Resident’s Corner: What to Make of Corneal Staining
Robert Ensley, O.D.

Disruption to corneal epithelium should elicit obvious concern for the risk of infection, most notably in contact lens wearers. Accordingly, the use of sodium fluorescein dye to stain the cornea should be an integral component of a contact lens evaluation. When corneal staining is present, one of the biggest debates for practitioners is what constitutes clinically significant staining? A multitude of contributory factors have been investigated; however, a review of the literature reveals variable, sometimes contradictory data.

It would seem reasonable to assume that contact lens wearers would have higher prevalence rates of corneal staining. Two large scale studies of contact lens wearers reported 56 percent and 54 percent of wearers with some degree corneal staining.\textsuperscript{1,2} However, only 8 percent and 26 percent, respectively, were reported to have moderate staining, described as dense, coalesced staining at which point intervention is recommended.\textsuperscript{1,2} Conversely, in studies of normal, non-contact lens wearing patients, as high as 79 percent of corneas exhibited some degree of staining.\textsuperscript{3,4}

While contact lens wear in general may not increase the prevalence of staining, certain factors may be contributory. Increased wear time per day and lens deposition have been shown to increase corneal staining.\textsuperscript{2} For this reason, patients wearing extended wear lenses might be expected to show increased staining. While one study suggests an increased prevalence in extended wear compared to daily disposable lenses,\textsuperscript{5} other studies show a prevalence as low as 4 percent,\textsuperscript{6} and comparable staining rates to daily disposable lenses.\textsuperscript{7} The difference between hydrogel and silicone hydrogel materials also reveal conflicting data.\textsuperscript{2,8}

Contact lens solutions have been widely researched and offer perhaps the most contested debate. While at least one study reports no correlation between solutions and corneal staining,\textsuperscript{2} others demonstrate less staining with hydrogen peroxide based solutions.\textsuperscript{9,10} Variable rates of staining have been seen with different preservatives.\textsuperscript{11} It is well documented that solutions preserved with polyhexamethylene biguanide (PHMB) exhibit increased levels of staining.\textsuperscript{12}

Patient-based factors including patient age, gender, systemic health, medications, and dry eye status have been investigated, with no conclusive association to corneal staining able to be made.\textsuperscript{2} Further complicating the matter is while an increased level of staining has been shown to decrease comfort,\textsuperscript{13} most low level corneal staining is asymptomatic. So what do we truly know about corneal staining? Staining may appear in any patient, both contact lens wearers and non-contact lens wearers alike. For our contact lens patients, compliance should be strongly encouraged, as over-wear in any lens modality and abuse of lens solutions are the most likely culprits for corneal staining.

References:

Dr. Rob Ensley graduated from the University of Missouri-St. Louis College of Optometry, where he is currently the cornea and contact lens resident. Dr. Ensley previously served as the AOSA national student liaison to the CLCS.

Please close this browser window to return to the CLCS Newsletter