

Prevalence and Distribution of Some Dermatophytosis in Relation to Age and Sex of Patients in Minia, Egypt

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ABSTRACT: Common dermatophytosis in upper Egypt were studied at three hospitals in Minia city. *Tinea corporis* (ringworm of glabrous skin) was diagnosed in 127 patients (84 males and 53 females). *Trichophyton* was the most common genus and was represented by 6 species among which *T. violaceum* was the commonest fungus. *Microsporum* was represented by 4 species and *M. canis* was the prevalent species. *Tinea pedis* (ringworm of the foot) was noticed in 22 cases (13 males and 9 females) and also *Trichophyton* and *Microsporum* were the causal organisms. Three species of *Trichophyton* namely: *T. violaceum*, *T. kuryngi* and *Trichophyton* sp. were isolated. *Tinea cruris* (ringworm of the groin) was diagnosed in 21 patients (16 males and 5 females). *Epidermophyton floccosum* was the most prevalent fungus associated with *tinea cruris* whereas *Trichophyton* and *Candida* were less frequent. *Tinea unguium* (ringworm of the nail) was diagnosed in 9 patients, 8 were females and one was male and the age incidence ranged between 5 and 55 years. *M. canis* occurred in 2 cases and *T. mentagrophytes* in one case. Out of 86 cases of *tinea versicolor*, 71 were males and 15 were females. *Malassezia furfur* was the main causal agent. All patients of candidiasis and paronychia were females and *Candida* was the most prevalent causal agent.

KEYWORDS: Dermatophytosis, ringworm, prevalence, distribution.

Tinea corporis (ringworm of the glabrous skin), *tinea pedis* (ringworm of the foot), *tinea cruris* (ringworm of the groin), *tinea unguium* (ringworm of the nail), *tinea versicolor* and candidiasis and paronychia are common dermatophytosis diagnosed in three hospitals in Minia. *Tinea corporis* was reported from many countries including Jordan (Shtayah and Arda, 1985); Spain (Saez *et al.*, 1984) and in USA (Bronson *et al.*, 1983). In Egypt, the disease was reported in Cairo by El-Mazny *et al.* (1973) and in Assiut by El-Samalouty (1979).

Tinea pedis was recorded in India by Kumari *et al.* (1985); in Texas, USA by Eduardo *et al.* (1980) and in Assiut, Egypt by Abdel-Magid *et al.* (1988). *Tinea cruris* was described in Japan (Sato *et al.* 1984); in Kuwait (Almishari *et al.* 1986); and in Egypt by Khafagy, 1965 in Cairo, by Zeid *et al.*, 1980 in Alexandria and by Nasseem 1986 in Assiut.

Tinea unguium (onychomycosis) has been diagnosed in Srilanka (Attapattu, 1980); in Nigeria (Gugnani *et al.*, 1986) and in Colombia (Velez and Diaz, 1985). *Tinea versicolor* is caused by *Malassezia furfur* and is easily observed in epidermal scales, but is very difficult to culture (Emmons *et al.*, 1977). This disease was recorded in Germany by Salomo and Schirren (1985); in Italy by Caretta *et al.* (1981) and in USSR by Malyshev (1979).

Candidiasis and paronychia were reported from different parts of the world including; USSR by Stepanova *et al.* (1984); India by Amma *et al.*, (1984); and Southern New Zealand by Bridger (1979). In Egypt, and particularly in the upper part of the country, information regarding the dermatophytes of various mycotic human skin diseases are scanty. In this study we report on fungi involved in six common dermatophytosis in Minia governorate in upper Egypt.

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Materials and Methods

One hundred and thirty seven patients with tinea corporis, 115 with tinea versicolor, 24 with tinea pedis, 23 with tinea cruris, 10 with tinea unguium onychomycosis and 5 candidiasis and paronychia were studied. Specimens were collected from these patients at three hospitals in Minia city. Specimens for mycological study were obtained from the lesions, after wiping the surfaces with 70% ethyl alcohol to remove surface adhering organisms and dust from the skin. These were then packed in steril filter paper envelops, sealed and labelled. Care was taken to avoid contamination with tick scales which were mostly composed of debris and dirt but no fungal elements. Direct microscopic examination of KOH preparations was carried out Fungal isolations were performed on Sabouroud's dextrose agar medium (Moss and McQuown, 1969) supplemented with 20 I.U./ml sodium salt of penicillin, 40 µg/m dihydrostreptomycin and 0.05% cyclohexamide (actidione). Before adding to the agar, the first two antibiotics were dissolved separately in steril distilled water while the third dissolved in methanol. Plates were incubated at 28°C for 3-4 weeks and the developing colonies were examined and identified.

