

Prevalence of Dermatophytes Skin Infections in Babylon Province

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Abstract

Background: Dermatophytosis is an infection produced by dermatophytic fungi in the keratinized tissues. Dermatophytes are fungi that infect skin, hair and nails of both humans and animals, they are the primary causative agent of dermatophytosis. **Objective :** Detecting the types and the frequencies of the dermatophytes infections in Babylon Province. **Methods:** In this study, 254 specimens of dermatophytic patients are collected in Babylon province. Collection of Specimens include: skin Scrapings, hair fragments and nail clippings . The specimens were diagnosed by direct microscopic examination and culture. **Results :** 213 (83.86%) specimens of dermatophytes infection were positive in direct microscopic examination and culture , and used in phenotypic diagnosis .Tinea corporis was the predominant infection in 106 (41.73%) patients, *Trichophyton rubrum* showed the highest frequency of dermatophytes isolates 36 (16.90%) , *Trichophyton mentagrophytes* 31 (14.55%) and *Microsporum canis* 30 (14.08%). The invasion of hair was ectothrix type, forming masses of arthroconidia on the outside of the hair shaft in 57 (78.08%) specimens, while the invasion of hair was endothrix type, and abundant sporulation inside the hair shaft causes breakage of the hair near the surface of the scalp in 16 (21.92%) specimens. **Conclusion:** Tinea corporis was the predominant infection. *T. rubrum* , *T. mentagrophytes* and *M. canis* showed the highest frequency of dermatophytes isolates. Positive direct microscopic examination and culture isolates could be used in phenotypic diagnosis.

Key words : Dermatophytosis, *T. rubrum* , *T. mentagrophytes* and *M. canis*

Introduction: Skin, hair, nail, and subcutaneous tissues in humans and animals are subjected to infection by several organisms, mainly fungi named dermatophytes which cause dermatophytosis [Valeria *et al.*, 1996 ; Amer *et al.*, 2006] .Dermatophytoses are one of the most frequent skin diseases in humans .They are a closely-related group of mycelial fungi that are classified into three major genera: Microsporum, Trichophyton and Epidermophyton. These fungi produce different types of proteolytic enzymes specially keratinases that have key roles in fungal invasion and pathogenesis in human and animal dermatophytosis [Hainer ,2003]. Dermatophytes require keratin for growth and they can cause superficial infections of the skin, hair, and nails. Dermatophytes may spread by direct contact from other people (anthropophilic organisms), animals (zoophilic organisms), and soil (geophilic organisms), as well as indirectly from fomites. The disease is widely distributed all over the world with various degrees and more common in men than in women [Pakshir and Hashemi,2006].

Materials and Methods

Patients :A total of 254 specimens were collected from patients with dermatophytosis (ring worm).They were recruited for the current study after attending to the consultant of Dermatology in Marjan Hospital, Al- Hilla-Educational Hospital and private clinic in Babylon Province , from November 2013 to October 2014. There are three types of specimens collected : 151 skin scrapings, and 69 hair fragments, and 34 nail clippings .Dermatophytes isolates can be diagnosed by direct microscopic examination with 10-20% KOH and using several physiological tests such as: production of urease, hair perforation test, vitamins requirement test, growth on rice grains , growth on 1% peptone agar medium , growth on dermatophytes test medium and producing reverse pigments in other cultures media [Burns *et al.*, 2010].

Results and Discussion:

The results proved that 187/254 (73.62%) specimens were positive in both direct examination and culture, 24/254 (9.45%) specimens has shown positive in direct examination and negative in culture, and

26/254 (10.23%) specimens were negative in direct examination and positive in culture, while the cases of negative results in both direct examination and culture were 17/254 (6.69 %) specimens (Table-1-).

Table-1-: Distribution of diagnostic specimens by direct examination and culture methods collected from dermatophytic patients

Clinical cases examination	Number	Percentage
Positive in both direct examination and culture	187	73.62%
Positive in direct examination and Negative in culture	24	9.45%
Negative in direct examination and Positive in culture	26	10.24%
Negative in both direct examination and culture	17	6.69%
Total	254	100%

The study also revealed that out of 73 cases were positive on direct microscopic examination. The invasion of hair (ectothrix type) forming masses of arthroconidia on the outside of the hair shaft in 57 (78.08%) specimens, while the invasion of hair (endothrix type) with abundant sporulation inside the hair shaft causes breakage of the hair near the surface of the scalp in 16 (21.92%) specimens (Figure 1). The foregoing results showed that the ectothrix type invasion was the prevalence type of hair infection, and this result is consistent with Al-Hamadani, *et al.* (2012), Ali(1990) , Abass (1995) and Hassan (2007), and is in discordance with the results of Gargoom *et al.* (2000), Basnet *et al.* (2000) and Morara *et al.* (2004).

