



Dermatophytosis infection in Al-Nassiriyah City

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Abstract

The current study was performed to determine the prevalence of superficial fungal infections among patients who were living in Al-Nassiriya city, and were attending a private clinic. One hundred patients with ages range from (3-65 years) were tested for fungal skin infections using a microscope and laboratory designed for expected diagnostic methods. The Results demonstrated that 55% of patients had skin lesions followed by nail lesions (27%) and scalp lesions (18%). The Tinea corporis was the most common types of clinical ringworm infections followed by Tinea unguium and Tinea capitis, while Tinea pedis and Tinea incognito were the least frequent with same percentage. The dermatophytes infection was higher in females than males, where tinea corporis, and tinea unguium displayed higher infection rates in females while tinea capitis, and tinea manuum showed higher infections in males than females. Also, the results indicated *Microsporum canis* was the most common etiological agent of dermatophyte infection followed by *Trichophyton tonsurans*, and *Microsporum gypseum*, while *Trichophyton mentagrophyte* was the least frequent of the isolated species. The findings of the current study demonstrated higher prevalence of dermatophytosis in Nasiriyah area. So the accurate and early diagnosis can help in successfully treatment of dermatophytosis and prevent complications.

Keywords: dermatophyte, tinea infection, *Microsporum* spp., *Trichophyton* spp.

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INTRODUCTION

Dermatophytes or skin fungus infection is the most prevalence human infection in the world (in addition to being the most common fungal infection), where tinea pedis is a common problem in the developed world, and tinea capitis is a predominant problem in the developing world. Consequently, it has been documented that at least half a billion dollars are being consumed in health care costs of a fungal skin (Achterman et al., 2011). Data by Havlickova et al. (2008) indicated that 20-25% of the world's population suffers from mycosis and appears to have recurrent infection.

Dermatophytes infection is superficial, but immunocompromised patients can exhibit astringent symptoms and may be a source of disease spread (Rodwell et al., 2008). However, dermatomycosis is not associated with mortality but is a type of painful and chronic disease.

With regard to natural habitats, dermatophyte fungi are divided into human-related skin fungi that is called anthropophilic, animal-related skin fungi that is called zoophilic and soil-relieving skin fungi that is called geophilic. These fungi are used to be abundant in soil and responsible for the breakdown keratinized structures like (hair feathers, fur, horns and other). It has also been recorded that fungi that present in animals can

cause human infection whereas anthropophilic infecting animals (Dahdah & Scher, 2008). Evidences indicate that dermatophyte fungi are one of the most efficient human parasites, due to their efficiency in invading keratinous tissues (Zarrin et al., 2011).

To date, the prevalence of fungal skin infections has been studied in different regions of the world 5,6 In Iraq, dermatophytosis was documented to be a highly contagious disease and considered as an official public health dilemma. In recent years, cases of dermatophyte have increased in Iraq in general and in the city of Nasiriyah in Thi-Qar Governorate in particular. This increasing stimulated many researchers and those interested in the scientific field to study the fungal skin infection and find out the most significant causative agents, so this study was performed in the Nasiriyah city to determine the clinical types of dermatophyte and the significant causative fungal agents (Ndako et al., 2012; Nader, & Alsayed, 2016).

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MATERIALS & METHODS

Collection of Specimens

A hundred samples were collected from the patients who have attended the private dermatology clinic in Al-Nasseiryia City of Thi-Qar Province between October 2018 to September 2019 with ages range from (3-65 years). The samples were collected after removing any cream or other topical agents applied to the skin, using 70% ethanol followed by using a sharp scalpel and tweezers, after that the lesion was scraped with a special force at the advanced border. If multiple lesions are present, the most recent one is destroyed by scraping them, as the old soft sore scrapes unsatisfactory.

All the samples of skin were of epidermal scales. Hair samples involved roots were extracted while nail samples were taken by scraping or cutting the entire end of the nail and these samples put in a dry envelope and transported to lab and during packaging and transportation, all rules of biological risk regulations were followed (Kwon-Chung & Bennett, 1992).

Diagnosis of Samples

The diagnosis was performed according to the criteria listed by Gupta et al (2002) in terms of clinical examination and patient history.

Direct examination of samples

The hair, nails and skin specimens were examined according to instruction of Koneman *et al.* (1978). In direct microscopy of hairs and skin, specimens were treated in 10% KOH while the specimens of nails were examined after mounted with 20% KOH for 24 hours and then examined. The prepared glass slide was gently heated for twice to three times on flame and then incubated of 30 minutes at RT. Then microscopic lenses of potency 40X and 100X were used to see the fungal structures. The examination was repeated twice in negative cases results. Also, the stain lactophenol Cotton Blue was used to identify the isolated fungi.

