Corneal staining: A new PATH ahead?
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When a contact lens patient presents with diffuse or peripheral punctate corneal staining, it is often believed to be the result of corneal toxicity to preservatives in multipurpose solutions (MPS).\(^1,2\) Typically referred to as solution-induced corneal staining (SICS), this transient, often asymptomatic staining is visible within several hours after insertion, disappearing shortly after.\(^3\) The concern for many practitioners is whether or not this indicates a compromised corneal epithelium, as well as its implications for infectious events. However, recent research has identified a new benign mechanism to be considered: preservative-associated transient hyperfluorescence (PATH).

When contact lenses are soaked overnight in MPS, preservatives such as polyhexamethylene biguanide (PHMB), polyquaternium-1 (PQ-1), and myristamidopropyl dimethylamine (Aldox) are absorbed into the lenses. These positively charged preservatives interact with the negatively charged mucin and phospholipid layer of the epithelial cell membranes. Upon instillation of fluorescein, which is also negatively charged, the preservative bound to fluorescein will hyperfluoresce.\(^4\) The release of preservative from the lens is dependent on lens material, but peak concentration of PHMB is within two hours, supporting the timing of the corneal staining.\(^4\) Previous studies have been unable to show strong evidence of a correlation between MPS staining and infectious keratitis.\(^5,6\) PATH supports these findings because there is no evidence of a breakdown in corneal integrity. Discretion is warranted, however, as PATH can mask other staining etiologies. Discomfort or other signs of ocular inflammation may indicate other contact lens complications. Just remember, the problem doesn’t always lie with the solution!

References

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