AUTOIMMUNE EYE DISEASES

Treatment Update: Dry Eye Syndrome and Corneal Defects in Diabetes

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Researchers at both Pennsylvania State University and Harvard University are conducting clinical trials on promising topical therapies for autoimmune eye disorders.

Dry Eye Syndrome

Dry eye syndrome is reported to affect more than 10 million people in the United States, primarily women. In the Harvard Eye Study described below, topical applications of essential fatty acids are used to prevent eye dryness. In a related study at Pennsylvania State University, researchers have found that topical applications of high dose naltrexone help repair corneal damage in patients with type 1 diabetes.

Dry eye syndrome is a common complaint in a number of different autoimmune disorders. In dry eye syndrome, the eyes are unable to produce adequate tears, which leads to eye dryness, irritation and inflammation. Symptoms of dry eye include stinging, burning, eye irritation, and a feeling of grittiness. Dry eyes are often seen in thyroid eye disease, which is a feature of autoimmune thyroid disease, and also myasthenia gravis, Sjogren’s syndrome, uveitis, multiple sclerosis, Cogan’s syndrome, and many other autoimmune conditions. In patients with diabetes, immune system changes can lead to corneal abrasions and poor wound healing.

Omega-3 Oils

Several years ago researchers found that oral doses of omega-3 oil supplements, particularly flaxseed oil, increased eye moisture. A daily dose of 1000 mg flaxseed oil is the usual recommendation for people with dry eye syndrome although some people with severe conditions require higher doses of omega-3 oils before they notice improvement.

The Harvard Eye Study

Research conducted by Massachusetts Eye and Ear Infirmary Cornea Service Director and Harvard Medical School Professor Reza Dana, M.D., M.Sc. MPH and colleagues at the Schepens Eye Research Institute have discovered that topical drop application of alpha-linolenic acid (ALA) leads to a significant decrease in clinical signs of dry eye syndrome in animal models. ALA is an essential fatty acid that must be supplied in the diet since it is not made by the body.

In this study researchers used three formulations of fatty acids, which they applied topically to the eye of a mouse once daily. In the control group the untreated group did not receive eye drops. Eyes evaluated 24 hours after the last dose of ALA showed significant reversal in epithelial damage to the cornea (the transparent dome that covers
the pupil). In addition to a reduction in signs of dry eye syndrome, ALA also caused a reversal in inflammatory changes characteristic of dry eye syndrome.

**Topical Fatty Acids**

Dr. Dana is now planning to conduct clinical studies in humans using topical fatty acid. He reports that the current animal study demonstrates the benefit of topical application of a particular fatty acid in treating the signs of dry eye syndrome at both the molecular and cellular level.

**Pennsylvania State University Study of Corneal Healing in Diabetes**

In an earlier related animal study, Dr. Ian Zagon and his colleagues at Pennsylvania State University discovered that high doses of opiate antagonists such as naloxone and naltrexone increase cell growth and help repair corneal damage related to type 1 diabetes. In a recent study, which will be published in *Archives of Ophthalmology*, this same team of researchers has demonstrated that topical applications of high dose naltrexone in the diabetic eye prevents neovascularization, a major problem in diabetics that leads to vision loss.

**Resources:**

Do You Have Dry Eyes? Harvard Study Shows Results, InFocus publication of the Autoimmune Diseases Association, March 2008.

Ian Zagon, Joseph Sassani, and Patricia McLaughlin, Insulin Treatment Ameliorates Impaired Corneal Reepitheliazation in Diabetic Rats, Diabetes, April, 2006: 1141-47.

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