Culture Diagnosis

Sabourauds dextrose agar plates that mixed with 0.05 g/ml Chloramphenicol and cyclohexamide were inoculated with fungal specimens, then these plates were incubated at 28 o C and examined twice in a week for perpetually up to 4 weeks. the Distinguished features of the fungal isolated were analyzed depending on the instructions of Rippon (1988). Also, macroscopic and microscopic examination for identification fungus isolates was based on references (Summerbell, 2011; Zagnoli et al., 2005).

RESULTS

Clinical Diagnosis

With regard to clinical diagnosis by a dermatologist, out of 100 samples, the results demonstrated that fungal skin infections focuses of the following areas , Scalp lesions (18 samples), nail lesions (27 samples), and skin



Fig. 1. Tinea faciei erythematous lesion with multiple pustules



Fig. 2. Tinea corporis



Fig. 3. Tinea corporis

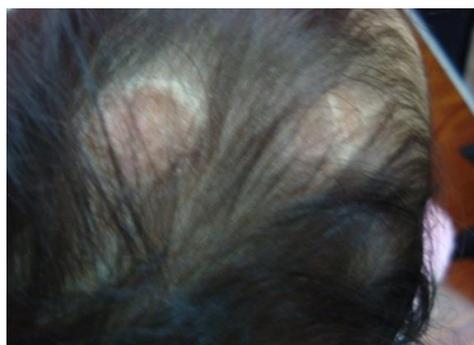


Fig. 4. Tinea capitis

lesions (55 samples). The Clinical types of dermatophytosis infections appear of various forms of fungi involving ringworm of the face (Tinea faciei) present in 7% (Fig. 1), ringworm of the body (Tinea corporis) in 36% (Figs. 2 and 3) Tinea Capitis in 18% (Fig. 4), Tinea unguium 27% (Fig. 5), Tinea manuum 10%

Table 1. The distribution of patients according to clinical types of Dermatophyte

Clinical Dermatophyte	Cases	
	No.	%
Tinea faciei	7	7
Tinea corporis	36	36
Tinea Capitis	18	18
Tinea unguium	27	27
Tinea manuum	10	10
Tinea pedis	1	1
Tinea incognito	1	1
Total	100	100%



Fig. 5. Tinea unguium onycholysis with yellowish discoloration of distal parts of nail plate



Fig. 6. Tinea manuum



Fig. 7. Tinea incognito

(**Fig. 6**), Tinea pedis present in 1% and 1% Tinea incognito and This type of infections are caused by mismanagement of the fungal infection with a topical steroid (**Fig. 7**; **Table 1**). Regarding to gender the relationship between dermatophytes infection and gender in the current study was indicated in **Table 2**, the

Table 2. The distribution of clinical disease of Dermatophyte according to gender

Clinical Dermatophyte	Cases		
	Male	Female	Total
Tinea faciei	4	3	7
Tinea corporis	9	27	36
Tinea Capitis	15	3	18
Tinea unguium	8	19	27
Tinea manuum	6	4	10
Tinea pedis	0	1	1
Tinea incognito	1	0	1
Total	43	57	100

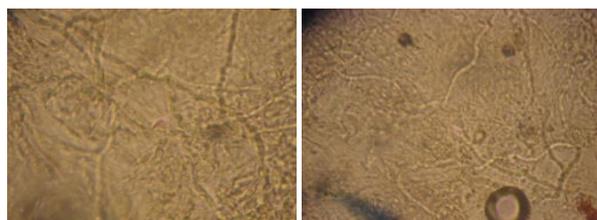


Fig. 8. Direct examination for dermatophyte with 15% KOH



Fig. 9. The colonies of *T.mentagrophyte* from both sides on SDA

results demonstrated that female gender was more susceptible to dermatophytes infection than male gender, where the dermatophytes infection was higher in females with 57 (57 %) cases, in comparison to males with 43 (43 %) cases. Tinea corporis, and tinea unguium documented higher infection rates in females than males. On the other hand tinea capitis, and tinea manuum showed higher infections in males than females.

Microscopic Examination and Culture Results

The results of direct examination for samples with 15% KOH appeared haypha as indicator for fungal infection where 83(83%) were found positive for direct examination (**Fig. 8**). The our results recorded that only 51(51%) samples were positive in both direct examination and culture, 8 (8%) were negative for direct examination and positive in culture and 32 (32%) specimens had recorded positive in direct examination and negative in culture, while 9 (9 %) of cases were negative in both examination.

