

Dry Eye Disease – Diagnosis and Treatment Pearls from the Trenches (2 hours)

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Summary

As our understanding of dry eye disease has evolved, so have the treatment options that we have available for our patients. Contemporary views on diagnosing and treating this condition will provide the strategies for successfully applying the concepts discussed to patient care.

Learning Objectives

- 1) Understand the contemporary literature
- 2) Understand the pathophysiology of the disease state
- 3) Discussion of the diagnostic tests available to help in diagnosing and monitoring treatment success
- 4) Understand point of care tests and their role in identifying appropriate treatment patterns
- 5) Understand current treatment options including new thoughts on therapeutically managing the disease
- 6) Understand the meibomian glands and their critical function for the ocular surface and strategies to rehabilitate the gland

- 1) Epidemiology
 - a. Prevalence – importance with an aging population
- 2) Understanding the Pathophysiology
 - a. Understanding the causes:
 - i. Poor aqueous production
 - ii. Deficient mucin layer
 - iii. Deficient lipid layer
 - iv. Understand the combined effects of the issues described above
 - b. Understanding the creation of a hyperosmotic tear film
 - i. The creation of a pro-inflammatory environment
 - c. Understand the inflammatory consequences
 - d. Dry Eye Blepharitis Syndrome (DEBS)
 - i. Bacterial over population creates biofilms that alters microbial physiology and interactions with other microbes
 - ii. Secrete excessive quantities of enzymes and pro-inflammatory molecules
 1. Initially effects lash follicles
 2. Meibomian glands are effected next
 3. Lacrimal glands of Kraus and Wolfring are then effected

4. Permanent lid architectural changes occur resulting in madarosis, tylosis
 - e. Discuss potential effects the conjunctiva and cornea
- 3) Diagnosis
- a. Case History
 - i. Current medications
 1. Discussion of those that medications that can cause ocular surface symptoms
 - ii. Concurrent medical conditions
 1. Autoimmunity
 2. Diffuse joint pain
 - b. Diagnostic work up
 - i. Anterior segment examination
 1. Eyelashes – observe for debris and / or collarettes
 - a. Differentiate demodex blepharitis
 2. Eyelid Margins
 - a. Differentiate normal from abnormal (tylosis)
 3. Meibomian glands
 - a. Assess the surface of the glands – assess presence or absence of capping
 - b. Assess the oils produced by the glands through expression – assess meibomian gland stasis
 - c. Understand obvious and non-obvious meibomian gland dysfunction
 - i. Meibomian gland evaluator (MGE)
 - d. Assessing the structure of the meibomian glands
 - i. Eyelid transillumination
 - ii. Infrared imaging
 4. Tear meniscus
 5. Conjunctival hyperemia
 - a. Grading scales
 - ii. Fluorescein assessment
 1. Fluorescein stain applied to eye
 - a. Understand hydrophilic properties of fluorescein
 - b. Understand it's interaction with the anterior segment
 - c. Discuss importance of viewing with a cobalt blue light and wratten filter
 2. Assess the anterior segment
 - a. Tear film break up time (TBUT)
 - i. Discuss clinical consequences of decreased TBUT
 1. Visual fluctuation / instability
 2. Corneal staining
 - b. Symptomatic Non-Invasive TBUT (SNIBUT)
 - i. Patients symptoms determine measurement

- c. Corneal staining
- d. Lid wiper epitheliopathy / Upper lid margin staining
 - i. Understand interaction between margin and cornea / conjunctiva
 - ii. Important diagnostic marker
 - iii. Understand how to grade this clinical finding
- e. Tear meniscus
 - i. Easily visible with fluorescein
- iii. Rose Bengal / Lissamine Green assessment
- iv. Schirmer testing
- v. Phenol Red Thread Test
- vi. Point of Care tests
 - 1. Tear Osmolarity
 - a. Measures osmolarity of the tearfilm
 - 2. Inflammadry
 - a. Measure's MMP-9
 - b. Is positive if MMP-9 is greater than 40 ng/mL
 - c. Understand the signal strength and the grading scale of the signal strength

4) Treatment

- a. Two step process
 - i. Provide relief
 - ii. Improve function
 - 1. Improving function is through two major treatment strategies:
 - a. Mechanical
 - b. Chemical
- b. Artificial Tears – providing relief
 - i. Differentiating between over the counter products
 - 1. Artificial tears vs. “gets the red out” products
 - 2. Multi-dose vs. single dose
- c. Supplements
 - i. Importance of essential fatty acids
 - ii. Omega 3's
 - 1. Discussion of mechanism of action to help control inflammation
 - 2. Discuss proposed mechanism of action on the ocular surface and meibomian glands
 - 3. Understand how to identify quality formula
 - 4. Understand the best time to take essential fatty acids
- d. Prescription Treatment
 - i. Oral antibiotics
 - 1. Tetracyclines
 - a. Understand mechanism of action
 - b. Understand appropriate dosages

- c. Discuss when to consider as treatment
- ii. Lifitegrast 5% (Xiidra)
 - 1. Lymphocyte function associated antigen-1 (LFA-1) is found on the surface of T-cells
 - 2. Lifitegrast is an LFA-1 antagonist
 - 3. Inhibits the interaction between LFA-1 and intercellular adhesion molecule-1 (ICAM-1)
 - 4. FDA approved for the signs and symptoms of dry eye
- iii. Cyclosporine 0.05% (Restasis)
 - 1. Immunomodulator
 - 2. Discuss appropriate expectations with patients and clinically
 - 3. Available in two forms:
 - a. Single dose vials
 - b. Multi-dose bottle
- e. Meibomian gland function
 - i. Heat and lid massage
 - 1. Thermal application to the eyelids
 - 2. Lipiflow (Johnson & Johnson)
 - 3. MiboFlo (Mibo Medical Group)
 - 4. iLux Device (Tear Film Innovations)
 - 5. Tear Care System (Sight Sciences)
 - ii. Topical therapy
 - 1. Anti-inflammatory agents, antibiotics
 - iii. Essential fatty acids
- f. TrueTear
 - i. Neurostimulation
- g. Microblepharoexfoliation (MBE)
 - i. Understand appropriate candidates
 - ii. Discuss procedure
 - iii. Understand clinical outcomes
 - iv. Review the literature on contact lens comfort
- h. Autologous serum
 - i. Understand it's importance in dry eye management
 - ii. Discussion of accessing autologous serum
- i. Punctal plugs
 - i. Review of the current literature – understanding when to perform punctal occlusion
 - ii. Silicone plugs – permanent
 - iii. Dissolvable plugs
 - 1. Intracanalicular
 - 2. Available as 2 week dissolvable, 3 month dissolvable and 6 month dissolvable plugs
 - 3. Available in various diameters (0.2mm, 0.3mm, 0.4mm, 0.5mm)

5) Follow-up visits

- a. Monitor therapy
 - b. Identify those measurable markers including: case history, physical exam and monitoring compliance with therapy
 - c. Keys to succeeding with therapy regimens
- 6) Importance of managing condition
- a. Discuss the disconnect that is sometimes noticed between the signs and symptoms of dry eyes
 - i. Review current literature to describe this further
 - b. Develop a standard protocol
 - c. Understanding the logic behind actively managing dry eyes
- 7) Case Presentations Illustrating concepts discussed to guide the attendee through the whole process and implement confidently into their practices