

Treating dry eye with natural therapies

Patients' eye, overall health may benefit from diet management, omega-3 fatty acids

By **John D. Sheppard, MD**; Special to Ophthalmology Times

A DEEPER UNDERSTANDING of dry eye disease (DED) has created a whole new subspecialty and a tremendous emphasis on a previously underidentified-and-undertreated-yet-common clinical enemy.

Resulting from an abnormality of the integrated lacrimal functional unit (LFU) that can no longer maintain tear stability,¹ dry eye is invariably associated with inflammation, which can exacerbate irritation and ocular surface disease.²

Production of pro-inflammatory mediators can be decreased by intelligent diet management as well as the consumption of specific omega-3 fatty acids.³ Though these may not be readily available in the American diet, people can still reap the benefits through supplementation.

NATURAL THERAPIES

The complexity of dry eye—including the diagnosis, etiology, and therapeutic interventions—has provided a wonderful scenario to practice internal medicine through the eye with natural therapies.

Clinicians would do well to emulate the populations that live in the co-called “Blue Zones” of the world, where human longevity is most prevalent. In these locations—such as Ikaria, Greece; Okinawa, Japan; and Sardinia, Italy—more people are living into their nineties and even hundreds, with fewer diseases and better health, than those of their genetically related American counterparts.⁴

While a number of factors contribute to this, natural foods rich in polyunsaturated fatty acids (PUFAs) that are consumed as part of the diet of these populations speak to the benefits of natural living. Though individuals living in other parts of the world may not have access to the same resources, the benefits can be replicated through supplements containing these components, especially when combined with the dry eye-specific anti-inflammatory properties of gamma-linolenic acid (GLA).^{5,6}

Patients' reactions to natural remedies are universally positive. The wealth of literature available on systemic and ocular health with proper nutrition, coupled with supplements, has shown time and again this approach to be beneficial not only for the eyes, but also for every organ system—cholesterol will be lower,

joint pain will be reduced, cerebral functions will sharpen, and cardiovascular resistance and resilience will improve.^{7,8}

Patients undoubtedly benefit greatly when physicians take into account their entire being, not just the eye.

A SCIENTIFIC RATIONALE

A powerful confluence of factors—from peer-reviewed literature in human and animal models to clinical studies—has allowed clinicians to produce remarkable results in these previously underserved patients. Supplementation with therapeutic levels of essential omega-3 fatty acids has been shown in several studies to have a positive effect on DED symptoms.^{5,6,9,10}

Our prospective, randomized, multicenter masked trial found that a combination of omega-3 fatty acids and GLA, an anti-inflammatory omega-6, produced exceptional benefits in post-menopausal women with dry eye.¹¹ Over a 6-month period, the omega fatty acid supplement was found to improve symptoms, enhance corneal smoothness as measured with topography, and suppress deterioration of cytologic markers for inflammation, while corneal topography and inflammatory markers tended to worsen for placebo. The level I evidence from this multicenter, randomized trial substantiating the role of beneficial polyunsaturated fatty acids has been corroborated in subsequent dry eye analyses.^{12,13,14,15}

DIAGNOSES AND INITIAL TREATMENT

Every patient is different, and every possible combination of therapies is important to consider depending on the patient's needs. A full medical history is imperative.

A modified OSDI questionnaire allows clinicians to gather essential information, including supplemental allergy and blepharitis symptoms. Diagnostic testing includes in-office allergy testing, testing for inflammatory elevated MMP-9 tear levels (InflammaDry, RPS/Quidel), evaluating whether a patient has hypo-secretion or

hyper-evaporation and increased tear concentration with an osmolarity test, and analyzing meibomian structure imaging.

To avoid overwhelming the patient with possible treatments, clinicians need to maintain a scientific and sequential approach. Choosing one short-acting intervention, one preventative measure, and one long-acting intervention will allow clinicians to analyze the effect of each individual therapy.

Quicker-acting interventions include treatments such as punctal plugs, potent anti-inflammatory drops, and hypochlorous acid lid scrubs.

Preventative measures are aimed at reducing the impact of outside forces that may be influencing ocular health. Limiting or eliminating prescription pills that cause dry eye as a side effect, smoking cessation, humidity control, air filtration, computer station ergonomic optimization, and dust removal are all preventative measures that can aid in improving ocular health and dry eye in particular.

Dietary optimization includes sensible carbohydrate restrictions consistent with many viable strategies, including the Zone diet, the

Paleo diet, and the Blue Zone diet.

Nutritional supplementation would be both preventative and a long-acting intervention. Many patients attempting their own therapy typically exacerbate the situation with store brand tears that have high concentrations of preservatives, vasoconstrictors and minimally effective emollients, pH balancing, and lubrication agents.

Conversely, the more scientifically formulated options from brand names—such as Alcon Laboratories, Allergan, Bausch + Lomb, Johnson & Johnson Vision, Oasis, and TheraTears, and similarly scientifically motivated companies—have much better success and tolerance rates and much lower toxicity than store brands.

