Onychomycosis in the Patient with Diabetes

The fungal infection onychomycosis is almost three times more prevalent in those with diabetes than in those without.

BY WARREN S. JOSEPH, DPM

Onychomycosis accounts for up to half of all nail disease occurrences, with the prevalence of dermatophyte onychomycosis being about 13% in the United States population. The prevalence of the fungus increases with age; in fact only about 1% of patients infected are aged <18 years. Half are aged >70 years.[1]

There is a genetic predisposition toward developing onychomycosis. Those patients who have distal subungual onychomycosis usually have concurrent tinea pedis. Some people may also inherit a susceptibility to *Trichophyton rubrum*. Because *T rubrum* is transmitted from the feet to nail and not vice versa, prevention of recurring tinea pedis will often prevent recurrence of onychomycosis.[2]

> Onychomycosis is more prevalent in diabetic patients compared to nondiabetic patients.

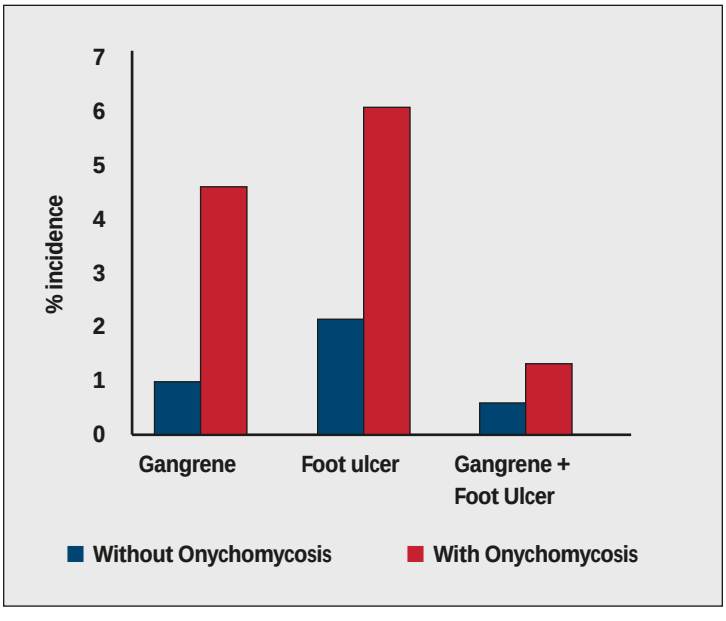

Figure 1. Infections in diabetic patients with and withouth onychomycosis.

QUALITY OF LIFE

In a study of onychomycosis and quality of life, Drake and colleagues looked at 258 patients.[3] In this group, 48% reported pain, 74% reported embarrassment, 40% had nail pressure and 38% had shoe discomfort. These patients also reported an average of 3.8 physician visits per year.

In a quality of life self-assessment survey in 93 patients with KOH-confirmed onychomycosis,[4] 92% said they had negative psychosocial or physical effects. Also in this group of patients, 44% reported negative effect on self-image and 41% reported pain or discomfort.

Among diabetic patients, onychomycosis is 2.8 times more prevalent than it is in patients without diabetes.[5] Nails that are thickened with fungus can develop serious bacterial infections and ulcerations (Figure 1).[6] Foot ulceration occurs in about 19% of diabetic patients, and among those with ulceration, the prevalence of amputation ranges from 6% to 43%, depending upon the severity of the ulcer.[7,8] In turn, among patients who have

had a unilateral amputation, the 5-year mortality rate is between 39% and 68%.[9]

In diabetes, the so-called unholy triad is known as neuropathy, angiopathy and immunopathy (Figure 2). Treatment patterns for onychomycosis-infected patients are shown in Table 1.

Mechanical debridement is considered the mainstay of the podiatric approach.

MAINSTAY OF THE PODIATRIC APPROACH

Therapeutic approaches for onychomycosis treatment include mechanical debridement, surgery, systemic/oral interventions and topical treatment. Mechanical debridement is considered the mainstay of the podiatric approach. Debridement reduces the thickness and length of the nail, causes decreased pressure and pain, and decreased fungal load. The nail also temporarily looks better. However, this approach does not address the fungus – therefore it is not a treatment.

ACTIVE FUNGUS TREATMENT

Approximately $250 million is spent each year between Medicare, debridement and diabetes costs. There are strict guidelines: There must be loss of protective sensation missing 3 out of 5 points; the patient must be receiving active care for diabetes management, and they must have been treated for ≥6 months. The class findings must be for ≥61 days and there must be active treatment for fungus.

A surgical approach for onychomycosis treatment

Figure 2. Onychomycosis infections in diabetic patients. In diabetes, the unholy triad is known as neuropathy, angiopathy and immunopathy.

TABLE 1. ONYCHOMYCOSIS TREATMENT PATTERNS

Treatments received by patients with onychomycosis during the previous 12 months

Condition	Oral antifungal (%)	Non-oral antifungal (%)	No Treatment (%)
Diabetes	8	62	30
Immune deficiency	7	55	37

Source: Liberman Research Associates: data on file, courtesy of Novartis Pharmaceutical Corp

includes removing the nail. The nail matrix can be removed (matrixectomy) or killed to prevent regrowth. This technique is frequently used in the case of isolated nail disease. If there is regrowth, fungus must be addressed. This approach can be painful and it may also lead to secondary bacterial infection.

There are currently three most often prescribed oral agents for the treatment of onychomycosis; fluconazole (Diflucan, Pfizer), itraconazole (Sporanox, Janssen), and terbinafine (Lamisil, Novartis). These are considered the gold standards in terms of cure rates, as a meta-analysis showed >70% success rate with these agents. All appear to be safe and effective in diabetes patients, but large studies are lacking.

It has only been within the past 6 or 7 years that reliable oral agents are available for onychomycosis treatment. Previous drugs required prolonged therapy and were associated with many adverse events and minimal success. There do continue to be some down sides such as toxicities, drug interactions and the cost to current oral treatments.

DESIRABLE TREATMENT

Topical treatments may be an option, as they have no cytochrome P450 system involvement. They are also desirable because they eliminate the fear of systemic toxicity. They do not require blood testing, they are less expensive than oral treatments and there are no drug-drug interactions.

Over-the-counter treatments have been used for several years, and ciclopirox 8% lacquer (Penlac, Dermik) is the only Food and Drug Administration-approved agent specifically for onychomycosis. However, this treatment is not specifically labeled for use among patients with diabetes. The diabetes data on Penlac has been gleaned from a postmarketing study of 215 diabetic patients. The affected area decreased from 64.3% at baseline to 25.7% and this group had a physician-rated improvement of 88.7%.

While onychomycosis is a common problem among patients with diabetes, there are no clear, hard and fast solutions as to how to treat it. It affects quality of life and it can lead to more serious conditions such as ulcers and subsequent amputations. More research is needed among larger samples of diabetic patients. ■

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