

## Management Of Vernal Keratoconjunctivitis

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Vernal keratoconjunctivitis (VKC) is a chronic, bilateral, at times asymmetrical, seasonally exacerbated, allergic inflammation of the ocular surface, involving tarsal and / or bulbar conjunctiva. It is more common in children and young adults having an atopic background.

Different authors, at different times, described it as spring catarrh, phlyctenula pallida, circumcorneal hypertrophy, recurrent vegetative conjunctiva, verrucosa conjunctiva and aestivale conjunctiva, calling attention to the various aspects of this disease. Although the allergic nature of this entity has been accepted for a long time, its exact aetiology and pathogenesis is still unclear.

The accumulation of a large amount of immunological data has established that the pathogenesis of VKC is much more complex than a mere type 1 hypersensitivity reaction. To the present day, the precise role played by genetic predisposition and environmental factors in the onset, progression and resolution of this self-limiting, but at times incapacitating, childhood entity is an enigma. Despite the universal acceptance of the nomenclature vernal keratoconjunctivitis, occurrence of this disease is not limited to spring, with episodes of reactivity being quite common in the winter. The initial seasonal attacks turn into perennial disease after a few years. The efficiency of school-aged children decreased profoundly because of the chronic and recurrent course. Although this is not usually a blinding disease, visual impairment may occur if the cornea is involved.

### **Clinical features and diagnosis**

Patients suffering from VKC may have several episodes of active inflammation throughout the year. Initially seasonal disease may become perennial after a few years. In approximately one

quarter of VKC patients the disease smolders throughout the year, without any remission, from the onset.

In its typical form, VKC presents with pruritus, hyperaemia, photophobia and watering. Thick mucus hyper-secretion with sticky mucous filaments, called 'ropy discharge', is a characteristic of VKC. Transient limbal or conjunctival yellow-white points or deposits, known as Horner-Trantas's dots are degenerating eosinophils and epithelial cell debris. Large (> 1 mm) papillae in VKC occur predominantly at the upper tarsus. Papillae size correlate positively with the persistence or worsening of symptoms over long-term follow-up. These papillae become quite swollen during the active stage but persist even during the quiescent stage.

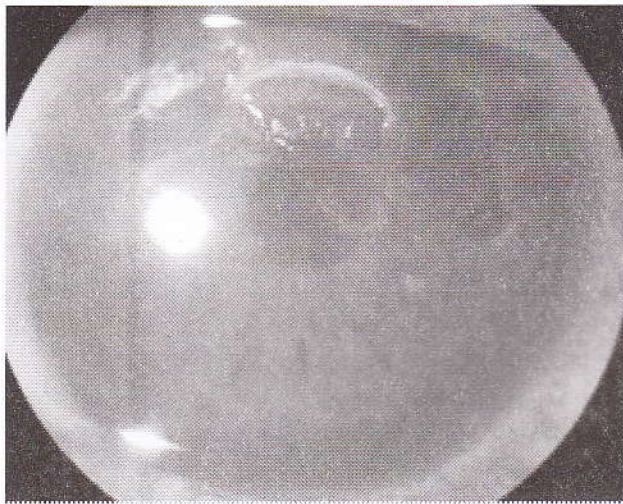


Horner -Trantas's dots



Cobblestone papillae

Photophobia, pain and foreign body sensation are caused by involvement of the cornea. Corneal changes include punctate epithelial keratitis, epithelial macro-erosions, shield ulcer plaque formation and late corneal vascularization. The oval-shaped epithelial defects, known as shield ulcers, usually have their lower border in the upper half of the visual axis. Healed shield ulcers may leave a subepithelial ring-like scarification. Pseudogerontoxon, which resembles arcus senilis, is a waxing and waning grey-white lipid deposition in the superficial stroma of the peripheral cornea.



Shield ulcer



Ring shaped corneal opacity after healed shield ulcer

The lack of standardized diagnostic criteria and lack of common language among physicians regarding the severity of VKC renders this disease more difficult to diagnose and treat. Despite mounting data suggesting the role of both IgE and non-IgE mediated immune responses in the pathogenesis of VKC, no clinical or laboratory test has evolved to support the diagnosis in atypical cases or predict the course of this disease.