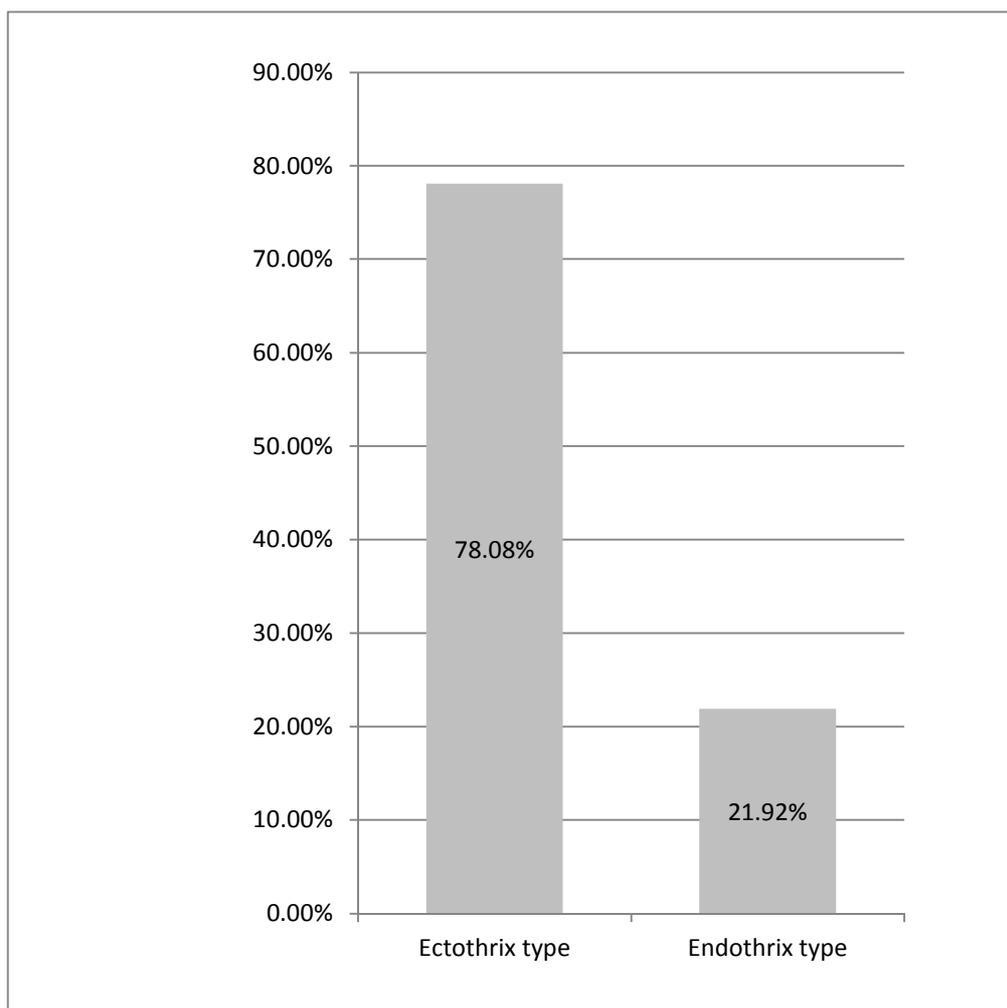


Figure -1-Distribution of ectothrix and endothrix type

Tinea corporis was the predominant infection which is recorded in 106 (41.73 %) patients followed by, tinea capitis 63 (24.81 %), tinea pedis 51 (20.08%), tinea cruris 14 (5.51%), tinea unguium 11 (4.33 %), tinea manuum 5 (1.97 %), tinea faciei 3 (1.18 %) and tinea barbae 1 (0.39 %) of patients (Figure 2) .This result was in agreement with Al-Hamadani *et al.* ,(2012) who found that the main two isolates of tinea infection were tinea corporis (47.77%) and tinea capitis (18.47%) in Najaf Province, while discordance with Al-Janabi *et al.*, (2014),where he found T. unguium (22.50%) and T.corporis (14.50%) as two main isolates respectively in Babylon Province.

