

# Management of Onychomycosis and Co-Existing Tinea Pedis

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## ABSTRACT

Onychomycosis is a common nail infection that often co-exists with tinea pedis. Surveys have suggested the diseases co-exist in at least one third of patients, although actual numbers may be a lot higher due to significant under-reporting. The importance of evaluating and treating both diseases is being increasingly recognized, however, data on improved outcomes, and the potential to minimize re-infection are limited. We review a recent post hoc analysis of two large studies treating mild to moderate onychomycosis with efinaconazole topical solution, 10%, demonstrating that complete cure rates of onychomycosis are significantly improved when any co-existing tinea pedis is also treated.

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## INTRODUCTION

Onychomycosis is the most common fungal infection comprising about one-third of all skin fungal infections, and 50% of all nail disorders.<sup>1,2</sup> It is well recognized in dermatology practice that onychomycosis and tinea pedis can exist together in the same patient, that tinea pedis can lead to onychomycosis, and that it is important to evaluate and treat both diseases.<sup>3</sup> Once the nails become infected, they become reservoirs for continued infection of the surrounding skin, potentially resulting in a cycle of re-infection.<sup>4</sup> However, data showing the impact of treating co-existing tinea pedis on onychomycosis outcomes, and the potential to reduce onychomycosis recurrence or re-infection is lacking.

### Prevalence of Onychomycosis and Co-Existing Tinea Pedis

Onychomycosis has been found to be significantly more likely to be diagnosed in the context of tinea pedis ( $P < .001$ ),<sup>5</sup> with a history of tinea pedis more than doubling the risk of onychomycosis.<sup>6</sup> Although the true prevalence of co-existing onychomycosis and tinea pedis is unknown, a number of surveys have suggested that about one third of patients with toenail onychomycosis also have tinea pedis.<sup>7-9</sup>

In a large survey of over 2700 patients with toenail onychomycosis, 42.8% had concomitant fungal infections, with tinea pedis being most common (seen in 33.8% of patients).<sup>7</sup> Inter-digital tinea pedis was the most common subtype noted in over 65.4% of cases.<sup>7</sup>

The extent of toenail onychomycosis and recurrent disease were found to be the most important parameters influencing the co-existence of tinea pedis.<sup>7</sup> Their co-existence is more commonly seen in men, and increases with age. Not surprising as both tinea pedis and onychomycosis are more common in men; and it has been estimated that 25.7% of elderly patients have both diseases,<sup>10</sup> where more advanced disease, greater non-target toenail

involvement, and longer disease duration are all commonplace.<sup>7</sup> A recent study in subjects with diabetic foot complications also showed a high prevalence of both types of infection, with tinea pedis observed in 46.7% and onychomycosis in 53.3% of subjects, compared to a prevalence of 14.7% and 22.7% in matched controls.<sup>11</sup>

### Treatment of Onychomycosis and the Implications of Co-Existing Tinea Pedis

Left untreated, onychomycosis and tinea pedis have the potential to cause further morbidity such as wounds, cellulitis, secondary bacterial infection, pain, and difficulty with ambulation, particularly for individuals with a compromised health status.<sup>12-14</sup> In addition, recurrence (relapse or re-infection) of onychomycosis is not uncommon, with reported rates ranging from 10% to 53%.<sup>15-17</sup>

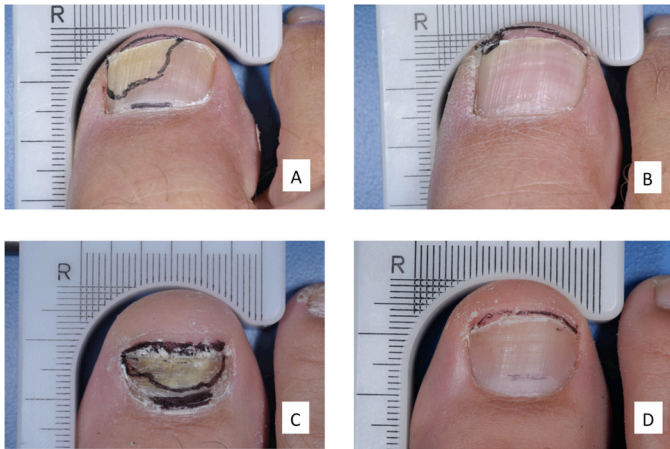
It is also worth mentioning that many patients with toenail onychomycosis and/or tinea pedis are not aware that they have fungal infection, and may not seek medical care and such patients pose a special challenge for physicians to detect and treat the disease.<sup>18-20</sup>

