

Clinico-mycological Profiles of Dermatophytosis in Gorgan, North of Iran

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Abstract

Background: Dermatophytes are a group of closely related fungi that invade keratinized tissues (skin, hair and nails) of humans and animals and produce infections called dermatophytosis. Our objective was to determine causative agents of dermatophytosis in Gorgan, North of Iran.

Methods: Data was based on collecting specimens from 1108 patients clinically suspected to have fungal infection during five years from 2003 through 2007. Specimens were collected from hair, nail and skin and were investigated by direct examination and cultured in Sabouraud dextrose agar. Fungal colonies were identified by macroscopic and microscopic examination and supplementary tests.

Results: 351 samples out of 1108 were positive for dermatophytes and 277 ones had positive cultures. *Epidemophyton floccosum* was the most frequent species (70.4%) followed by *Trichophyton rubrum* (14.5%) and *Microsporum audouinii* (7.2%). Regarding the location of the lesions, groin and nails were the most frequent sites that developed dermatophytosis in the majority of the patients.

Conclusion: Dermatophytosis is probably still one of the most infectious diseases in Iran. The anthropophilic (*E. floccosum*) and zoophilic (*T. rubrum*) species were the most common causes of dermatophyte of tinea in Gorgan, north of Iran. The frequency of tinea was higher in females and tinea cruris showed a remarkably increasing rate and can be an important public health issue in Gorgan. (*Iran J Dermatol* 2009;12: 13-15)

Keywords: dermatophytes, dermatophytosis, epidemiology, Gorgan, Iran

Introduction

Dermatophytosis is an infection of the skin, hair or nails caused by dermatophytes, a group of related filamentous fungi also known as ringworm fungi.¹ They can be divided into three groups of anthropophilic, zoophilic and geophilic depending on their natural habits and host preferences. Fungi in all three categories may cause human infections.¹ These organisms, which attack the keratinized tissue of living host, are classified into three genera of *Epidemophyton*, *Trichophyton* and *Microsporum*.² The prevalence of dermatophytoses varies in different geographical locations. Many epidemiological studies have investigated the prevalence of fungi responsible for superficial mycoses in different regions of the world and many parts of Iran.^{1,4} The immigration of labour, troop movements, emigrations and other travelings have

played important roles in spreading these fungi.⁵ This study was undertaken to determine the prevalence and etiological agents of dermatophytosis and site of the infection among the patients of Gorgan, north of Iran.

Patients and Methods

A total of 1108 specimen were collected from patients clinically suspected to have fungal infection during five years from 2003 through 2007. An informed consent was obtained from all human adult participants and from the parents or legal guardians of minors and the study was approved by ethics committee of Golestan University of Medical Sciences. Materials were collected from hair, nail and skin and investigated by direct examination and cultured in Sabouraud dextrose.

Fungal colonies were identified by macroscopic and microscopic examination and supplementary tests. A portion of each sample was examined microscopically by KOH 10-20%. The cultures were incubated at 25°C for one to three weeks. Then, the frequency of each causative dermatophyte was calculated.

Results

A total of 351 cases of dermatophytosis from 1108 patients were diagnosed by direct examination and 277 cases were confirmed by culture. The patients consisted of 143 females and 134 males with an age range of 2 months to 78 years and a mean age of 31.4 ± 6.2 years. Tinea cruris was the most frequent clinical feature with 66 cases (23.8%) followed by tinea unguium with 53 cases (19.1%), tinea corporis with 47 cases (17%), tinea pedis with 46 cases (16.6%), tinea manuum with 25 cases (9%), tinea capitis with 21 cases (7.5%), and tinea faciei with 19 cases (6.8%).

Six species from three genera of dermatophytes were identified. *Epidermophyton floccosum* (195, 70.4%) was the most frequently causative agent of dermatophytosis. The other dermatophytes were identified as *Trichophyton rubrum* (40, 14.5%), *violaceum* (34, 12.3%), *Microsporum audouinii* (20, 7.2%), *Trichophyton mentagrophytis* (13, 4.7%), other *Trichophyton* specie (5, 1.8%), and other *epidermophyton* specie (4, 1.4%).

