Nail fungus infections are difficult to treat because microorganisms live under the nail and are difficult to eradicate. Treatments require months to years for resolution. Left alone they will not go away and generally spread to other nails. Oral medications are not always the best choice for a patient who may have alcoholism or who has liver damage due to a disease, as these drugs can be highly toxic to the liver. Topical treatments bypass the liver metabolism and are applied directly to the source (nail) of the infection in the form of a nail paint or lacquer.

Not all of us have nails that are just alike. Most nails infected with a fungus are hard, flaky, discolored, and uncomfortable and may require different strengths of the medication in different penetration enhancing bases in order to get rid of the infection. There are many antifungal medications available commercially for oral therapy but only a few available in commercially manufactured topical products resulting in the need for individualized therapy to be compounded.

During treatment, it is important to soak the nail(s) and keep them short by clipping or filing off loose nail material at least weekly. Topical treatments should be applied to the nail(s) and the skin under and around the nail(s) and allowed to dry for at least 1 minute before putting on socks or stockings. This medication should not be applied to any other parts of the patient’s body. It is good to clean the nail weekly with a cotton ball or tissue that is soaked with alcohol.

Here are 2 case reports of the treatment of nail fungus with compounded topical anti fungal preparations rather than commercial oral treatments. Commercial oral treatments can have many side effects that can be even more pronounced due to the long-term therapy needed.

Here is a list of these plus other topical nail solution preparations and one topical cream preparation that podiatrists, hand surgeons, dermatologists, and family medicine practitioners have shown success when prescribed:

- Terbinafine 1% in Dimethyl Sulfoxide, USP
- Terbinafine 1.67% in Dimethyl Sulfoxide, USP
- Terbinafine 2.5% Tincture
- Ketoconazole 2% and Ibuprofen 2% in Dimethyl Sulfoxide, USP
- Fluconazole 16-mg/mL in Dimethyl Sulfoxide, USP
- Thymol 4% in Isopropyl Alcohol
- Thymol 0.2% in Isopropyl Alcohol
- Fluconazole, Tea Tree Oil, and Ibuprofen in Dimethyl Sulfoxide, USP
- Clotrimazole 2%, Ibuprofen 2%, and Tea Tree Oil 5% in Dimethyl Sulfoxide, USP
- Itraconazole in place of clotrimazole, fluconazole, ketoconazole or terbinafine in any of the formulas above
- Butenafine Hydrochloride 2% and Tea Tree Oil 5% in a cream base

Although no documented studies support this, 6% ibuprofen added to the solutions has been reported to help soften the nail.

RESOURCES:
CASE REPORT: 
TERTBINAFINE 1.67% TOPICAL NAIL SOLUTION FOR ONYCHOMYCOSIS

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Myrtle Towne Pharmacy
Henderson Center Pharmacy
Eureka, California

A 55-year-old man was diagnosed as having a fungal infection (onychomycosis) on the thumb of his right hand. He saw his physician, who wanted to initiate therapy with terbinafine (Lamisil), an orally administered treatment. The dose of terbinafine usually used to treat onychomycosis of the fingernail is one 250-mg tablet daily for 6 weeks. This patient has a high level of alcohol intake socially; his physician is aware of this. However, terbinafine oral therapy has been associated with rare cases of liver failure that have occurred in individuals with and without preexisting liver disease. The severity of these hepatic events or their outcome may be worse in patients with active or chronic liver disease.¹ The physician discussed his concerns with the patient, who asked if there were alternate routes of administration. Neither the cream nor the gel form of terbinafine in a 1% concentration is recommended for the treatment of nail fungus. Product information on the topical forms of terbinafine does not include a warning about the possibility of hepatic failure.² The patient’s physician asked whether we could compound a formulation of terbinafine in a vehicle that could penetrate the nail and skin, and we recommended terbinafine 1.67% topical nail solution, which the physician prescribed. The patient was instructed to apply the solution twice a day on top of and under the nail after washing his hands with antibacterial soap for 1 minute.

After 4 weeks of therapy, signs of improvement were evident: The nail had begun to reattach to the nail bed. At that time, treatment was interrupted for 4 weeks but was then reintroduced. Two weeks after therapy was reintroduced, the nail had completely reattached to the nail bed, and no signs of a fungal infection remained. The treatment was considered successful and was discontinued.

REFERENCES

SUGGESTED READING

Reprinted from November 2001 RxTriad.

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Case Report: 
KETOCONAZOLE 2% AND IBUPROFEN 2% IN DIMETHYLSULFOXIDE, USP, TOPICAL NAIL SOLUTION FOR ONYCHOMYCOSIS

Barb Anliker, RPh
Kathy Jackson, Pharmacy Technician
Northwest Iowa Compounding
Emmetsburg, Iowa

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Patricia A. Banwart, DO
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A 47-year-old white woman who loved to wear sandals had been embarrassed to do so for several years because her toenails had become hard, yellow, and detached from the nail bed. Before coming to our clinic, she had been diagnosed as having a bilateral fungal infection (onychomycosis) of the great toenails and was treated with terbinafine (Lamisil) and ketoconazole (Nizoral), both of which were administered orally. Neither of these therapies was considered successful and was discontinued.

When the patient’s toenails were reevaluated 3 weeks after she had taken the last dose of itraconazole, it was determined that oral treatment with that drug had been ineffective. One of the staff members (LM) at the West Bend Medical Clinic had read about a compounded terbinfine preparation that was applied topically to fingernails and toenails and that had been effective in treating onychomycosis in several patients whose disease was refractory to conventional therapy.³ Our patient stated that orally administered ketoconazole had produced the greatest amount of improvement in her onychomycosis. When LM had determined that our pharmacy could compound ketoconazole

REFERENCES

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Tea Tree Oil

Tea tree oil is an essential volatile oil from the tea tree plant, Melaleuca alternifolia, said to have antiseptic properties. It is used for insect bites, nail fungus infections, acne, vaginal fungal infections, as a deodorant, mouthwash, and a shampoo.

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Read more about this essential volatile oil in the article:
Botony EF. Tea Tree Oil. JPC 1996; 2(5): 244-257.