Every office should offer a facile method for patients to obtain high-quality supplements. Our office offers a particular line (ScienceBased Health, including HydroEye), which I prefer due

Continues on page 47 : **Natural**

take-home

► **Patients benefit when physicians take into account their entire being, not just the eye. To that end, production of pro-inflammatory mediators can be decreased by intelligent diet management as well as the consumption of specific polyunsaturated fatty acids, explains John D. Sheppard, MD.**

Special Report) CLINICAL CONCEPTS FOR **DRY EYE & OCULAR ALLERGY**

NATURAL

(Continued from page 46)

to the inclusion of the unique omega fatty acid, GLA, as well as a philosophy dedicated to continuously updated formulations derived from pure natural sources and peer-reviewed scientific literature.

Patients appreciate the fact that they can leave the clinic with a high-quality product that will be an important component of both their preventative and long-term health care.

Most patients show improvement within the first 2 months, with many noticing benefits much sooner. Dry eye can be symptomatically and functionally much more devastating than anyone imagined.

However, with a detective's approach and natural therapies, clinicians can improve patients' ocular and overall health, as well as support a significantly enhanced quality of life. ■

References

1. Stern ME, Beuerman RW, Fox RI, et al. The pathology of dry eye: the interaction between the ocular surface and lacrimal glands. *Cornea*. 1998;17:584-589.
2. Hessen M, Akpek EK. Dry Eye: An inflammatory Ocular Disease. *J Ophthalmic Vis Res*. 2014;9:240-250.
3. Kelley DS, Taylor PC, Nelson GJ, et al. Docosahexaenoic acid ingestion inhibits natural killer cell activity and production of inflammatory mediators in young healthy men. *Lipids*. 1999;34:317-324.
4. Buettner, Dan (2012). *The Blue Zones*, Second Edition: 9 Lessons for Living Longer From the People Who've Lived the Longest. Washington, DC.: National Geographic.
5. Creuzot C, Passemard M, Viau S, et al. Improvement of dry eye symptoms with polyunsaturated fatty acids [in French]. *J Fr Ophthalmol*. 2006;29:868-873.
6. Brignole-Baudouin F, Baudouin C, Aragona P, et al. A multicentre, double-masked, randomized, controlled trial assessing the effect of oral supplementation of omega-3 and omega-6 fatty acids on a conjunctival inflammatory marker in dry eye patients. *Acta Ophthalmol*. 2011;89:e591-e597
7. Simopoulos AP. Omega-3 fatty acids in inflammation and autoimmune diseases. *J Am Coll Nutr*. 2002;21:495-505.
8. Calder PC. n-3 polyunsaturated fatty acids, inflammation, and inflammatory diseases. *Am J Clin Nutr*. 2006;83(6 Suppl):1505S-1519S.
9. Kangari, Haleh, et al. Short-term consumption of oral omega-3 and dry eye syndrome. *Ophthalmology* 120.11 (2013): 2191-2196.
10. Barabino S, et al. Systemic linoleic and gamma-linolenic acid therapy in dry eye syndrome with an inflammatory component. *Cornea* 2003;22:97-102.
11. Sheppard JD, Pflugfelder SC, et al. Long-term supplementation with n-6 and n-3 PUFAs improves moderate-to-severe keratoconjunctivitis sicca: a randomized double-blind clinical trial. *Cornea*: 2013;32:1297-1304.
12. Epitropoulos AT, Donnenfeld ED, Shah ZA, et al. Effect of Oral Re-esterified Omega-3 Nutritional Supplementation on Dry Eyes. *Cornea*. 2016;35:1185-1191.
13. Phargava R, Kumar P, Kumar M, et al. A randomized controlled trial of omega-3 fatty acids in dry eye syndrome. *Int J Ophthalmol*. 2013;6:811-816.
14. Kangari H, Efeckhari MH, Sardari S, et al. Short-term consumption of oral omega-3s and dry eye syndrome. *Ophthalmology*. 2013;120:2191-2196.
15. Liu A, Ji J. Omega-3 essential fatty acids therapy for dry eye syndrome: a meta-analysis of randomized controlled studies. *Med Sci Monit*. 2014;20:1583-1589.



JOHN D. SHEPPARD, MD

E: jsheppard@vec2020

Dr. Sheppard is a board-certified ophthalmologist and corneal surgeon;

president of Virginia Eye Consultants, and professor of ophthalmology, Eastern Virginia Medical School.

He has financial interest in ScienceBased Health.

This is
NOT
a plug.



This is a solution

to the discomfort of dry eye. The VeraPlug™ FlexFit™ is simple to size and insert, comfortable for your patients, and comes with the confidence of our industry leading 45 day retention pledge.

Visit us at ASCRS booth #2209

A FRESH PERSPECTIVE™



lacrivera.com (855) 857-0518

2500 Sandersville Rd • Lexington KY 40511 USA

Preventing dry eye via long-chain lipids

VERY LONG-CHAIN lipids in the tear film cause severe dry eye disease when shortened in mice—a result that could help develop new drugs for the disease, according to a published study (www.sciencedaily.com/releases/2018/02/180220094958.htm).

A research team led by Akio Kihara, PhD, of Hokkaido University, created mice whose *Elovl1* gene—which encodes an enzyme that elongates fatty acid chains—was deleted from everywhere

but the skin. When young, the knockout mice blinked frequently and exhibited signs of dry eye. After 5 months, many of the mice developed cloudy corneas. Researchers also found that the knockout mice had less very long-chain meibum, but more short-chain meibum.

Results indicate *Elovl1* is closely linked to the synthesis of very long-chain meibum, which appear to be essential to preventing dry eye disease, Dr. Kihara said. ■