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EDITORIAL

Better methods of clinically assessing mucus functions are required

Son necesarios mejores métodos de evaluar clínicamente la funcionalidad del mucus

Mucus is an integral part of the tear film with functions including the anchoring of the aqueous components and stabilising their contact with the cornea by rendering structural support to the microplicae, having potential involvement in apoptotic and cell mediating activity as well as combatting pathogens and foreign bodies.[1] Ocular mucus helps maintain the wettability of the ocular surface and provides lubrication for lid movements over it.[2] In the healthy eye, the glycocalyx, which has previously been referred to as the mucus layer, prevents the epithelial surface from dewetting.[3] Consistent with the current understanding of tear function, the fluorescein tear break up time test devised by Norn[4] was originally intended to be used as a measure of mucus efficiency or deficiency. This model is supported by the finding that shorter tear break up times have been found to be associated with reduced goblet cell density. Thus short tear break up time findings may be partly a consequence of qualitative and/or quantitative mucus dysfunction. The focus in current dry eye literature could suggest that short tear break up times and other indications of tear instability may be attributed to Meibomian gland dysfunction without consideration of other sources of tear instability such as mucus and/or aqueous deficiency. However, excess mucus production can also interfere with tear functions. For example, giant papillary conjunctivitis is associated with excess mucus production as are other forms of ocular inflammation such as vernal and allergic conjunctivitis.[5] Abnormal quantities of mucoid corneal filaments may accumulate in the tear layer in dry eye syndromes[6] and contribute to tear instability.

Epitheliopathy over the pupil is associated with increased higher order aberrations and backward light scattering[7] and any abnormal distribution of mucus over a desiccated area of epitheliopathy could also contribute to tear instability, shorter TBUT, backward light scattering and reduced visual function. Roles for mucus in tear functions and dysfunctions are supported by the finding that in dry eye syndrome subjects instillation of 3% diquafosol was found to increase mucus concentration in tears as well as to increase tear break up time.[8]

Tear instability and associated short tear break up times suggest that, apart from Meibomian gland dysfunction, mucus deficiency may be involved. Mucus functions can be examined by immunofluorescent or electron microscopy as well as Western Blot analysis and conjunctival impression cytology.[1] Clinical assessment of ocular mucus is difficult however. Tear instability which cannot be explained by Meibomian gland dysfunction raises the possibility of some form of mucus deficiency. The density of conjunctival goblet cells (the prime source of secretory mucus) can be determined by conjunctival impression cytology but this form of examination is a relatively cumbersome and time consuming procedure.[9] A tear-ferning test may also be useful in evaluating levels of mucus activity but lack of a standardised examination protocol and a reliable grading scheme limit the clinical application of this procedure.[2] Mucus dysfunction may be suspected when findings such as lid wiper epitheliopathy and lid parallel conjunctival folding suggest the possibility of eyes with reduced mucus-related lubrication of blink movements over the ocular surface.[10] However, the potential for mucus to have important negative influences on tear function indicate the need for the development of better methods for the clinical evaluation of mucus functions.

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Charles W. McMonnies (DSc)
Adjunct Professor, School of Optometry and Vision Science, University of New South Wales, Sydney, Australia