

Contact Lens Update

CLINICAL INSIGHTS BASED IN CURRENT RESEARCH

Essential fatty acids for dry eye

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Nadine Furtado is an Assistant Clinical Professor at the University of Waterloo's School of Optometry and Vision Science.

Patients presenting to an eye care professional commonly complain of symptoms related to dry eye syndrome (DES), a multi-factorial condition causing instability of the tear film which can potentially result in ocular discomfort and reduced visual function.¹ It is estimated that up to a quarter of individuals seen in an optometric clinical setting report symptoms associated with dry eyes, a statistic which doubles when you survey patients who wear contact lenses.² The increased frequency of DES in contact lens wearers is related to the fact that a contact lens on the anterior surface of the eye has the tendency to decrease the thickness of the tear film lipid layer, which subsequently leads to increased tear evaporation.³

Dry eye syndrome can be categorized into two groups: evaporative and aqueous deficient. Evaporative dry eye is usually caused by poor quality secretions from the meibomian glands, resulting in a reduced lipid layer and tear film instability. Aqueous deficient DES typically occurs due to a deficiency in aqueous production from the lacrimal glands, and can be further divided into Sjögren's and non-Sjögren's types of dry eye. Both evaporative and aqueous deficient DES will result in tear film hyperosmolarity.

The treatment for dry eyes can be challenging, since the clinical signs often do not parallel a patient's presenting symptoms. Traditionally, the management of DES has been based on the use of artificial tears for symptomatic relief. However, this form of treatment does not address the underlying etiology of DES, and therefore, in most cases only provides temporary relief to patients.

Nutrition has been shown to play a role in numerous eye diseases, including DES.⁴ In particular, essential fatty acids (EFAs) may play a role in stabilizing the ocular surface tear film by improving the lipid layer.⁵ EFAs may also be useful in addressing the inflammation seen in DES given their proven anti-inflammatory properties in the treatment of other systemic conditions such as rheumatoid arthritis.⁶

Roncone et al. carried out a literature search to review the potential use of EFA supplementation to treat DES.⁷ The following article highlights the results of this study.

Roncone M, Bartlett H, Eperjesi F. Essential fatty acids for dry eye: A review. Cont Lens Anterior Eye 2010;33:49-54.

Results

Essential fatty acids are required for good health but need to be ingested through one's diet since they are not produced by the human body. The only two fatty acids considered to be essential are omega-3 and omega-6, the difference between the two being the location of the first carbon double bond in their chemical structures.

Omega-6 EFAs are readily available in a western diet as they can be found in eggs, poultry, beef, commonly used oils as well as many whole-grain breads and cereals. Omega-3 EFAs are predominantly found in foods that are less frequently consumed in the diets of individuals living in developed countries, such as fish and fish oils, flaxseed and certain vegetables.

Although both omega-3 and omega-6 are considered essential, a proper balance of these EFAs is needed for optimum health. The recommended omega-3 to omega-6 EFA ratio is ideally 1:4, however, for most individuals in the western world this ratio is estimated to be much lower and closer to 1:25. This low ratio characteristic of a North American diet high in meat and processed foods means that most people are consuming higher than necessary amounts of omega-6 EFAs and have a deficiency in omega-3 EFAs.

Omega-3 EFA supplementation appears to be beneficial in the treatment of DES. Omega-3 promotes oil secretions from the meibomian glands and improves the lipid layer in the tear film, thus increasing its stability.⁸ In addition, omega-3 EFAs help to decrease inflammation by preventing lacrimal gland apoptosis and the subsequent elevation in tear film osmolarity, as well as improve dry eye symptoms.⁹⁻¹⁰ However, for omega-3 EFA supplementation to have its optimal anti-inflammatory effect the dietary intake needs to be well-balanced with the consumption omega-6 EFAs, with the ideal recommended ratio of omega-3 to omega-6 being 1:2.3.¹¹

Conclusion

The results of this literature review indicate that omega-3 EFAs have a potential role in the treatment of DES as they are able to address the underlying cause of this condition. Omega-3 EFAs have been shown to not only help reduce the inflammation associated with DES, but they also have the ability to increase tear production and improve the tear lipid layer, thus improving tear film stability. Recent studies have confirmed that oral omega-3 supplementation has a definite role in the treatment of DES, especially in those with associated meibomian gland dysfunction and dry eyes secondary to contact lens wear.¹²⁻¹⁵

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