

Atopic dermatitis is associated with increased prevalence of multiple ocular comorbidities

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Clinical Implications

- Multiple ocular comorbidities are more prevalent among patients with atopic dermatitis, including dry eye syndrome, keratoconjunctivitis, conjunctivitis, blepharitis, inflammatory ocular conditions, keratoconus, retinal detachment, cataracts, and glaucoma.

TO THE EDITOR:

Atopic dermatitis (AD) is a chronic, pruritic inflammatory skin disease with a considerable burden of disease.¹ In recent years, AD has been found to be associated with various systemic comorbidities, including cardiovascular, neuropsychiatric, and autoimmune diseases.² Regarding eye disease, AD has traditionally been associated with ocular surface changes, such as blepharitis, conjunctivitis, and keratoconus.³ However, studies that examine the association of AD with a wider array of ocular comorbidities are limited. Thus, the goal of the present study was to further elucidate the relative frequency of ocular comorbidities in a diverse patient population examined at a tertiary care center.

Using the Slicer Dicer feature of the electronic medical record system EPIC, we retrospectively collected anonymous, aggregate-level data on patients 18 years or older seen at the Johns Hopkins Hospital System over a 5-year period (July 1, 2013, to July 1, 2018). Institutional review board approval was waived, because only anonymous aggregate-level data counts were used. The prevalence rates of dry eye syndrome, ophthalmic herpes simplex, cataracts, glaucoma, retinal detachment, iritis, uveitis, keratoconjunctivitis, keratoconus, conjunctivitis, and blepharitis were

collected in patients with a concomitant diagnosis of AD. As a control, we compared these values with the prevalence of ophthalmic conditions in the general population of patients seen at Johns Hopkins Hospital System, and then calculated the odds ratios (ORs) and *P* values for each comparison using a 95% CI. Of note, the Slicer Dicer feature within the electronic medical record system accounted for any repeat visits.

A comparison of 8,992 patients with AD was undertaken with 4,764,955 control subjects from the general population. Compared with the general population, patients with AD had a higher incidence of various ocular conditions (Figure 1). Of the ocular conditions studied, the following ocular surface diseases had the greatest association with AD: blepharitis (OR, 10.99; 95% CI, 10.08-11.98; *P* < .001), conjunctivitis (OR, 12.88; 95% CI, 12.00-13.82; *P* < .001), keratoconjunctivitis (OR, 8.21; 95% CI, 6.91-9.73; *P* < .001), and dry eye (OR, 6.72; 95% CI, 5.88-7.69; *P* < .001). In addition, as displayed in Figure 1, patients with AD also had a higher incidence as compared with the general population of the following conditions: keratoconus (OR, 5.40; 95% CI, 3.61-7.78; *P* < .001), uveitis (OR, 5.43; 95% CI, 4.33-6.73; *P* < .001), retinal detachment (OR, 3.22; 95% CI, 2.39-4.26; *P* < .001), glaucoma (OR, 4.13; 95% CI, 3.68-4.63; *P* < .001), cataracts (OR, 4.89; 95% CI, 4.55-5.25; *P* < .001), and ophthalmic herpes simplex (OR, 4.90; 2.23-9.34; *P* < .001).

Our findings reveal that patients with AD are significantly more likely to experience various ocular complications as compared with the general population. The greatest increase in ophthalmic comorbidities among patients with AD is seen in ocular surface changes, including dry eye, keratoconjunctivitis, conjunctivitis, and blepharitis. In addition, a higher incidence of retinal detachment, keratoconus, cataracts, glaucoma, and ocular inflammatory conditions was found in patients with AD.

The etiology of the findings may be related to genetic susceptibility, trauma from excessive rubbing,⁴ and may be related to therapies for AD. The most commonly prescribed treatment for AD is topical dermatologic steroids, which can lead to increased intraocular pressure and the development of cataracts and glaucoma. In addition, dupilumab, an IL-4 receptor alpha

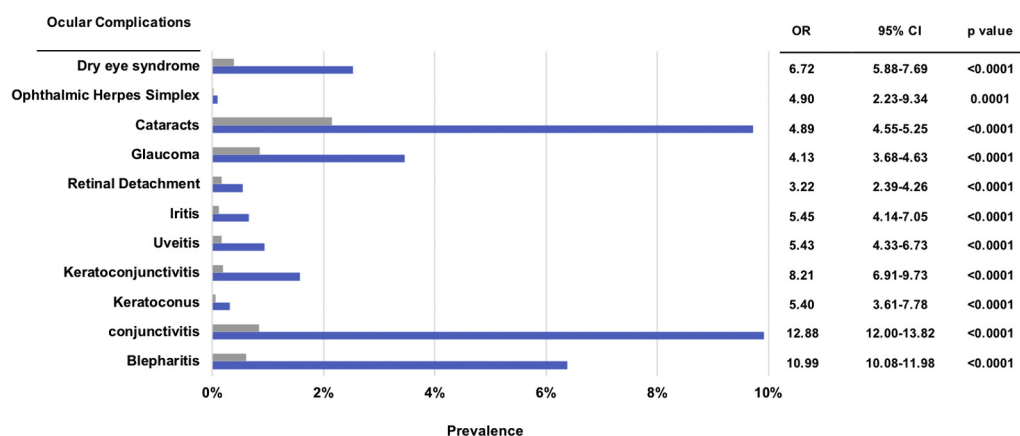


FIGURE 1. Ocular comorbidities in patients with AD vs the general population. Gray bar—general population; Blue bar—patients with AD.

antagonist, used for the treatment of AD has recently been associated with the exacerbation of conjunctivitis.⁵

These findings represent one of the largest epidemiologic investigational studies into ocular comorbidities and complications of AD. Ocular diseases require early detection and treatment to prevent visually threatening consequences. AD-induced keratoconjunctivitis may result in extensive corneal neovascularization, which can compromise the visual axis of the cornea and therefore threaten vision.

Limitations of our study include the inability to determine the relationship between the severity of AD and ocular involvement due to disease severity information not being available. There was an inability to determine a temporal relationship between the diagnosis of ocular conditions and AD, and other potentially relevant patient comorbidities were not examined in our study group versus our control group.

These findings highlight the need for a collaborative effort by all health care providers that are extensively involved in the care of patients with AD and ophthalmologists in ensuring early diagnosis of ophthalmic involvement in patients with AD for early intervention to prevent vision-threatening complications.

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