UNDERSTANDING OPHTHALMIC MEDICATIONS...the biggies!

Format of Lecture
Drug Name (scientific name)
What is it?
What class/group of medications?
How does it work?
Rx: how it is commonly prescribed?
SE: common side effects?

Evaluating Ophthalmic Medications
Efficacy – how well does it work?
Compliance – how well will a patient use it?
Cost – how much will it cost the patient?
Side effects – what side effects may occur?

Restasis (cyclosporine susp)
Cyclosporine ophthalmic is used to increase tear production in people with dry eye disease
In a class of medications called immunomodulators
It works by decreasing swelling in the eye to allow for tear production
Rx: one drop 2X per day
SE: temporary burning sensation, redness

“Dry eye is a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface.”


Treatment Options:
90's
Artificial Tears
Punctal Plugs
Moist chamber goggles
Today
Artificial Tears
Rx products:
Restasis
Corticosteroids
Omega-3 supplements
Nutrition
Tetracyclines
Punctal Plugs

Delphi Panel Consensus for Dry Eye Management
The Asclepius Panel
Recommended Treatment Model for Dry Eye Inflammation
Lotemax (loteprednol etabonate)
Loteprednol is in a group of drugs called corticosteroids. Alrex is the same drug but in 0.2% instead of 0.5% formulation. It prevents the release of substances in the body that cause inflammation. Used to treat eye swelling caused by surgery, infection, allergies, and other conditions. Rx: one drop 4x per day or more. SE: IOP (unlikely), blurred vision, allergic reaction.

Pred Forte (prednisolone acetate) is a steroid medicine. Pred Forte is the same medication in a 0.12% instead of 1.0% suspension. It prevents the release of substances in the body that cause inflammation. Used to treat eye swelling caused by allergy, infection, injury, surgery, or other conditions. Rx: one drop 4x per day or more. SE: IOP (more likely), PSC, blurred vision, discharge.

TobraDex (tobramycin + dexamethasone) contains a combination of the antibiotic tobramycin and the steroid dexamethasone. It is used to treat bacterial infections and inflammation/swelling of the eye. Rx: one drop 4x per day. SE: allergies, blurring, IOP.

Travatan Z (travoprost) lowers intraocular pressure of the eye. It is in a class of drugs called prostaglandin analogues. The “Z” means that it does not have the old preservative BAK in it. It works by increasing the drainage of aqueous fluid inside the eye. This increase in drainage lowers IOP and helps prevent damage to the optic nerve, which can lead to a loss of vision. Rx: one drop at bedtime. SE: redness of eyes/lids, darkening of iris, thickening of lashes. Prostaglandin Analogs used for over 10 years now. Very few, if any, systemic side effects. Additive to all other glaucoma meds. Except Pilocarpine. 3 common choices: Travatan, Xalatan, Lumigan. QD dosing. Increased compliance. Expensive?!

Ocular side effects: Iris darkening, Thickening of lashes, Latisse? Few occurrences of Uveitis.
Macular edema

HSK

Timoptic (timolol maleate)
Used to decrease intraocular pressure since 1978
It belongs to a group of medications called Beta-blocker: non-selective
Most commonly Rx’d glaucoma medication in the past
1st line drug for the past 20 years until prostaglandin analogues
Cost effective for long-term usage
0.5% or 0.25% or XE-gel based delivery system
Studies show not much more effective
Causes decrease aqueous production
Rx: one drop 2X per day (or once)
Side effects on lungs and heart
Shortness of breath
Bradycardia

Alphagan (brimonidine)
Lowers intraocular pressure
First line med or additive to other class of glaucoma drops
It is in a class of drugs called alpha agonists
Alphagan – solution
Alphagan p-suspension
Less stinging
Less redness
This medication reduces aqueous production
Rx: one drop 2X or 3X per day
SE: uveitis, dry mouth, fatigue
Facts About Glaucoma
50% of glaucoma patients are undiagnosed
Large percentage of glaucoma patients are overmedicated
Glaucoma patients are mostly medically underserved
Glaucoma treatment can be optometry’s most important contribution to public health
Treatment of Glaucoma
Glaucoma is a balancing act
Aqueous production – inflow
Aqueous drainage – outflow
If over production of aqueous, then IOP increases
If under drainage of aqueous, then IOP increases
Therefore if you can decrease production or increase outflow,
IOP decreases

Glaucoma Medications

**BB** = Beta Blockers
Decrease aqueous production

**P** = Prostaglandins
Increase aqueous outflow

**AA** = Alpha Agonists
Decrease aqueous production

**CAI** = Carbonic Anhydrase Inhibitors

Decrease aqueous production

It’s all a balancing act!!

