

Review

New Dimensions for Medical Mycology in the 21st Century

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INTRODUCTION

Three challenges for medical mycology in the 21st century include 1) Fungal infections in AIDS patients; 2) Dermatophytosis reassessment; and 3) The onychomycosis dilemma.

Fungal infections in AIDS patients are atypical, severe, less responsive to treatment, and more likely to recur. In addition, they are a constant reminder of disease progression and have a major negative psychological impact which further depresses the immune system.

Onychomycosis affects 1 in 5 HIV positive patients and is usually extensive with rapid spread. Its most common presentation is proximal white subungual. Systemic fungal infections in AIDS include candidosis, which is usually oral, mucocutaneous, and/or disseminated. There is emerging resistance to treatment particularly from *Candida krusei* infections. Other organisms occurring in this patient population are *Aspergillus*, *Fusarium*, *Mucor*, *Penicillium*, blastomycosis, coccidioidomycosis, and *Aureobasidium pullulans*. Histoplasmosis is seen as disseminated in 90% of cases, with 10% being acute pulmonary. Finally, cryptococcosis is very common with meningitis and pneumonitis being frequent.

Dermatophytosis must be reassessed as a challenge because it is increasing in incidence and prevalence due to the high immunosuppressed populations (HIV, transplants), major increase in the elderly population (anticipated at 20% by the year 2050), higher numbers of diabetics. The greater number of susceptible individuals is made obvious because we have better diagnostic

methods as well as more resistant and atypical fungi. The widespread use of broad spectrum antibiotics and corticosteroids is also a contributing factor.

We now have available to us more effective systemic agents. They include terbinafine (fungicidal), itraconazole (intermittent regimens), and fluconazole (long term, once weekly dosage popular for *Candida* infections).

The last challenge to be addressed is the onychomycosis dilemma. What are needed are more effective topicals with greater penetration through the nail unit and systemics with fewer adverse effects, less drug interaction, and long term/permanent cure. Why do we see recurrences and what are the signs of more difficult to treat patients? Genetic susceptibility, concomitant diseases (diabetes), immunosuppression (AIDS, transplants), the elderly (poor circulation, faulty biomechanics, trauma, and slow nail growth), hyperhidrosis, and greater exposure to spas, exercise facilities, and the like. Those signs that predict poorer response rate include >2 mm subungual hyperkeratosis, >50% involvement, total dystrophic onychomycosis, dermatophytoma, lateral disease, the yellow spike, mixed infection (dermatophyte + *Candida*), and 2 diseases (fungus + psoriasis). Also non-responsive organisms such as *Scytalidium* and resistant ones such as *Candida* contribute to this problem.

In summary, three important areas for medical mycology for the 21st century include AIDS fungal infections, dermatophytosis reassessment, and the onychomycosis dilemma provide an opportunity for significant future accomplishment.

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