

# Ichthyosis associated with widespread tinea corporis: report of three cases\*

Ictiose associada a dermatofitose disseminada: relato de três casos

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**Abstract:** Ichthyoses are a common group of keratinization disorders. A non-inflammatory generalized persistent skin desquamation is observed. It is characterized by increased cell turnover, thickening of the stratum corneum and functional changes of sebaceous and sweat glands. All of these favor fungal proliferation. Dermatophytes may infect skin, hair and nails causing ringworm or tinea. They have the ability to obtain nutrients from keratinized material. One of its most prevalent genera is *Trichophyton rubrum*. Although tineas and ichthyoses are quite common, the association of the two entities is rarely reported in the literature. Three cases of ichthyosis associated with widespread infection by *T. rubrum* are presented. Resistance to several antifungal treatments was responsible for worsening of ichthyosis signs and symptoms.

**Keywords:** Dermatocycoses; Ichthyosis; Therapeutics; Tinea

**Resumo:** Ictioses são distúrbios da queratinização que se expressam com descamação cutânea generalizada persistente não inflamatória. Os pacientes que apresentam essa doença possuem aumentada renovação celular, maior espessura da camada córnea e alterações funcionais de glândulas sebáceas e sudoríparas, aspectos que parecem favorecer a infecção por dermatófitos. Dermatofitoses são infecções causadas por fungos ceratinofílicos, que acometem pele, pelos e unhas. Um dos gêneros mais prevalentes é o *Trichophyton rubrum*. Apesar das infecções fúngicas por dermatófitos e os quadros clínicos de ictiose serem muito comuns, são raros em literatura os relatos de associações dessas duas entidades. Apresentamos os relatos de três casos de ictiose associada a dermatofitose por *T. rubrum*. A ausência de resposta aos antifúngicos leva à piora clínica da ictiose.

**Palavras-chave:** Dermatocomicoses; Ictiose; Terapêutica; Tinha

## INTRODUCTION

Ichthyosis corresponds to a group of illnesses characterized by widespread persistent noninflammatory scaling. It is the most common disorder of keratinization. Several forms of ichthyosis are classified according to inheritance, clinical appearance, pathological features and systemic disorders.<sup>1,2</sup>

Patients with ichthyosis demonstrate increased cell turnover, stratum corneum thickening and sebaceous and sweat glands functional changes, which seem to favor dermatophyte infection.<sup>3</sup>

Dermatophytes are fungi that obtain nutrients from keratinized tissues, such as skin, hair and nails. One of the most prevalent dermatophytes is *Trichophyton rubrum*, with universal occurrence.<sup>2</sup>

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Although dermatophytosis and ichthyosis are common in the clinical realm, the association of these two entities is rarely reported.<sup>1,3</sup> Three cases of ichthyosis associated with widespread *T. rubrum* infection are reported.

## CASE REPORTS

### Patient 1

An 87-year-old female patient with congenital ichthyosiform erythroderma had been followed since 1976. Over the years she presented with erythematous-scaling patches, with peripheral activity and central clearing. The diagnosis of chronic dermatophytosis had been established for more than 30 years. The patient underwent several treatments with systemic antifungal agents, including griseofulvin and azoles for periods of 3 to 12 weeks. In addition, topical creams were used with temporary improvement. In 2006 she accepted treatment with Acitretin. Partial improvement of erythema and desquamation was seen within 2 months; however, arciform lesions were occasionally seen. In September 2011, she showed signs of clinical deterioration with widespread lamellar scaling on the limbs and trunk, ectropion and multiple bilateral erythematous round patches on the lower limbs (Figure 1A). Direct examination demonstrated hyaline septate hyphae with a positive culture for *T. rubrum*. Association with dermatophytosis was diagnosed. Thirty days after prescription of terbinafine 250 mg qd the patient showed dramatic improvement of the lesions (Figure 1B).

### Patient 2

A 73-year-old male patient was diagnosed with ichthyosis linearis circumflexa in 1999. Disseminated arciform and round patches had been seen since his first dermatology visit. Previous empiric treatment to rule out coincident fungal infection included ketoconazole, topical terbinafine, ketoconazole or ciclopirox olamine. This therapy had no impact.

During one of his regular visits in July 2011, he presented ill-defined erythematous scaly papules and plaques on the trunk and upper limbs (Figure 2A). Onycholysis, distal leukonychia, subungual hyperkeratosis and onychorrexis on the toenails were also evident. A mycological examination demonstrated septate hyaline hyphae, and a positive culture for *T. rubrum*. Skin biopsy presented several hyphae within the stratum corneum, suggesting the diagnosis of dermatophytosis (Figure 2B). A subungual sample also demonstrated *T. rubrum*. Patient was treated with terbinafine 250 mg qd for 120 days, with significant improvement of skin scaling and nail dystrophy (Figures 2C and 2D).