For effective onychomycosis therapy it is essential not only to treat the affected toenails but also to prevent spreading the infection to other sites of the skin. Prevention of onychomycosis includes adequate treatment of any concurrent tinea pedis, and screening and treating family members for co-existing disease.<sup>21</sup> In addition, it has been suggested that an unnoticed and stable reservoir of dermatophytes in the nail plate can lead to infection and re-infection of the surrounding cutaneous surfaces such that effective long term cure of tinea pedis may require nail-directed therapy.<sup>5,6</sup>

### Treatment of Onychomycosis and Co-Existing Tinea Pedis

Despite the clear need to look for and treat both diseases concurrently, there are few clinical data in practice to support this

**FIGURE 3.** Representative photographs of mild (A) and moderate (B) onychomycosis patients with co-existing tinea pedis before treatment. Both patients were almost clear at week 52 (Percent nail involvement: 1% [B] and 5% [D]).



rationale. Numerous studies have presented compelling data on the efficacy and tolerability of antifungal therapy for onychomycosis. To our knowledge only one study has looked at the benefits of treating co-existing tinea pedis on onychomycosis outcomes, and this was a post hoc analysis of two large studies treating mild to moderate toenail onychomycosis with efinaconazole topical solution, 10%.<sup>22</sup>

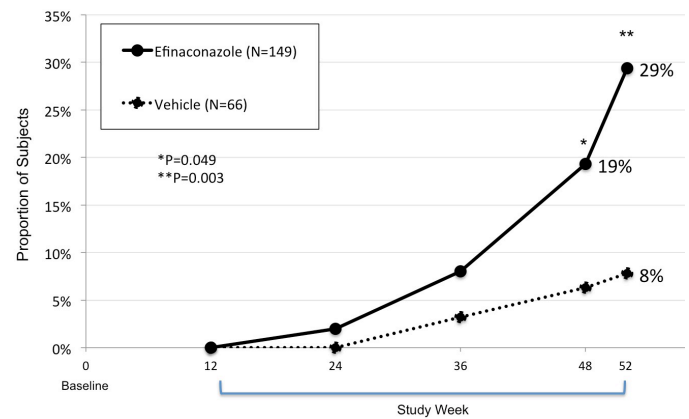
Overall, 21.3% (352/1655) of onychomycosis patients reported interdigital tinea pedis at baseline, a figure very similar to that reported in previous surveys.<sup>7</sup> Although the studies were not designed to investigate tinea pedis treatment, investigator approved topical antifungals were allowed. Almost two thirds of patients with onychomycosis also had their co-existing tinea pedis treated.

In reviewing all primary and secondary endpoints, treatment of mild to moderate onychomycosis with efinaconazole topical solution, 10% was much more effective when co-existing tinea pedis was also treated.

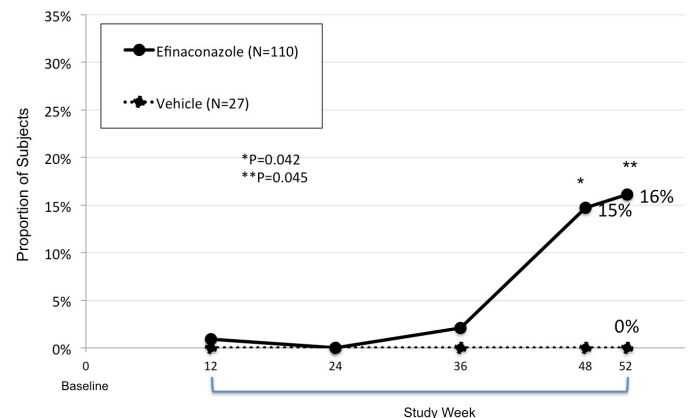
"Despite the clear need to look for and treat both diseases concurrently, there are few clinical data in practice to support this rationale."

