

The Prevalence of Cutaneous *Trichophyton* Spp in Patients with Skin Mycosis in Babylon Province

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ABSTRACT

Background: *Trichophyton* is a [keratinophilic](#) filamentous fungus which has the ability to invade keratinized tissues thus; it is considered as one of the leading causes of hair, skin, and nail infections in humans. Most of the *Trichophyton* species have teleomorphic forms and these teleomorphs are classified under genus *Arthroderma*

Objective: The present study aimed to determine the prevalence of *Trichophyton* spp. infection among patients with skin mycosis in Alhella, the center of Babylon Province.

Subject and Methods: During the period from Oct. /2010 to May. /2011, a total of 972 specimens (Skin scraping and nail were collected from patients attending the out-patient clinic for dermatology and venereal diseases in Babylon General Hospital. Direct microscopical examination and culture were done for specimens. Identification of *Trichophyton* spp. based on standard cultural and biochemical criteria. All data were statistically analyzed according to Chi-Square and Kolmogorov-smirnov (P<0.05).

Results: The results revealed that 753 (77.5%) patients were clinically and laboratory confirmed as having skin mycosis, 197 (26.2%) of them have *Trichophyton* infection. The prevalence of *Trichophyton* infection was significantly higher in folded skin 124(62.9) compared to other body sites and in females compared to males (66.5% vs. 33.5%). Additionally, the highest prevalence was recorded in 12-21 years age group, and there was non-significant difference in the infection rate regarding the residence.

Conclusion: *Trichophyton* constitutes about one quarter of skin mycoses infections in Babylon Province, so must raise awareness of health and increase health education among people and make them be known of the diseases which are caused by fungi and their danger, and the importance of diagnosing them as early as possible and to treat them and control their spread, make independent units in the hospital Laboratory to diagnose the fungal diseases and send specialized medical groups to the endemic areas with the fungal diseases.

Key words: Skin mycoses, *Trichophyton*, Cutaneous, Babylon

INTRODUCTION

There are twenty – seven species under genus *Trichophyton*. Most common are *Trichophyton concentricum*, *Trichophyton mentagrophytes*, *Trichophyton rubrum*, *Trichophyton schoenleinii*, *Trichophyton tonsurans*, *Trichophyton verrucosum*, and *Trichophyton violaceum*^[1]. *Trichophyton* is a [keratinophilic](#) filamentous fungus which has the ability to invade keratinized tissues thus; it is considered as one of the leading causes of hair, skin, and nail infections in humans^[2]. Most of the *Trichophyton* species have teleomorphic forms and these teleomorphs are classified under genus *Arthroderma*^[3]. Growth rate may range from being slow to moderately rapid, and colonies are waxy, glabrous, downy to cottony; and surface colony color ranges from white to bright yellowish beige or red violet and the reverse may be pale, yellowish, brown, or red – brown^[4]. Hyphae appearance [hyaline](#), [septate hyphae](#), microconidia, macroconidia, and

conidiophores, and arthroconidia are present, chlamydospores may also be produced. [Conidiophores](#) are little differentiated from vegetative hyphae. [Microconidia](#) are unicellular, round - to pyriform – shaped, numerous present, may be solitary or arranged in grape – like clusters.^[5] [Macroconidia](#) are multicellular (with two or more cells), may either be smooth thin or thick – walled, cylindrical, club – shaped, or cigar – shaped, and are often absent; and several species are typically sterile; however, sporulation may be induced with the use of an appropriate media^[5]. The fungi can cause *tinea pedis*, *tinea cruris*, *tinea corporis*, and onychomycosis. The infection spreads by contact, especially in gyms and showers.^[6,7] The infection can be stopped by bathing with soap and water and applying an appropriate fungicide.^[7] The treatment generally, amorolfine, clotrimazole, itraconazole, ketoconazole, naftifine, and terbinafine are general active *in vitro* against *Trichophyton* species. Terbinafine usually shows to be the most effective agent. Isolates of *Trichophyton rubrum* are more vulnerable to antifungal agents compared to *Trichophyton mentagrophytes*. Also active *in vitro* against *Trichophyton* species are the azole derivatives, Syn 2869, Syn2836, Syn2903, and Syn2921^[8]. Terbinafine and itraconazole are commonly used now in treatment of infections caused by *Trichophyton* species compared to griseofulvin which is once the drug of choice for dermatophytosis treatment^[9]. However, due to the availability of more effective and less toxic drugs griseofulvin is now less commonly used. Oral therapy is usually preferred for treatment of *tinea capitis* and onychomycosis^[7,10]. The study aimed to determine the spread of superficial – cutaneous *Trichophyton* in Babylon province, we had done the Isolation, identification, and description of main species that cause the superficial – cutaneous *Trichophyton*^[10].

