Modern Management of Dry Eye Disease

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Course Description and Learning Objectives

Dry eye is a common yet under diagnosed cause of ocular morbidity such as decreased vision and ocular discomfort. This course will view the modern management of dry eye disease including pharmaceuticals, nutraceuticals, and devices. This case based presentation will aid in the diagnosis, treatment, and guidance around pitfalls.

- Review aqueous deficient and evaporative dry eye
- Review the diagnostic techniques to help diagnose aqueous deficient versus evaporative dry eye
- Discuss current and modern treatment of dry eye disease
- Discuss current pharmaceutical and nutraceutical therapies
- Review the current devices available for the treatment of dry eye disease

Vital Dyes

- Fluorescein
  - Detects disruption of intercellular junctions
  - Positive (staining) pooling
  - Negative (high or elevated areas)
- Rose bengal and lissamine green
  - Stains devitalized cells and cells that have lost normal mucin surface
  - Detects abnormal epithelial cells

How Many People With

- Diabetes
- Thyroid
- Glaucoma
- Dry Eye

Why is Conjunctival Staining and SPK Often Missed or Under Scored?

Wratten Filter
Aqueous Deficient vs Evaporative

What's the common denominator?
What's the next question?

48 year old man
OU red, gritty, sandy and dry feeling

Va 20/20
20/20
cc 20

Current Correction
R -2.00 sphere
L -3.00 sphere

EOMS: full, unrestricted
PERRL (-)APD
CT: ortho D/N
CF: full by FC OU

Diagnosis
¬ Rosacea
¬ What findings support your diagnosis?
¬ Telangiectasias
¬ Erythema of the cheeks, forehead and nose
¬ Rhinophyma
¬ Indicates chronic
¬ Let us get a closer look

Meibomian Gland Dysfunction
Exacerbated by Rosacea
Evaporative

Treatment:
¬ In my opinion, most under treated condition
¬ Warm compresses
¬ Lid hygiene
¬ Artificial tears
¬ Omega 3 fatty acid:
  EPA and DHA total 1500 mg (1000 mg minimum)
¬ Dermatological consult (Acne Rosacea)
¬ Oral antibiotics...
¬ Which one and why???
Minocycline / Doxycycline

- Drug of choice for marginal inflammatory blepharitis (posterior blepharitis)
- AB, anti-inflammatory and anti-collagenase
- Inhibits lipase enzyme
- No renal adjustment
- 50-100 mg qd bid 2-12 weeks (pulse)
- Lower maintenance dose
- 20 mg Periostat (Doxycycline)
  - Helpful in those with stomach or GI sensitivity
  - Excellent for those requiring long maintenance dose

Precautions With Oral Tetracycline Analogs

- Enhanced photosensitivity
- Avoid in children and pregnancy
- Can enhance Coumadin
- Can enhance the action of digoxin
- Long-term use with increased risk of breast cancer
- 1 paper/study, not regarded as highly reliable study
- Further investigation discredited the association
- Benign intracranial hypertension, reported in cases
- 17 cases from 1978-2002

Clinical Pearl

- If you continue to think of doxycycline and minocycline as antibiotics, treatment failure will be the result
- From this point on consider them a steroid

Minocycline / Doxycycline Paradigm

- Status of MG
  - Inspissated
  - 50-100 mg qd bid 2-12 weeks (pulse)
  - 100 mg BID, QD
  - Turbid
  - 50-100 mg qd while turbid
  - 20 mg longer treatments
  - Periostat (Doxycycline)
  - Clear
  - 20 mg if maintenance dose needed

Clinical Pearl

- How About Steroids?

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Successfully Treated

- Warm Compresses
- Lid Scrubs
- Artificial Tears, Systane Balance
- Omega 3 (1500 EPA and DHA)
- Mino 100 mg PO 6 weeks, 50 mg 3 months, 20 mg maintenance (Doxycycline)
- Steroids, Tobradex qid (5 weeks with taper)
  - Moderately red and thickened lid margins
  - Marginal Infiltrates

What is an Insipssated MG?

I Can’t Believe It’s Not Butter!® Squeeze

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What Has Changed?

Bruder Moist Heat Eye Compress

- Moist heat treatment
  - Stabilize the tear film, improve oil gland function, slow tear evaporation
- Ready in seconds, easy to use
  - Patient compliance increases
- Patented MediBeads
  - Self-hydrating (no need to add water)
  - Anti-bacterial and non-allergenic
  - Washable and reusable
- Safe for frequent use
  - Microwave for 20-25 seconds
  - Apply for 10 minutes
- Unique pod design provides improved fit and performance

Dry Eye Relief and Daily Eyelid Hygiene

- Micro-fine sheets are designed to cleanse the eyelids

Bruder Cold Therapy Eye Compress
Modern Management of Dry Eye

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Xiidra
What Have I Learned?

