New Advances in the Management of Lid Disease

Paul M. Karpecki, OD, FAAO
Koffler Vision Group
Lexington, KY

Lid Disease Fundamentals

- Association or synonymous with Dry Eye
- Differentiating anterior blepharitis from MGD
- The various types of blepharitis
- Terminology: MGD, meibomitis etc.
- Treatment options
- New understandings of lid margin disease
- Communicating that information

Lacrical Functional Unit (LFU)

- Tear film
- Lacrimal glands
- Corneal and conjunctival epithelia
- Meibomian glands

- Homeostasis controlled by nerve connections and systemic hormones

DTS: Clinical Categories

- Most common presentation: "No lid margin disease"
- Treatment decision based on severity level

Lacrical Functional Unit (LFU)

- Anti-inflammatory factors such as expression of vascular endothelial growth factor receptor-3, and regulatory T-cells play an active role in protecting the ocular surface
- Prevention may represent the most promising therapeutic strategy!
Anterior Blepharitis

- Inflammation of the eyelids usually caused by bacterial infection (staphylococcal) of the eyelid margin
- Infection normally occurs at the origins of the eyelashes and involves the lash follicles and the meibomian glands
- Signs and symptoms include:
  - Morning crusting of lids
  - Loss of lashes
  - Collarettes - scales that encircle lash
  - Lid margin redness
  - Conjunctival hyperemia

Anterior Blepharitis: Staphlococcus

Target Profile For Optimal Treatment of Lid Margin Disease

Anterior Blepharitis: Staphylococcal

- Broad spectrum antimicrobial activity → eliminate the bacteria in acute cases
- Anti-inflammatory effect → reduce the inflammation
- Good penetration → high levels at site of disease
- Long contact time
- Convenient dosing → promote good compliance

Anterior Blepharitis Treatment

- Current treatment options
  - Lid hygiene with hot compresses
  - Commercial lid scrubs
  - Antibiotic ointment to lid margin (Bacitracin, Erythromycin)
  - Corticosteroids for persistent inflammation (Lotemax ung)
Typical Antibacterial Choices

- Macrolide: erythromycin ung
- Bacitracin ung
- Polysporin ung

Typical Anti-inflammatory Choices

- Combination drops and ointments
- Steroid drops and ointments

Anterior Blepharitis: ?

Target Profile For Optimal Treatment of Lid Margin Disease

Anterior Blepharitis: Demodex

- Tea-Tree oil ~ 50%
- Cliradex
- OcuSoft tea-tree kit (also contains sea buckthorn oil)
- Make in office
- Sterilid for maintenance
Target Profile For Optimal Treatment of Lid Margin Disease

Anterior Blepharitis: Seborrhea

- Dermatological prep such as triamcinolone 0.1%
- No more than 2-3 weeks
- Lotemax ointment if fear patient may get in eyes
- OcuSoft Lid Scrub Plus for maintenance

MGD

Frothy / Foamy Tears = MGD

Meibomian Gland Dyfunction

- Involves a change in composition of meibomian gland secretions, inflammation, irritation and an altered tear film
- Signs and symptoms include:
  - Plugged meibomian gland orifices with "toothpaste" like material
  - Dry eye signs and symptoms (burning, foreign body sensation, contact lens intolerance)
  - Thickened lid margin
  - Filmy vision with foam in tear film (soaps/fatty acids)

Evaluation of the Treatment Response in MGD

- Evaluate role of inflammation by in vivo confocal microscopy
- Randomized between anti-inflammatory treatment and 2 types of AT's (non-preserved and those with HA)
- TBUT, NaFl staining and inflammatory cell densities improved statistically in the anti-inflammatory group (p<0.05), but no change in the control groups

Chronic changes

- Telangiectasia
- Scarring

MGYLS

- Symptomatic CL wearer: 4.8
- Asymptomatic non-CL: 5.5
- Asymptomatic RGP wearer: 9.0
- Asymptomatic SCL wearer: 10.7

Potential Theories on major causes of the high incidence of MGD in North America

- Diet
- Hormonal
- Contact lens wear (Villani E et al)
- Heredity

One Potential Theory on a major cause of the high incidence of MGD in North America

TREATMENT

Mild/Acute

- Hot/warm compresses
- Lid hygiene
- Lipid based tears for mild to moderate
- Osmolarity lowering tears for moderate to severe
Bruder Hydrating Mask

Liposome Spray
- Self-closed colloidal particles
- Membranes composed of one or more lipid bilayer(s)
- The surfaces of bilayers are hydrophilic while the interior, which contain hydrocarbon chains, are hydrophobic
- Because of the different microenvironments in their structure, liposomes can encapsulate hydrophilic molecules
- Applications for lid disease but also drug delivery, diagnostics, computer vision syndrome and nutraceuticals

Moderate/Acute
- Zylet
- Tobradex ST
- Tobradex
- Maxitrol
- AzaSite
- Lotemax ung QHS

Long Term
- Pulse dose medications periodically
- Steroids when symptoms are worse
- Essential fatty acids
  - EPA
  - DHA
  - GLA

