

Refractive

Dry eye prevention

Omega fatty acid supplements useful strategy before LASIK

Reduction in tear lactoferrin levels less marked in treated group with history of dry eye

By Cheryl Guttman
Reviewed by Frank A. Bucci Jr., MD

Wilkes-Barre, PA—Preoperative oral intake of nutritional supplements containing omega fatty acids prevents the precipitous drop-off in tear lactoferrin that occurs following the LASIK-induced creation of a neurotrophic cornea, reported Frank A. Bucci Jr., MD.

Dr. Bucci, a private practitioner in Wilkes-

Barre, PA, evaluated the effects of pre-LASIK treatment with a source of omega fatty acids (HydroEye, ScienceBased Health) in a non-randomized study of 40 patients undergoing simultaneous bilateral surgery.

Twenty patients with a history of evaporative or aqueous dry eye were instructed to take two capsules of the nutritional supplement daily beginning 1 month before surgery and continuing for 1 month postoperatively.

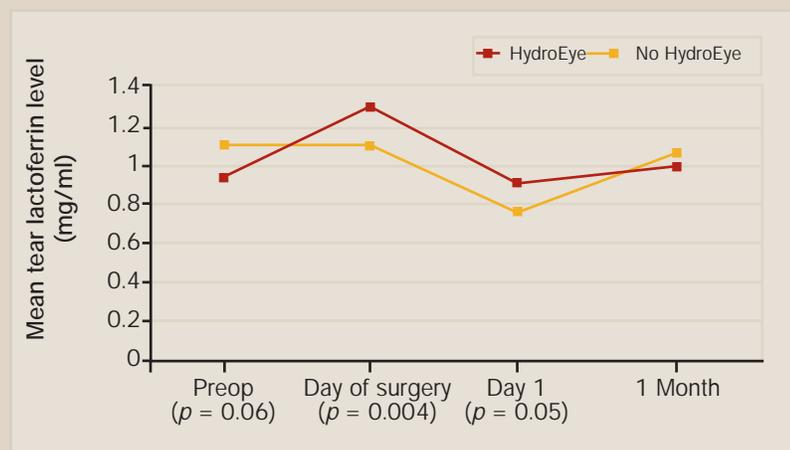
Each oral capsule contains a mixture of omega-3 and omega-6 fatty acids derived from black currant seed oil and cod liver oil, as well as vitamins A, C, B₆, and a proprietary mucin complex.

The remaining 20 patients were age-matched but had no dry eye complaints and received no adjunctive treatment. Patients in the treated group had a higher incidence of ocular surface disease compared with the controls.

Tear lactoferrin levels were measured at study entry using the Tear Profile Analyzer (Corneal Science), on the day of surgery, and at 1 day and 1 month after surgery. In the treated patients, tear lactoferrin increased significantly during the pretreatment period and became significantly higher than in the controls on the day of surgery (Figure 1). In both groups, tear lactoferrin decreased significantly on the first day after LASIK. However, the postsurgery reduction was less marked in the treated versus the control group, reported Dr. Bucci.

"Levels of tear lactoferrin have been shown to be decreased in eyes with tear-deficient dry eyes, and this iron-binding tear protein is thought of by many as an indicator of ocular surface health. Against that background, the results of this study support the preoperative prophylactic use of oral omega fatty acids in patients with a mild-to-moderate risk for dry eye after LASIK," he said.

Figure 1 Mean tear lactoferrin levels



OT Graphic

Ophthalmology Times / Source: Frank A. Bucci, Jr., MD

Figure 1 Mean tear lactoferrin levels comparing patients taking omega fatty acid supplements before and after LASIK and controls.

At study entry, the mean lactoferrin level was lower in the patients assigned to omega fatty acid supplementation compared with the controls, 0.95 versus 1.1 mg/ml, respectively. On the day of LASIK, mean lactoferrin had increased significantly by 36% to 1.32 mg/ml in the group taking the omega fatty acid supplement. Because the tear lactoferrin level was essentially unchanged in the controls, the mean level was 24% higher in the treated group and the difference was statistically significant.

On the day after LASIK, the mean tear lactoferrin level in the treated group was 0.88 mg/ml, which was 17.6% higher than the level of 0.77 mg/ml measured in the controls. A significant difference favoring the omega fatty acid-treated group over controls was also noted in an analysis of the percentage change from baseline to post-LASIK day 1, 8% versus 31%, respectively.

Tear lactoferrin levels rose during the 1 month after surgery, and despite continued intake of the supplement in the treated group, there was no difference from the controls at the last assay.

Dr. Bucci noted that the mechanism by

Take-Home Message

A study compared patients treated with a nutritional supplement containing omega fatty acids (HydroEye) and untreated controls. The oral intake of the product for 1 month prior to surgery significantly increased tear lactoferrin levels and minimized the LASIK-induced decrease in levels of that protein.

which omega fatty acids benefit dry eye is not known for certain. The presiding theory is that they change the character of the oils in the meibomian glands and thereby lead to stabilization of the tear film's lipid layer with subsequent improvement in ocular surface health. Omega fatty acids also have a well documented anti-inflammatory effect that has been shown to benefit dry eye.

Anecdotal reports

He mentioned that previously there have been a number of anecdotal reports as well as a few studies showing the benefits of

omega-3 fatty acid intake for increasing tear production, tear clearance, and dry eye symptoms. Studies conducted by Dr. Bucci in normal subjects and LASIK patients have also demonstrated that their use results in significant increases in tear lactoferrin levels.

In addition, data analyses presented at the 2003 meeting of the American Association for Research in Vision and Ophthalmology from more than 32,000 women health professionals participating in the Women's Health Study found a positive correlation between dietary intake of omega-3 fatty acids and fish and a decreased risk for the diagnosis of dry eye syndrome. ○T

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Dr. Bucci has no financial interest in any of the products mentioned in this story.