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## Ophthalmology

# Multipurpose solution may be associated with contact lens-associated infiltrative keratitis

Practitioners discuss the incidence of the condition and its possible connection with a multipurpose disinfecting solution.

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Sterile corneal infiltrates, called corneal infiltrative events by various investigators, with silicone hydrogel soft contact lenses are not rare and have a number of causes, including hypoxia, solution and preservative hypersensitivity, tight lens syndrome and marginal infiltrates.

An increase in the incidence of corneal infiltrative events (CIEs) has been noted by a large number of eye care practitioners, especially those specializing in contact lenses at referral and large-volume practices. In particular, a specific type of CIE, called contact lens-associated infiltrative keratitis (CLAIK) by a number of investigators, has been on the rise. This entity presents as sterile, small, superficial, central, granular/grainy infiltrates with a varying number of symptoms, including red, irritated eyes, mildly diminished vision and contact lens intolerance, or no symptoms at all.

We began noticing this increase in CIE cases in 2009 at our respective practices. Unaware of existing research showing a correlation between Opti-Free Replenish (Alcon) and infiltrates, we were troubled to observe an increase in infiltrate cases that shared trending characteristics consistent with CLAIK. The use of Opti-Free Replenish was eventually observed as a common variable. As we were not aware of what we were seeing in the early cases, this is not an exhaustive list of patients who could have met these conditions, nor do we imply that all sterile infiltrate cases seen during this time were related to Opti-Free Replenish, but rather we intend to bring attention to the fact that this correlation is so strong that almost all memorable cases turned out to be associated with Opti-Free Replenish and not associated with other multipurpose disinfecting solutions.

## Results

In an effort to catalog what we were observing, cases were collected that met a strict set of predetermined criteria. To ensure that cases met the CLAIK definition, inclusion and exclusion rules were created. These rules included the criteria presented in Tables 1 and 2.

Thirty patients met the inclusion and exclusion rules and were evaluated further. The patient demographics are summarized in Table 3. Patients ranged in age from 15 years to 55 years, with an average age of 27 years, and were predominantly female (66%). Sixty-one percent of patients experienced symptoms bilaterally and 39% in one eye only. One case was noted in 2009 and one in 2010. Fifty percent of the cases were noted in 2011 and 43% in 2012. In addition to topical steroids and/or antibiotic treatment, patients were instructed to discontinue contact lens wear until symptoms resolved and then change lens care solutions. All symptoms resolved in a timely manner without further complication.

**Table 1. Inclusion criteria**

Unilateral or bilateral
Sudden onset, but usually history of red eyes
Mild photophobia and burning, but may have none
Infiltrates are multiple, diffuse, any location
Infiltrates are small, coarse, granular and gray, epithelial or subepithelial
No overlying edema
Sterile
Associated with contact lens use
Using Opti-Free Replenish at time of exam

Source: Sher NA, Jedlicka J, Golben M

A typical case was a 29-year-old man who presented with a 3-week history of mild eye pain, eye redness and light sensitivity in both eyes. He had been using Opti-Free Replenish multipurpose solution and Acuvue Oasys silicone hydrogel contact lenses (Johnson & Johnson Vision Care) on a daily-wear basis. The symptoms resolved after discontinuing use of contact lenses and Opti-Free Replenish for a week. However, when the patient restarted contact lenses and Opti-Free Replenish, the symptoms and infiltrative events recurred. Examination showed bilateral discrete corneal subepithelial infiltrates. The patient was treated



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with Dexacidin (neomycin polymyxin B dexamethasone suspension) four times a day, and the infiltrates resolved when the patient was seen 10 days later. The patient was switched to an alternative contact lens solution, and he has been asymptomatic since then. The Figure shows the multiple infiltrates in the left eye.

**Table 2. Exclusion criteria**

Single lesions
Marginal corneal lesions
Epithelial defects
Central or inferior superficial punctate keratitis
Giant papillary conjunctivitis, vernal or shield ulcer
Follicular conjunctivitis

Source: Sher NA, Jedlicka J, Golben M



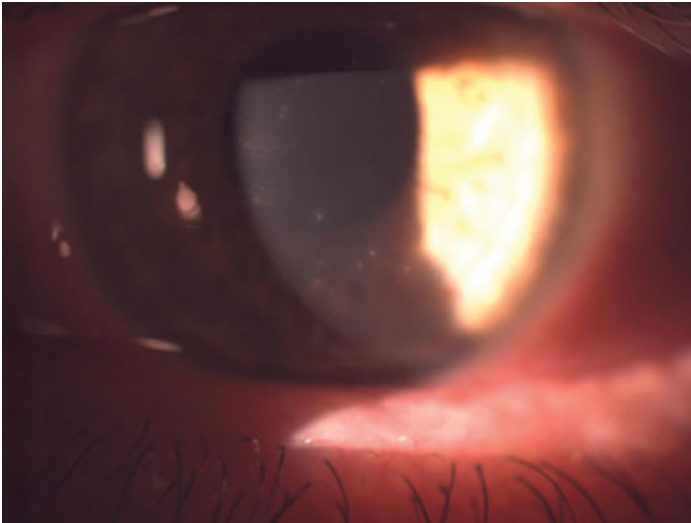
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**Table 3. Patient demographics (30 subjects)**

Average age	27 years
Minimum age	15 years
Maximum age	55 years
Male	33%
Female	66%
Both eyes	61%
One eye only	39%

Source: Sher NA, Jedlicka J, Golben M



Multiple, diffuse infiltrates in the central and mid-peripheral cornea with accompanying signs of redness.

Image: Sher NA, Jedlicka J, Golben M



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