Results and Discussion

I-Tinea corporis: Males were more commonly infected, out of 137 cases of tinea corporis examined by direct microscope with 10% KOH, 127 cases (84 males and 53 females) were positive. Patients with positive cases were 9 months-20 years old (99 patients); 21-40 years (22 cases) and 6 patients were 41-60 years old (Table 1).

Twenty-one genera and fifty species were recovered. The most frequent dermatophytic genera were; *Trichophyton*, *Microsporium* and *Candida* (Table 2)

Trichophyton was the most common genus and was isolated from 48 cases and was represented by 6 species. *T. violaceum* was the commonest species (recovered from 42 cases of tinea corporis). This genus was previously reported to be the

Table 1. The age distribution of tinea corporis.

Age group by months and years	No. of cases	%
9 months-20 years	99	78.0
21-40	22	17.3
41-60	6	4.7
Total	127	100.0

main causal organism of tinea corporis in India (Amma *et al.*, 1984) in Jordan (Shtayeh & Arda, 1985); in Saudi Arabia (Lubwama, 1986) and in Cairo, Egypt (El-Mazny *et al.*, 1973). The remaining species of *Trichophyton* were isolated in rare frequency and these were; *T. mentagrophytes*, *T. rubrum*, *T. simii*, *T. ajelloi* and *Trichophyton* sp.

Microsporium was the second common causal agent of tinea corporis. This genus was represented by 4 species isolated from 17 patients. *M. canis* was the most prevalent and was isolated from 12 cases. This species was reported as a causal organism of tinea corporis by Gentles and Scott (1981) in Scotland and by El-Mazny *et al.* (1972) and El-Samalouty (1979) in Egypt. *M. audouinii*, *M. persicolor* and *Microsporium* sp. were recovered in rare frequency. *Candida* was recovered in 4 cases and was represented by *C. albicans*, *C. tropicalis* and *Candida* sp. This genus was reported to be associated with tinea corporis by Silvia *et al.*, 1986 in Argentina and by Malyshev 1979 in USSR.

II-Tinea pedis: Direct microscopic examination indicated that 22 cases out of 24 cases examined were positive for tinea pedis. Among the 22 cases, 13 were males and 9 were females. The age incidence shows that 9.1% were below the age of 25 years, whereas 54.5% were of the age group 25-45 years and 36.4% were 46-65 years old (Table 3).

Trichophyton was identified in 3 cases and was represented by 3 species; *T. violaceum*, *T. kuryngei* and *Trichophyton* sp. (Table 4). *T. rubrum* and *T. mentagrophytes* were reported by other investigators to be the main causal organism of tinea pedis

Table 2. The isolation and occurrence of fungal dermatophytes from humans infected with tinea corporis.

Genera & Species	No. of cases of isolation			% of occurrence			O.R.
	♂ + ♀	♂	♀	♂ + ♀	♂	♀	
<i>Trichophyton</i>	48	29	19	37.8	22.8	15.0	H
<i>T. violaceum</i>	42	26	16	33.1	20.5	12.6	L
<i>T. mentagrophytes</i>	2	1	1	1.6	0.8	0.8	R
<i>T. rubrum</i>	1	1	0	0.8	0.8	0.0	R
<i>T. simii</i>	1	1	0	0.8	0.8	0.0	R
<i>T. ajelloi</i>	1	1	0	0.8	0.8	0.0	R
<i>Trichophyton</i> sp.	1	0	1	0.8	0.0	0.8	R
<i>Microsporum</i>	17	11	6	13.4	8.7	4.7	L
<i>M. canis</i>	12	7	5	9.4	5.5	3.9	L
<i>M. audouinii</i>	3	2	1	2.4	1.6	0.8	R
<i>M. persicolor</i>	1	1	0	0.8	0.8	0.0	R
<i>Microsporum</i> sp.	1	1	0	0.8	0.8	0.0	R
<i>Candida</i>	4	2	2	3.2	1.6	1.6	R
<i>C. tropicalis</i>	1	1	0	0.8	0.8	0.0	R
<i>C. albicans</i>	1	0	1	0.8	0.0	0.8	R
<i>Candida</i> sp.	2	1	1	1.8	0.8	0.8	R

O.R.= Occurrence remarks.

