Prevalence and Incidence of Dermatophytosis in Al-Diwaniya City, Iraq

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Abstract

The present study carried out in Al-Diwaniya city, 71clinical specimens were taken from the patients with dermatophytosis. The age of patients were between (1-50) years, real positive cultural examinations were 49(69%), whereas negative cultural examinations were 22 (31 %) . The occurrence of dermatophyte fungi were higher in females than males, depending on the gender, as for the age groups, the infection was higher in the age group 31-40 and 41-50 years followed by the age group ≤ 11 years, whereas the lowest infection was among the age group 21-30 and 12-20 years. Also, the result of this study showed that 37(52.11%) patients were housewives, 20 (28.16%) students, 7(9.85%) office employees, 7(9.85%) hospital workers. Out of 49 patients 25(51.0 %) cases were Tinea pedis, followed by Tinea cruris15(30.6%), Tinea capitis 5(10.2%), and 4(8.2%) Tinea unguium. The result of this study also showed that 31(63.3%) isolates were *T. rubrum*, 11(22.4%) *T. mentagrophytes* , *E. floccosum* and *M. canis* isolates were found 2(4.1%) and 5(10.2%) respectively.

Keywords : *Dermatophytosis, Tinea unguium, T. rubrum, KOH* .

Introduction

Dermatophytes are a group of fungi that cause a superficial infection (dermatophytosis). Dermatophytes are keratinophilic fungi , infecting the epidermis and keratinized structure such as hairs and nails for both humans and animals [(1)].There is a wide range of hosts that are preferred by dermatophytes such as ; carnivores , rodents , rabbits and people [(2)]. The infection is usually transmitted by direct contact from human to human or infected animals or by fomites [(3)]. Dermatophytes are included anthropophiles , zoophiles and geophiles according to natural habitat , where the first is human associated while the second is animal associated but the latter soil dwelling [(4)] . It is important to note that the infection of dermatophyte fungi was not invasive and easy to recover, but it is widespread and treatment costs are one of the major health problems and cause serious damage to the economic situation of countries such as Iraq[(5)] . This study aims to isolation and identification of local dermatophyte species from patients with both sexes and different ages admitted to department of dermatology at Al-Diwaniya Teaching Hospital, Iraq.

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Materials and Methods

Collection of specimens : Seventy-one samples were collected from patients with both sexes and different ages admitted to Department of Dermatology at Al-Diwaniya Teaching Hospital during period from February 2018 to January 2019. The samples included : hair, nail, and skin collected by using sterilized forceps, fine scissors and blunt scalpel. In addition to, the skin scales were collected after sterilization of the affected area with alcohol 70% and then edge scrape with a sterile blunt scalpel, whereas infected hair were collected by using sterile forceps . The nail samples was taken by using sterile fine scissors, as well as all samples

were divided into two portions ; one portion was tested directly under light microscope but the other portion considered for cultivation [6].

Direct microscopy :

The hair, scales, and nail specimens were put on new slide with drops of KOH 10% and heated gently for 5-10 min., subsequently the slide left cooled and placed the cover slip and tested under the microscope (40x) to observe septate hyphae and arthroconidia [7] .

Culture :

The clinical samples were primary cultured on sabouraud's dextrose agar containing of cyclohexamide 0.5gm to suppress the growth of non-dermatophytic fungi and permit only the growth of dermatophyte fungi , as well as added to media chloramphenicol (0.05gm) to inhibit the growth of bacteria. The plates were inoculated with samples were duplicated and incubated at 28°C for at least 3–4weeks.

Lacto phenol cotton blue method:

The isolates were tested microscopically by separating a portion of aerial mycelium with needle, as well as the material was placed on slide with a drop of (Lacto phenol cotton blue) and covered by thin slip , also excess of stain removed with blotting paper and examined under (100 and 400 magnifications).

Results and Discussion

Seventy one specimens were collected from patients with symptoms of dermatophytosis . Real positive cultural examinations were 49(69%), whereas negative cultural examinations were 22 (31 %) by examination of KOH 10% and culture on Sabouraud dextrose agar with cyclohexmaide (Table 1).

Table (1): Numbers and percentages of clinical samples with dermatomycosis infections.

Results	N	%
Positive	49	69
Negative	22	31
Total	71	100
P value	0.001*	

*** represents a significant difference at p<0.05.**

This result is similar to that found by Ismael,[8] who recorded the positive cultural results (79.31%) which was higher than negative cultural results . Table (2) shows the occurrence of dermatophyte fungi were higher in females than males, depending on the gender.

Table (2): Distribution of dermatophyte infections according to age and gender.

