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PREVALENCE OF DERMATOPHYTIC INFECTIONS IN KARACHI, PAKISTAN DURING THE YEAR 2003-2004

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Abstract

A study was carried out using clinical material from patients having dermatophytic infection of hair, skin and nails in Karachi during the year 2003-2004. Of the 90 samples collected from the Institute of Skin Diseases, Karachi, 51 (30 males and 21 females) were found positive for dermatophytic infections, all belonging to the genus *Trichophyton*. Of the five species isolated and identified, *Trichophyton violaceum* 21 (41%) was found to be the most prevalent followed by *T. rubrum* 14 (27%), *T. tonsurans* 9 (18%), *T. verrucosum* 6 (12%) and *T. mentagrophytes* one (2%). The incidence of infection was seen to be the highest in patients of the age of 20 years.

Introduction

Infection by dermatophytes, which include the species belonging to the genera *Microsporum*, *Trichophyton* and *Epidermophyton* are common all over the world (Kane, 1997). From an epidemiologic point of view they are divided into Anthropophilic, Zoophilic and Geophilic species whose normal habitat are man, animal and soil respectively (Weitzman & Summerbell, 1995). The prevalence of different species of dermatophytic fungi are different all over the world (Rahim, 1996; Flammia *et al*., 1995; Yehia, 1980; Davise Honig Larone, 1976). In the present study, samples from patients suspected of having dermatomycoses were collected from the Institute of Skin Diseases, Karachi. The epidemiology of infection and prevalence depending on sex, age and district were found. Samples were collected in sterile Petri plates and inoculated on mycobiotic agar medium. Growth appearing on the plate was then isolated and identified.

Materials and Methods

Sample collection: All samples of skin scraping, nails, hair and scalp were collected from the Institute of Skin Diseases, Saddar, Karachi over a period of four months i.e., from June until September, 2003. Skin samples were collected from the periphery of the zone of suspected dermatophytic infection by scrapping the skin with sterile scalpel. A Petri plate was held close to that area so that the separated skin falls on the Petri plate, which was immediately replaced with the lid. Nail samples were collected in sterile Petri plates by using sterilized nail cutter and were then inoculated in media. Also, a couple of nail samples were kept in tubes containing 10% KOH solution for microscopy. Hairs were plucked from the infection site using sterile forceps.

Direct microscopic identification: This was done using (10-20%) KOH preparations. Sufficient amount of sample in a drop or two of KOH solution on a clean glass slide after passing over flame 2-3 times revealed any fungal hyphae present as highly refractile, hyaline, septate, branched or unbranched hyphae and anthroconidia in hair or on outside or inside of hair shaft or as hyphae with bubbles and tunnels.

Culturing and incubation: Sabourauds Dextrose agar (SDA) with chloramphenicol and cycloheximide was used. Pieces of skin, hair and nail were directly placed on the surface of the agar slants. Culture tubes were incubated at 35°C and any growth was observed in 2-3 weeks time. On appearance of fungal growth, its colonial and microscopic morphology was observed (Davise Honig Larone, 1976; Bailey & Scott, 1994; Topley & Wilson, 1996)

Physiological tests

***In Vitro* hair perforation test:** This test differentiates *T. mentagrophytes* from *T. rubrum. T. mentagrophytes* perforates hair *in vitro* while *T. rubrum* does not (Davise Honig Larone, 1976; Topley & Wilson, 1996).

Production of urease: *T. rubrum* can be differentiated from *T. mentagrophytes* when inoculated on Christensen's Urea media. *T. rubrum* is urease positive while *T. mentagrophytes* is urease negative. Fluctuation of media color from straw to reddish purple indicates positive result.

Results

Of the 51 positive results, 30 (59%) samples were of males and 21 (41%) were collected from females. The five species isolated were of the genus *Trichophyton*. Of these 51 cultures 21 (41%) were cultures of *T. violaceum*, 14 (27%) of *T. rubrum*, 9 (18%) of *T. tonsurans*, 6 (12%) of *T. verrucosum* and one (2%) was of *T. mentagrophytes* (Table 1). *T. violaceum* was found to be the commonest cause of infection as also seen in some studies (Sutton *et al.*, 1998) though prevalence rates can be different (Junaid *et al*., 1974). The incidence rate of dermatophytic infections was seen to be highest in the age group of 0-10 and 11-20 years (Table 2). Patients reporting at the skin centre were mostly from east, west and central districts of Karachi (Table 3). *Tinea capitis* and *Tinea corporis* are the most prevailing dermatophytic infections in Karachi affecting more frequently males and children respectively.

Discussion

The objective of this study was to isolate and identify various dermatophytic species (fungi causing infection in nails, skin and hair) prevailing in Karachi. Due to severe itching and duration for longer periods, these infections cause discomfort to the patients (Rippon, 1988).

T. violaceum was the most commonly isolated organism in this study. *T. rubrum, T. tonsurans, T. verrucosum* and *T. mentagrophytes* also were isolated in varying percentages. Using colonial and morphological identification (Davise Honig Larone, 1976; Al Doory, 1980; St. Germain *et al.*, 1996; Collier *et al*., 1998), *Epidermophyton floccosum* and *Microsporum* species were not isolated, suggesting that they do not prevail in high percentages in our environment. Children (boys and girls both) and men (mainly the labor class) are among the most affected people. Men are earning members of the family and are more exposed to the outside environment so they are more predisposed. Children like to play in mud, with pet animals (cats, dogs and goats) from which they acquire infection. Contaminated tools at the barbershop also greatly contribute to infection specially in children of age group 2-10 years.

Table 1. Prevalence of dermatophytic isolates according to sex.

Sex	Number	Positive	Percentage	*Trichophyton violaceum*	*Trichophyton rubrum*	*Trichophyton tonsurans*	*Trichophyton verrucosum*	*Trichophyton mentagrophytes*
Male	47	30	59%	13	8	5	3	1
Female	43	21	41%	8	6	4	3	-
Total	**90**	**51**	**100%**	**21**	**14**	**9**	**6**	**1**

Table 2. Prevalence of dermatophytic isolates according to age.

Age	*Trichophyton violaceum*	*Trichophyton rubrum*	*Trichophyton tonsurans*	*Trichophyton verrucosum*	*Trichophyton mentagrophytes*
0-10	13	1	2	2	1
11-20	6	3	2	1	-
21-30	1	5	2	1	-
31-40	1	2	2	-	-
41-50	-	1	1	2	-
51-60	-	2	-	-	-

Table 3. Prevalence of dermatophytic isolates according to districts.

Districts	*Trichophyton violaceum*	*Trichophyton rubrum*	*Trichophyton tonsurans*	*Trichophyton verrucosum*	*Trichophyton mentagrophytes*
North	-	-	-	-	-
East	7	2	3	-	1
West	5	5	1	3	-
South	2	-	-	-	-
Central	3	4	2	2	-
Miscellaneous	4	3	3	1	-
Total	**21**	**14**	**9**	**6**	**1**

Awareness, cleanliness and hygiene must be given utmost importance, as also preached by our religion, so that not only dermatophytic but other infections will also find a sure drop in their incidence rates.

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