Management strategies for onychomycosis in special patient populations
Phoebe Rich, Nathaniel J. Jellinek and David M. Pariser
Copyright: COPYRIGHT 2015 International Medical News Group
http://www.edermatologynews.com/
Abstract:
Clinicians must be aware of characteristics unique to certain populations when diagnosing and treating onychomycosis. For example, although onychomycosis is uncommon in children, it should be considered in the differential diagnosis when young patients have nail changes, particularly if a family history of onychomycosis is present. In elderly patients, comorbid medical conditions may complicate systemic treatment, and physical impairments may interfere with topical therapy. Nondermatophyte molds and yeasts should be considered as possible pathogens in patients with diabetes and psoriasis. Patients who are immunosuppressed for any reason are at increased risk for nail infections.

Keywords
Compromised vascular circulation; diabetes; geriatric patients; onychomycosis; pediatric patients; psoriasis

Full Text:
Several populations of patients who acquire onychomycosis warrant special attention with respect to potential clinical sequelae and treatment. These populations include pediatric and geriatric patients, individuals with medical comorbidities (including those with psoriasis, diabetes, and compromised vascular status), and patients who are medically or pharmacologically immunocompromised.

Age-Related Issues

Pediatric Patients
According to the most recent epidemiologic evidence available from a large-scale study, onychomycosis is uncommon in children prior to adolescence, and is rare in children less than 6 years of age. (1) However, such findings should not be interpreted to mean that young children never present with onychomycosis. In fact, this condition has been reported in pediatric patients of all ages, including neonates, and always must be considered in the differential in any patient who presents with nail dystrophy. (2)

In general, children who present with onychomycosis have a family history of onychomycosis and/or tinea pedis. The underlying cause may be a genetic predisposition, but the most likely source of early exposure to causative organisms is family members with onychomycosis or tinea pedis. Whenever a child presents with signs and symptoms of onychomycosis and/or tinea pedis, clinicians should ask about others in the household (adolescents as well as adults) who share these signs and symptoms or who have been diagnosed with either of these infections.

It is important to identify and treat children with onychomycosis as early as possible. Because it is likely that these patients have a genetic susceptibility, it is also probable that they will be at increased risk for recurrent and/or refractory infections in the future. To date, no medication--systemic or topical--has received approval from the US Food and Drug Administration (FDA) for use in children with onychomycosis. Some systemic antifungal agents are FDA-approved for other indications--for example, the treatment of tinea capitis--and commonly are used off-label to treat onychomycosis in children.
With this caveat stated, Feldstein and colleagues (3) recently reviewed the topic of treatment for pediatric onychomycosis and concluded that the evidence on terbinafine, itraconazole, and fluconazole shows good efficacy and a low incidence of adverse effects in the pediatric population. These findings echo the experience of many clinicians that monotherapy with a topical agent may be more effective in children with onychomycosis than in adults because children's nails are thinner and grow faster than those of adults. Whereas complete nail turnover is typically 12 to 18 months in adults, complete turnover in children may take as little as 4 months.

The characteristics of thinner, faster-growing nails also allow clinicians to more quickly assess efficacy of treatment in an individual patient. Patients and their parents also are able to recognize the benefits of an effective therapy, which helps promote continued adherence.

In addition to treating nails directly, the long-term attention to and management of tinea pedis are as important in pediatric patients as they are in adults with onychomycosis.

Geriatric Patients

An estimated 40% of elderly patients have onychomycosis, making this one of the most common infections seen in this population. (4) It is also an important and challenging clinical condition among older individuals, for several reasons.

Comorbidities are increasingly common with advancing age, and many older people have circulatory compromise in their lower extremities, as a primary disease or secondary to diabetes mellitus. This complicates systemic treatment choices for onychomycosis for two main reasons. First, systemic medications are problematic. Older patients tend to require multiple medications to manage various medical issues and the chances for drug-drug interactions increase with each addition to an individual's prescription regimen. Second, compromised circulation and slower drug metabolism related to age can interfere with effective drug concentrations in target tissues in the lower extremities.

For these reasons, collaboration with the patient's primary care clinician (or a selected specialist, depending on an individual's specific medical issues) is advisable if a systemic antifungal medication is being considered.

When a topical medication is preferred, it is important to establish how the medication will be applied correctly and consistently--that is, whether the patient is able to do the applications or if daily assistance is available, if needed. Because of diminished flexibility from arthritis and other age-related conditions, many elderly patients find it difficult to self-administer topical therapy.

The assessment of treatment efficacy also is complicated in elderly patients. The age-related changes that are common--thickened, yellowed, brittle nails, and deformation resulting in ingrown nails or severe curvature of the nail plate ("pincer nails") (5)--do not permit the achievement of a therapeutic goal of clear or almost clear nails, or even, in some cases, an appreciable improvement in appearance. However, mycologic cure or substantial reduction in mycologic burden is a reasonable goal, even in the absence of improvement in appearance.

Medical Comorbidities

Diabetes

Epidemiologic studies worldwide suggest that the prevalence of onychomycosis in patients with diabetes is high, with some reports estimating a range of about 20% to 30%. (6-7) Several studies have demonstrated the presence of onychomycosis predicts the development of a constellation of complications referred to as diabetic foot syndrome (including bacterial infections that increase the
risk for ulceration and, ultimately, amputation). (6-8-10) Boyko and colleagues (8) reported that the risk for foot ulceration was 1.6 times greater among patients with diabetes who had onychomycosis.

