Top 10 Tips from TFOS DEWSII

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Abstract:

Dry eye disease (DED) is the most common condition that primary eye care providers
encounter in daily practice. In 2017, members of the Tear Film and Ocular Surface society
(TFOS) published an updated series of consensus papers regarding the fundamental aspects
of DED. The major aims of the Dry Eye Workshop #2 (TFOS DEWS II) were to:

1. Update the definition, classification and diagnosis of DED. 3,4
2. Critically assess the etiology, mechanism, distribution and impact of this disorder. 5-10
3. Address its management and therapy. 11

In this presentation, I will review the top 10 “tips” from TFOS DEWS II that are valuable
to a clinician to help them diagnose and manage patients with DED, using contemporary
methods.

Course Learning Objectives:

Upon completion of attending this course, attendees will:

1) Be conversant with the new definition of DED and the classification of DED that
helps confirm the presence of DED.
2) Be aware of the contemporary methods to appropriately diagnose DED.
3) Be aware of the latest peer-reviewed evidence concerning the use of various
techniques and devices to manage DED, using a staged approach.

1. Definition & Classification

The Definition and Classification Subcommittee refined the existing DEWS definition.
The TFOS DEWS II definition of dry eye is as follows:

“Dry eye is a multifactorial disease of the ocular surface characterized by a loss of
homeostasis of the tear film, and accompanied by ocular symptoms, in which tear film
instability and hyperosmolarity, ocular surface inflammation and damage, and
neurosensorial abnormalities play etiological roles.”
Dry eye disease was further classified according to the following diagram:

The top section of the figure represents a clinical decision algorithm, which starts with the assessment of symptoms, and is followed by an evaluation for signs of ocular surface disease. By definition (as above) DED exhibits both symptoms and signs. It can be differentiated from other ocular surface disease with the use of triaging questions and supplementary testing that are described in the diagnostic methodology report. After exclusion of other ocular surface disease, and DED is confirmed, it is to this group that diagnostic subtyping (determining the relative contributions of aqueous deficiency and evaporative components) and conventional dry eye management strategies, apply.

Symptomatic patients without obvious clinical signs do not fall into the DED group, but are differentiated into pre-clinical dry eye or neuropathic pain (non-ocular surface disease). Conversely, asymptomatic patients exhibiting signs are differentiated into patients with poor corneal sensitivity, or those with prodromal signs, who are at risk of developing manifest DED with time or provocation, for example following ophthalmic surgery.

The lower portion of the diagram represents the etiological classification of DED, and highlights the two predominant and non-mutually exclusive categories; aqueous deficient dry eye (ADDE) and evaporative dry eye (EDE). Epidemiological and clinical evidence suggest that DED is predominantly evaporative in nature, which is reflected in a greater
proportion of the figure devoted to EDE than ADDE. While it is possible that ADDE can occur without obvious signs of EDE and vice versa, as DED progresses, it is increasingly likely that characteristics of both ADDE and EDE will become evident. Recognition of this continuum between the ADDE and EDE subtypes is acknowledged by a color gradient within the figure.

Further sub-classification of ADDE and EDE is not detailed in this diagram, but is acknowledged to relate to a vast range of conditions, as detailed in the TFOS DEWS II Pathophysiology report. ADDE describes conditions affecting lacrimal gland function. EDE is recognized to include both lid-related (e.g. MGD and blink-related) and ocular surface-related (e.g. mucin and contact lens-related) causes.

2. Diagnosis

The diagnostic methodology committee identified the following approach for diagnosis of dry eye disease

DED diagnostic test battery: The screening DEQ-5 or OSDI confirms that a patient might have DED and triggers the diagnostic tests of non-invasive breakup time, osmolarity and ocular surface staining with fluorescein and lissamine green (observing the cornea, conjunctiva and eyelid margin). On initial diagnosis, it is important to exclude conditions that can mimic DED with the aid of the triaging questions and to assess the risk factors which may inform management options. MGD lipid thickness/dynamics and tear volume assessment and their severity inform the subtype classification of DED (as predominantly evaporative or aqueous deficient) which helps inform the management of DED. Videos of these diagnostic and sub-classification techniques are available on the TFOS website.
3. Management

The results presented from the Management and Therapy Report will include the following categories:

- **Treatments for Tear Insufficiency**
  - Tear replacement
    - Artificial tear substitutes
    - Biological tear substitutes
  - Tear conservation
    - Punctal occlusion
    - Moisture chamber spectacles and humidifiers
  - Tear stimulation
    - Topical secretagogues
    - Lipid stimulation
    - Oral secretagogues
    - Nasal neurostimulation