- How many did you write before you called failure?
- Only pharmaceutical indicated for the signs and symptoms of dry eye
  - Prior authorization:
    - CovenlyMed
    - ParRx
  - BID means 12 hours apart
  - It’s safe, safe, safe… 3-25% report side irritation, blurred vision, or dry eye
  - Tell the patients they may taste it
  - Use it as a diagnostic

Xiidra
What Have I Learned?

- Restasis when prescribed: how long until you see improvement?
- Xiidra
  - 2 weeks: symptom relief in moderate patient
  - 6 weeks: symptom relief in mild patient
  - 12 weeks/months: cornea improvement
  - Restasis or Xiidra?

Xiidra
What Have I Learned?

- Use on DES patient with steroid (Lotemax gel)
  - Then as maintenance
  - Use if thinking a specialty IOL, discussing IOL and refractive outcome, monovision
  - Take advantage of the free 30-day trial and $10 refill

Nutraceutical Therapies

Prostaglandins

- Myth busted: they are not all bad
  - Prostaglandin E1 (PGE 1) - good
    - Shown to stimulate lacrimal production (Pharmacology 2001)
    - Supports wound production
    - Experimental deprivation of vitamin E is a required cofactor for PGE 1
    - Stages lacrimal production, produces E prostaglandin (PG) signs & symptoms
  - Precursor: GLA
  - Prostaglandin E2 (PGE 2) - bad
    - Precursor: AA
  - Prostaglandin E3 (PGE 3) - good
    - Precursor Omega 3 "fish oil"

Nutraceutical Therapies in Dry Eye

Looking for anti-inflammatory fatty acids

- Dry eye efficacy
  - "Fish oil" will provide nice hair, nails, and skin
  - Gamma-Linolenic Acid GLA
    - Specific action that "fish oil" omegas lack
    - 7 randomized controlled trials for dry eye
      - Aragona, 1993
      - Kokke, 2004

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    - Precursor Omega 3 "fish oil"
1) GLA heavily favors the anti-inflammatory pathway

2) As back up, adding EPA to GLA in proper balance, blocks production of pro-inflammatory pathway

- Consistently shown improvement in markers of inflammation / inflammatory mediators in dry eye
- Shown promise in other inflammatory diseases, like rheumatoid arthritis, IBD, dermatitis, and diabetic retinopathy
- In Sjogren's increases tear production, raises PGF1 in tears (Regan, 2003)
- Supports meibomian glands (Simard, 2017)
- Probably through anti-inflammatory action
- 2,000-3,000 mg omega-3 usually required to have significant effect
- In contrast 215 mg of GLA significantly reduced 2 different inflammatory markers (EPA-DR, CD11c) in the HydroEye trial (Regan, Mortgage et al in S. Sponsor, 2013)

Aren't all Omega-6s Bad?
- Most assume omega-6 are bad / pro-inflammatory
- Most people have also heard that we get too much omega-6 in our diet and that we need more omega-3
- The aka Omega-6 / omega-3 ratios
- This is based on studies that use dietary info – and therefore this info applies only to dietary omega
- GLA is not a dietary omega
  - except at trace levels
  - It's not valid to apply dietary info to GLA
- GLA is a potent anti-inflammatory omega
  - Like EPA/DHA in the omega-3 family
  - Backed by a number of dry eye clinical trials
- GLA has a unique dry eye specific action

Is GLA offered in the triglyceride (TG) form? aka "re-esterified"
- These forms of omegas triglyceride (TG) vs ethyl ester (EE) mainly apply only to fish oils
- Fish oil when it’s purified is transformed from the natural TG form in fish to the EE form
  - Which allows the omegas to be concentrated & purified
- Fish oil companies have heavily marketed re-esterified or TG fish oils as vastly more absorbable and bioavailable
- GLA only comes as TG form
  - No other form
  - TG vs EE discussion is purely about different fish oils
Nutraceutical Therapies

- Pick the right nutraceutical not “fish oil” ad get:
  - Improvement in irritation symptoms
  - Better cornea smoothness
  - Significantly lower levels of inflammatory markers

Amniotic Membrane

- To help reset the eye from a stage 3-4 back to something manageable
- Failure on multiple therapies
- Sjogren’s and the rheumatological patient

Dry Eye and Amniotic Membrane

In-Office Lab Testing

- Helps with:
  - Switching patient to dailies
  - Starting nutraceuticals
  - Starting pharmaceuticals
  - Following patients over time

TearLab Osmolarity Test

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InflammaDry®

For inflammatory dry eye detection

Normal levels of MMP-9 in human tears ranges from 3-41 ng/ml

POSITIVE TEST RESULT
MMP-9 ≥ 40 ng/ml

NEGATIVE TEST RESULT
MMP-9 < 40 ng/ml

InflammaDry®

Sjö Diagnostic Test

Uses proprietary biomarkers to create an advanced diagnostic panel

Early detection of Sjögren’s syndrome in your patients

Thank You and Hope You Enjoyed

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