Evaluation of risk factors for dupilumab-associated ocular sequelae in the treatment of atopic dermatitis

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Background: Dupilumab is a monoclonal antibody that inhibits IL-4 and IL-13 signaling. It is used in the treatment of moderate-to-severe atopic dermatitis in those 6 months or older who are uncontrolled on or cannot tolerate topical treatments. Ocular surface disease is a recognized adverse effect of dupilumab use that has been highlighted in previous studies. Few studies describe the risk factors for developing such ocular adverse effects.

Objectives: This study aims to highlight the risk factors associated with the development of dupilumab-associated ocular surface disease (DAOSD) described in the literature.

Methods: The PubMed and ScienceDirect databases were searched in April 2024 using key search terms including “dupilumab”, “demographics”, “risk factors”, “ocular”, “keratitis”, “conjunctivitis”, “side effects”, and “atopic dermatitis”. Nine articles were included after deduplication, title/abstract screening, full-text review, and quality appraisal. Studies were included if they were written in English and discussed risk factors for ocular side effects of
dupilumab. Studies were excluded if they discussed other biologic agents or ocular conditions of other origins.

**Results**: Out of the nine studies analyzed, six described prior history of ocular disease as a risk factor for developing DAOSD. Severe atopic dermatitis was highlighted as a risk factor in five out of nine studies. Elevated total IgE levels and eosinophil count were described as risk factors in four out of nine studies. Three studies cited facial or eyelid eczema and two studies highlighted family history of atopy as having an association with the development of DAOSD. One study described high levels of chemokines, as well as personal history of other atopic conditions. At least one patient needing to discontinue treatment with dupilumab due to ocular side effects was mentioned in six out of nine studies. Seven out of nine studies included a recommendation for ophthalmological evaluation prior to or during treatment with dupilumab.

**Conclusions**: While the etiology of DAOSD is not fully understood, past studies have elucidated potential risk factors for its development. Patients being treated with dupilumab for atopic dermatitis have higher severity or refractory disease, and the discontinuation of treatment due to ocular side effects may have implications on the quality of life of these patients. Additional studies are needed to better understand the risk factors for DAOSD and prevent further complications. Limitations include small sample size and lack of control group in some studies, inclusion of studies in non-US countries, and lack of gender and racial representation in some studies.
**Keywords:** dupilumab, atopic dermatitis, dupilumab-associated ocular surface disease, adverse effects

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