After this treatment, features of *ichthyosis lin-*

*earis circumflexa* were no longer observed. Lamellar desquamation, skin thinning and a discrete ectropion suggested lamellar ichthyosis as a primary diagnosis.

### Patient 3

A 27-year-old female patient, with Sjögren Larsson Syndrome (congenital ichthyosis associated to spasticity), had been followed since 2003. She was on Acitretin since 2004 and presented with sudden worsening. From 2008 on, she had onycholysis and subungual hyperkeratosis on toenails. She was on ciclopirox olamine nail lacquer and ketoconazole cream for more than 2 years with mild improvement. In September 2011 her mother reported severe worsening of ichthyosis, despite regular use of Acitretin. Clinical examination demonstrated lamellar desquamation of the lower limbs, ill-defined erythematous patches, and round scaly lesions on trunk and left leg (Figure 3A). Direct mycological examination showed hyaline septate hyphae and the culture was positive for *T. rubrum* (Figure 3B). Skin biopsy demonstrated several hyphae within the stratum corneum. Terbinafine 250 mg qd for 30 days led to clearance of the erythematous lesions, slight scaling persisted due to baseline ichthyosis (Figure 3C).

## DISCUSSION

According to the 2006 Census of *Sociedade Brasileira de Dermatologia*, superficial mycoses are the second most common cause for dermatology visits.<sup>4</sup>

Dermatophytes obtain nutrients from the abundant keratinized cells seen in ichthyosis. Several factors may lead to chronic dermatophytosis in patients with ichthyosis: defects of the skin barrier; defective cell-mediated immunity, primarily responsible for immunity against *T. rubrum*, in some cases with atopic background; and finally, delayed keratin scaling, facilitating persistence of fungal infection.<sup>5,6</sup>

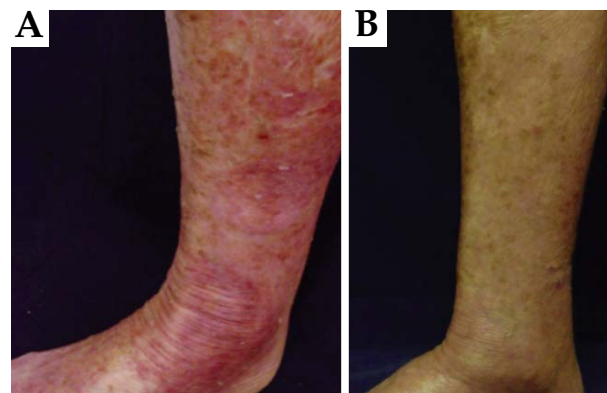
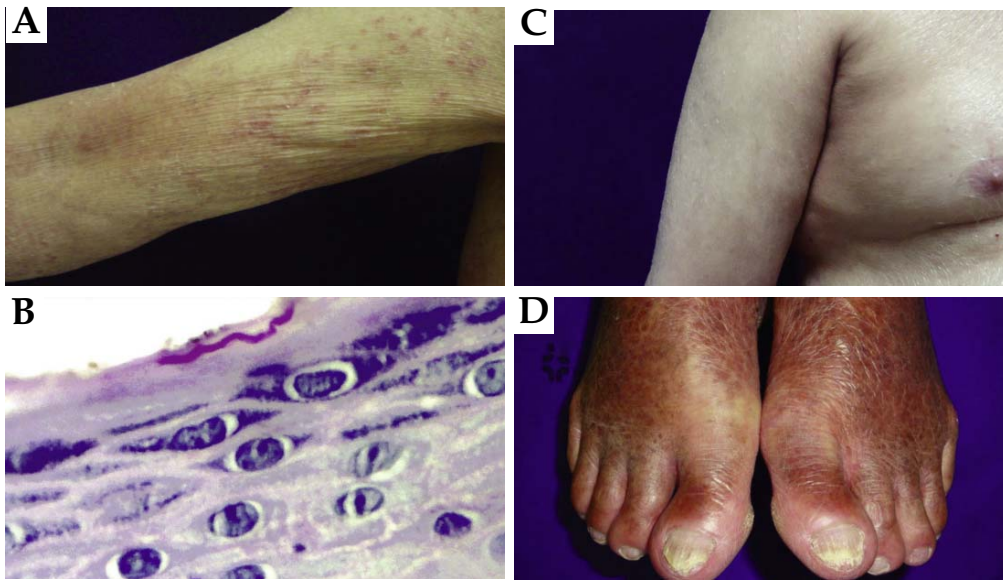
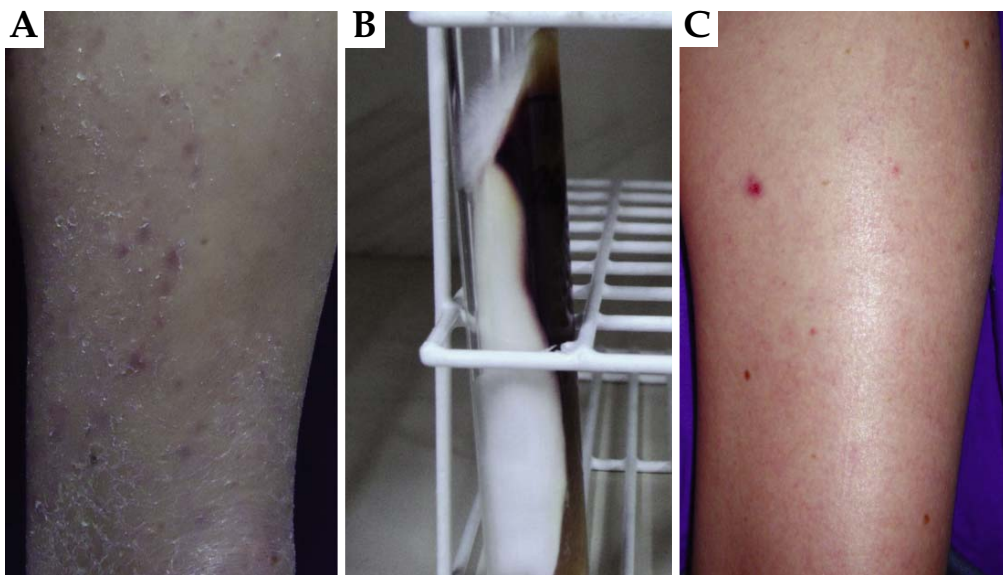