MATERIALS AND METHODS

During the period from October /2010 to April / 2011, a total of 972 specimens (skin scrapping and nails) were collected from patients attending the out-patient clinic of dermatology and venereal diseases in Babylon General Hospital. All specimens were examined microscopically by direct mount with 10% potassium hydroxide and lactophenol blue stain Beiträgen (2010)^[11]. Culture of specimens was done on Sabouraud's Dextrose Agar using direct microscopy of lye-treated material and cultivation on glucose peptone agar with examination of the cultures for microcolonies of *Trichophyton verrucosum* after 2-4 days incubation. Identification of *Trichophyton* based on colonial morphology, on corn meal agar, as well as the form of the hyphae Screened under the microscope Isolation 92010)^[9]. All data were statistically according Chi-Square and Kolmogrov-smirnovz ($P < 0.05$) Ebraheem (2006)^[18].

Results:

The distribution of infection according to age groups showed that a significant differences ($P > 0.05$) although the highest infection rate was recorded in age group of (12-21) years compared with other age groups Table (1)

Table 1: Infection rate according to age groups

Age group(years)	No. of infections	%
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12-21	80	40.6
22-31	44	22.3
32-41	15	7.6
42-51	22	11.2
52-61	18	9.1
Total	197	100.0

X² table= 0.00

X² calculate = 0.00

P= 0.042

(p<0.05)

Table (2) showed the relationship between site of infection and sex. Generally, the overall infection rate in females (66.5%) was significantly higher than males (33.5%).

Table 2: Infection rate of *Epidermophyton floccosum* according to sex

Site of infection	No. of infected	
	Males	Females
Skin folds:		
Toe web	8	48
Finger web	10	30
Thighs	18	0
Axillary	8	0
Nails:		
Finger nails	10	30
Toe nails	8	15
Hair	3	8
Total (%)	66 (33.5)	131 (66.5)

X² table= 0.00

X² calculate = 0.65, (P <0.0)

Table (3) revealed the infection rate by cutaneous *Tricophyton* according to residence. Although the infection rate was higher in urban areas in comparison with rural areas (55.8% vs. 44.2%), the difference between the two groups was statistically non significant (p<0.05).

Table 3: Infection rate according to the residence

Residence	No. of Infections	%
Urban	110	55.8
Rural	87	44.2
Total	197	100.0

X² table= 0.00

X² calculate = 0.00

***K-S = 0.368 *(Kolmogorov- Smirnovz)**

(P<0.05)

The results found that 197 out of 753 (26.2%) patients had laboratory confirmed cutaneous *Tricophyton* infection. The distribution of infection according to body sites showed that the infection rate was significantly higher in folded skin and hair sites as compared with other sites in the body (p<0.05), [Table (4)].

Table 4: Distribution of *Tricophyton* infection according to body sites

Site of infection	No. infected	%	Total (%)
Skin folds:			
Inter digital	58	29.4	124 (62.9)
Inter finger	41	20.8	
Thighs	18	9.3	
Axillary	7	3.5	
Nails:			
Finger nails	40	20.3	62 (31.5)
Digital nails	22	11.2	
Hair:	11	5.6	11 (5.6)

X^2 table= 0.00

X^2 calculate = 2.00

(P<0.05)

