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ORIGINAL ARTICLE/ARTICLE ORIGINAL

# Epidemiological trends of dermatophytosis in Tehran, Iran: A five-year retrospective study



*Tendances épidémiologiques des dermatophytoses à Téhéran, Iran : étude rétrospective sur cinq ans*

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## KEYWORDS

Dermatophytosis;  
Clinical epidemiology;  
*Trichophyton*;  
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*Epidermophyton*;  
Iran

## Summary

**Objective.** – Dermatophytosis is the most frequent fungal infection all over the world and its frequency is constantly increasing. The aim of this study was to evaluate clinical features and epidemiological trends of dermatophytosis over the years 2010 to 2014 in Tehran, Iran.

**Patients and methods.** – A total of 13,312 patients clinically suspected of cutaneous fungal infections were examined. Skin scales, plucked hairs, nail clippings and sub-ungual debris were examined by direct microscopy and culture. Dermatophyte species were identified at the species level by a combination of morphological and physiological criteria.

**Results.** – Direct microscopy confirmed a contamination rate of 19.7% (2622/13,312 cases) of which 1535 cases (58.5%) were culture positive distributed in male (1022 cases) and female (513 cases). The most commonly infected age group was the 30–39 years old. *Tinea pedis* (30.4%) was the most prevalent type of dermatophytosis followed by *tinea cruris* (29.8%) and *tinea corporis* (15.8%). *Epidermophyton floccosum* (31%) was the most prevalent causative agent, followed by *Trichophyton rubrum* (26.2%) and *Trichophyton mentagrophytes* (20.3%).

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**MOTS CLÉS**

Dermatophytose ;  
Épidémiologie clinique ;  
*Trichophyton* ;  
*Microsporum* ;  
*Epidermophyton* ;  
Iran

**Conclusion.** — Our results showed considerable distribution of dermatophytosis from zoophilic, anthropophilic and geophilic species among population with diverse age groups. Although anthropophilic fungi such as *T. mentagrophytes*, *E. floccosum*, and *T. rubrum* were the main etiologic agents of dermatophytosis, the prevalence of *T. verrucosum* showed a meaningful increase over the years, which highlights the importance of rural dermatophytosis mainly transmitted from large animals. This noticeable information improves our current knowledge about dermatophytosis and assists to establish effective prevention and therapeutic strategies to overcome the disease.

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**Résumé**

**Objectif.** — La dermatophytose est l'infection fongique la plus fréquente dans le monde et sa fréquence augmente constamment. Le but de cette étude était d'évaluer les caractéristiques cliniques et les tendances épidémiologiques de la dermatophytose au cours des années 2010 à 2014 à Téhéran, Iran.

**Patients et méthodes.** — Un total de 13 312 patients cliniquement suspects pour des infections fongiques cutanées ont été examinés. Squames cutanées, poils épilés, fragments d'ongles et de débris sous-unguéaux ont été examinés au microscope et cultivés. Les espèces de dermatophytes ont été identifiées sur des critères morphologiques et physiologiques.

**Résultats.** — La microscopie directe a confirmé un taux de 19,7 % (2622/13 312 cas), dont 1535 cas (58,5 %) étaient positifs à la culture. Le sex-ratio mâles/femelles était de 1022/513. Le groupe d'âge le plus souvent infecté était de 30–39 ans. Tinea pedis (30,4 %) était le type le plus répandu de la dermatophytose suivie par tinea cruris (29,8 %) et tinea corporis (15,8 %). *Epidermophyton floccosum* (31 %) était l'agent causal le plus répandu, suivi de *Trichophyton rubrum* (26,2 %) et *Trichophyton mentagrophytes* (20,3 %).

**Conclusion.** — Nos résultats ont montré la distribution considérable de dermatophytose des espèces zoophiles, anthropophiles et géophiles parmi la population avec des groupes d'âge divers. Bien que les champignons anthropophiles tels que *T. mentagrophytes*, *E. floccosum* et *T. rubrum* ont été les principaux agents étiologiques de dermatophytose, la prévalence de *T. verrucosum* a montré une augmentation significative au cours des années mettant en évidence l'importance de la dermatophytose rurale principalement transmise par des grands animaux. Cette information notable améliore nos connaissances actuelles sur la dermatophytose et aide à proposer une prévention efficace et des stratégies thérapeutiques pour vaincre la maladie.

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**Introduction**

Dermatomycoses are considered as one of the most frequent superficial infections affecting public health worldwide [1]. Mycotic dermal infections are caused primarily by keratinophilic fungi of the dermatophyte family, the yeast species of the genera *Candida* and *Malassezia*, and more rarely by other mold and yeast species [29]. Since dermatophytes are the major pathogens causing dermatomycoses, the following article will focus on this group of pathogens.

The dermatophyte family includes over 40 species assigned to 3 genera: *Trichophyton* (skin, nail and hair), *Microsporum* (skin and hair) and *Epidermophyton* (skin and nail) [1,5,7,9,25,31]. They are able to infect the hair, nails and skin and are divided according to the source of infection into anthropophilic, zoophilic and geophilic species [8,25,28]. Members of all three groups can cause human infection. Dermatophytosis includes several distinct clinical manifestations. The severity of the disease depends on the strain or the species of infecting fungus, the sensitivity of the host and the site of infection. The pathogenicity of fungal strains is different; for example, one strain of *M. gypseum* was poorly pathogenic and another produced typical dermatophyte

lesions after local infection [17,41,42]. It is believed that the causative agents of dermatophytoses have affected 20–25% of the world population and the disease is increasing every year [7,23,25,35,38].

A number of factors may contribute to this rise. First, as the population ages, there is a corresponding increase in chronic health problems particularly diabetes and poor peripheral circulation. Second, the number of persons who are immunocompromised (because of infections with human immunodeficiency virus and the use of immunosuppressive therapy, cancer chemotherapy or antibiotics) continue to expand. Third, better antibiotic therapy, leading to increased survival of patients who are predisposed to fungal infections, as well as inappropriate antibiotic therapy disrupting the normal microbial flora on the skin and mucosal surfaces. Fourth, avid sports participation is increasing the use of health clubs, commercial swimming pools and occlusive footwears for exercise [30,40].

The distribution of dermatophyte infections and their causative agents varies depending on geographical region and is influenced by a wide range of factors, such as seasonal migration, international travel, extreme weather, natural disasters, climatic factors and drug therapy [23]. In addition,

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