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ORIGINAL ARTICLE/ARTICLE ORIGINAL

Updating the epidemiology of dermatophyte infections in Palestine with special reference to concomitant dermatophytosis

Mise à jour de l'épidémiologie des infections à dermatophytes en Palestine avec une référence particulière à la dermatophytose concomitante

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Recurrence

Summary
Objective. — To determine the epidemiology of dermatophytosis in Palestinian patients, detect changes in the etiological agents during the last three decades, and to correlate between concomitant tinea pedis infections, and other cutaneous lesions.
Materials and methods. — 220 suspected dermatophytosis patients were involved in this study. In an additional 38 cases, where consultation was prompted by tinea pedis, the presence of other lesions of concomitant dermatophytosis was studied, to further investigate the diagnosis. Clinical specimens were collected and identification of dermatophyte species was based on gross and microscopic morphology.
Results. — Epidemiology of tinea capitis has gone the most radical changes in Palestine in the last three decades, with the zoophilic dermatophyte *Microsporum canis* replacing *Trichophyton violaceum*, becoming the predominant causative agent. During this study, 21.6% (38/176) patients with tinea pedis and concomitant lesions caused by the same dermatophytes at sites distant from the primary lesions in the foot were prospectively identified. About 63.2% of

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patients with tinea pedis have a concomitant toenail onychomycosis infection.
Conclusions. — The epidemiology of dermatophytosis, especially tinea capitis, has gone the most radical changes in Palestine in the last three decades, with *M. canis* replacing *T. violaceum*, and becoming the predominant causative agent of all cases of infections. The coexistence of tinea pedis with other types of fungal skin infections is a frequent phenomenon; we believe that the infected foot may be a site of primary infection. Thus, the effective therapy for tinea pedis is essential to prevent spreading the infection to other sites of the skin.

MOTS CLÉS
Dermatophytosis ;
Les lésions multiples ;
Onychomycos ;
Dermatophytose concomitante ;
Récurrence

Résumé
Objectif. — Pour déterminer l'épidémiologie des dermatophytoses chez les patients palestiniens, détecter les changements dans les agents étiologiques au cours des trois dernières décennies, et de rechercher une corrélation entre les infections tinea pedis et d'autres lésions cutanées.
Méthodes. — Au total, 220 patients suspectés de dermatophytose ont participé à cette étude. Dans 38 cas supplémentaires, où la consultation serait suscitée par la tinea pedis, la présence d'autres lésions de dermatophytose concomitante a été étudiée afin d'approfondir le diagnostic. Les échantillons cliniques ont été recueillis et l'identification des espèces de dermatophytes a été basée sur la morphologie macroscopique et microscopique.
Résultats. — Épidémiologie de la tinea capitis a connu des changements les plus radicaux en Palestine dans les trois dernières décennies, avec le dermatophyte zoophile *Microsporum canis* remplacant *Trichophyton violaceum* pour devenir l'agent causal prépondérant. Au cours de cette étude, 21,6 % (38/176) des patients avec tinea pedis et des lésions concomitantes, causées par les mêmes dermatophytes à des sites distants des lésions primaires dans le pied, ont été prospectivement identifiés. À peu près 63,2 % des patients atteints de tinea pedis ont une onychomycose concomitante.
Conclusions. — L'épidémiologie des dermatophytes, notamment la tinea capitis, a connu des changements radicaux en Palestine au cours des trois dernières décennies, avec le remplacement de *T. violaceum* par *M. canis* devenant l'agent causal prépondérant de tous les cas d'infections. La coexistence de tinea pedis avec d'autres types d'infections fongiques de la peau est un phénomène fréquent ; nous croyons que le pied infecté peut être un site d'infection primaire. Ainsi, le traitement efficace de tinea pedis est essentiel pour éviter de propager l'infection à d'autres sites de la peau.

Introduction

Dermatophytoses are common worldwide and are believed to affect about 25% the world population [13]. They are typically caused by dermatophytes, which vary with geographic regions. Some species (e.g., *Trichophyton rubrum, Trichophyton mentagrophytes, Microsporum canis*, and *Epidermophyton floccosum*) are distributed worldwide, whereas others have partial geographic restriction (e.g., *Trichophyton schoenleinii, Trichophyton soudanense, Trichophyton violaceum*, and *Trichophyton concentricum*) [7].

Most cases of tinea pedis, tinea cruris, onychomycosis, and tinea corporis, are caused by *T. rubrum*, which is the prevailing dermatophyte in most developed countries and in most urban areas of some developing countries and is likely to remain the dominant dermatophyte worldwide [8,11,14].

The epidemiology of dermatophyte infection is likely to alter with changing patterns of migration, growth in tourism, and changes in socioeconomic conditions. Such changes to the epidemiology of causative agents are thought to be a reflection of changing patterns of dermatophytosis. For example, a century ago, tinea capitis was the principal dermatophytosis worldwide, but the last few decades of the 20th century witnessed a global increase in tinea pedis and a spread of one major etiologic agent, *T. rubrum* [7,15]. This phenomenon is likely to be due to increases in urbanization and the use of sports and fitness facilities, the growing prevalence of obesity, and the aging population. Tinea pedis, often transmitted by autoinoculation, is thought to be an important reservoir for dermatophytosis in other parts of the body (e.g., onychomycoses, tinea cruris, tinea corporis) [9]. Szepietowski et al. [20] reported that tinea pedis was the most common concomitant dermatophytosis; about one-third of patients with tinea pedis have a concomitant toenail onychomycosis infection.

Improvements in living conditions have generally been associated with a decline in zoophilic dermatophyte and an increase in anthropolic dermatophyte infections. The epidemiology of tinea capitis and tinea pedis (together with onychomycosis) has gone the most radical changes. Epidemiologic changes in the prevalence of tinea corporis, tinea cruris, tinea manuum, and tinea faciei have been less extensively studied. Their prevalence and the dermatophytes responsible for causing them reflect local trends in tinea capitis and tinea pedis, which are thought to be the source of infection [7].