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SHORT COMMUNICATION / COMMUNICATION COURTE

Epidemiology of onychomycoses assessed by histomycology in psoriatic patients

Épidémiologie des onychomycoses évaluées par histomycologie chez des patients psoriasiques

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Received 19 January 2006; accepted 9 June 2006

Available online 21 August 2006

KEYWORDS

Dermatophyte;
Mould;
Yeast;
Histomycology;
Onychomycosis;
Nail;
Psoriasis

Abstract Onychomycosis is a common condition in the adult population. It has been reported to be more prevalent in association with some specific diseases including psoriasis. This study using combined histomycology and cultures was performed on nail clippings collected from thickened dystrophic toenails in 233 eligible psoriatic patients. Onychopathies associated with psoriasis were more numerous in men. Their prevalence increased up to the age of 40 and remained stable thereafter. A total of 42/233 cases were diagnosed as onychomycoses. These infections were more prevalent in middle-aged men. The identified infectious agents (35/42 cases) frequently corresponded to dermatophytes, but *Candida albicans* was also implicated, particularly in women.

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MOTS CLÉS

Dermatophyte ;
Moississure ;
Levure ;
Histomycologie ;
Onychomycose ;
Ongle ;
Psoriasis

Résumé L'onychomycose est un état commun dans la population adulte. Cette affection est rapportée être plus fréquente en association avec quelques maladies particulières dont le psoriasis. Cette étude est réalisée sur la base de l'histomycologie et des cultures de fragments d'ongles dystrophiques collectés au niveau des orteils chez 233 patients psoriasiques. Les onychopathies associées à un psoriasis sont plus nombreuses chez les hommes. Leur prévalence, en augmentation jusqu'à la quarantaine, se stabilisent ensuite. Un total de 42/233 cas sont diagnostiqués comme des onychomycoses associées à un psoriasis. Ces infections voient leur prévalence maximale atteinte chez les hommes quadragénaires. Les agents infectieux identifiés (35/42 cas) correspondent fréquemment à des dermatophytes, mais *Candida albicans* est aussi impliqué, particulièrement chez les femmes.

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Introduction

Nails of psoriatic patients often show alterations in their structure [8,23]. The most typical changes consist of subungual hyperkeratosis, nail pitting, yellowish discoloration and onychorrhexis. In some cases, the clinical presentation may mimick onychomycosis. In addition, psoriatic onychopathy and onychomycosis may also coexist. Indeed, many epidemiological surveys have suggested that the prevalence of onychomycosis was higher in psoriatic patients than in non-psoriatic individuals [12,15,16,18,27,28]. Mycopsoriatic onychopathy has been reported to be more frequent with increasing age, and to be 2.5 times higher in men than in women [12]. Most cases of mycopsoriatic onychopathy affect toenails and are due predominantly to dermatophytes [12,18,28]. The strong implication of yeasts was also suggested [28]. Non-dermatophyte molds were found prevalent in another study [27].

The diagnosis of onychomycosis requires laboratory examinations [4]. The combination of fungal culture and KOH preparation is routinely performed. However, the diagnostic accuracy of this procedure is not ideal [26,30]. Histomycology combining the histological examination of nail fragments and culture shows higher diagnostic sensitivity and specificity [10,17,20-22,24-26,29,30]. This refined procedure was never used previously to study mycopsoriatic onychopathy.

The aim of the present study was to revisit the prevalence of fungal invasion of psoriatic nails and to investigate the causative pathogens using the combination of nail histomycology and fungal cultures.

Patients and methods

Patients

This prospective study was performed for 5 years starting in January 2001. It was conducted according to the Declaration of Helsinki and its subsequent amendments. During routine examination of psoriatic outpatients eligible for PUVAtherapy, 271 adults aged from 23 to 72 years exhibited toenail changes characterized by marked thickening, brittleness and discoloration. A total of 38 of these patients who were diabetic or had received an antifungal treatment during the past 6 months were not included in this study.

Methods

Nail clippings were collected from the most severely affected toenails after wiping them with alcohol. They were submitted to histomycology and fungal culture as previously described [4,20-22,24,25]. In short, the unfixed nail samples were sliced in the laboratory. Some of the slices were further fragmented and put in culture on Sabouraud medium (Mycoline®, BioMerieux, Marcy l'Etoile, France). Other slices were embedded in agar for histomycology. After trimming, they were soaked in Tween 40 in order to soften the nail structure. This material was cut with a microtome to prepare 6 µm-thick histological sections. They were processed with the periodic-acid Schiff staining

in order to reveal fungi inside the nail plate. The diagnosis of onychomycosis was given when histomycology was positive, and onychodystrophy was considered when this evaluation revealed no fungi. The diagnostic histomycological criteria were described in previous studies [4,20-22,24,25]. In particular, finding yeasts only in nail cracks was considered to merely represent contamination or colonization. By contrast, the combination of yeasts and invasive pseudo-filaments was interpreted as a true nail infection. Non-dermatophyte molds were recorded when the same fungus grew from most nail fragments at culture and when nail histomycology was consistent with this type of infection.

Onychomycoses were identified according to the nature of the fungi growing at culture. They were thus classified as dermatophyte, yeast or non-dermatophyte mold onychomycoses. Some onychomycoses found at histomycology remained unidentified because the culture remained negative. This condition suggested the presence of a dead portion of the fungal mycelium in the sampled nail clipping.

Data were gathered according to the gender and age of the patients. They were expressed as total numbers and percentages. Differences in nail disorder prevalence according to the gender were assessed using the χ^2 test and variance analysis. Differences were considered significant when the *P*-value was lower than 0.05.

Results

The gender and age distribution of the 233 eligible psoriatic patients with onychopathies (137 men and 96 women) are presented in Fig. 1. The prevalence of psoriatic onychopathy increased in young men until about 40 years of age ($P < 0.01$), and remained stable in the following decades of life. By contrast, the prevalence in women steadily increased with age ($P < 0.01$), and constantly remained lower than in men.

Among the 233 cases of psoriatic onychopathy, 42 mycopsoriatic onychopathies were diagnosed using histomycology. Their age and gender distributions are presented in Fig. 2. In general, affected men outnumbered women. In both genders, the prevalence of mycopsoriatic onychopathy increased with age in young adults, and fell after the age of 50 ($P < 0.01$).

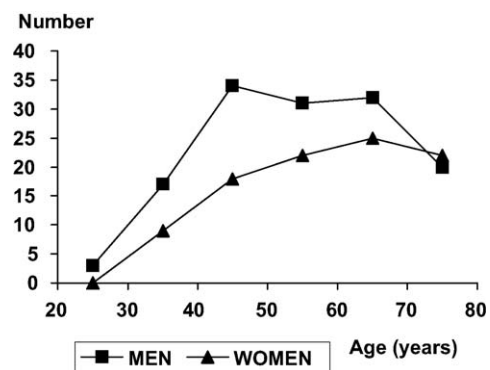


Figure 1 Age- and gender-related prevalence of onychopathy in psoriatic patients ($N = 233$).

Figure 1 Prévalence de l'âge et du sexe dans les onychopathies chez des patients psoriasiques ($n = 233$).

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