



ALLERGY OR DRY EYE? THERE'S A TEST FOR THAT!

A look at two ways to diagnose dry eye disease and the latest method that can determine if the patient is suffering from allergies instead.

By Jeffrey Anshel, OD, FAAO

There are many causes of dry eye disease (DED), making it a challenge to efficiently test for the cause of the disorder. Most practitioners rely on one of the many questionnaires that are available but those take some time to complete and depend on patient recall of their symptoms. Dry eyes and ocular allergies can have many overlapping complaints, making it more challenging to determine the specific disorder needing therapy. It would be expedient if we could distinguish between the two forms of dry eye—aqueous deficient (ADDE) and evaporative (EDA)—quickly

and accurately, as well as confirm the diagnosis of dry eye vs. allergic conjunctivitis.

Tests that are available to determine the source of DED include tear film breakup time, which determines tear film integrity, Shirmer's Test and Zone Quick (phenol red thread) for tear volume, tear osmolarity, rose bengal and lissamine green for cell

integrity, lid wiper epitheliopathy to observe increase in friction between the lid margin conjunctiva and the ocular surface, and a measurement of lactoferrin protein levels in the tear film.

Testing the tear layer involves more than just any one of these tests. Because of the variety of causes and several factors involved in tear film instability, practitioners should

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incorporate these tests into a pre-examination routine. Any patient who complains of excessive or deficient tearing, redness, irritation, discharge, or any other typical anterior ocular complaint should be screened prior to seeing the doctor.

TESTING TEARS

One of the more established tests is the tear osmolarity test. The TearLab Osmolarity System (TearLab) is intended to measure the osmolarity of human tears to aid in the diagnosis of dry eye disease in patients suspected of having DED. This test, in conjunction with the TearLab Osmolarity System, provides a quick and simple method for determining tear osmolarity using nanoliter (nL) volumes of tear fluid collected directly from the eyelid margin. The Test Card is held by the Osmolarity Test Pen for safe collection. The TearLab Osmolarity Test utilizes a temperature-corrected impedance measurement to provide an indirect assessment of osmolarity. After applying a lot-specific calibration curve, osmolarity is calculated and displayed as a quantitative numerical value.

Another point-of-care instrument is InflammDry (Quidel). The device is a rapid, in-office test that detects elevated levels of MMP-9, an inflammatory marker that is consistently elevated in the tears of patients with DED. Using direct sampling micro-filtration technology, InflammDry accurately identifies elevated levels of MMP-9 protein in tear fluid samples taken from the inside lining of the lower eyelid, the palpebral conjunctiva.

While much of the media surrounding DED is directed toward lipid layer enhancement, just adding "oils" to a tear layer is not adequate in resolving the underlying source of the disease process. Consider a visit

to the dentist with a cavity in one tooth. They would not think of just "capping" the tooth without treating the underlying root to address the source of the degeneration. Likewise, just enhancing the lipid layer of the tears requires addressing the "root" of the tear layer, which means enhancing the mucin layer as well.

Lactoferrin is an antiviral, antibacterial, iron-binding protein that is particularly vital to tear production. It is also a mucous-specific, anti-inflammatory molecule. Serum lactoferrin is released from the lacrimal gland in a manner similar to serum IgG and possibly from tear neutrophils during infection and inflammation. By binding iron, lactoferrin prevents the pathogen from obtaining sufficient iron, which it relies upon for growth.

TESTING LACTOFERRIN LEVELS

The most recent development in tear evaluation is the TearScan 300 Tear Analyzer (Advanced Tear Diagnostics). Its quantitative tests can distinguish the source of dry eye (ADDE or EDA) vs. allergic reaction (IgE). A technician draws a sample of tears into a micropipette and then transfers this to a test strip incorporated into a cassette. This cassette is then inserted into a computerized unit that evaluates the concentration of lactoferrin and IgE, thus offering a numerical evaluation of those molecules. The time of the test is typically 10 minutes. Thus, a determination of the condition can be accomplished while the patient is still in the office and treatment can be directed immediately. Lactoferrin testing is reported to be the most reliable, single marker in the diagnosis of DED.

The TearScan 300 has been cleared by the FDA and provides the practitioner more precise clinical data regarding lactoferrin levels in the tear film. Multiple studies have dem-

onstrated the low value of normal tear lactoferrin levels to be about 0.9 mg/mL. Values less than this indicate lacrimal gland dysfunction, with the smaller the number, the greater the dysfunction of the lacrimal gland.

Medicare and most insurance companies reimburse the TearScan 300, using codes 83520 (lactoferrin) and 82785 (IgE). Eyecare providers must first register as a "lab" and obtain a Clinical Laboratory Improvement Amendments (CLIA) number to get the reimbursements. In most states, optometrists qualify as lab directors for Class I and Class II Certification. This type of certificate is issued to a laboratory that performs waived or non-waived (moderate complexity) testing. Advanced Tear Diagnostics will assist the practitioner in gaining their certification.

While diagnosing and treating dry eye can seem daunting and overwhelming, there are many avenues to walk down when deciding what to use in the clinic. One way is to promote yourself as a "dry eye center" to your patients, which can certainly achieve recognition in your community. However, the best way to make gains in this area is being successful with your existing patients, who will undoubtedly tell their friends and loved ones about your abilities. Getting positive results is your best advertising. **0|0**

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WHERE TO FIND IT

Advanced Tear Diagnostics
888.328.1941 | AdvancedTearDiagnostics.com

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855.832.7522 | TearLab.com

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