Unrecognized Dermatophyte Infection in Ichthyosis Vulgaris

Maja Grahovac, Dragomir Budimčić

University Department of Dermatology and Venereology, Zagreb University Hospital Center and School of Medicine, Zagreb, Croatia

SUMMARY A case of unrecognized widespread dermatophyte infection associated with ichthyosis vulgaris and atopy is described. Our patient was a young woman in which the diagnosis of ichthyosis vulgaris and atopic dermatitis precluded recognition of widespread dermatophyte infection for more than six months. The case showed some clinical peculiarities in terms of both extent of lesions and their clinical appearance.

KEY WORDS: chronic dermatophytosis, *Trichophyton mentagrophytes*, ichthyosis vulgaris, atopy

INTRODUCTION

Ichthyoses are a large heterogeneous group of disorders, typically involving most of the body surface and usually presenting at birth or shortly thereafter. Ichthyosis vulgaris (IV) is the most common disorder of keratinization with diffuse scaling and highly variable degree of involvement. The predilection sites are extensor surfaces of the extremities and the trunk. About 25%-33% of patients have atopic dermatitis (AD). When an IV patient has severe pruritus or flexural involvement, the answer is usually AD (1).

Several host conditions such as atopy and epidermal barrier defects like ichthyosis are associated with an increased prevalence of dermatophytosis (2). One of the most prevalent causes of dermatophytosis is *Trichophyton* infection with ubiquitous occurrence because of its ability to escape the host's immune response.

We present a case of a young woman in which the diagnosis of ichthyosis vulgaris and atopic dermatitis precluded recognition of a widespread dermatophyte infection for more than six months.

CASE REPORT

A 26-year-old female patient with ichthyosis vulgaris and atopic dermatitis from early childhood presented to our hospital with itching rash. The first skin lesions had appeared six months earlier. All aspects of her erythema and scaling were assumed to be caused by atopic dermatitis. In this
period, she had been treated with several cortico-
steroid creams (betamethasone, alclometasone), which made her lesions even worse. When the pa-
tient presented to our Department, dermatological 
examination revealed, besides dry skin, multiple 
nummular erythematous plaques on both arms, 
upper back and left lower leg. The lesions were 
markedly infiltrated, exalted and showed peri-
pheral scaling (Fig. 1). Direct microscopic exami-
nation of scales obtained by scraping the plaques 
displayed septate hyphae. Finally, *Trichophyton (T.) mentagrophytes* was confirmed by culture. The 
source of dermatophyte infection was not con-
firmed. She was treated with antimycotic systemic 
treatment, terbinafine 250 mg/day and locally with 
clotrimazole twice a day for one month. After one 
month, the skin lesions completely resolved and 
mycologic examinations were negative (Figs. 2 and 3).

**DISCUSSION**

Defective epidermal differentiation and cornifi-
cation are observed in various skin disorders, pre-
dominantly ichthyoses, a group of skin diseases 
characterized by generalized scaling of the skin 
(3). Dermatophytes are keratinophilic fungi able 
to infect keratinized tissues of human or animal 
origin, leading to infections that are mainly restrict-
ed to the corneocytes of the skin, hair and nails. 
These filamentous fungi are usually identified on 
the basis of clinical features, direct microscopic 
examinations, and by culture (4). The majority of 
dermatophyte infections in humans and animals 
are caused by *Trichophyton rubrum*, followed by 
*T. mentagrophytes* (5,6). Infections are usually lo-
calized and display characteristic clinical features. 
Besides pathogen-associated virulence factors, 
several host conditions are associated with an 
increased prevalence of dermatophytosis (2). In 
several studies of chronic dermatophytosis, the 
prevalence of genetic ichthyosis in the form of 
IV and atopy was observed (2,7-9). In an Indian 
study (10) of chronic dermatophytosis, IV was 
observed in 25% of patients. The most common 
 systemic association was atopy in 7.3% of cases. 
The association between atopy and chronic infec-
tion by dermatophytes is well documented down 
to the molecular level (11). It has been proposed 
that immune abnormalities in the atopic skin (a 
shift from T-helper Th1 to Th2 response) might 
be responsible for the higher prevalence and se-
verity of dermatophyte infections in such patients 
(5,11-13). However, in his study, Kaaman (1988) 
has concluded that atopy alone may not be the 
major contributory factor in chronicity (14). Atopy 
and barrier defects like those in ichthyoses are 
known risk factors for dermatophytosis (11). It is 
thought that due to excessive keratin production, 
ichthyotic skin provides a more favorable habitat 
for fungi than normal skin (5,10). It is also seen 
in other patients that an abnormal process of 
keratinization itself may increase the chance for 
dermatophyte infection. Several studies report 
an increased prevalence of dermatophytosis in 
patients with isolated disorders of keratinization 
such as palmar and plantar hyperkeratosis and 
KID (keratitis, ichthyosis, deafness) syndrome.
The amount of keratin is considered the most important factor for dermatophytosis affinity for palms and soles.

We present a case of a young woman in which the diagnosis of ichthyosis vulgaris and atopic dermatitis precluded recognition of widespread dermatophyte infection for more than six months. Similar experience has been described by Sheetz and Lynch, where fungal infection proceeded unrecognized for many years and all aspects of scaling were assumed to be caused by ichthyosis (19). Another two reports suggest that dermatophyte infection is rarely recognized in patients with congenital ichthyosis (20,21).

**CONCLUSION**

The dermatophyte infection presented in this report was initially misdiagnosed because of its atypical clinical aspect and widespread localization. The relationship of fungal infection and ichthyosis vulgaris, although worthy to note, is infrequently reported. Therefore, tinea should always be excluded, especially in patients suffering from ichthyosis and atopy widespread erythematous plaques.

**References**