Fungal Keratitis Associated With Vernal Keratoconjunctivitis

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Purpose. To report a case of fungal keratitis associated with vernal keratoconjunctivitis. Case Report. A 22-year-old man with a history of vernal keratoconjunctivitis since October 1999 developed a shield ulcer in the left eye in June 2000, which resolved with intensive topical steroid therapy. He presented in August 2001 with onset of acute pain, redness, and decreased vision. The tarsal conjunctiva in the left eye showed large papillae. The cornea showed a white plaque-like lesion with an underlying stromal infiltrate involving the upper half of the cornea. The overlying epithelial defect measured 4.5 × 2.5 mm. The anterior chamber showed 1+ flare and cells and hypopyon measuring about 1 mm.

Results. Corneal scrapings were performed for microbiologic investigations. Smears of corneal scrapings revealed septate fungal filaments, and the culture showed a significant growth of Aspergillus flavus. Conclusions. Fungal keratitis may be associated with vernal keratoconjunctivitis. Though rare, fungal keratitis should be considered in the differential diagnosis of infections associated with vernal keratoconjunctivitis.

CASE REPORT

A 22-year-old man with a history of vernal keratoconjunctivitis on October 14, 1999. On June 21, 2000, he developed a shield ulcer in the left eye. At this visit, the upper tarsal conjunctiva showed 1+ papillae in the right eye and 3+ papillae in the left eye. The cornea in the left eye showed an epithelial defect superiorly. The patient was treated with 1% prednisolone acetate eye drops four times hourly along with 0.3% ciprofloxacin hydrochloride eye drops four times daily, 2% sodium cromoglycate eyedrops four times daily, and artificial tears. The ulcer resolved after 1 week of therapy. He presented to us on August 16, 2001, with complaints of pain, redness, and decreased vision in the left eye of 1 week duration. The patient gave a history of self-medication with steroids before the onset of symptoms. There were papillary changes in the upper tarsal conjunctiva in the right eye and large papillae were seen in the left eye (Fig. 1). The corneal examination of the left eye revealed a white plaque-like lesion with underlying stromal infiltrate involving the upper half of the cornea. The overlying epithelial defect measured 4.5 × 2.5 mm. The anterior chamber showed 1+ flare and cells and hypopyon measuring about 1 mm (Fig. 2). Based on these findings, he was diagnosed as having a shield ulcer with secondary infection in the left eye. Corneal scrapings were performed for microbiologic investigations. Smears revealed septate fungal filaments on Gram stain, Giemsa stain, and KOH preparation. Therapy was initiated with 5% natamycin eye drops every half hour along with 1% atropine eyedrops three times daily, and 200 mg ketoconazole in tablet form twice daily. Culture revealed a significant growth of Aspergillus flavus.

DISCUSSION

As with all persistent corneal epithelial defects, vernal corneal ulcers are subject to secondary microbial infection.3 In a series of 66 shield ulcers and/or plaque in 55 eyes of 41 patients with vernal keratoconjunctivitis reported by Cameron,1 bacterial keratitis was seen in five eyes. Superimposed bacterial keratitis occurred in grade II ulcers, which had a translucent base or were opaque with white or yellow deposits. The causative organisms in these five eyes were Staphylococcus aureus and hemolytic Streptococcus, Staphylococcus epidermidis, and Streptococcus sanguisII.

Kerr and Stern3 reported four eyes of two patients with bacterial keratitis associated with vernal keratoconjunctivitis. Of these, two eyes were treated with topical corticosteroid therapy, and two patients presented with onset of acute pain, photophobia, and decreased vision. Corneal stromal infiltrate occurred in conjunction with other inflammatory signs, including hypopyon. Significant vascularization and a stromal infiltrate beneath a calcific surface plaque led the authors to conclude that these ulcers represented acute bacterial superinfection of vernal corneal ulcers. Culture of corneal scrapings from all four eyes was positive for S. aureus, and three of the four infections were polymicrobial. The authors believed that S. aureus was isolated in these cases because these patients were exposed to heavy inocula of S. aureus, as seen in atopic dermatitis, and were immunocompromised. Antimicrobial action of the tear film in vernal conjunctivitis may be compromised because of reduced levels of lactoferrin, an iron-complexing...
protein with bacteriostatic properties. In addition, variable abnormalities of the immunoglobulin composition of tears in patients with vernal conjunctivitis may inhibit their resistance to corneal infection.

The case reported relates to a patient known to have vernal keratoconjunctivitis who presented with acute symptoms in the left eye. The tarsal conjunctiva showed large papillae in the affected eye. A plaque lesion was present with infiltrate beneath it and hypopyon.

Considering the site of the ulcer and presence of infiltrate beneath the plaque, we concluded that fungal keratitis represented a superinfection. Use of topical steroids might have been associated with the development and worsening of fungal keratitis. In tropical countries like India, fungi are frequent causes of keratitis following trauma or an immunocompromised state. Among the fungal pathogens, Aspergillus and Fusarium species have been more frequently encountered in keratitis, and the incidence of Aspergillus species in corneal mycosis has been reported to range between 4 and 40%. Molds that constitute the transient microbiota of the external ocular surface or those present in the atmosphere can invade and initiate infection in a compromised cornea.

The association of the use of topical or systemic steroids and a diseased corneal epithelium with an increased frequency of fungal isolation from ocular surfaces was demonstrated previously. This patient, besides receiving topical steroids, also had an epithelial defect in the cornea that would have provided a favorable environment for the fungus to invade, adhere, and establish infection. To the best of our knowledge, fungal infection has been reported in association with shield ulcers of vernal keratoconjunctivitis, but a MEDLINE search revealed no reference to it.

In patients with severe vernal keratoconjunctivitis with confluent SPKs or shield ulcers, minimum use of steroids and associated use of topical cyclosporin A may be useful to prevent the complication of fungal infection because cyclosporin A has been shown to inhibit fungal growth. Several studies have shown that topical cyclosporin A is safe and effective treatment of vernal keratoconjunctivitis. To conclude, fungal keratitis may be associated with vernal keratoconjunctivitis. Though rare, fungal keratitis should be considered in the differential diagnosis of infections associated with vernal keratoconjunctivitis.

REFERENCES