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Pathogens in the meibomian gland and conjunctival sac: A study of bacterial flora of patients with aqueous deficient dry eye

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Statement of the Problem: Dry eye is a type of disease with ocular discomfort and abnormal quantity or quality on tears and further cause pathological changes in ocular surface. The prevalence of dry eye has increased in recent years and bacteria isolated from the ocular surface were thought to be correlated to the severity of dry eye. This study aims to explore the composition of the ocular microbiome in normal subjects and patients with one major kind of dry eye and aqueous deficient dry eye (ADDE).

Methodology & Theoretical Orientation: Twenty eight patients (56 eyes) with ADDE and twenty nine normal subjects (58 eyes) were enrolled in our study. Signs of dry eye were evaluated and bacterial species in conjunctival sac and Meibomian gland secretions were identified by 16S rRNA gene analysis. Besides, differences of pathogens in surface and deep layer of MG secretions were further investigated by segmental secretion analysis of ten patients with ADDE and six normal subjects.

Findings: The bacterial composition of ADDE was more complex than the control. The positive isolation rate and number of bacterial types were significantly higher in ADDE than those in the control. *Corynebacterium macginleyi* was only detected in ADDE group (7.1% of all eyes). However, with the exclusion of *Staphylococcus epidermidis*, no significant difference was observed. The isolation rate of *S. epidermidis* was markedly higher in ADDE than in the control. The grading system for ocular microbiome showed that ADDE had higher grade of bacterial severity than the control, especially grade 2, in which only *S. epidermidis* was detected.

Conclusion & Significance: Compared with the control, patients with ADDE showed a higher isolation rate, a greater number of bacterial species, and a higher grade of bacterial severity. Among all bacteria isolated from ADDE, only *S. epidermidis* was the key difference in comparison with control, which provided some basis for exploring the pathogenesis of ADDE. Additionally, *Corynebacterium macginleyi* might be considered as a biological marker for dry eye diagnosis.

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