ocular Allergy

- Artificial Tears
- Mild Vasoconstrictors
- Decongestant / Astringents
- Vasoconstrictor / Antihistamines
- Antihistamines
- Antihistamine / Mast Cell Stabilizers
- Mast Cell Stabilizers
- Non-steroidal Anti-inflammatories
- Mild Corticosteroids
- Systemic Antihistamines
- Potent Corticosteroids
- Homeopathic Formulations

Antihistamine/Mast Cell Stabilizer

- Highly selective H1 receptor blockers with prolonged receptor binding
- Good mast cell stabilization
- All bid dosing, except Pataday and Lastacraft qd

Olopatadine	0.1%	(Patanol) (5 ml)
	0.2%	(Pataday) qd (2.5 ml)
Bepotastine	1.5%	(Bepreve) (5, 10 ml)
Epinastine	0.05%	(Elestat) 5 ml
Alcaftadine	0.25%	(Lastacraft) qd (3 ml)
Azelastine	0.05%	(Optivar and generic) (6 ml)
Ketotifen	0.025%	(generic and OTC)
		(Claritin Eye) (5 ml)
		(Zyrtec Itchy Eye) (5 ml)
		(Zaditor) (5 ml)
		(Alaway) (10 ml)
		(Refresh) (5ml)

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- Available as 0.5% (Lotemax) and 0.2% (Alrex) ophthalmic suspensions

Systemic Antihistamines

OTC

- Chlorpheniramine (Chlor-Trimeton)
- Diphenhydramine (Benadryl)
- Loratadine (Claritin) - 10 mg qd
- Fexofenadine (Allegra) - 60 mg bid; 180 mg qd
- Cetirizine (Zyrtec) - 5 or 10 mg qd

Rx

- Desloratadine (Clarinex) – 5 mg qd
- Levocetirizine (Xyzal) – 5 mg qd
 - Metabolized by the liver
 - Excreted in bile and urine (1/2 dose if renal disease)

Intranasal Steroids for Ocular Symptoms in Allergic Rhinitis

- In a randomized trial, intranasal steroids relieved both nasal and ocular symptoms.
 - Because intranasal steroids are the most effective medications for allergic rhinitis symptoms (especially congestion), guidelines recommend them as first-line agents for moderate-to-severe disease
 - As many as 85% of patients with seasonal allergic rhinitis also have ocular symptoms
 - For these patients, many clinicians prescribe oral antihistamines or ocular products rather than (or in addition to) intranasal steroids

Reference: *journalwatch.com*, June, 2010