pollen season. It is unlikely that a previously nonallergic individual, seen in the dead of winter, really has allergic conjunctivitis. Allergy affects about 15% of the population and has a strong hereditary tendency. Most allergy sufferers are allergic to grass, trees, or weeds, and allergy to animal dander (especially cat) is quite common. Itching is a common symptom of allergy. The eyes show mild-to-moderate redness and chemosis. Whereas most allergy sufferers have nasal symptoms, ocular symptoms may be the dominant feature. Anti-allergic drugs, such as mast-cell stabilizers and vasoconstrictor/antihistamine eye drops work well for mild-to-moderate allergic conjunctivitis. More severe allergic symptoms require corticosteroid eye drops. Milder, less penetrating corticosteroids are preferred because they are less likely to cause glaucoma and cataracts.

Dry Eye

More nonsense has been written about dry eye than perhaps any other ocular condition. Dry eye is caused by a deficiency of tears from a variety of causes. The most severe is the autoimmune disease known as Sjögren’s syndrome. Patients with this condition are almost always of middle age or older and women. They usually have dry mouth and dryness of other mucous membranes. Most will develop a systemic autoimmune disease, such as rheumatoid arthritis, polymyalgia rheumatica, or fibromyalgia. Inflammation of the secretory glands reduces the flow of tears or saliva. It is rare to find severe dry eye in a male. I have never been convinced that there is such an entity as the “postmenopausal dry eye.” As people get older, there is a slight reduction in their tear production, but it is rarely symptomatic. Systemic medications, such as diuretics, antihistamines, and psychotropic drugs, can contribute to dryness. Eyelid surgery can cause dry eye by severing nerves or lacrimal ducts. LASIK surgery can be associated with a temporary reduction of tear secretion, lasting up to 6 months. However, this type of dryness is mild, relieved by artificial tears, and self-limited. The mainstays of treatment for dry eye are artificial tears. There does not appear to be any one particular artificial tear that appeals to all patients. My impression is that nearly all dry-eye conditions are caused by an aqueous deficiency. Pemphigoid and Stevens-Johnson syndrome and alkali burns have aqueous deficiency and an additional loss of mucin-producing goblet cells. In most other instances, the clinical importance of chemical abnormalities of tears remains unconvincing. It is sometimes taught that people with dry eye can have excessive tearing, or epiphora. This is patently false. If an eye is dry, it cannot, by definition, be wet. Patients understand this concept perfectly, but somehow, doctors seem to have trouble with it. Moderate or severe dry eyes may benefit from punctal occlusion with silicone plugs. Insertion of these plugs is one of the most successful minor surgical procedures in ophthalmology. Relief is almost immediate. If epiphora occurs, the plugs can be removed. plugs that are inserted fully into the canaliculus and are not visible to the ophthalmologist may be associated with complications. There are a number of topical and systemic medications that are designed to promote tear secretion. A discussion of these medications is beyond the scope of this article.

Conclusion

Blepharitis, allergy, and dry eye are separate entities. They may coexist, but one condition does not “cause” another. Each entity should be considered separately and treated in a methodical way. These are conditions in which the “splitters” will be far more successful than the “lumpers” in satisfying their patient’s needs.

Mitchell H. Friedlaender, MD
La Jolla, CA

MEASURING INTRAOCULAR PRESSURE

Question: What is the Most Accurate Method to Measure Intraocular Pressure?

Answer:

Much has been written about the role of intraocular pressure (IOP) in the pathogenesis and clinical management of glaucoma. Although it is well understood that IOP is only one component in the diagnosis of the disease, many now argue that, given the development of high-tech diagnostic equipment that can detect more subtle visual field changes or measure thinning of the retinal nerve fiber layer, the relative importance of IOP has diminished. However, imaging and visual field testing can only detect damage that has already occurred. Certainly from a patient’s point of view, it would be preferable to know ahead of time so the damage can be prevented. Early diagnosis of glaucoma leads to early treatment, with the goal of retained visual function using less aggressive therapy. IOP measurement is a fundamental glaucoma-screening tool, and IOP is the only modifiable risk factor on which treatment is based. Several large prospective clinical studies in the last decade, such as Ocular Hypertension Treatment Study (OHTS), Early Manifest Glaucoma Trial (EMGT), and the Advanced Glaucoma Interven-

SEP 2006;38 (1) ........................................................
With this in mind, clinicians need the most precise and repeatable measurement of IOP possible. I remember as a resident learning to digitally ballot an eye and having one of my faculty members talk about developing the touch to ballpark the IOP at the patient’s bedside. I spent many an hour at remote clinics utilizing my Schiøtz tonometer to screen people for glaucoma. In the office, the use of the Goldmann applanation tonometer was “the gold standard.” It failed for postoperative edematous corneas, but it was what we had. As a comprehensive ophthalmologist back then, I felt comfortable using applanation tonometry for my day-to-day screening device, as well as for my glaucoma monitor.

In recent years, given the litany of literature that has revealed inherent errors in Goldmann applanation tonometry (GAT), a myriad of algorithms have now been published for “correcting” IOP based on central corneal thickness (CCT). These correction algorithms are being promoted by the pachymeter manufacturers. Unfortunately, these algorithms may have lulled us into a false sense of security. Cynthia Roberts, a PhD in the Department of Ophthalmology at the Ohio State University, recently said at the World Glaucoma Congress in Vienna: “Linear correction of GAT based on CCT will not accurately correct error. The error in GAT could not possibly be a linear function based exclusively on CCT.” Her research has shown that it is not corneal thickness, but rather corneal biomechanical properties that mask the true IOP from the clinician (1). Not only will linear algorithms based on CCT often give you the wrong correction factor, they may have you dangerously correcting in the wrong direction!

The proliferation of refractive corneal procedures over the last decade has muddied the waters even further. With the advent of LASIK, we suddenly were curing myopia, but creating an eye that defied accurate IOP measurements with the “gold standard” Goldmann. It is well established that LASIK and photorefractive keratectomy usually have an effect on GAT readings, but not always, lowering the measured GAT IOP about 4 to 5 mmHg. Attempts have been made to correlate the amount of thinning of the cornea with the amount of IOP effect, but no such correlation has been substantiated. As a refractive surgeon, this was a concern to me. The Blue Mountain Eye Study showed us that myopes have an increased risk of glaucoma to begin with. With refractive surgery, every year we destine a million eyes into a world of uncertain IOP assessment. Reports surfaced in the literature about glaucomatous field loss on postrefractive patients secondary to severe increases in true IOP that were masked by misleadingly low GAT values. Suddenly my comfort level with my IOP readings was gone. Are we creating a subset of patients destined to become “normal tension glaucoma” patients 10 or 20 years down the road? With the intent of providing better patient care, I decided to try the new Pascal Dynamic Contour Tonometer (DCT) from Ziemer Ophthalmics of Switzerland.

The Pascal DCT, introduced and described by Kannagiesser et al. at the Association for Research in Vision and Ophthalmology (ARVO) meetings in 2002–2004, became commercially available in August of 2004 (Fig. 1). With a 1.2-mm piezo-electric pressure sensor built flush into the concave surface of the SensorTip, the Pascal gives direct and continuous measurement of IOP, purportedly independent of corneal biomechanical properties, including CCT, curvature, edema, and so on.