H=High occurrence: more than 42 cases(out of 127 cases).

L=Low occurrence: between 10-42 cases.

R=Rare occurrence: less than 10 cases.

Table 3. The age distribution of tinea pedis.

Age group by years	No. of cases	%
25	2	9.1
25 - 45	12	54.5
46 - 65	8	36.4
Total	22	100.0

Verrone *et al.*, 1985 in Italy Ogbonna *et al.*, 1985 in Nigeria and Abdel Magid *et al.*, 1988 in Egypt.

Microsporum, represented by *M. canis* was recovered from 2 cases. It was also recovered as causal agent of tinea pedis in USA(Eduado *et al.*, 1986) and in Australia(McAller, 1981).

Candida sp emerged in one case only. Todaro *et al.*, 1983 isolated *C. albicans* in Italy and Caretta *et al.*, 1981 found *Candida* sp.

III-Tinea cruris: Direct microscopic examination by KOH(10%) revealed that, out of 23 cases of tinea cruris studied, 21 cases were positive.

Results in Table (6) indicated that among the positive cases, 16 were males(76.2%) and 5 cases were females(23.8%). Two patients were less than 29 year old, 14 were between 20-40 year-old and 5 were between 41-60 year-old (Table 5).

Epidermphyton floccosum was the most prevalent fungal species associated with tinea cruris and was recovered from 7 cases Table (6). This fungus was reported as the main causal agent of tinea cruris in Italy(Todaro *et al.*, 1983); in Jordan(Shtayeh & Arda, 1985); and in Egypt(Khafagy, 1965; El-Mazny *et al.*, 1972 and Nassem, 1986).

Trichophyton was isolated from 4 cases and was represented by 3 species; *T. equinum*, *T. violaceum*, and *Trichophyton* sp. Other investigators

Table 4. The isolation and occurrence of fungal dermatophytes from humans infected with tinea pedis.

Genera & Species	No. of cases of isolation			% of occurrence		
	♂ + ♀	♂	♀	♂ + ♀	♂	♀
<i>Trichophyton</i>	3	2	1	13.6	9.1	4.5
<i>T. violaceum</i>	1	1	0	4.5	4.5	0.0
<i>T. kuryngi</i>	1	0	1	4.5	0.0	4.5
<i>Trichophyton</i> sp.	1	1	0	4.5	4.5	0.0
<i>Microsporum canis</i>	2	1	1	9.1	4.5	4.5
<i>Candida</i> sp.	1	1	0	4.5	4.5	0.0

Table 5. The age distribution of tinea cruris.

Age group by years	No. of cases	%
20	2	9.5
20 - 40	14	66.7
41 - 60	5	23.8
Total	21	100.0

have reported that *Trichophyton* is the causal agent of tinea cruris in many parts of the world (Sato, 1984 in Japan; Carett *et al.*, 1981 in Italy and Nasseem, 1986 in Egypt).

Candida was isolated from 2 cases of tinea cruris and was represented by *C. albicans* and *Candida* sp. The genus was reported in Italy by Todaro *et al.*, (1983).

IV-Tinea unguium(onychomycosis): Six genera and seven species were isolated from nine specimens of tinea unguium (Table 7). *Microsporum canis* was recorded in 2 cases (22.2%) which were females.

Trichophyton mentagrophytes emerged from one case (11.1%) which was female. In Esfahan, Iran, Chadegani *et al.*, 1987 reported 7 cases (0.5%) caused by *T. mentagrophytes*. In Japan, Reddy *et al.*, 1977 recorded 27 (67.5%) from 40 cases caused mostly by *T. rubrum* and *T. mentagrophytes*. In Abidjan, west Africa, Dunand *et al.*, 1978 diagnosed 123 cases of onychomycoses, 62% caused by *Candida* spp. and 34% by *T. rubrum*, *T. soudanese*, *T. mentagrophytes*, *T. tonsurans*, *M. gypseum*, *M. lageronii* and *E. floccosum*.