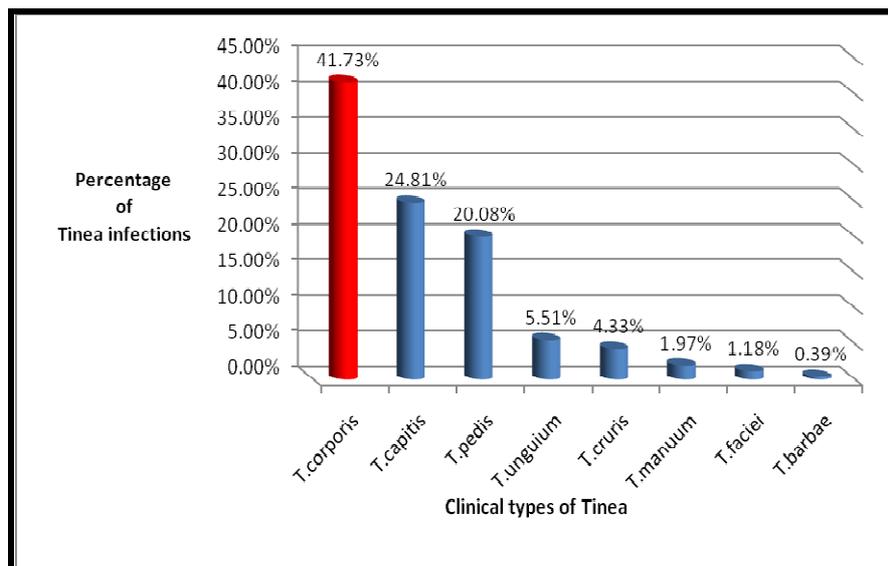


Figure -2- Percentage distribution of clinical types of the isolated tinea infections

Out of a total of 254 investigated specimens 213/254 (83.86 %) yielded growth of dermatophytes. Isolates were cultured on the traditional culture media, and considered as positive specimens which were used in the phenotypic diagnosis. Nine of the dermatophytes species were identified in specimens of examined patients, out of them in *T. rubrum* 36 (16.90%) isolates showed the highest frequency followed by *T. mentagrophytes* 31 (14.55%) isolates, *M. canis* 30 (14.08%), *T. tonsurans* 27 (12.68%) isolates, *E. floccosum* 25 (11.74 %) isolates, *T. ajelloi* 21 (9.86 %) and *M.gypseum* 17(7.98%) isolates and finally *T. schoenleinii* 15 (7.04%) and *M. audouinii* 11 (5.58%) isolates. Out of the 213 specimens which were positive in culture.

This result was in agreement with Costa (2002), who found that *T. rubrum* was the most frequently isolated species (49.4%) followed by *T. mentagrophytes* (30.8%) and *M. canis* (12.6%). Infections caused by dermatophytes are widespread, increasing in prevalence on a global scale, and have been considered a major public health concern in some areas of the world, which accounts for as many as 69.5% in humans [Chen and Friedlander,2003].

In addition to the well-known superficial infections caused by this organism, such as tinea capitis, tinea corporis, tinea unguium, and tinea pedis, dermatophytes species are also responsible for deep dermal invasion in immunocompromised patients. Moreover, dermatophytosis infections are often intractable, and relapse frequently occur after cessation of antifungal therapy [Wenchuan *et al.*,2008].

Furthermore dermatophytes are parasitic fungi that infect skin, hair and nails of both humans and animals, they are the primary causative agent of dermatophytosis, a major public health concern in some geographic regions [Chermette and Ferreiro,2008].

While not fatal, dermatophyte infections cause significant morbidity and are of significant cost to society because of their chronic nature and resistance to therapy. Dermatophytes encompass three genera, the following three species, *T. rubrum*, *T. mentagrophytes* and *M. canis* are the most common species in hospital isolates (72–95%) [Yuan *et al.*, 2009]. Dermatophytosis has been reported to be encouraged by hot and humid conditions and poor hygiene and occur throughout tropical and temperate regions of the world [Richa *et al.*,2012].

During the period of present study, the results of direct examination revealed that it was very essential, as it allows the clinician to start treatment, pending culture. Although in the present study false-negative results in both direct examination and culture have been reported in 17 (6.69 %) specimens in routine practice. These depend essentially on the skill of the observer and on the quality of sampling. Cultures remain negative in spite of the positivity of direct examination in 24(9.45%) specimens. Therefore out of the positive specimens by culture 213 (83.86%) were positive by direct KOH microscopic examination. This was in relatively agreement with Escobar and Carmona-Fonseca(2003), Arca *et al* (2004) and Samia *et al.* (2006) who found that direct microscopy was positive in 92%, 77% and 71.7% respectively from all culture positive cases.

The direct microscopic examination shows false negative results in 26 (10.24%) of specimens. This is relatively in accordance with Liu *et al.*(2000) who found false negative results up to (19%). These false-negative results may be related to an insufficient amount of material or a specimen poor in fungal elements, but also to a too short incubation time, a non-suitable temperature or the presence of “contaminants” which can prevent the development of the pathogen.

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