Focus shifts to detecting OSD preoperatively

by Dermot McGrath in Milan

A new range of diagnostic tools which are beginning to make their way into clinical practice have the potential to play an important role in helping physicians diagnose and treat ocular surface disease (OSD), according to Beatrice Cochener MD.

"The growth of refractive surgery in recent years has driven new interest in research into dry eye and OSD. We know that a common source of dissatisfaction after refractive surgery is related to issues concerning ocular surface disease, which is why we have seen a shift to making the diagnosis preoperatively rather than postoperatively on the basis that it is always better to prevent than to treat," she said.

Addressing the 3rd EuCornera Congress here, Prof Cochener, professor and chairman of the Ophthalmology Department at Brest University Hospital, France, noted that preoperative dry eye is a risk factor for more severe dry eye after surgery.

"This is why it is important for it to be identified and treated before surgery. The problem, of course, is that we tend to underestimate the role played by ocular surface changes and do not really look for them preoperatively in the absence of obvious symptoms," she said.

Following on from the Dry Eye Workshop (DEWS) report in 2003, dry eye is now deemed a multifactorial disease involving the tears and ocular surface, involving especially inflammation, that results in symptoms of discomfort, visual disturbance and tear film instability with potential damage to the ocular surface, said Prof. Cochener.

OSD is also a common comorbidity of other ocular conditions, she added, "Up to 50 per cent of cataract patients will complain of dry eye and the figure is around 30 per cent or higher for those who have undergone LASIK or other refractive procedures."

Prof. Cochener stressed the importance of looking for clinical signs of dryness in preoperative examinations and patient questionnaires.

"Symptoms of dryness include foreign body sensation, burning, itching, stinging, lid heaviness and corneal punctate epithelial keratopathy. These symptoms may be combined with fluctuating vision, regression, decrease in best-corrected visual acuity, glare, night vision problems and severe discomfort," she said.

Risk factors to watch for before surgery include blepharitis, which can predispose patients to infection and inflammation, epitheliopathy, which can induce dry eye and recurrent keratlogoia, as well as defects during LASIK such as epithelial ingrowth or diffuse lamellar keratopathy. Allergies can also cause irritation, inflammation and dryness and alter the transparency of the cornea.

In terms of the risk factors for cataract-refractive surgery, Prof. Cochener cited studies showing that the prevalence of dry eye signs and symptoms in patients undergoing cataract surgery is more common than frequently reported.

"If the dry eye is not diagnosed preoperatively, it can affect topography, aberrometry and keratometry measurements and may also impact on the accuracy of IOL power calculation, and axis measurements and degree of astigmatism for toric IOL implantation," she said.

"Before any decrease in visual acuity, OSD usually induces a deterioration of vision quality, with instability reflected in the aberrometric and topographic images and OCT measurements, said Prof. Cochener.

In screening patients with preoperative dry eye, Prof Cochener advised careful examination of the patient’s systemic and ocular history, contact lens use, medication history and so forth.

"All these factors may contribute to ocular surface disease and we need to pay particular attention to medications such as diuretics, anticholinergics, antidepressives, antihistamines, arthritis drugs and other allergy treatments which can all play a major role in altering the integrity of the ocular surface," she said.

The sequence of clinical tests for standard diagnosis of dry eye should include symptoms and clinical history, break-up time, ocular surface fluorescein staining, Schirmer’s test and examination of the lid and meibomian gland morphology, said Prof Cochener.

Although measuring tear film osmolarity has traditionally been limited to research laboratories, Prof Cochener said that a micro-osmometer (TearLab Osmolarity System, TearLab Corp.) is now commercially available and may prove useful in the diagnosis of OSD, dedicated to clinical trials on OS.

"While it is not always easy to collect enough tears to get these measurements, the device provides a quick and simple method for determining tear osmolarity using nanolitre (nL) volumes of tear fluid collected directly from the eyelid margin," she said.

Another new test that can detect a marker for inflammation in a minuscule sample may also provide evidence of the early presence of OSD, said Prof Cochener.

Known as the RPS InflammaDry Detector (Rapid Pathogen Screening), the device works by detecting the presence of MMP-9, a cytokine produced by epithelial cells experiencing inflammation, that appears to be a reliable marker for the presence of early OSD and dry eye.

Prof Cochener said that valuable diagnostic information may also be obtained using the Optical Quality Analysis System (Visiometrics), based on a double-pass technique that measures light scatter as it passes through the ocular structures. Even small changes in the tear film can increase the light scatter and degrade the retinal image quality, she said.

Another new diagnostic tool, the LipiView Ocular Surface Interferometer (TearScience), is a non-invasive device that captures live images of the patient’s tear film and measures lipid content and quality, said Prof Cochener. To treat the patient, the device can be combined with the LipiFlow Thermal Pulsation System, a combined lid warmer and lid massager.

"While it will be some time yet before these devices are widely used in day-to-day clinical practice, Prof Cochener said that it was encouraging to see new developments emerging in the field of OSD.

"If nothing else, it shows that we are doing great brainstorming between what we understood, what we can diagnose and now what we can treat," she concluded.