Adding to the risk for bacterial infections in patients with diabetes is the high prevalence of peripheral neuropathy. Patients with onychomycosis-related nail changes may experience—but not feel or be aware of—-injuries sustained to the periungual tissue that can lead to cellulitis and limb-threatening secondary infections.

Onychomycosis involving atypical organisms, especially yeasts, are more common in patients with diabetes than in people without diabetes. (11)

For patients with diabetes in whom topical therapy is being considered, the two newer agents—efinaconazole and tavaborole—have demonstrated efficacy in this population. Patients with diabetes were not excluded from the pivotal trials of efinaconazole and tavaborole, but the disease was a cause for exclusion in the pivotal clinical studies of ciclopirox. In addition, the use of ciclopirox requires that patients keep their nails trimmed and that they follow up with their clinicians for regular removal of unattached, infected nails and debris; these activities potentially increase the risk for trauma and secondary infection, particularly in patients with diabetic neuropathy. No "relevant clinical experience" has been reported with the use of ciclopirox in insulin-dependent patients with diabetes or patients with diabetic neuropathy. (12)

Vlahovic and Joseph (13) published the results of a post-hoc analysis of data on 112 patients with diabetes in the efinaconazole trials. These investigators reported that, in the two multicenter, double-blind, vehicle-controlled, 48-week pivotal studies of efinaconazole, the patients with diabetes who were randomized to receive the study medication had significantly greater mycologic cure rates compared to those in the vehicle-only control group (P = 0.016). Complete cure—the primary end point—was also greater for the efinaconazole-treated group versus vehicle-only group (13.0% vs 3.7%, respectively), although the difference did not achieve statistical significance.

Psoriasis

Onychomycosis can be difficult to distinguish from nail psoriasis, and in many cases the two conditions coexist. Psoriasis should be considered in the differential diagnosis of any patient with signs and symptoms that suggest onychomycosis. Psoriasis as a comorbid cause for nail symptoms should be considered when mycologic cure is achieved but appearance does not improve completely; the portion of a nail affected by psoriasis will not change with antifungal treatment.

Patients with psoriasis also tend to have mixed dermatophyte and Candida infections. Efinaconazole and tavaborole both have good activity against Trichophyton rubrum as well as Candida organisms and nondermatophyte molds. In addition, any patient with psoriasis who is being treated with certain biologic agents—particularly those that target the interleukin-17 pathway, such as secukinumab—should be monitored for nail infections caused by yeasts.

Immunosuppression

Patients who are immunosuppressed for any reason are at increased risk for nail infections; this is particularly true for patients who have a history of onychomycosis or tinea pedis.

Systemic antifungal agents have been the treatments of choice prior to the introduction of efinaconazole and tavaborole. As in patients with psoriasis, antifungal medication must reach the nail bed to be effective, and the two newer topical agents have good penetration through the nail plate. In addition, efinaconazole and tavaborole have excellent minimum inhibitory concentrations against Candida albicans, Candida parapsilosis, and many nondermatophyte molds; these organisms are not uncommon pathogens in onychomycosis in this population. Patients on long-
term immunosuppressant therapy--such as those who have undergone renal transplantation and patients with a history of recurrent onychomycosis--may benefit from the preventive use of a topical antifungal medication; however, no antifungal agents are FDA-approved for the prevention of onychomycosis.

Conclusion

Onychomycosis presents special clinical challenges in some patient populations. These include children, the elderly, and patients who are immunosuppressed or who have comorbid conditions, particularly diabetes and psoriasis. To manage onychomycosis effectively in these special patient populations, clinicians must consider the species of organisms most commonly present, the potential adverse events associated with antifungal medications that may complicate treatment, and the patient characteristics that may affect the choice of therapy.

References


Phoebe Rich, MD, * Nathaniel J. Jellinek, MD, ([dagger]) and David M. Pariser, MD ([double dagger])

* Clinical Adjunct Professor of Dermatology, Oregon Health Science University, Portland, Oregon

([dagger]) Assistant Clinical Professor, Department of Dermatology, Warren Alpert Medical School at Brown University, Adjunct Assistant Clinical Professor, Division of Dermatology, University of Massachusetts Medical School, Fellowship Director. Procedural Dermatology, Dermatology Professionals, Inc., East Greenwich, Rhode Island

([double dagger]) Professor of Dermatology, Eastern Virginia Medical School.

Department of Dermatology, Pariser Dermatology, Norfolk, Virginia Publication of this CME/CE article was jointly provided by the University of Louisville School of Medicine Continuing Medical Education and Global Academy for Medical Education, LLC, and is supported by an educational grant from Valeant Pharmaceuticals North America LLC. Dr Rich, Dr Jellinek, and Dr Pariser have received an honorarium for their participation in this activity. They acknowledge the editorial assistance of Joanne Still, medical writer, and Global Academy for Medical Education in the development of this continuing medical education journal article.


Address reprint requests to: Phoebe Rich, MD, 2565 NW Lovejoy Street, Suite 200, Portland, OR 97210; phoeberich@aol.com

Rich, Phoebe^Jellinek, Nathaniel J.^Pariser, David M.

**Source Citation** (MLA 7th Edition)

URL
http://go.galegroup.com/ps/i.do?id=GALE%7CA428177051&v=2.1&u=ohsu&it=r&p=PPNU&sw=w&asid=e889e41c925595ade0f862a806d09e34

**Gale Document Number:** GALE|A428177051