Potential Chronic Changes
- Telangiectasia
- Dislocation of meibomian glands/ gland atrophy
- Scarring/atrophy

Moderate/severe or not improving
- Add PO tetracycline
- Recommendation:
  - _____________ ___ mg bid x 4-8 weeks then taper to qd
- Periostat (20 mg doxycycline) bid
Tetracyclines

- Antibiotics inhibit bacterial protein synthesis by binding 30S ribosome
- Anti-inflammatory properties
  - decreases IL-1, TNF-α
  - decreases NO production
  - decreases HLA Class II antigen expression
  - decreases metalloproteinase production and activation
- Decrease symptoms and joint destruction in RA

The non-antibiotic properties of Tetracycline

- Shown to be able to reduce inflammation in the eyelid meibomian glands, improve optical clarity of the cornea, retard cataract formation and limit ocular angiogenesis


Contraindications

- Pregnant, nursing or even of child bearing age
- Children

Cautions

- Photosensitivity
- Chelates with dairy products, antacids etc.
- Minocycline may cause vestibular toxicity
- Number one drop-out reason?
- GI problems

How to Minimize Stomach Problems with Tetracycline

1. Do not take the second pill (bid) before going to bed
2. Do not take pills with acidic beverages
3. Take pills with food (except a high dairy meal)
4. Prescribe the lowest dose available
Nutritional Supplements: Essential Fatty Acids

- Omega fatty acids shown to help with dry eye disease:
  - ALA: e.g., flaxseed oil
  - EPA/DHA: e.g., fish oils
  - GLA: e.g., black currant seed or evening primrose oil

Effect of Essential fatty acids on MGD inflammation

- Role of good Omega-6 (GLA) vs. Omega-6 LA vs. lid hygiene (control)
- 57 patients randomized and analyzed MG secretions, obstruction, hyperemia and staining
- Statistically significant improvement in ALL groups on GLA compared to LA or lid hygiene

Omega Balance

- North American diet (type)
  - 1.6 g/day of ALA (ω-3) (oils, fatty fish, egg white)
  - 12-16 g/day of ω-6 (meat, fried meals)

- Ideal diet (g/day)
  - 3 ω-3: means to increase daily consumption × 2
  - 7.55 ω-6: means to reduce daily intake × 2

- Ideal ratio (3/6)
  - 1:4 to 1:2.5

Omega and Dry Eye

- LA / GLA (ω-6)
  - Increase “good” PG (PGE-1)
  - Against ocular surface inflammation
  - Increase tear production


- Help to maintain MG function (Macsai, 2008)

Omega and Dry Eye

- ALA (ω-3; flaxseed oil)
  - Helps to restore ocular health
  - Blocks cytokine release (IL-1) and release of necrosis factors (TNF-α)
  - Reduce local leukocytes action
  - Contra-indicated if GI problems or history of prostate disease
  - Conversion rates in men

Omega and Dry Eye

- EPA/DHA
  - Cold water fish
  - More absorption
  - Triglyceride vs. Ethyl Ester
  - USP Certified
  - Dosing?
    - Depends on 2 key things
      - Current level of nutrition
      - Current disease state
  - Contraindications
    - Blood thinners?
**Ingredient and Dose** | **Inclusion Rationale** | **Dose Rationale**
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**Vitamin A, 2080 IU** | • Required for expression of gene encoding for mucin  
• Some reports of low A status in dry eye | Lower than DV to avoid vitamin A excess if combined with other supplements

**Vitamin E, 12 IU** | • Fat soluble antioxidant — free radicals result from chronic inflammation | Modest amount needed to protect GLA, ALA & DHA from oxidation

**Vitamin C, 240 mg** | • Key antioxidant in eye  
• Co-factor for GLA’s metabolism | Within range estimated to saturate eye tissue (Tufts)

**Vitamin B6, 12.6 mg** | • Co-factor for fatty acid metabolism | Poor status common in older individuals

**Magnesium, 40 mg** | As above | As above

**GLA, 235 mg** (from 1570 mg of black current oil) | • Clinical support for reducing objective & subjective symptoms of the eye  
• Metabolites give rise to anti-inflammatory prostaglandins | In range of amounts tested in studies. Also provides 200+ mg of ALA

**EPA, 100 mg**  
**DHA, 70 mg** (from USP fish oil) | • Gives rise to anti-inflammatory prostaglandins  
• Ensures no GLA goes to arachidonic  
• Ensures no GLA goes to arachidonic | Balanced ratio of GLA and EPA ensures no GLA goes to arachidonic

**Mucin Complex, 100 mg** (90% mucin) | May provide building blocks for body’s synthesis of mucin | Simply a contribution of specific mucin sugars

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**Non Responsive Blepharitis and MGD**

**Non Responsive MGD**

**Carcinoma:**

**Meibomian gland carcinoma**

**Carcinoma:**

**Carcinoma**

- Rare entity
- Usually originates from meibomian glands
- Can be highly malignant, infiltrative and metastasize
- Mortality may reach 30%
- May masquerade as a Chalazion
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THANK YOU

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