DISCUSSION

Trichophyton refers to a group of [fungi](#) that can infect humans, animals, and soil. There are a multitude of different fungal species that are classified within the genus *trichophyton*. There are, however, only a few of these that actually infect humans Carin (2008) ^[4]. These fungi feed on keratin — a protein found in the skin. As a result, they cause a variety of ailments, including athlete's foot, [ringworm](#), [jock itch](#), fungal nail infection, [tinea](#) barbae, tinea capitis, and majocchi granuloma. The specific fungus that most commonly causes athlete's foot is called trichophyton rubrum. These fungi thrive in areas that are warm and moist. They can grow in socks, shoes, wet floors, and other soggy environments Beiträgen (2010) ^[1]. The overall prevalence obtained in the present study was 26.2%, which is in agreement with those reported by other studies; 27.8% in Babylon Mahmud (2000) ^[14]. The results revealed that the highest infection rate among those with 12-31 years old. This probably related to the work style of those people, and Exposed to contaminated water in the marshes, and farm, Federman (2001) ^[12]. The significantly higher infection by coetaneous *Tricophyton* infection in females 131(66.5) compared to males 66 (33.5) in the present study was consistent with those reported by Ella- bid and Khalifa (2001) in Libya ^[16]. This probably due to exposure of female hands to longer periods of humidity during homework including washing of cloths and dishes Furthermore, females frequently use acetone as nail polish removal beside exposure to other chemicals such as detergents cracks the superficial layer of nails predisposing them for *Tricophyton* infection ^[11]. Males were the most frequency isolated species causing in the results of coetaneous Tricophyton, nails and hair infection among the skin fungi infections in Babylon province Ebraheem (2006) ^[18]. *Tricophyton*, was the most frequent species caused skin infections, in urban 110 (55.8%) and rural areas 87 (44.2%) Marshlands who infected with superficial – coetaneous mycoses. The predominant site of infection in this study was the skin folds (62.9%), nails (31.5%) and hair (11%). These results were consistent with those reported by Mahmud, (2000) who found that cutaneous *Tricophyton* is common in skin folds (7%, 8%) followed by nails (18.1%) and hair areas (12.5%). The predominance of cutaneous *Tricophyton* in skin folds such as axillary, interdigital, inframammary glands areas seems to be not unusual, since these areas provide suitable environment e.g. humidity and warmth for *Tricophyton* growth Mahmud (2000) ^[14]. We must recommend to increase health education among peoples and make them be known of the diseases which are caused by fungi and their danger, and the importance of diagnosing them as

early as possible and to treat them with control their spread, and make independent units in the hospital laboratory to diagnose the fungal diseases and send specialized medical groups to the marshlands areas for diagnosis dissemination of health education Virella(1997)^[17].

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معدل إنتشار الفطريات الجلدية *Tricophyton spp.* بين المصابين بالأمراض الفطرية الجلدية في الحلة – محافظة بابل

الخلاصة

الخلفية الدراسية: *Tricophyton* هو نوع من الفطريات الخيطية المحبة للكرياتين الذي لديه القدرة على غزو الأنسجة المتقرنة وبالتالي، فهو يعتبر واحدا من الأسباب الرئيسية لأصابة البشرة والشعر والأظافر وسريع العدوى بين البشر معظم الأنواع الشعرية وكذلك تمتلك أنزيمات عديدة وأحماض مثل حامض البروتينيز تعتبر عوامل فوعة.

المرضى وطرق العمل: أجريت هذه الدراسة لمعرفة معدل إنتشار الفطريات الجلدية بين المرضى المصابين بالأمراض الفطرية الجلدية في مدينة الحلة –مركز محافظة بابل. جمعت النماذج خلال الفترة من تشرين الأول 2010 الى مايس 2011 ، ما مجموعه 972 نموذجا (قشط من الجلد أو الأظافر) من المرضى المراجعين لشعبة الأمراض الجلدية والزهريّة في العيادة الخارجية لمستشفى بابل العام. فحصت جميع النماذج مجهرياً بالطريقة المباشرة وكذلك بزرها على الأوساط الزرعية الخاصة. أعتمد تشخيص الفطريات الجلدية نوع الترايكوفاييتون على الصفات الزرعية والكيموحيوية. حللت جميع النتائج احصائياً.

النتائج: أظهرت نتائج الفحص السريري والفحوصات المختبرية التوكيدية بأن 753 (77.5%) مريضاً كانوا مصابين بالفطريات الجلدية ، من بينهم 197 (26.2%) مريضاً مصابين بـ *Tricophyton* كان معدل الإصابة بالفطريات *Tricophyton* أعلى وبشكل معنوي في مناطق الطيات الجلدية مقارنة بـ أماكن الجسم الأخرى ، كذلك في النساء مقارنة بالرجال (66,5 مقابل 33,5 %). فضلاً عن ذلك ، فإن أعلى نسب الإصابة سجلت في الفئة العمرية 12-21 سنة .

التوصيات: شكلت الإصابة بالفطر *Tricophyton* ما يقارب ربع المرضى المصابين بالأمراض الجلدية الفطرية في محافظة بابل هذا المرض شكل حوالي ربع الإصابات التهابات الجلد في محافظة بابل وعليه يجب نشر الوعي الصحي وزيادة التنقيف بين الناس ، ويجب أن نعطيهم فكرة عن الأمراض التي تسببها الفطريات وخطورتها ، وأهمية تشخيصها وعلاجها بأسرع وقت ممكن والسيطرة على انتشارها ، وتكوين وحدات مستقلة في مختبرات المستشفيات لتشخيص الأمراض الفطرية وإرسال مجموعات طبية متخصصة إلى المناطق الموبوءة مع للسيطرة على الأمراض الفطرية.

، محافظة بابل. *Tricophyton* الكلمات المفتاحية: الفطريات الجلدية،