



Ophthalmology Update

Richmond Eye Associates, P.C.

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Ophthalmic Topics of Interest to the Medical Physician

Ophthalmic Medications

This issue discusses ophthalmic medications for the treatment of common problems such as conjunctivitis, seasonal allergy, and dry eye.

Contents

Ophthalmic Antibiotics: Benefit vs. Toxicity	1
Treatment of Seasonal Allergic Conjunctivitis	1
Treatment of Specific Ophthalmic Infections	2
Clinical Pearl: Indications for Referral to an Eye Specialist	2
Treatment Options for Dry Eye	3
Office locations, addresses, and phone numbers	4

Ophthalmic Antibiotics: Benefit versus Toxicity

There are a large number of topical ophthalmic medications available to treat conditions including conjunctivitis, blepharitis, prophylaxis of infection following corneal abrasion, and corneal ulcer. Broad classes of topical ophthalmic antibiotics include:

- **Aminoglycosides** are commonly used to treat bacterial conjunctivitis, blepharitis, bacterial keratitis (corneal ulcer), and dacryocystitis (lacrimal infection). They are available in both eyedrop and ointment form, and are available generically. Generally, these broad spectrum antibiotics are good choices for virtually all significant bacterial ocular infections, with coverage including pseudomonas. **Gentamicin** is effective, though slightly more likely to cause corneal breakdown. **Tobramycin** (Tobrex) may be somewhat better tolerated as both an eyedrop and ointment.
- **Neomycin** is technically an aminoglycoside, but is usually combined with Polymixin B, Bacitracin, or Gramicidin to increase its spectrum of activity. Common names include Neosporin and AK-

Spore. Many of these combinations are only found in ointment form. **Contact eyelid and facial dermatitis** is a significant risk of Neomycin use, with up to 10% of patients being affected!

- **Quinolones** include **Ciprofloxacin** (Ciloxan, available as an eyedrop and ointment), **Ofloxacin** (Ocuflox), and **Levofloxacin** (Quixin). The use of Quinolones has increased dramatically, due to their effectiveness in treating bacterial conjunctivitis and corneal ulcer. They are also frequently used as a prophylactic antibiotic with intraocular eye surgery. Quinolones are generally well tolerated, even with intensive (hourly) use. However, they do not provide good streptococcal coverage.

“Up to 10% of patients may develop a contact dermatitis while using Neomycin.”

Continued on page 4 . . .

In the Next Issue of

Ophthalmology Update:

Ocular Trauma

- Airbag Eye Injuries
- Bungee Cord Risks
- Chemical Burns
- Orbital Blowout Fractures

New Treatment Options for Seasonal Allergic Conjunctivitis

Over the past year, a number of new medications have been approved for the treatment of seasonal allergic conjunctivitis. Many of these are very potent, having multiple mechanisms of action, as well as having minimal adverse effects. It has been estimated that more than 50 million Americans suffer from some form of ocular allergy,

most commonly being seasonal allergic conjunctivitis. Unfortunately, most (up to 90%) of patients self-treat ocular allergy symptoms with OTC medications. These are much less effective than the prescription medications, have a very short (often just 2 hours) duration of action, and have frequent adverse effects.

Continued on page 3 . . .

Antibiotics for Specific Ophthalmic Conditions

Conjunctivitis

Most cases of adult conjunctivitis are **viral** in etiology, with prominent symptoms being itchy, watery, red eyes with lid and conjunctival edema. Pre-auricular adenopathy is almost exclusively seen in cases of viral conjunctivitis. While viral conjunctivitis has to resolve on its own over a course of 1 to 2 weeks, eyedrop antibiotics are useful to prevent a secondary bacterial infection. Good choices include **Polytrim** and **Tobramycin** qid. However, to greatly reduce viral symptoms, a short course (1 week) of a steroid / antibiotic combination such as **Maxitrol** or **Tobradex** can be considered.

Bacterial conjunctivitis is characterized by a copious purulent discharge. It may be reasonable to culture severe cases prior to starting antibiotics. Good antibiotic choices include **Polytrim**, **Ocuflox**, **Gentamicin**, **Tobramycin**, and **Neosporin** (if not allergic to neomycin). Extremely severe cases of conjunctivitis can be from *Neisseria gonorrhoeae*, referred to as “hyper acute” conjunctivitis. Systemic therapy directed toward *Neisseria* is indicated if this is suspected.

Chlamydia trachomatis is a cause of chronic (1 month duration) conjunctivitis in adults, and appropriate systemic treatment is indicated along with **Erythromycin** ophthalmic ointment, and treatment of sexual partners.

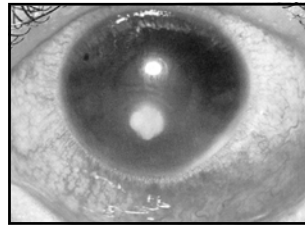
Prophylaxis of Corneal Abrasions

Antibiotic eyedrops or ointment should be used during the healing period of corneal abrasions to prevent corneal ulcer. This includes abrasions that follow removal of corneal foreign bodies such as metal or rust. Good antibiotic choices include **Gentamicin**,

Tobramycin, or **Polytrim** qid for 3 days. If there are stronger risk factors for infection due to the nature of the injury, **Cipro**, **Ocuflox**, or **Quixin** given every 2 to 4 hours may be indicated, with ophthalmic follow-up scheduled. Particularly large corneal abrasions may be soothed and healing promoted with addition of an antibiotic ointment such as **Erythromycin** or **Bacitracin**.

Blepharitis

Blepharitis, or eyelid margin inflammation or infection, is very common, leading to symptoms of lid redness, itching, and burning. Sty formation is not uncommon. Eyelid hygiene is important, including the use of warm compresses on a daily basis. For significant flare-ups of the condition, antibiotic ointments applied at bedtime such as **Erythromycin**, **Bacitracin**, or **Tobramycin** can be useful, but short courses of steroid / antibiotic combination ointments such as **Maxitrol**, **Dexacidin**, and **Tobradex** may give more rapid relief. Oral doxycycline or tetracycline can help chronic, recalcitrant cases of blepharitis. While Metrogel is useful for facial rosacea, it is not indicated for eyelid use.



Peri-limbal injection pattern typical of a corneal problem or iritis, as opposed to conjunctivitis (corneal ulcer shown).

Clinical Pearl: Situations that Indicate the Need for Ophthalmic Referral

Many “red eye” conditions have associated symptoms or factors that indicate a need for referral to an ophthalmologist to rule out a more serious condition or complication. Some of these situations include:

- **Contact Lens Associated Eye Infection, Redness, or Inflammation** - Contact lens use is increasing, and with the popularity of disposable lenses, often abused. While an apparent eye infection associated with the use of contact lenses could be a routine case of conjunctivitis, it could also be a contact lens related problem such as solution allergy, lens overwear or intolerance, poor lens fit, or even corneal ulcer. Many patients who routinely use contact lenses develop an anesthetic cornea, and will not feel the pain associated with corneal ulcer that others may feel. Finally, contact lenses can be associated with unusual infections such as parasitic and fungal infections (avoid steroids.)
- **Corneal Abrasions with a Prior History of Lasik Surgery** - In Lasik, a lamellar corneal flap is created that heals without the need for suturing. However, a potential intra-corneal interface is created that can develop inflammation following simple corneal abrasions months or years after the surgery. This condition, called Diffuse Lamellar Keratitis (DLK) requires intensive steroid therapy to prevent scarring under the flap. Some cases require a re-lifting and washing out under the flap.
- **Red Eyes or Eye Infections with a History of Filtering Glaucoma Surgery (Trabeculectomy)** - In filtering glaucoma surgery, a partial thickness flap is created in the sclera usually just above the corneal edge at the 12:00 position. This allows a slow seepage of fluid under the conjunctiva at this location, creating a filtering “bleb” that lowers eye pressure. These blebs usually appear white, round, and possibly elevated to the naked eye. The conjunctiva is thin-walled in this area, and a direct connection to the inside of the eye exists through this filtering bleb. Thus, any case of bacterial eye infection in an eye with a previously created filtering bleb could easily progress into an internal eye infection (endophthalmitis), and requires more intensive monitoring.
- **“Spontaneous” Corneal Abrasions** - Corneal abrasions that seem to occur without any history of trauma or foreign body could represent a recurrent corneal erosion or spontaneous erosion. These are often difficult to treat, and may require debridement of the weakened corneal epithelium and sometimes bandage contact lens use to facilitate proper healing.
- **“Eye Infections” Associated with Great Pain** - Extremely painful red eyes could actually be cases of corneal ulcer, scleritis, iritis or uveitis, angle closure glaucoma, or internal eye infection, and should be referred to an ophthalmologist for a definitive diagnosis.

Treatment of Seasonal Allergic Conjunctivitis (from page 1)

Undesirable side effects include rebound hyperemia when the medication is stopped, as well as significant corneal toxicity. The table below presents an overview of the topical medications available to treat seasonal allergy, their mechanisms of action, and their individual benefits.

<u>Medication</u>	<u>Dosing</u>	<u>Mechanism of Action</u>	<u>Indications for Use</u>	<u>Side Effects</u>
Zaditor	bid	Mast Cell stabilizer, antihistamine, eosinophil inhibitor	Treatment and prevention of symptoms	Minimal, some headache
Optivar	bid	Mast Cell stabilizer, antihistamine, eosinophil inhibitor	Treatment and prevention of symptoms	Infrequent Headache, burning, bad taste
Alocril	bid	Mast Cell stabilizer, eosinophil and basophil inhibition	Prevention of allergy symptoms	Yellow eyedrop color is normal
Patanol	bid	Mast Cell stabilizer, antihistamine	Prevention and treatment of symptoms	Minimal
Livostin, Emadine	qid	Antihistamine	Treatment of symptoms	Infrequent burning, headache
Amast, Alomide, Crolom	qid	Mast Cell stabilizer	Prevention of seasonal and vernal conjunctivitis	Burning on installation
Alrex, FML	qid	Selective steroid (low risk of intraocular complications)	Treatment of symptoms	Rarely, elevated eye pressure, cataract
Acular	qid	Non-steroidal anti-inflammatory	Treatment of symptoms	Burning on installation
Artificial Tears (preserv. free)	prn	Dilution of antigens	Treatment of symptoms	Especially effective <u>refrigerated</u>
OTC meds (Visine, etc.)	qid	Minimal antihistamine, vasoconstriction	Cover-up of symptoms	Rebound hyperemia, toxicity