### **Treatment**

- Preventive measures and patient education
- Compliance with instructions is better with a well-informed patient and outcome of treatment is gratifying.
- Patient education and preventive measures to improve the management of vernal keratoconjunctivitis
- VKC is a chronic, recurrent condition that usually improves by adulthood
- Avoid rubbing itchy eyes, as this makes the condition worse
- Avoid provocative nonspecific triggers such as sun, wind, and salt water, that exacerbate the condition, using sunglasses, hats with visors, swimming goggles where necessary
- Avoid contact with commonly known allergens
- Application of cold compresses and preservative-free artificial tears help to provide symptomatic relief
- Hands, face and hair should be washed frequently to reduce exposure to allergens

### **Pharmacological therapy**

The variety of currently available drugs to treat VKC include anti-histamines, mast-cell stabilizers, dual acting agents, corticosteroids and immunomodulators but none is enough to treat all aspects of multifaceted pathophysiology of VKC. Most drugs used are merely palliative and do not eliminate the complex immune response initiating and perpetuating the allergic ocular inflammation, so there is recurrence of disease when the therapy is discontinued.

## Common topical ocular allergy medications for the treatment of vernal keratoconjunctivitis

Class	Drug	Indication	Comments
Vasoconstrictor/ antihistamine combinations	Naphazoline/ pheniramine	Rapid onset of action Episodic itching and redness	Short duration of action Tachyphylaxis, Mydriasis, Ocular irritation Hypersensitivity, Hypertension Potential for inappropriate patient use
Antihistamines	Levocabastine Emedastine	Relief of itching Relief of signs and symptoms	Short duration of action Frequently does not provide complete disease control when used alone
Mast cell stabilizers	Sodium cromoglycate Nedocromil Lodoxamide	Relief of signs and symptoms	Long-term usage Slow onset of action Prophylactic dosing Frequently does not provide complete disease control when used alone
Antihistamine/ mast cell stabilizers (dual-acting)	Azelastine Epinastine Ketotifen Olopatadine	Relief of itching Relief of signs and symptoms	Bitter taste (azelastine) No reported serious side effects Frequently does not provide complete disease control when used alone
Corticosteroids	Loteprednol Fluormetholone Desonide Rimexolone Dexamethasone Betamethasone	Treatment of allergic inflammation Use in moderate to severe forms	Risk for long-term side effects No mast cell stabilization Potential for inappropriate patient use Requires close monitoring

## Non-steroidal anti-inflammatory drugs

Topical formulations of ketorolac and diclofenac have been shown to diminish ocular pruritus and conjunctival hyperaemia associated with allergic conjunctivitis.

**Corticosteroids**

Topical corticosteroids are one of the most effective drugs to control the signs and symptoms of VKC. Because of complications associated with their prolonged use, these should not be prescribed as first-line treatment. Prolonged application of corticosteroids may cause steroid-induced cataract, glaucoma and increase susceptibility to viral and fungal infections.

In comparison to other steroids, loteprednol has a superior safety profile, which has been attributed to its 'soft drug' characteristics. Loteprednol is highly effective in the acute and prophylactic treatment of allergic conjunctivitis.

Supratarsal injection of corticosteroids can be used to treat VKC refractory to conventional treatment.

Although corticosteroids are the most efficacious drugs, steroid-resistant forms of VKC are not unusual and may necessitate an alternative therapy.

**Immunomodulators**

Topical corticosteroids and artificial tears have

been shown to act synergistically with cyclosporine 0.05% eyedrops and help in the re-epithelialization of corticosteroid-resistant vernal shield ulcers.

### ***Anti-metabolites***

Mitomycin-C is an inhibitor of fibroblast proliferation. Mitomycin-C (0.01%) eyedrops were shown to decrease the mucous discharge, conjunctival hyperaemia and limbal oedema in VKC patients refractory to topical steroids and mast-cell stabilizers.

### ***Surgical treatment***

Surgical excision of giant papillae is recommended if they cause corneal lesions. Excision or cryocoagulation of large papillae helps in the early resolution of corneal epitheliopathy or ulcer, although papillae regrow in most patients. Cryotherapy of giant papillae promotes inflammation and may cause conjunctival scarring. Intraoperative application of 0.02% mitomycin-C (MMC) to the upper palpebral conjunctiva immediately after papillae resection for 2 min reduces the chances of recurrence of papillae significantly. Free autologous conjunctival graft after resection of giant papillae facilitates the re-epithelialization of nonhealing shield ulcer.

Debridement of ulcer base, surgical removal of plaque or excimer laser phototherapeutic keratectomy helps in early re-epithelialization of vernal shield ulcer refractory to medical treatment. Amniotic membrane implantation leads to complete re-epithelialization of persistent corneal epithelial defects and vernal plaques recalcitrant to conventional medical treatment. Corneal epithelial cell transplants could be beneficial when amniotic membrane transplant is not sufficient to restore the ocular surface

### ***References***

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***Childhood means simplicity.***

***Look at the world with the child's eye - it is very beautiful***