Gender	Age Groups No. (%)					Total	P value
	≤ 11	12_20	21-30	31-40	41-50		
Female	6(66.7)	3(75)	2(66.7)	10(52.6)	8(57.1)	29(59.2)	a- 0.901
Male	3(33.3)	1 (25)	1(33.3)	9 (47.4)	6(42.9)	20(40.8)	b- 0.199
Total	9(18.4)	4(8.2)	3 (6.1)	19(38.8)	14(28.6)	49 (100)	c- 0.001*

*** represents a significant difference at p<0.05. letters (a, b and c) represent the following statistical analysis in sample distribution: a- between gender and age groups, b- between male and female, c- among age groups.**

This result was matching with Lafta, [9] ; Maluki and Al-Hulli [10] and Abed Ali *et. al*. [11] revealed the occurrence of Onychomycosis in females were higher than males. As well as , Bassiri-Jahromi *et. al*[12] showed that the infection with dermatophyte was more predominant in females 72.3% than males 27.7% . This may be due to the females are more in contact with water in their home works, hence they may be more exposed to moisture which preferred by dermatophytes fungi . Other causes such as ; Quality of lifestyle , hormonal differences and physiological functions for both males and females [13] .

As for the age groups, the infection was higher in the age group 31-40 and 41-50 years followed by the age group ≤ 11 years, whereas the lowest infection was among the age group 21-30 and 12-20 years . This result is an approach with that found by Ismael, [14] who found that the dermatophyte infections were most predominant among the age group 41-50 years 38.8% followed by age group 41-50 years which was recorded 20.9% and then age group 21-30 which was 14.92% , as well as the age group 1-10 and 11-20 years each both was 7.46% then the age group 51-60 years was 5.98%, also age group 61-70 years which was 2.98%, but the rate of the lowest infection was 1.5%, among the age group 61-70 years . Table (3) showed that out of 71 patients, 37(52.11%) patients were housewives, 20 (28.16%) patients were students, 7(9.85%) patients were working as office employees, 7(9.85%) patients were a hospital workers .

Table (3): Distribution of patients according to Occupational status:

Results	N	%
Housewives	37	52.1
Students	20	28.2
Office employees	7	9.9
Hospital worker	7	9.9
Total	71	100
P value 0.002*		

*** represents a significant difference at p<0.05.**

This result is identical to Abed Ali *et al* . [11] who revealed that the patients (20%) were students whereas (32.5%) were housewives. This can be explained by many reasons, including ; exposure to many different environmental factors such as; trauma, sport events, abnormal lifestyles, tight shoes, using of cosmetics, exposure to stressful conditions, and using of the strong detergent which affecting on the nails and constant contact with animals, also lack of personal care or the use of personal objects which may be contaminated [15] .

Table (4) showed that out of 49 patients 25(51.0 %) cases were Tinea pedis, followed by Tinea cruris which was represent 15(30.6%), Tinea capitis which was represent 5(10.2%), and 4(8.2%) cases were Tinea unguium.

Table (4): Distribution of clinical types among the gender of patients.

Types	Gender No. (%)		Total (%)
	Male	Female	
T. pedis	11 (50)	14 (51,9)	25 (51.0)
T. cruris	6 (27.3)	9 (33.3)	15 (30.6)
T. capitis	3 (13.6)	2 (7.4)	5 (10.2)
T. unguium	2 (9.1)	2 (7.4)	4 (8.2)
Total	22 (100)	27 (100)	49 (100)
P value	0.031*	0.062	<0.0001*

*** represents a significant difference at p<0.05.**

The result of this study is inconsistent with Tan [16] who revealed the most important infection in Singapore was T. pedis 27.3%. T. pedis is the most prevalent type among the dermatophytosis; it is reaches about 70% of the total infection [17]. As well as the result of this study showed that 31(63.3%) isolates out of the 49 culture positive isolates were *T. rubrum*, also it is regarded the most frequent etiological agent followed by11(22.4%) *T. mentagrophytes* whereas *E. floccosum* and *M. canis* isolates were found 2(4.1%) and 5(10.2%) respectively (Table 5) .

Table (5): Distribution of fungal species among positive cultures.

Types	No. (%)
T. rubrum	31(63.3)
T. mentagrophytes	11(22.4)
M. canis	5(10.2)
E. floccosum	2(4.1)
Total	49 (100)
P value	<0.0001*

*** represents a significant difference at p<0.05.**

This result is in agreement with that found by Tan, [16] who found that the *Candida sp*. were most prevalent , also this is in consistence with Di Silverio et. al. [18] who found that the dermatophytosis infection was (34.6%) whereas Candidiasis was (10.8%) .

Conclusion

We conclude from the above that the dermatophyte infection is widespread in a worldwide and occurs in increasing proportions, especially in tropical countries such as Iraq. Also, there are several factors that control on increased infection rates such as poor hygiene, illiteracy, age, sex, and social economy . In the present study we

also concluded *T. pedis* was the major clinical infection and *T. rubrum* was the most frequent etiological agent . This has been proven by our current study.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: None

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