

## **Enhancing Specialty Lenses Through Performance Enhancing Drugs**

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### **Course Outline**

#### **1) Ptosis**

- a. Differentiate between emergent versus non-emergent
- b. Many factors influence the lid position and appearance of lid position over time
  - i. Levator muscle
  - ii. Levator aponeurosis
  - iii. Mueller's muscle
  - iv. Dermatochalasis – doesn't respond well to pharmaceutical treatment
- c. Three options for Ptosis
  - i. Do nothing
  - ii. Prescribe pharmaceutical to improve lid position
  - iii. Refer for eye lid surgery
- d. Pharmaceutical treatment of ptosis
  - i. Oxymetazoline 0.1%
    - 1. Acts on alpha receptors on the Mueller's muscle
      - a. Five times stronger affinity for alpha-2 compared to alpha-1 receptor
    - 2. Clinical trial data
      - a. Improved superior lid position compared to placebo
      - b. Improved superior visual field score compared to placebo
- e. Case in point
  - i. 67 year old male referred for specialty lens fit for longstanding corneal scar
  - ii. Substantially improved vision with scleral lens fit
  - iii. Ptosis improved with scleral lens on eye
  - iv. Vision improved when lid was mechanically moved vertically
  - v. Oxymetazoline 0.1% prescribed qam 15 minutes prior to lens applied to eye

#### **2) Dry Eye Help**

- a. Inflammation is a critical component of dry eye disease
- b. Clinical point of care test allows measurement of inflammation
  - i. Inflammadry
  - ii. Measures levels of matrix metalloproteinase-9 (MMP-9) on the ocular surface
  - iii. Normal levels are below 40ng/mL
  - iv. Above this level is abnormal

- c. Allows decision to either reduce inflammation or preserve tears
  - d. Punctal occlusion
    - i. Silicone plugs
    - ii. Temporary intracanalicular plugs
  - e. Case in Point
    - i. Post RK patient fit with scleral lenses
    - ii. Patient noted excellent vision but eyes were getting dry secondary to computer use
    - iii. Inflammadry response was negative OU
    - iv. Proceeded with punctal occlusion
- 3) Pupil Size
- a. Size is balance between sphincter and dilator activation and relaxation
  - b. Dilator
    - i. Is activated by alpha-1 receptors on the dilator
    - ii. Alpha-2 receptors are located on the pre-synaptic nerve endings
    - iii. They act as a negative feedback loop
      - 1. When alpha-2 receptor on pre-synaptic nerve endings are activated, it reduces the release of norepinephrine from nerve ending
      - 2. Reduced norepinephrine reduces activation of dilator muscle
      - 3. Effect is pupil reduces in size
  - c. Pharmaceutical manipulation of pupil size
    - i. Brimonidine is an alpha-2 agonist
    - ii. Can reduce the pupil size after instillation
    - iii. Various concentrations available
      - 1. 0.025%, 0.1%, 0.15%, 0.2%
  - d. Case in point
    - i. Keratoconus patient wearing corneal gas permeable lenses
    - ii. Excellent vision except in low light levels
    - iii. Discussed options and began brimonidine as needed
- 4) Sjogren's Syndrome – dry eye help
- a. Often times most severe form of dry eye
  - b. Scleral lenses provide and moisture chamber with retained fluid on the cornea
  - c. Regener-Eyes
    - i. Biological eye drops
    - ii. Anti-inflammatory cytokines and growth factors
    - iii. Provides regenerative properties to the eyes
      - 1. Discuss role in scleral lenses
  - d. Case in point
    - i. Non-resolving keratitis in patient with sjogren's syndrome
    - ii. Coupled fluid with a drop of regener-eyes in the bowl of the lens
- 5) Ocular Allergies
- a. Mast cells are at the center of the allergic response

- b. Immunoglobulin-E on mast cells when activated with bound allergen causes degranulation and histamine release
  - c. Treatments
    - i. Mast cell stabilizer/anti-histamine combination
      - 1. Olopatadine 0.1%, 0.2%, 0.7%
      - 2. Ketotifen
      - 3. Alcaftadine
      - 4. All are now over the counter
    - ii. Corticosteroids
      - 1. FML
      - 2. Loteprednol
      - 3. Prednisolone
    - iii. Peroxide solutions
- 6) Specialty Lens wearer and presbyopia
- a. Pilocarpine 1.25%
    - i. Available as a qd dosing regimen
    - ii. Creates pupil constriction
    - iii. Improves near vision through pinhole effect
  - b. Case in point
    - i. 48 year old male
    - ii. PKP and is wearing scleral lenses
    - iii. Reduced near vision
    - iv. Places pilocarpine 1.25% 1 gtt 15 minutes prior to placing lenses on eyes