Glucoma Medication Combinations

**P** + Nothing “They are really that good!”

**P** (qHS)+ **BB** (qAM) “What could be easier?”

**P** (qHS) + **AA** (BID) “Works great together!”

**P** (qHS) + **Cosopt** (BID) + **AA** (BID) “Close to maximum medical therapy”

Lots of new combination drops coming to market at the moment! They all increase compliance and decrease costs

Vigamox (moxifloxacin)

Vigamox is an antibiotic

It belongs to a group of medications called the fluoroquinolones

4th generation

It kills sensitive bacteria by stopping the production of essential proteins needed by the bacteria to survive

Vigamox is used to treat bacterial infections

Rx: one drop 3X or 4X per day

SE: redness, blurring, dry eye sensation

**Bacterial Keratitis Management**

Prior to the 1990’s, treatment of bacterial keratitis by primary eye care providers was limited.

Empirc use of aminoglycosides for small, peripheral ulcers

Sight-threatening, central ulcers were typically referred to fellowship-trained corneal specialists and treated with fortified antibiotics

**Bacterial Keratitis Management**

The approval of Ciloxan™ and Ocuflox™ for bacterial keratitis treatment in the early 1990s facilitated more widespread empirical management by general eyecare providers

**Bacterial Keratitis Management**

2010: Three FDA-approved commercial drugs for bacterial keratitis therapy

Emerging resistance has spurred development of new antibiotics with great acceptance...

**Bacterial Keratitis Management**

2010: Off-label use of later-generation fluoroquinolones is relatively common for bacterial keratitis

**Culturing Bacterial Keratitis**

1, 2, 3 Rule - “potentially sight threatening” ulcers:

AC reaction $\geq 1+$ ($\geq 10$ cells in 1 mm beam)

Dense infiltrate $\geq 2$ mm in size (greatest linear dimension)

Edge of infiltrate $\leq 3$ mm from center of the cornea

Also...

Neonates

Immuno-compromised patients

Post-surgical patients

Polytrim (polymyxin B + trimethoprim)

Polytrim is a combination of two different antibiotics used to treat conjunctivitis
The two drugs work differently to increase this drops effectiveness against different types of bacterial eye infections:

**Polymyxin** B, a cyclic lipopeptide antibiotic

It increases the permeability of the bacterial cell membrane by interacting with the phospholipid components of the membrane thus killing the bacteria.

**Trimethoprim** is a synthetic antibacterial drug

It blocks the production of tetrahydrofolic acid by binding to an enzyme and interferes with bacterial biosynthesis of nucleic acids and proteins.

- **Rx:** one drop 4X to 6X per day
- **SE:** redness, stinging, allergies to component (sulfa)

**Pataday (olopatadine hydrochloride)**

Pataday is a 0.2% sterile ophthalmic solution used to treat ocular allergies.

Olopatadine is an antihistamine that reduces the natural chemical histamine.

Histamine can produce symptoms of itching or watery eyes.

- **Rx:** one drop once per day
- **SE:** mild stinging, headache, runny nose

**Seasonal Allergic Conjunctivitis**

Occurs during peak allergy seasons:

usually Spring & Fall

Primarily caused by OUTDOOR allergens:

- ragweed pollen, mountain cedar, melaleuca

**Hallmark signs & symptoms:**

- Itching
- Redness
- Chemosis
- Tearing
- Lid swelling

**Treatment Options:** 2010

OTC:

Vasoconstrictors, vasoconstrictor / antihistamine combinations

Ketotifen 0.025%

**Treatment Options:** 2010

Rx:

**Treatment Options:** 2010

Oral medications: