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Hot Topic

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A Globally Emerging Fungus Causing Dermatophytosis

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Trichophyton species are fungi that can cause dermatophytosis also known as ringworm or tinea. This episode reviews four papers about an emerging *Trichophyton* in which sexual transmission has been reported and antifungal resistance might be a concern.

Topics:

- ringworm
- trichophyton
- tinea
- Trichophyton indotineae
- STI
- rash

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Disclosures

Disclosures for Meena S. Ramchandani, MD, MPH
Consulting Fee: Innoviva Specialty Therapeutics

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intro--background**[00:00] Intro & Background**

Hello everyone. My name is Meena Ramchandani. I'm an infectious disease physician at the University of Washington in Seattle. This podcast is dedicated to an STI [sexually transmitted infection] literature review for health care professionals who are interested in remaining up to date on the diagnosis, management, and prevention of STIs.

I'd like to talk about the recent emergence of certain *Trichophyton* subspecies in this episode. It's an important topic health care providers should be aware of, especially in the field of sexual health. *Trichophyton* cause dermatophytosis, which is also known as ringworm or tinea, and it's a superficial fungal infection that is easily treated with topical antifungal agents. There's a recent emergent of certain *Trichophyton* subspecies, which are a public health concern, and have been reported in several countries, including the U.S. The two types to remember for this episode are *Trichophyton indotineae* and *Trichophyton mentagrophytes* genotype VII. Sexual transmission of both organisms has been described in case reports or in case series. These fungi can cause a severe persistent dermatophytosis or pruritic skin rash in patients, often in the genital region if sexually transmitted. In the case of *Trichophyton indotineae*, antifungal resistance is a major concern, and treatment requires a longer course of therapy. A sexual history as well as a travel history can be important when evaluating patients with these infections.

paper-1**[01:37] Paper #1**

Descalzo V, Martín MT, Álvarez-López P, et al. *Trichophyton mentagrophytes* genotype VII and sexually transmitted tinea: An observational study in Spain. Mycoses. 2025 Apr;68(4):e70049. **[PubMed Abstract]**

The first article to review was published in *Mycoses* in April 2025 by Dr. Descalzo and colleagues. It is titled "*Trichophyton mentagrophytes* genotype VII and sexually transmitted tinea: An observational study in Spain." This group evaluated 14 cases of *Trichophyton mentagrophytes* genotype VII between 2020 and 2025 at an STI clinic in Barcelona. They identified the organism based on DNA sequencing, which is the most common technique used for differentiating the *Trichophyton* subspecies. All patients were MSM (or men who have sex with men), and the median age was 37 years. Seven patients were persons with HIV on antiretroviral therapy, and they had a CD4 count that was greater than 500. Six patients were on HIV PrEP (or preexposure prophylaxis). Eight patients had concurrent STIs, for example, gonorrhea, syphilis, chlamydia, or mpox at the same time, and four patients reported recent travel within Europe.

The rash mainly occurred in the groin or buttocks and perineal regions. Two patients had lesions around their beard or their mustache. For treatment strategies, six patients required multiple courses of treatment due to recurrence. Five patients were treated successfully with oral terbinafine, and seven with topical agents, either clotrimazole or terbinafine, that was topically applied. Most patients required a longer course of therapy of 3 to 8 weeks, and all patients cleared their infection with a median time to cure of 49 days.

Trichophyton mentagrophytes genotype VII has been reported in several countries as a cause of oral or genital dermatophytosis transmitted through sexual contact. Most reports indicate oral terbinafine for several weeks has been the treatment of choice for these infections.

Now, this particular case series we just discussed by Descalzo and colleagues suggests topical terbinafine may be effective for certain patients, maybe those with less severe presentation. But if you're interested in learning more, including some pictures of the rash patients can present with, I suggest you also review an article published by Dr. Jabet and colleagues in the *Journal of European Academy of Dermatology and Venereology* that was published in February 2025, as well as one published by Dr. Zucker and colleagues in the *Morbidity and Mortality Weekly Report* in October 2024. The majority of patients in those articles received

oral terbinafine to treat their infections.

paper-2**[04:15] Paper #2**

Jabet A, Chiarabini T, Hennequin C, et al. Autochthonous transmission of *Trichophyton indotineae* through sexual contact, France, 2024. Euro Surveill. 2025 Jul;30(26):2500416. **[PubMed Abstract]**

Now, let's talk about *Trichophyton indotineae*, which is another emerging global pathogen with difficult-to-treat infections. *Trichophyton indotineae* is often resistant to the antifungal medication, terbinafine, which is used to treat dermatophytosis, including *Trichophyton mentagrophytes* genotype VII that we just discussed. Case reports indicate other antifungals, such as ketoconazole or fluconazole, may also not work for these infections. The organism was initially described in South Asian or Middle Eastern countries, but now has been reported in six continents and in multiple U.S. states.

I'd like to start out by reviewing an article published by Dr. Jabet and colleagues in *Eurosurveillance* in July of 2025. It is titled “Autochthonous transmission of *Trichophyton indotineae* through sexual contact, France 2024.” In this report, four cases of sexually transmitted dermatophytosis caused by *Trichophyton indotineae* in Paris are described. The age of these patients ranged from early 20's to late 60's. Two patients were MSM with multiple sex partners, and the other two patients were female sex workers. Two patients were living with HIV and were on antiretroviral therapy. Three patients had not traveled outside of Europe in those last 6 to 12 months prior to the onset of lesions, and based on history, these three patients likely acquired the infection in France. The fourth patient likely acquired the infection in Portugal. Three patients reported sex with men who were from South Asia in the previous months before the onset of their symptoms. And, this group used mass spectrometry to identify *Trichophyton indotineae* and then confirm the diagnosis with molecular sequencing. They found one isolate that was resistant to terbinafine in their cohort of four cases. Two patients received oral terbinafine, and the third patient received topical ketoconazole. Clinical recovery was achieved in all three patients, and the last patient was lost to follow-up.

