Increased numbers of Demodex in contact lens wearers

As Etty Bitton points out in her editorial, the presence of Demodex on the eyelashes has been linked to ocular discomfort and a number of clinical signs and conditions. For example, the prevalence of ocular Demodex infestation is higher in patients with blepharitis than it is for control subjects,¹ ³ and the risk factors for Demodex include age,¹ ³ male sex,³ ⁴ blepharitis,² ⁵ chalazia,⁶ and rosacea.⁷ Both improper hygiene³ and immunodeficiency⁷ have been suggested as factors contributing to Demodex infestation. The following review highlights the results of a study designed to determine if Demodex infestation was higher in contact lens wearers, and whether there is a quantifiable association between Demodex and ocular health.

Methods

This was a cross-sectional study that enrolled 40 females with or without ocular discomfort. Half the group consisted of contact lens wearers and the other half were subjects who had not worn lenses for at least six months. The presence of Demodex was confirmed using two methods:

The first method involved scanning the base of the eyelashes with a confocal microscope and for the second method, a total of eight lashes (two per eyelid) were epilated and mounted on a glass slide with fluorescein and examined under light microscopy. With both methods, the number of Demodex mites present was counted. The clinical outcomes tested were symptoms, collected using three questionnaires: the Ocular Surface Disease Index (OSDI),⁸ Ocular Comfort Index (OCI)⁹ and the Dry Eye Questionnaire (DEQ)¹⁰. The following measurements were also taken: tear osmolarity using the TearLab Osmolarity System,¹¹ fluorescein tear stability, biomicroscopy of the eyelid margin, corneal/conjunctival staining, lid wiper epitheliopathy¹² and meibomian gland function.¹³

Results

The confocal microscope detected Demodex more effectively than the light microscope. In both cases, Demodex numbers were found to be higher in contact lens wearers than non-lens wearers. Confocal microscopy detected Demodex in 18 of 20 the lens-wearing participants, and in 13 of 20 non-lens wearing participants. The average number of Demodex detected per eight lashes were 7.6±5.8 mites in contact lens wearers and 5.0±3.1 mites in non-lens wearers.

There was no difference in symptoms between Demodex-positive and Demodex-negative participants in either
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groups (with the exception of the DEQ score in the non-lens wearers; however, only two people were Demodex-negative). The authors also did not find an association between Demodex numbers and symptoms. Furthermore, there was no statistically significant difference between the Demodex-positive and Demodex-negative groups in terms of osmolarity, tear stability, meibomian gland function, corneal/conjunctival staining or lid wiper epitheliopathy, for both lens and non-lens wearers. Interestingly, while not statistically significant the authors found lower tear osmolarity and better tear stability in Demodex-positive individuals than Demodex-negative individuals in the non-lens wearing group.

Discussion

The authors suggest a number of reasons why confocal microscopy detected higher numbers of Demodex than light microscopy. The confocal microscope has a higher magnification than a light microscope, which may facilitate easier identification of Demodex. In addition, the confocal microscope scans the base of the lashes directly without needing to epilate lashes. Epilating lashes, as required by light microscopy, may not remove all the Demodex from the follicle, and could lose some mites during transfer to a glass slide for viewing. Both methods were also able to identify Demodex eggs in addition to the mites.

The reason why contact lens wearers harbor higher numbers of Demodex remains unknown at this time. The authors believe it may be due to a higher microbial bioburden associated with contact lens wear. Blepharitis, from the accumulation of excessive bacteria may bring about a more favourable environment for Demodex to inhabit. Despite this finding however, the authors were not able to establish a clear association between symptoms, signs of eye disease and Demodex numbers.

REFERENCES