Acremonium strictum, *Alternaria alternata*, *Aspe-*

Table 6. The isolation and occurrence of fungal dermatophytes from humans infected with tinea cruris.

Genera & Species	No. of cases of isolation			% of occurrence		
	♂ + ♀	♂	♀	♂ + ♀	♂	♀
<i>E. floccosum</i>	7	5	2	30.4	21.7	8.7
<i>Trichophyton</i>	4	2	2	17.4	8.7	8.7
<i>T. equinum</i>	2	1	1	8.7	4.3	4.3
<i>T. violaceum</i>	1	1	0	4.3	4.3	0.0
<i>Trichophyton</i> sp.	1	1	0	4.3	4.3	0.0
<i>Candida</i>	2	2	0	8.7	8.7	0.0
<i>C. albicans</i>	1	1	0	4.3	4.3	0.0
<i>Candida</i> sp.	1	1	0	4.3	4.3	0.0

Table 7. Fungal species isolated from 9 human patients infected with onychomycosis (tinea unguium).

Specimen No.	Sex	Age in years	Fungi recovered
1	Female	55	<i>Trichophyton mentagrophytes</i>
2	Female	7	<i>Microsporium canis</i>
3	Female	20	<i>M. canis</i>
4	Female	7	<i>Alternaria alternata</i>
5	Male	40	<i>Acremonium strictum</i>
6	Female	31	<i>Alternaria alternata</i>
7	Female	15	<i>Aspergillus flavus</i> <i>P. corylophilum</i>
8	Female	45	<i>Acremonium strictum</i>
9	Female	38	<i>P. janthinellum</i>

Table 8. Distribution of specimens collected from patients infected with tinea versicolor (Pitryasis versicolor).

Age & Sex Disease	Age in years								Total	
	10-20		21-30		31-40		41-50		Male	Female
	Male	Female	Male	Female	Male	Female	Male	Female		
Tinea versicolor		5		7		2		1		15
(Pitryasis		45		31		7		3		(17.4%)
Versicolor)	40		24		5		2			86
										(100%)
										71
		(52.3%)		(36.1%)		(8.1%)		(3.5%)		(82.6%)

rgillus flavus, *P. corylophilum* and *P. janthinellum* were also recovered. In Japan, Wadhvani & Srivastava, 1985 reported 3 cases due to *Atternaria humicola*, *A. pluriseptata* and *Aspergillus niger*. In Srilanka, Attapattu, 1980 reported 46 cases caused by dermatophytes and saprophyte (*Aspergillus*, *Fusarium*, *Penicillium* spp. and *Scopulariopsis brevicaulis*). In Medellin, Colombia, Velez Diaz (1985) noticed 125 cases of onychomycosis caused by *Fusarium* spp. (40%), *Aspergillus* spp. (20%), *Scopulariopsis brevicaulis* and *Penicillium* spp. (2.4%).

V-Tinea versicolor: Tinea Versicolor was a common disease. It was recorded in 86 cases, 71 were males (82.6%) and 15 were females (17.4%) as shown in Table (8).

Malassezia furfur was the main causal agent of

the disease. This disease was diagnosed in Italy (Caretta *et al.*, 1981); in India (Singh & Nath, 1981); in Kuwait (Almishari *et al.*, 1986) and many others.

VI-Candidiasis: Candidiasis and Paronychia were less frequent (4 cases). Two genera and three species were recovered (Table 9). *Candida* was the most prevalent genus, it was represented by two species; *C. albicans* (2 cases) and *candida* sp. (one case).

Candida was the most prevalent causal agent of candidiasis. It was reported in Moscow, USSR by Stepanova *et al.*, 1984; in Calicut, India by Amma *et al.*, 1984 and in Kuwait by Almishari *et al.*, 1986.

Table 9. Fungal species isolated from 4 human patients infected with candidiasis and Paronychia.

Specimen No.	Sex	Age in years	Fungi recovered
1	Female	20	<i>Candida albicans</i>
2	Female	47	<i>C. albicans</i>
3	Female	20	<i>Candida</i> sp.
4	Female	60	<i>Acremonium strictum</i>

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