E. floccosum from groin, foot and body, *T. rubrum* from nail and body, and *T. mentagrophytis* from nail were the most frequently isolated fungi from different sites of tinea infection as shown in table 1.

Discussion

The dermatophytes are among the commonest infectious agents of human and no person or geographic area is free of them². Our data revealed that the anthropophilic fungi were the major cause of dermatophytosis in our area. Humans are the normal hosts for this group and transmission may occur by direct contact or

indirectly by fomites.² However, host factors such as immunologic status and local factors such as trauma, excessive moisture or occlusive clothing may constitute risk factors when combined with exposure to the etiologic fungi². The most frequent types of dermatophytosis in the world are tinea capitis, tinea cruris, tinea pedis and tinea unguium (onychomycosis)².

According to the anatomic sites of dermatophytosis infection, tinea corporis in Baroda, an area in the Republic of Yemen and south of Tehran^{4,6,7}, tinea pedis in Goiania³, and tinea capitis in Isfahan and Sociedade Brasileira^{8,9} were the predominant clinical forms of dermatophytosis. In our study, like the other studies in Khuzestan and also Karaj in Iran^{1,5}, the most common clinical feature of ringworms was tinea cruris. It seems that excessive moisture in this region, exercises, crowded places, low level of personal hygiene and type of clothes and shoes might be the major causes and risk factors for this problem.

The most frequently isolated dermatophytes in Goiania, Baroda, Poland, Sociedade Brasileira and Yemen were *T. mentagrophytes*, *T. violaceum*, *M. canis* and *T. rubrum*, respectively^{3,6,7,9,10}. The major dermatophytes involved in human infection in the world are *T. rubrum* and *T. mentagrophytes*, followed by *T. tonsurans*, *E. floccosum* and *M. Canis*². In two epidemiological studies in Karaj and Khuzestan^{1,5} and according to our study, *E. floccosum*, an anthropophilic species, was the most common etiological agent of dermatophytosis; However in Isfahan, center of Iran, *T. verrucosum* was the dominant agent⁸. It seems that *E. floccosum* has gradually become the dominant agent of dermatophytosis in these areas.

Tinea cruris is most commonly caused by *T. rubrum* worldwide, followed by *E. floccosum* and *T. Mentagrophytes*², but in our study, *E. floccosum* was the dominant agent of tinea cruris. Tinea pedis is most commonly caused by *T. rubrum* in Goiania of Brazil and Yemen^{3,7}, but *T. mentagrophytes* was the dominant agent in Isfahan⁸. Compared to these reports, *E. floccosum* was the dominant agent of

Table 1: Distribution and frequency of dermatophyte species by site of infection

Species	Site of infection							Total
	Foot	Hand	Body	Nail	Groin	Head	Face	
<i>E. floccosum</i>	46	25	44	-	62	-	18	195
<i>T. rubrum</i>	-	-	2	38	-	-	-	40
<i>T. mentagrophytes</i>	-	-	-	13	-	-	-	13
<i>M. audouinii</i>	-	-	1	-	-	18	1	20
<i>E. specie</i>	-	-	-	2	2	-	-	4
<i>T. specie</i>	-	-	-	-	2	3	-	5
Total	46	25	47	53	66	21	19	277

tinea pedis in our study as the reports from Karaj and Khuzestan^{5,1} and *T. rubrum* was the most prevalent species causing tinea unguium in our study as a report from Poland¹¹. Tinea capitis is most commonly caused by *M.canis* and *M.audouinii* ² worldwide. In our study, *M.audouinii* was the commonest agent of tinea capitis; therefore, this agent should be considered in the management of these patients. In contrast to the study in Baroda⁶, female to male ratio was >1 in our study. In this study, as other similar researches in this area, adults were the commonest group of patients.

This is the first report of dermatophytosis in Gorgan, north of Iran. Since immigrant people with different traditions and cultures comprise most of the population in this area and due to the proximity of the city and villages in this region, people migrate from villages to this area. This condition could affect the fungal fauna and the distribution of new species. Improvements in public health care and self-hygiene may play an important role in controlling these diseases

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