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Studies on inflammation in atopic keratoconjunctivitis

AKADEMISK AVHANDLING
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ABSTRACT

Atopic keratoconjunctivitis (AKC) is an ocular inflammatory condition associated with atopic dermatitis. AKC is classified as ocular allergy but with features quite different from common seasonal allergic conjunctivitis. The clinical picture includes eyelid eczema, blepharitis, conjunctivitis, and some degree of keratitis. The condition is chronic and normally starts off in young adulthood with periods of exacerbations during the following decades. Due to corneal affection it is a potentially blinding disease. Little is known about the factors determining the development of AKC, the on-going inflammation, and the severity and frequency of exacerbations.

The aim of the present studies was to characterize inflammation and to describe corneal complications in AKC. The possible influence of ocular and periocular microcolonization on the degree of inflammation in AKC was addressed in study I. In study II, treatment of eyelid eczema with either tacrolimus ointment or potent steroid ointment was analysed, with the objective to evaluate possible ocular effects. In study III, the ocular surface response to conjunctival provocation with airborne allergen was explored. In all three studies, tear cytokines were analysed as an objective parameter of inflammation. Two retrospective case series studies (IV and V) were performed presenting AKC patients with corneal emergencies.

No association was found between microcolonization and the degree of inflammation in AKC. However, a relationship between Staphylococcal enterotoxin B antibodies and disease severity was found. Significant differences in tear fluid cytokines comparing AKC subjects and healthy controls were shown in this study and the cytokine levels correlated well with conjunctival signs. Both tacrolimus ointment and steroid ointment had excellent and comparable effect on eyelid eczema. There were no change in ocular surface signs or cytokines following treatment, neither were there any ocular adverse events. In the provocation experiment, an immediate conjunctivitis was elicited and a significant increase in tear cytokines was documented 48 hours after allergen challenge in AKC subjects. The retrospective studies revealed AKC patients to be at risk for *Candida albicans* keratitis and spontaneous corneal perforation.

In conclusion, AKC presents with a spectrum of mild to severe inflammatory manifestations. Our studies indicate that bacterial colonization is unrelated to the inflammatory activity in moderate AKC, but antibodies to Staphylococcus aureus antigen could possibly be a marker of disease severity. Tear cytokines may further be markers of conjunctivitis and the provocation study indicates that allergen exposure may fuel the inflammation. Tacrolimus ointment appears to be a viable treatment option for eyelid eczema in AKC, but no evident improvement on the ocular surface was found after 3 weeks of medication. Further research is needed to unravel the exact causes of ocular surface inflammation and particularly of the debilitating keratopathy in AKC.

Keywords: allergy, atopic keratoconjunctivitis, atopy, chronic conjunctivitis, cytokine, keratitis, tear fluid

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