- **Treatments for Lid Abnormalities**
  - Anterior blepharitis
  - Meibomian gland dysfunction
    - warm compresses
    - physical treatments
  - Blinking abnormalities and ocular exposure
    - Exposure keratopathy
    - Lagophthalmos / nocturnal lagophthalmos
    - Entropion and ectropion
    - Contact lenses

- **Anti-inflammatory Therapy**
  - Topical glucocorticosteroids
  - Non-glucocorticoid immunomodulators
  - Lymphocyte Function-associated Antigen 1 (LFA-1) antagonist
  - Inflammatory modulation with systemic and topical antibiotics

- **Surgical Approaches**

- **Dietary Influences**
  - Essential fatty acids

- **Local Environmental Considerations**
  - Chronic topical medications
  - Systemic medications
  - Decreased blink rate
  - Desiccating conditions and environmental pollutants
  - Contact lens wear
• **Complementary Medicines**
  - Herbal and natural products
  - Honey
  - Acupuncture

• **Staged Management Algorithm**
  - A 4 step algorithm is proposed that aims to manage patients with progressive disease

**Dry Eye Disease Management**

Diagram of the process associated with the management of DED

**Staged management & treatment recommendations**

<table>
<thead>
<tr>
<th>Step 1:</th>
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<tr>
<td>• Education regarding the condition, its management, treatment and prognosis</td>
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<tr>
<td>• Modify local environment</td>
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<tr>
<td>• Education regarding potential dietary modifications (including oral essential fatty acid supplementation)</td>
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<td>• Identification and potential modification/elimination of offending systemic and topical medications</td>
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<tr>
<td>• Ocular lubricants of various types (if MGD is present, then consider lipid-containing artificial tear substitutes)</td>
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<td>• Lid hygiene and warm compresses of various types</td>
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<tr>
<th>Step 2:</th>
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<tr>
<td>If above treatments are inadequate consider:</td>
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<tr>
<td>• Unpreserved ocular lubricants to minimize preservative-induced toxicity</td>
</tr>
<tr>
<td>• Tea-tree oil management for Demodex (if present)</td>
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<tr>
<td>• Tear conservation</td>
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o Punctal occlusion
o Moisture chamber spectacles/goggles
  • Overnight treatments (such as ointment or moisture chamber devices)
  • In-office, device-assisted physical heating and expression of the meibomian glands (eg LipiFlow)
  • In-office intense pulsed light for MGD
  • Prescription drugs to treat DED  
    o Topical antibiotic or antibiotic/steroid combination applied to the lid margins
    o Topical corticosteroid for short-duration
    o Topical secretagogues
    o Topical non-glucocorticoid immunomodulatory drugs (eg cyclosporine)
    o Topical LFA-1 antagonist drugs (eg lifitegrast)
    o Oral macrolide or tetracycline antibiotics

Step 3:
If above treatments are inadequate consider:
  • Oral secretagogues
  • Autologous/allogeneic serum eye drops
  • Therapeutic contact lens options
    o Soft bandage lenses
    o Rigid scleral lenses

Step 4:
If above treatments are inadequate consider:
  • Topical corticosteroid for longer duration
  • Amniotic membrane grafts
  • Surgical punctal occlusion
  • Various surgical approaches (eg tarsorrhaphy; salivary gland transplantation)

a. The management options listed above are not intended to be exclusive. Depending upon the severity of the dry eye disease and the cause behind the disease state it may be that patients require several management options from one or more steps. The table is merely intended to suggest what options could be considered at various severity levels of dry eye, within a disease spectrum that will differ between patients.

b. Under each step of management it is not assumed that each bullet-point is to be considered in the order listed, but rather that each treatment may be considered appropriate for consideration within that step of the dry eye disease state.

c. It should be noted that the levels of evidence to support each management option differ and will inevitably be less for those management options that are newer. Thus, each treatment option should be considered in light of the degree of evidence available at the time management is instigated.

d. The use of prescription drugs need to be considered in the context of the individual patient presentation, and the relative level of evidence supporting their use for that specific application as this group of agents differ widely in their mechanism of action.

4. Top 10 Tips to Take Away

1. Dry eye is a subset of ocular surface disease
   a. need differential diagnosis
2. Symptoms are essential
   a. use standard questionnaire
   b. Severe ‘dry eye’ symptoms may be neuropathic
3. Signs without symptoms are not dry eye
   a. but still needs management if ocular challenge
4. Spectrum of DED exists between evaporative and aqueous dry eye
5. Non-invasive assessment are preferred for diagnosis
6. Majority of DED has an evaporative component
7. DED has a “vicious circle” that needs to be broken to restore tear film homeostasis
8. Lubricants remain a mainstay of treatment
9. Preservatives are bad for severe dry eye
   a. “soft” preservatives appear fine for milder cases
10. Good evidence treatments work
    a. but not on when they are optimal

References