FIGURE 1: A. Multiple bilateral erythematous round patches on the limbs; B. Dramatic improvement of the lesions after treatment



**FIGURE 2:** A. Ill defined erythematous scaly papules and plaques on upper limbs; B. Skin biopsy presenting hyphae within the stratum corneum (400x); C. Improvement of skin scaling after treatment; D. Distal nail dystrophy due to trichophyton rubrum



**FIGURE 3:** A. Ill-defined erythematous patches, and round scaly lesions on left leg; B. Culture positive for t. rubrum; C. Clearance of erythematous lesions after treatment

All these aspects of ichthyosis favor an ideal natural habitat for fungi. The three cases investigated had positive cultures for *T. rubrum*, which is the most prevalent pathogen in fungal cultures in Brazil, accounting for 37.4% to 58.3% of superficial fungal infections in several studies in the Brazilian population.<sup>7,8</sup>

Typically, the clinical appearance of dermatophyte infections is characterized by round patches with erythematous scaling circinate edges, due to the combination of keratin destruction and host inflammatory response. In patients with ichthyosis, most

tinea lesions are ill defined,<sup>9</sup> as noticed in all three cases, so careful clinical examination is mandatory for detection of these lesions. A previous diagnosis of ichthyosis can mislead an experienced dermatologist to fail to diagnose dermatophytosis, due to their similar clinical signs. Therefore, in any patient with ichthyosis who develops unexplained exacerbation of pruritus or erythroderma, a hidden fungal infection should be excluded and direct mycological examination is mandatory.<sup>2</sup>

Tinea treatment, in these cases, was challenging. In all cases, the treatment with imidazoles did not

result in clinical improvement. These drugs are enzymatic fungistatic agents, which lead to blockage of the synthesis of ergosterol, a fungal cell membrane steroid. All cases responded to terbinafine. This synthetic allylamine is highly lipophilic and tends to accumulate in the skin, which may be relevant in patients with ichthyosis. Fungicidal activity of terbinafine is higher and initiates faster than that of azoles.<sup>10</sup>

Although both drugs inhibit growth of dermatophytes, the more rapid fungicidal activity of terbinafine may have clinical relevance in the treatment of tinea cases associated with ichthyosis.

Dermatologists should be aware that associated dermatophytosis in patients with ichthyosis may present as clinical worsening of baseline scaling, sometimes resistant to usual therapies, such as acitretin. Allylamines seem to elicit a better clinical response from these patients. □

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