DRY EYES
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APPROACH TO TEARING
• Dry eyes
• Wet eyes
• Other
  • Ocular surface disease
  • Eyelid disorders
  • Orbit

TEAR SECRETION
• Lacrimal gland - aqueous
• Meibomian glands - lipids
• Goblet cells - mucin
PATIENT FACTORS

- Older age
- Female
- Post-menopausal
- Smoking
- Contact lens wear
- VDU use

ENVIRONMENTAL

- Air pollution
- Artificial air
- Allergens
- Low humidity

DRUGS

- Anti-histamines
- Anti-depressants
- Anti-spasmodics
- Diuretics
- Oral contraceptives
- Hormonal therapy

DISEASE FACTORS

- Systemic
  - Auto-immune diseases
  - Neurologic - reduced blink
  - Vitamin A deficiency
- Local
  - Lacrimal gland infiltration
  - Eyelid malposition, laxity, lagophthalmos
  - Ocular surface disease
Lacrimal Glands:

- The committee felt that the term embraced the essential pathophysiological events in dry eye. However, although the committee's final schemes were attractive, it was decided that multiple schemes serving different purposes was more appropriate. As a result, the scheme as a whole was not adopted, because it was realized that the name more accurately reflected disease severity.

**DRY EYE CLASSIFICATION**

**DRY EYE**

- Aqueous-deficient
  - Sjogren Syndrome Dry Eye
    - Primary
      - Intrinsic
        - Meibomian Oil Gland Deficiency
        - Low Blink Rate
        - Drug-Induced Arteritis
      - Extrinsic
        - Glandular Deficiency
        - Episcleral Drugs

- Evaporative
  - Primary
    - Loss of Lid Aperture
    - Ocular Surface Damage or Allergy
  - Secondary
    - Meibomian Gland Dysfunction
    - Lipid Dysfunction

**L. 5. N.**

**Subcommittee**

A subdivision based on the presence or absence of lid disease.

**Definition and Classification Subcommittee**

A reclassification of the current groupings that includes the presence or absence of lid disease.

- Triple Classification also presented a severity grading.

**Subcommittee**

This scheme served multiple purposes and had much to recommend it.

**Inflammation.**

- Antimicrobial proteins
- Electrolytes - osmolality
- Lipid
- Mucin - viscosity
- Antimicrobial proteins
- Growth factor
- Cytokines - suppress inflammation.
FUNCTIONS OF A HEALTHY TEAR FILM

- Optical clarity, refractive power
- Ocular surface comfort, lubrication
- Protection from environmental and infectious insults
  - Antibacterial proteins, antibodies, complement
  - Reflex tears flush away particles
- Trophic environment for corneal epithelium
  - Necessary electrolytes maintain pH
  - Protein factors for growth and wound healing
  - Antioxidants

TEARS IN CHRONIC DRY EYE

- Decreased proteins and growth factor
- Altered cytokine balance favouring inflammation
- Proteases activated
- Increased electrolytes
- Altered viscosity

EFFECTS OF ALTERED TEAR COMPOSITION IN CHRONIC DRY EYE

- Ocular surface environment altered
  - Lubrication compromised (poor viscosity)
  - Increased osmolality
  - Imbalanced growth factors and cytokines - fail to promote normal epithelial cell growth
- Ocular surface damage
  - Loss of epithelial integrity
  - Squamous metaplasia of conjunctival epithelium
SYMPTOMS OF DRY EYE

- Asthenopia
- Grittiness, irritation
- Dryness
- Burning
- Photophobia
- Red eye
- Blurred vision

TEAR BREAKUP TIME (TBUT)

- Tear film instability is a hallmark of dry eye
  - Correlates with aqueous and evaporative tear deficiency (Pflugfelder et al, 1998)
- TBUT measures tear film quality
  - Fluorescein introduced from strip, yellow filter increases sensitivity
  - TBUT = time from completed blink to 1st dry spot (3 repetitions)
  - TBUT < 10 seconds abnormal
  - Anesthesia decreases TBUT (de Paiva et al, 2004)
  - Abnormal corneal surface - > break-up spots

SCHIRMER'S TESTS

- Test for tear quantity
- Schirmer’s I (measure at 5min)
  - without anaesthetic: total secretion; normal = 10–30mm
  - + anaesthetic: basal secretion; normal >10mm
- Schirmer’s I I (measure at 2min)
  - reflex tear secretion
  - cotton but to irritate nasal mucosa or up the nose!
  - Normal >15mm

LISSAMINE GREEN STAINING

Lissamine green stains dead & degenerating cells
ROSE BENGAL

- White light
- Stains dead and devitalised cells + mucus
- Stings & mildly toxic to ocular surface
Blepharitis is best to think of this as part of your daily routine. This is the best way to keep symptoms away, or to a minimum.

Further advice

- Avoid rubbing your eyelids as this may make inflammation worse
- It’s best to avoid wearing eye-makeup particularly nearer to the may make symptoms worse

Prescribing Guideline for the Management of Dry Eye

If you use drops that contain this preservative for long periods, they may damage the front of the eye. Therefore, if you use artificial tears more than four times per day, it is best to use a preservative-free brand which does not contain benzalkonium chloride. In some cases, this may cause irritation in your eyes. By changing to a type which is preservative-free, also, contact lenses cannot be used with many types of eye drops. Check with your local pharmacist or doctor for advice. It is often the preservative in the drops that may cause problems. Some types of drops are available without preservatives, which are suitable for contact lens wear.

Eye drops:

- These can also be bought from pharmacies
- They provide a soothing and lubricating effect and should be used at bedtime
- Do not use during the day as they may make the artificial tear drops less effective, and can blur vision
- Do not use whilst wearing contact lenses
- Do not use if you use other eye drops for other conditions. The other eye drops may not work as well as top of the stem.
- Although artificial tears and soothing solutions work well in most cases, other treatments may be considered by your doctor to severe cases.

Further advice

- Limit the use of contact lenses
- If using a computer for long periods, ensure that the monitor is at or below eye level, avoid staring at the screen, and take frequent breaks to close/look away
- Use a humidifier to moisten ambient air

Dry eye

In this guideline based on

* Abbreviation

December

Produced by the Medicines Management Team, West Suffolk CCG in partnership with the WSFT. Version 1, December 2015. Review dates December 2017