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The ocular surface microbiome in Dupilumab associated ocular surface disease

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Background/Aim: In real-world analyses, ocular surface adverse events have been reported in as many as 60% of atopic dermatitis (AD) patients treated with the monoclonal antibody Dupilumab targeting the IL-4 receptor-? subunit of IL-4 and IL-13. The aim of this study was to clarify the pathogenesis behind Dupilumab associated ocular surface disease (DAOSD).

Methods: Twenty moderate to severe AD patients receiving Dupilumab underwent thorough ophthalmological slit lamp examinations, dermatological examinations and conjunctival smears and swabs before Dupilumab initiation, four weeks after initiation, at the time point of developing DAOSD and sixteen weeks after initiation. Ten healthy controls underwent these examinations, except the dermatological whole-body examination, at a single time point. 16S sequencing was carried out for microbiome analyses.

Results: Six of the twenty patients receiving Dupilumab developed DAOSD. An increased granulocytic infiltrate was observed in histological stainings from conjunctival smears in these patients. An unaltered microbial diversity and a unique colonization of certain microbial species in patients with DAOSD was shown, whereas AD patients not developing DAOSD showed a decrease in microbial diversity after Dupilumab treatment.

Conclusion: Our results strongly indicate an important role of the ocular surface microbiome in the pathogenesis of DAOSD.