Treatment of Dry Eye

Dry eye, or keratitis sicca, is a very common external ocular condition that often results in symptoms that impair a patient's activity of daily living. This includes ocular grittiness, burning, foreign body sensation, paradoxical tearing, blurred vision, and light sensitivity. Reading and computer use can become progressively more difficult as the day progresses. The condition is often complicated by co-existing blepharitis or allergic conjunctivitis, and is aggravated by oral use of antihistamines and by many medications used in psychiatry.

Preservative Free Artificial Tears

Artificial tears are the mainstay of dry eye, and surprisingly, are underused. Many patients only place these drops a couple of times during the day, which is not sufficient. As long as the eyedrop is preservative free, they can be used continuously during the day.

Good choices include **GenTeal**, **Refresh Tears**, and **HypoTears Select**, which are bottled, preservative free artificial tears. This encourages use throughout the day. Artificial tears in single use containers (usable for 24 hours after opening) are good, but less convenient. These include **TheraTears** and **BionTears**, which also feature a hypotonic electrolyte balanced preparation that mimics natural tears. These eyedrops do not blur the vision.

Thicker Lubricating Preparations

For more severe or symptomatic cases, thicker preparations of artificial lubricants can be used. In eyedrop form, this includes **Celluvisc**, a thick preservative free lubricant that blurs the vision for a few minutes after use. **GenTeal Gel** is a non-petrolatum based ointment suitable for day or bedtime use, since it rapidly liquefies. **Refresh PM** and **Moisture Eyes PM** are preservative free ocular ointments that will blur the vision for at least an hour. However, they can significantly promote corneal healing during the night.

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- Extensive patient information, including discussion of over 80 eye conditions and a section discussing risks and benefits of laser vision correction.
- Interactive Clinical Section concerning eye disease and physical findings
- Clinical Trials Database

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Ophthalmology Update

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Ophthalmic Antibiotics (page 1)

- **Sulfa** (Sulfacetamide) has been widely used in the past for bacterial conjunctivitis, and it is available generically. However, due to its high rate of irritation to the ocular surface, it is not a favorite medication of ophthalmologists. It should never be used with a history of systemic sulfa allergy.
- **Erythromycin** is available only in ointment form. While not as potent as some antibiotics, it is an excellent lubricant following corneal abrasions and is generally well tolerated. It also is used for chlamydial infections (in addition to an appropriate oral medication), and in children who do not tolerate eyedrop installation.
- **Bacitracin** is also available as an ophthalmic ointment, and is well tolerated in cases of blepharitis as well as corneal conditions.
- **Polytrim** (Trimethoprim - Polymixin B) is an effective broad-spectrum antibiotic, especially in cases of conjunctivitis. Long term use may cause corneal irritation and toxicity, however. There is often a misconception that Polytrim cannot be used when there is a sulfa allergy, probably due to the well known Bactrim combination of Sulfa and Trimethoprim.
- **Steroid / Antibiotic Combinations** include Dexamethasone with Neosporin (Maxitrol) or Tobramycin (Tobradex), along with others. The risk of steroid use in eyedrop or ointment form includes a small risk of temporarily increasing eye pressure, usually taking from 1 to 3 weeks to develop. Steroids should not be used in cases of herpetic corneal infection or of corneal ulcer or infiltrate.

Treatment of Dry Eye (page 3)**Other Treatment Strategies**

Treatment of aggravating ocular conditions such as blepharitis and allergy, and room humidification are also important in treating dry eye. Recently, it has been found that **oral flaxseed oil** can be a successful adjuvant to treating dry eye by improving the lipid layer of the tears. Up to 2000 mg of flaxseed oil can be helpful (the dose usually used in rosacea patients), but it can be started at 2 capsules per day. Improvement of symptoms can be noted within 2 months. **HydroEye** is an over-the-counter supplement that is undergoing clinical trials for efficacy in dry eye syndrome. It contains omega-6 fatty acids similar to flaxseed oil, along with mucin complex and nutrient cofactors.

Some cases of dry eye need to be treated with occlusion of the lacrimal puncta to increase the time that tears stay in contact with the ocular surface before draining away. A common cause of aqueous tear deficiency is Sjogren's Syndrome, although other autoimmune syndromes can also be associated.

Treatments in Development

Topical **Cyclosporin A** is still undergoing FDA evaluation for dry eye treatment, as many dry eye syndromes are associated with inflammation. **Evoxac**, originally developed to treat dry mouth, has shown promise for treating dry eye alone, and the FDA approval process is ongoing for this as well. A P2Y2 agonist is also under development to add fluid to the ocular surface through mucin secretion of the conjunctiva.