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Prevalence and Etiological Agents of Cutaneous Fungal Infections in Milad Hospital of Tehran, Iran.

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Abstract

The cutaneous mycoses are superficial fungal infections of the skin, hair or nails. This study was undertaken to determine the prevalence and etiological agents of cutaneous fungal infections among the patients admitted to the dermatology clinics of Milad Hospital of Tehran. A total of 201 patients clinically suspected to have cutaneous fungal infections were examined for causative fungal agents. Laboratory examination confirmed the diagnosis in 87 cases. Among dermatophytes species isolated, Epidermophyton floccosum in 11cases (12.2%) Trichophyton mentagrophytes in 10 cases (11/1%), Trichophyton .rubrum in 10 cases (11/1%) were the predominant dermatophytes. We also observed malassezia furfur in 16 cases (17/7%). Cutaneous candidiosis in 30 cases (33/3%) was found to be an important agent of fungal infection particularly in females involved in our study. According to the rate of anatomical site infections with tinea unginum, tinea corporis, tinea crusis and tinea pedis were the next prevalent. Dermatophytosis was more prevalent in females in comparison with males.

In conclusion, this study showed that dermatophytes were the most common cause of cutaneous fungal infections. Candidial infections were also common. However, other non-dermatophytes such as Malassezia furfur were involved in skin infections.

Introduction

Superficial fungal infections of the skin can be caused by dermatophytes, yeasts and non dermatophytes. Dermatophytes can be divided in three groups; anthrophilic, zoophilic and geophilic, depending on their natural habits and host preferences. Fungi in all three categories may cause

human infections [1]. Anthrophilic organisms are responsible for most fungal skin infections .Transmission can occur by direct contact or from exposure to desquamated cells. Direct inoculation through breaks in the skin may occur in persons with depressed cell immunity. Once fungi enter the skin; they geminate and invade the superficial skin layers [2]. These organisms, which attack the keratinized tissue of living hosts are classified into three genera of Epidemophyton, Trichphyton and Microsporium. However, non- dermatophytes fungi such as Malassezia furfura in tinea (pityriasis) versicolor and candida species in conditions such as perlech, vuvovaginitis or balanitis, are also potential causes [3]. Dermatophytosis and other cutaneous fungal infections are still being considered as the major public health problem in many parts of the world. Many epidemiological studies have investigated the prevalence of fungi responsible for superficial mycosis in different region of the word and Iran. However some factors such as immigrations of labor, troop movement, economical and health conditions may play important roles in spreading of these fungi [1]. Milad hospital is a 1000-bed hospital located in Tehran and has an active dermatology clinic. The aim of this study was to determine the etiologic agents and the frequency of the most common cutaneous fungal infection in this hospital.

Materials and Methods

From April 2006 to November 2006 specimens were taken from skin lesions of patients who were attending the dermatology clinics at Milad Hospital of Tehran. Specimens consisting of epidermal scales and infected hairs were scraped from the scalp/rim of lesions using a sterile scalpel blade following cleaning of the affected sites with 70 v/v isopropyl alcohol. The scrapings were collected on a piece of sterile Petri dish. Moist cotton swabs were used to collect pus from inflammatory lesions. The samples were divided into two portions: one for microscopic examination and one for culture [4]. A portion of each sample was examined microscopically by KOH 10-20% and lactophenol cotton blue solutions. The other portion was cultivated on Sabouraud's dextrose agar and mycosel agar. The cultures were incubated at 25°C for one to three weeks. Identification of the etiological agents performed based on the gross morphology of the fungal colony (texture, color, surface and reverse pigment, topography), rate of colony growth and microscopic characterization of their conidia (type of macroconidia, shape and size of microconidia) and accessory structures, using slide culture method. Candida albicans isolates were tested for germ tube production in human serum and confirmed by using chromoagar. Laboratory identification of Malassezia furfur is usually made by direct examination of skin scrapings from the infected site. Microscopic examination shows clusters of small, thick-walled, round blastoconidia with mycelial fragments. The combination of round blastoconidia and mycelia gives an appearance called "spaghetti and meatball" effect. Cultures are usually unsuccessful and not required to establish a diagnosis of tinea versicolor. [3,4]

