UNDERSTANDING DRY EYE DISEASE AND THE WAVE OF NEW TREATMENT STRATEGY

Dry eyes affect many people in the community, and with different levels of severity. Though common, the disease is often ignored and underdiagnosed, leaving patients undertreated and resulting in loss of productivity at work and at play.

The increased understanding of dry eyes in more recent times has brought about significant advances in the technologies and the way eye doctors diagnose, treat and manage the condition. Besides the lack of tear production and excessive evaporation, dry eyes is also due to increased osmolarity (concentration) of the tear film and inflammation of the eye surface.

Dry eye disease can be classified into Tear Deficiency (Inadequate Tear Production) and Evaporative Loss (Excessive Evaporation) and both situations can often occur in the same patient suffering from dry eye disease.

SYMPTOMS OF DRY EYE

Symptomatic dry eye is more common in this part of the world (South East Asia) compared to the temperate countries. Its prevalence ranges from 20% to 50% and is higher in females than males.

COMMON SYMPTOMS

- Eye Fatigue: Patient's eyes usually feel tired at the end of the day and some experience difficulty in opening the eyes.
- Foreign Body Sensation: A persistent feeling of "sand" in the eye.
- Burning, stinging and sensation of dryness: Intermittent sharp pains and sensation of "dryness" in the eyes.
- Itchy eyes: Itchiness especially in the morning and tendency to rub the eyes results in more discomfort.

VISUAL SYMPTOMS

For moderate to severe dry eyes, vision can be affected. As the eye surface becomes irregular, the images that the patient sees also become fuzzy and unclear despite wearing glasses. Some symptoms are so severe that the patient may even have difficulty opening the eye and performing their daily duties and activities.

WHAT ARE THE RISK FACTORS OF DRY EYES?

Risk factors that cannot be modified:

- **Age:** Risk of dry eye disease increases as one ages
- **Race:** Asians are at higher risk of dry eyes
- **Gender:** Females are at higher risk than males.

Risk factors that can be modified:

- **Extended Use of Portable Visual Devices**
- **Contact Lens Wear**
- **Low Humidity Environment**

Risk factors associated with other medical conditions:

Medical Conditions: Meibomian gland dysfunction, Allergic conjunctivitis (Vernal/ Atopic Keratoconjunctivitis), Sjogren Syndrome, Rheumatological diseases

Use of Medications: Anti-histamines, Isoretinoin, anti-depressants and anti-anxiety medicines etc.

THE DIAGNOSIS OF DRY EYES

The diagnosis of dry eyes is based on a combination of the patient's symptoms, clinical examination and occasional use of specialized instrumentation.

CLINICAL SIGNS OF DRY EYE

During an eye examination, the clinical signs of dry eyes that can be seen are:

- **Eyelid margin diseases**
- **Injected conjunctival**
- **Irregular cornea surface**
- **Frequent blinking of the eyelids**

CLINICAL TESTS

- **Tear Breakup time:** tests for tear film stability by measuring the time required for the tear film to evaporate and detects early evaporative loss in the tear film.

- **Schirmer's Test:** tests for tear production by measuring how much tears are produced in the patient's eye in a span of 5 minutes.

OTHER SPECIALIZED TESTS

- **Tear film interferometry** – Tests the tear film stability
- **Tear film osmolarity testing** – Tests the osmolarity levels increase in dry eye disease
- **OCT meniscometry** – Assesses the tear volume by measuring the tear meniscus

MANAGEMENT OF DRY EYE DISEASE

Depending on the severity, the aim of dry eye disease management is to decrease the patient's discomfort caused by the symptoms and improve the patient's visual function. This would allow the patient to live and function effectively with the dry eye disease.

TEAR SUBSTITUTES

With new technology and understanding of the disease, the latest eye drops are now able to hydrate the eye surface more effectively with longer retention time, thus decreasing the frequency of application.

The addition of agents such as hyaluronic acid, carboxyl methylcellulose and HP- guar increases the viscosity (tear film thickness) and the retention time on the surface of the eye, relieving the dry eye symptoms.

Osmoprotectants – such as L-carnitine is added to protect the eye from hyperosmolarity.

Lipid supplementation – a variety of mineral oils eg. glycerin is added to eye drops to enhance the lipid layer in the tear film to prevent early evaporation.

Preservatives – are often found in over-the-counter lubricating eye drops. The most frequently used preservative in eye drop preparation is benzalkonium chloride (BAK). However, it can cause damage to corneal and conjunctival epithelial cells.

To avoid long term exposure, eye drops now use preservatives that are gentler to the eye surface. Some of these new preservatives are designed to degrade to ions or oxygen and water upon exposure to ultraviolet light.

Despite being gentler to the epithelial cells, there will still be some damage. Therefore, preservative-free eye drops would be more effective in decreasing the damage to the eye surface, and are often used for eyes with pre-existing ocular surface condition.

LID HYGIENE

As the eyelid is closely related to the ocular surface, inflammation or abnormalities of the lid margin must be managed in the treatment of dry eyes:

- Warm compress with warm towel for 5 minutes twice a day, followed by a lid scrub to clear off or liquefy secretions in the obstructed glands in cases of Meibomian Gland Dysfunction (MGD).

- In Rosacea-related MGD, a course of Doxycycline would help in decreasing eyelid inflammation and improving the ocular surface.

ANTI-INFLAMMATORY EYE DROPS

In very symptomatic dry eyes and poor vision due to dry and irregular eye surfaces, anti-inflammatory eye drops such as steroid eye drops and Ciclosporine eye drops will be used to decrease the inflammation and damage to the eye surface.

ESSENTIAL FATTY ACID SUPPLEMENT

Supplements such as high concentration Omega-3 have been useful in managing MGD and blepharitis. Studies have shown decreasing tear evaporation in dry eye patients consuming these supplements.

CONCLUSION

Dry eye disease is a multifactorial and heterogeneous condition that has significant impact on patients' daily activities.

Understanding the disease, identifying the symptoms in tandem with clinical findings, and tailoring the medications and treatment options based on the severity of the patient's condition is essential for a complete and holistic management of dry eye disease. PRIME

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