This case series highlights *Trichophyton indotineae* infection acquired through sexual contact in Europe. Historically, this infection was associated with exposure in South Asia or in Middle East, but this case series suggests local transmission of this pathogen is occurring. While several of the isolates in this article were sensitive to terbinafine, isolates may be resistant to this medication. Typically, itraconazole, at high doses and for long treatment duration, is recommended for this infection. But relapse can occur.

There's some interesting pictures from 14 patients with *Trichophyton indotineae* infection published in February 2026 in the *Journal of European Academy of Dermatology and Venereology* by Dr. Rivera Lopez and colleagues, which I also encourage you to view if you're interested in learning more.

paper-3**[07:10] Paper #3**

Dos Santos AR, Uhrlaß S, Nenoff P, et al. Global emergence of antifungal-resistant dermatophytosis caused by *Trichophyton indotineae* (Formerly *T. mentagrophytes* ITS genotype VIII): A Genomic investigation involving 14 countries. Mycoses. 2025 Aug;68(8):e70101. **[PubMed Abstract]**

The next article to review was published in *Mycoses* in August 2025 by Dr. Ribeiro Dos Santos and colleagues. It is titled “Global emergence of antifungal-resistant dermatophytosis caused by *Trichophyton indotineae*: A genomic investigation involving 14 countries.” This group analyzed 347 *Trichophyton indotineae* isolates from 14 different countries, and found 65% were resistant to terbinafine in vitro. Among the isolates, which were phenotypically resistant to terbinafine, meaning they grew on media containing a certain amount of terbinafine or had a minimum inhibitory concentration greater than or equal to 0.5 micrograms per milliliter using broth microdilution, 99% were genotypically resistant. They found that the isolates had mutations in the squalane epoxidase gene, which has been linked to terbinafine resistance.

Just some background. Squalene epoxidase is an enzyme in the ergosterol biosynthesis pathway and is an antifungal target. The highest number of isolates they analyzed came from India, Germany, Bangladesh, and the United States. Using whole genome sequencing and a phylogenetic tree analysis based on single nucleotide polymorphisms, they did not find there was clustering by age, sex, or country. The *Trichophyton indotineae* isolates had less intraspecies genomic diversity compared with other trichophyton groups, such as *Trichophyton rubrum* or *interdigitale*. This suggests *Trichophyton indotineae* is a recently emergent pathogen. They found one subcluster of terbinafine-resistant isolates that had a specific squalene epoxidase gene mutation at F397L, and it was widely dispersed among 10 of the countries. So this was a large, multinational, genomic investigation of *Trichophyton indotineae* using isolates from 14 countries. This group found that the isolates were genetically close, and did not cluster by country or origin. It suggests ongoing international transmission and possible recent emergence of this pathogen. They found that the majority of isolates (or 65%) were resistant to terbinafine.

paper-4**[09:31] Paper #4**

Caplan AS, Todd GC, Zhu Y, et al. Clinical Course, antifungal susceptibility, and genomic sequencing of *Trichophyton indotineae*. JAMA Dermatol. 2024 Jul 1;160(7):701-709. **[PubMed Abstract]**

Next, I'd like to briefly review an article published in *JAMA Dermatology* in July of 2024 by Dr. Caplan and colleagues. This article is titled “Clinical course, antifungal susceptibility, and genomic sequencing of *Trichophyton indotineae*.” *Trichophyton indotineae* isolates from 11 patients in New York City were analyzed from 2022 to 2023. The median age of patients with this infection was 39 years. Six patients were male, and five were female. The majority of patients in this case series reported travel in Bangladesh before acquiring the infection, and the median time from tinea onset to diagnosis was about 10 months. All patients had received at least one topical antifungal medication without improvement when used as monotherapy, and many patients received more than one antifungal treatment.

What they found in their case series is that two patients had resolution with oral fluconazole weekly for 4 to 12 weeks, but this treatment also failed in two other patients. So, about 50% of patients in the cohort of four responded to treatment with oral fluconazole. Two patients improved with griseofulvin that was given for eight weeks, but another three did not improve with griseofulvin. What they found is that three patients had resolution with itraconazole, and another two patients improved at the last known follow-up, so a total of five patients had improvement or resolution of their infection with itraconazole. They found that itraconazole had to be given for at least 4 to 8 weeks. One patient was lost to follow-up, and another did stop itraconazole due to adverse effects. This case series highlights how difficult it can be to treat *Trichophyton indotineae* infections. Patients might need to receive a long course of therapy but they did find that the majority of patients had improvement with itraconazole.

There is a nice review by Dr. Gold and Dr. Lockhart in *Clinical Microbiology Newsletter*, published in June of 2025, discussing the recently emerged dermatophytes of public health concern, which I encourage you to read if you'd like to learn more.

summary**[11:44] Summary**

To conclude, I'd like to summarize some key points from the session.

- *Trichophyton mentagrophytes* genotype VII is causing sexually transmitted dermatophytosis in many countries.
- When patients present with a rash in the oral or general region, most reports indicate oral terbinafine, given for several weeks, can treat *Trichophyton mentagrophytes* genotype VII, although topical terbinafine might be effective in select cases with less severe presentation.
- *Trichophyton indotineae*, on the other hand, is an emerging pathogen that can also cause a severe persistent dermatophytosis, but the organism is often resistant to terbinafine. Sexual transmission has

also been described.
- A long course of itraconazole has been used successfully for *Trichophyton indotineae* infections.

credits**[12:38] Credits**

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