Results

Specimens were taken from 201 patients presenting with superficial mycosis during our study. Diagnosis was confirmed by direct microscopic examination and culture. Of the 201 patients 87(43.28%) patients had cutaneous fungal infections. Of those 87 patients 53 were females and 34 were males. From the total fungal isolates dermatophytes species accounted for 36 cases, candida 30 cases and non- dermatophytes 6 cases. Of the 36 cases with dermatophytes, E. floccosum, T. mentagrophytes and T. rubrum were the predominant species and it was the major causative agent in tinea corporis especially in glabrous skin such as chest, neck and back. We observed microscopically M. furfur in 16 cases of pityriasis versicolor. The frequency of ring worm infections among patients attending the Dermatology Clinics were tinea unguium (34 cases), tinea cruris (16 cases), tinea corporis (20 cases), tinea pedis (13 cases) and others (3 cases). Eight of the patients were diabetic;

four of them had dermatophytes as the causative agent and in the other four candida albicans was isolated from their skin lesions. Superficial candidiasis was mainly due to C. albicans and other candida spp. The commonly affected sites were nails 18 cases and feet 7cases (P-value <0.05)

Fungi	Frequency	%
Epidermophyton floccosum	11	12.20%
Trichophyton mentagrophytes	10	11.11%
Trichphyton rubrum	10	11.11%
Trichphyton tonsurance	2	2.20%
Trichophyton schoenline	1	1.10%
Trichphyton violaceun	1	1.10%
Microsporum canis	1	1.10%
Scopolariopsis	4	4.40%
Rodotorula	2	2.20%
Fusarium	1	1.10%
Malassezia furfur	16	17.70%
Acromonium	1	1.15
Canids albicans	15	16.60%
Candida spp	15	16.60%

Table 1: Frequency of fungi isolated from patients specimen

Species	T.unginum	T crusis	T.corporis	T.pedis	T. faciei	others
Dermatophytes	10	12	5	6	-	-
Malassezia furfur	-	-	14	-	2	-
Non-dermatophytes	6	-	-	-		
Candida species	18	4	5	7	1	3

Table 2: Anatomic site distribution of dermatophytes and non-dermatophytes isolated from patients with ringworm infections.

Discussion

Fungi are everywhere and no geographical area or any group of people is spared by this organism [5] In Iran superficial mycosis are the prevalent fungal disease. However study of causative agents and epidemiology aspects of diseases useful to determine the size of the problem, prevention of the disease and establishment of treatment protocol [6,7]. Certain factors may influence the distribution of fungal infections. These factors included environmental condition, age

and sex. In our study we found that the highest incidence of infections occurred in females same as it has been shown in other studies [8].

In our study among dermatophytes, Epidermophyton floccosum, Trichophyton mentagrophyte and Trichophyton rubrum were the predominant dermatophytes. The results of our study agree with other studies which were carried out in other parts of our country such as Qazvine province and Tehran [9,10,11]. However in other studies there was some differences in frequency of isolated dermatophytes. This may be due to environmental, climate, cultural, sex, age and health features [12,13].

Malassezia furfur species was the other predominant yeast that we observed microscopically. The most common isolates (14 cases) were from upper and lower limbs, neck and trunk. Yeasts of the genus Malassezia belong to the normal microflora of the human skin. In addition they are known be linked to a variety of skin diseases such as seborrheic dermatitis, dandruff, Malassezia folliculitis and atopic dermatitis of the head and neck region [14,15].

Cutaneous candidiosis was found to be an important agent of fungal infection particularly in females involved in our study. Candida species had a high frequency of isolation. Our study agrees with other studies that suggest that cutaneous candidiasis may be as important as dermatophytes, particularly in women [4].

Isolation of other non-dermatophytes such as Scolaropsis, Rodotell, Fusorium and Acromonium may be due to the ubiquitous of their spores in our environment, carried transiently on healthy skin. Cutaneous infections caused by these fungi are often associated with debilitating disease.

In conclusion, this study showed that dermatophytes were the most common cause of all culture positive cutaneous fungal infections. However other non-dermatophytes, including Malassezia furfur and candida species were also involved in skin infections.

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