Pooled data from the two studies have already been reported.<sup>23</sup> Complete cure rates of 18.5% and mycologic cure rates of 56.3% were seen at week 52, compared with 4.7% and 16.6% with vehicle (both  $P < .001$ ). In a post hoc analysis of patients with co-existing tinea pedis, when the tinea pedis was

**FIGURE 1a.** Primary efficacy endpoint complete cure weeks 12-52 in onychomycosis patients when co-existing tinea pedis was treated (ITT Population, OC pooled data). Complete cure defined as 0% clinical involvement of target toenail in addition to mycologic cure.

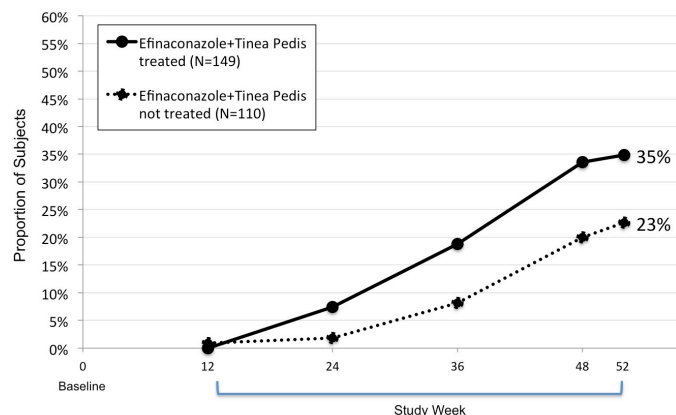


**FIGURE 1b.** Primary efficacy endpoint complete cure weeks 12-52 in onychomycosis patients when co-existing tinea pedis was not treated (ITT Population, OC pooled data). Complete cure defined as 0% clinical involvement of target toenail in addition to mycologic cure.



also treated, complete cure rates with efinaconazole were 29.4% (Figure 1a), and mycologic cure rates 56.2%. When tinea pedis was not treated, complete cure rates were 16.1% (Figure 1b), and mycologic cure rates 45.2%. Interestingly, in the vehicle group where co-existing tinea pedis was not treated complete cure rates remained zero throughout the study (Figure 1b).<sup>22</sup> The number of patients achieving complete/almost complete cure was also greater if their co-existing tinea pedis was treated, with more than one third of patients having an affected target toenail involvement of  $\leq 5\%$  at week 52 (Figure 2). This post hoc analysis had some limitations. The studies were not designed to investigate both diseases and their treatment. There is no information about the severity of tinea pedis or how successfully it was treated. Nevertheless, it does provide important data to support the importance of treating both diseases.

**FIGURE 2.** Secondary efficacy endpoint complete/almost complete cure weeks 12-52 in onychomycosis patients with tinea pedis reported on-study (ITT Population, OC pooled data). Complete/Almost Complete Cure defined as  $\leq 5\%$  affected target toenail area in addition to mycologic cure.



## Concluding Remarks

The prevalence of toenail onychomycosis is highly associated with the presence of pre-existing tinea pedis. In fact a number of surveys, and a recent post hoc analysis of two large clinical studies have shown that the two diseases co-exist in at least one third of patients.<sup>7,10,11,22</sup> In our experience, the reported co-existence of the two diseases is likely to be significantly under-recorded as many patients are not aware they have a fungal infection, or may not seek medical treatment. As a result, we recommend that all patients with toenail onychomycosis should be examined for tinea pedis. All areas of the feet should be inspected for tinea, including plantar feet, toe webs and lateral/medial feet. Shoe evaluation should also be part of any toe onychomycosis/tinea pedis assessment.

When managing patients with onychomycosis, it is important to treat any co-existing tinea pedis. The benefits in treating both diseases has now been clearly demonstrated.

## DISCLOSURES

Dr. Scher has served as paid consultant to Valeant Pharmaceuticals North America LLC.

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