

Answer to Ophthalmproblem *continued from page 449*

### 3. Fungal keratitis

Fungal keratitis is an uncommon pathology, representing less than 6% of infectious keratitis in developed countries and 10% to 15% in developing countries.<sup>1</sup> It is usually diagnosed late, so the process is often quite advanced. The main risk factors are trauma with organic materials, use of contact lenses, previous corneal surgery, or use of topical corticosteroids.<sup>2</sup>

Some systemic diseases can increase the risk of developing fungal keratitis, such as diabetes mellitus or conditions that compromise immune function. Fungal infections are caused by a variety of fungi, but by far most cases are caused by filamentous fungi. Fungal keratitis characteristically presents as a gray-white lesion with a satellite focus in patients with a history of ocular trauma; if it progresses, it can develop a substantial supuration and advance to the anterior chamber, causing intense inflammation and hypopyon. Clinically it is not always easy to make the diagnosis of fungal keratitis, so laboratory tests are of great importance. Before starting antibiotic treatment, try to sample the edge of the lesion, where it is assumed that fungus grows. The goals of treatment are rapid eradication of the responsible agents and inactivation of the inflammatory response caused by microorganisms. Antifungal treatment options include natamycin and topical amphotericin B.

- Natamycin has low penetration of the corneal epithelium, but removing the epithelium could lead to rather high levels in the stroma. It has a wide spectrum of action and is especially active against *Fusarium* spp. Where it is available, it is considered first-line treatment in fungal keratitis secondary to filamentous fungi. Topical natamycin (5%) is available commercially in some countries, such as the United States; it is not available in Canada.
- Topical amphotericin B (0.15% to 0.25%) covers a wide spectrum but requires removal of the epithelium to achieve greater penetration. It is active against *Candida* spp and is the first choice in countries where natamycin is unavailable.

### Management

In general, infectious keratitis is treated as bacterial until laboratory results confirm otherwise. The preferred initial therapy for infection with yeast that is not severe is topical amphotericin B (0.15% to 0.25%), administered every 15 minutes during the first 24 hours, every 30 minutes for the next 2 days, and every hour for an additional 2 days, while the patient is awake. If the infection is from filamentous fungi, initial therapy is topical natamycin (5%), administered every hour during the first 48 hours and every 2 hours for the next 72 hours.<sup>3</sup> Treatment should be maintained for at least 4 to 6 weeks, with gradual reduction of the dosing interval.<sup>3</sup>

Mild to moderate conjunctival hyperemia is an acceptable response to treatment. For treatment of severe keratitis that progresses despite topical therapy, oral and topical fluconazole should be considered as adjunct or replacement therapy.<sup>4</sup> The use of corticosteroids is controversial; on the one hand it might reduce corneal damage due to inflammatory response, but it can also facilitate the entry of microorganisms into deeper layers of the cornea. Our regimen includes the use of corticosteroids after at least 15 days of antifungal therapy and after there is clinical evidence of infection control.

### Recommendation

Family physicians should not overlook the possibility of a fungal infection in patients with a history of trauma with organic material, use of contact lenses, or corneal surgery. It is an aggressive pathology, so urgent referral to an ophthalmologist should be made to confirm diagnosis. 

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**Competing interests**  
None declared

### References

1. Tanure MA, Cohen EJ, Sudesh S, Rapuano CJ, Laibson PR. Spectrum of fungal keratitis at Wills Eye Hospital, Philadelphia, Pennsylvania. *Cornea* 2000;19(3):307-12.
2. Srinivasan M. Fungal keratitis. *Curr Opin Ophthalmol* 2004;15(4):321-7.
3. Jones DB. Diagnosis and management of fungal keratitis. In: *Clinical ophthalmology* [CD-ROM]. Philadelphia, PA: Lippincott Williams & Wilkins; 2004. Vol. 4, Chapter 21.
4. Yilmaz S, Maden A. Severe fungal keratitis treated with fluconazole. *Am J Ophthalmol* 2005;140(3):454-8.

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