

Contact Lens Update

CLINICAL INSIGHTS BASED IN CURRENT RESEARCH

Summary: Report of the Contact Lens Interactions with the Tear Film Subcommittee

April 28th, 2014



Ulli Stahl, PhD, Dipl. Ing. (AO) is a Post-Doctoral Fellow at the Centre for Contact Lens Research.

Craig JP, Willcox MDP, Argüeso P, Maissa C, Stahl U, Tomlinson A, Wang J, Yokoi N, Stapleton F. The TFOS International Workshop on Contact Lens Discomfort: Report of the Contact Lens Interactions With the Tear Film Subcommittee. Investigative Ophthalmology and Vision Science 2013 54:TFOS123-TFOS156.

The insertion of a contact lens leads to a separation of the pre-ocular tear film into a pre- and a post-lens tear film, with the potential to affect both the biophysical and biochemical properties of the tear film.

Changes to the biophysical properties of the tear film

Although the literature may not be conclusive for all parameters, there is evidence that the insertion of a contact lens leads to thinning of the lipid layer, reduced tear film stability as measured using tear film break-up time, decreased tear volume and turnover rate, and an increase in tear film thinning and evaporation.

Changes to the biochemical properties of the tear film

Information on changes to the biochemical properties seems more controversial and sparse.

The current literature suggests that the concentration of the major proteins (lysozyme and lactoferrin) and the total content are not affected by soft contact lens wear. Phospholipase A2 (sPLA2) and cholesterol esters increase in symptomatic lens wearers with a negative effect on the lipid layer and its function, thereby increasing dryness symptoms.

Mucin secretion decreases during contact lens wear, and research suggests that symptomatic contact lens wearers have decreased levels of MUCAC2 – but no clear correlations have been established between reduced mucin content and ocular symptoms.

Although the association to ocular discomfort is unknown, there is general agreement that contact lens wear is associated with physical and biochemical changes to the epithelial glycocalyx and an increase in inflammatory markers.

Conclusions

The subcommittee concluded that there is still a significant gap in our understanding which tear film parameters and changes contribute to contact lens discomfort. A series of future studies has been proposed. It is likely

impossible to pinpoint a single parameter responsible for contact lens discomfort. Instead evidence suggests that the biochemical and biophysical properties are closely related, with parameters being interlinked and one component affecting a multitude of other factors. This theory is supported by the fact that the strongest association to contact lens discomfort can be found with tear film stability, a parameter greatly influence by a variety of parameters, including the lipid layer, tear volume and evaporation.

For further details, please refer to The TFOS International Workshop on Contact Lens Discomfort: Report of the Contact Lens Interactions with the Tear Film Subcommittee.