The results of culture samples appeared after 7 days and primly diagnosed depended on the morphological character for colonies on Sabourauds dextrose agar plates with antibiotic **Fig. 9**, where 59 (59 %) were recorded with positive culture and considered as positive specimens. The current study identified four types of

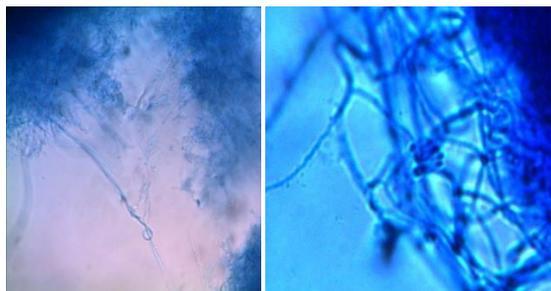


Fig. 10. Spiral Hyphae for *T.mentagrophyte*

dermatophytes species from isolated samples. *Microsporumcanis* was the most causative agents that isolated from fungal skin infections with 26 cases (44.07%) followed by *Trichophyton tonsurans* 19 cases (32.2%), and *Microsporumgypseum* with 13 (22.03%) while *Trichophyton mentagrophyte* appeared in only one (1.7%) of the isolated species, where it showed Microscopy of the latter, with lacto-phenol stain, spiral filaments belonging to *T.mentagrophyte* (**Fig. 10**).

DISCUSSION

According to clinical diagnosis by a dermatologist, the findings demonstrated that fungal skin infections are more focused in skin lesions (55 samples) areas, followed by nail lesions (27 samples), Scalp lesions (18 samples). **Table 1** showed distribution of clinical disease types of dermatophytosis Infections in patients, Tinea corporis was the most prevalence infection followed by Tinea unguium and Tinea Capitis, while Tinea pedes and Tinea incognito were the least common. These results relatively compatible with the previous data reported by Abedet *al.* (2017) in Hilla city of Iraq.

According to the relation between gender and clinical dermatophyte, the results pointed that females are more likely to develop dermatophytes than males, and Tinea corporis, and tinea unguium appeared higher rates of infections in females than males, whereas tinea capitis, and tinea manuum demonstrated higher rates of infections in males than females. These findings are in coincident with published study by Najemet *al.*(2016) in Nassiryah city who found more frequent of dermatophytosis in females than males, also the results compatible with Al-Khazaali who reported the same results in Diyala(Al-Khazaali, 2006). While, the results documented by Al-Janabi disagreed with the present study (Al-Janabi, 2006).

Frequent dermatomycosis in Females more than males reflect the fact that females deal more with water at home, therefore they are more vulnerable to moisture that dermatophytes favors it. In addition to other reasons such as lifestyle method and physiological differences between male and female, and differences in social behavior who has significant role in occurrence dermatomycosis (Hay & Adrians, 1998).

In the current study, the positive growth on SDA culture of dermatophytic infection were founded in 59 (59 %). Also, our results showed that 8 (8 %) isolates were false negative for direct examination and appeared positive growth on SDA. These results correlates with the findings of local study in Nassiryah that found 61.1% of samples gave positive growth on SDA. While 16 (8.89%) specimens were negative for direct examination and positive in culture (Al-Khazaali, 2006) . Also, the current results compatible relatively with finding documented by Garg et al (2009). The negative findings of direct examination may be due to a little amount of sample or the method of sample preparation, non-suitable temperature or bad storage which lead to contamination of the sample and efficiency of culture. The results of culture in this study identified four types of dermatophytes species from isolated samples. *Microsporumcanis* was the most causative agents that isolated from fungal skin infections with 44.07% followed by *Trichophyton tonsurans* (32.2%), and *Microsporumgypseum* (22.03%) while *Trichophyton mentagrophyte* was the least frequent in only one (1.7%) of the isolated species. The date recorded by Al-Hmadani et al., (2014) and Najem et al (2016) and agree partially with the findings of the resent study that also showed *Microsporumcanis* was the most prevalence agent of samples ,while the results of Najem et al (2016) don't recorded any isolate of *Trichophyton mentagrophyte* that was recorded in this study. We conclude that the present study may be provides data that are related for determination of dermatomycoses among the population in Nasirriyah via detect of the prevalence and etiological cause of the dermatophyte infections. And may be the key to solving this problem more precisely in the future and hence in preventing the spread of dermatophyte. Moreover, emphasizing the necessity of adopt preventive measures related to public health and maintaining personal hygiene in order to reduce the occurrence of dermatophytes and thus the burden of this disease in society as a whole.

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