



Courtesy of EyeRounds.org

Close inspection of the eyes of children with vernal keratoconjunctivitis may show areas of gelatinous thickening of the conjunctiva by the edge of the cornea (Horner-Trantas dots).

Vernal keratoconjunctivitis can lead to vision loss if untreated

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Spring weather is well on its way and so are the pollen and eye allergies in its wake. Allergic conjunctivitis is common, affecting up to 30% of children (Leonardi A, et al. *Curr Opin Allergy Clin Immunol.* 2015;15:482-488).

Most forms of allergic conjunctivitis are relatively mild and related to typical allergen exposure in an isolated, seasonal or perennial fashion. A less common, more severe form of allergic conjunctivitis, however, can threaten vision if untreated or undertreated and should be on pediatricians' radar. This ocular disease is vernal keratoconjunctivitis (VKC).

What is VKC?

VKC is a chronic, severe form of ocular allergic disease that primarily affects children ages 5-10 years living in hot climates. Most cases of VKC resolve spontaneously after puberty but can cause significant visual impairment if not managed appropriately.

Classic signs and symptoms include bilateral conjunctival and eyelid hyperemia and swelling, severe eye itching, photophobia, blurred vision, foreign body sensation and "ropy" eye discharge.

Close inspection of the eyes may show areas of gelatinous thickening of the conjunctiva by the edge of the cornea (Horner-Trantas dots, see figure) and sterile corneal lesions (shield ulcers). Boys may be affected more frequently than girls, and symptoms typically flare in the spring/summer with remission in the fall/winter.

VKC is more prevalent in subtropical regions of Africa, Asia, the Middle East and Latin America and relatively uncommon in the United States and northern Europe. Estimated prevalence of VKC in the U.S. is 1.24 per 10,000 people (Doan S, et al. *World Allergy Organ J.* 2023;16:100788; Babineaux S, et al. *Invest Ophthalmol Vis Sci.* 2020;61:4592).

Children with VKC living in more temperate climates like the U.S. and northern Europe tend to have coexisting atopic conditions like asthma and eczema. Of note, prevalence and severity of allergic diseases in general are increasing, likely related to climate change, so VKC may become more prevalent even in temperate regions (Seastedt H, Nadeau K. *Ann Allergy Asthma Immunol.* 2023;131:694-702).

How is VKC treated?

Similar to typical allergic conjunctivitis, treatments like allergen avoidance, cold eyelid compresses and cold artificial tears can help VKC. However, given the aggressive nature of this disease, medication management generally is necessary.

Topical antihistamines and/or mast-cell stabilizers, such as olopatadine and ketotifen, help alleviate acute and long-term symptoms in all forms of ocular allergies, including VKC. These treatments can be used safely year-round or instituted during known exacerbation periods.

Additionally, topical nonsteroidal anti-inflammatory medications like ketorolac may help alleviate symptoms. Oral antihistamines can be used, as some children will benefit from improvement of both nasal and ocular allergic symptoms.

Refractory cases of VKC are not uncommon and require more intensive treatments with corticosteroids, immunomodulators (cyclosporine) and calcineurin inhibitors (tacrolimus) administered locally and/or systemically. Recent reports of systemic treatments with monoclonal antibodies (omalizumab, dupilumab) show promise in allergic and atopic disease and are being studied for use in VKC (Doan S, et al. *World Allergy Organ J.* 2023;16:100788).

Given the nuanced nature of aggressive ocular treatments that often are needed in VKC and potential ocular complications with prolonged corticosteroid use, it is important to involve an ophthalmologist in the care of these patients. Additionally, VKC management may benefit from a multidisciplinary team approach, particularly if there are concurrent systemic signs of atopy.

What happens if VKC is untreated or undertreated?

In addition to decreased quality of life and disruption in schooling from severe symptoms, undertreated or untreated VKC can lead to permanent vision loss. Chronic eye inflammation from VKC can cause corneal infection and ulceration (microbial keratitis), corneal scarring and warping of the cornea (keratoconus). Very severe VKC disease even can lead to spontaneous corneal perforation.

As long as VKC is caught early and appropriate treatment is instituted in a timely fashion, severe vision complications often can be avoided.

The take-home message for pediatricians is that not all ocular allergies are created equal. If symptoms are particularly severe or if standard treatments are not working, patients should be referred to an ophthalmologist to help optimize treatment and evaluate for more severe conditions like VKC.

Dr. Collinge is a member of the AAP Section on Ophthalmology.

Resources

- [Information on vernal keratoconjunctivitis](#)
- [Information for patients on eye allergies and conjunctivitis](#)

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