

A Clinical-Mycolological and Immunological Study of a Wide Spread Tinea Corporis

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ABSTRACT

A wide spread Tinea corporis infections might be a tinea incognito which is a dermatophyte infection with atypical clinical features modified by the improper use of corticosteroids or calcineurin inhibitors, or due to poverty, poor hygiene, and unsanitary conditions. A total of 100 patients was investigated, 60 patients were 60 females and 40 males, female to male ratio 1.5 were included in the study. Tinea corporis was most prevalent in the thirties. The size of the individual skin lesion was more than 5cm up to 50cm. The mean duration of the disease was 9.5months (range 6-12 months). Sixty patients had a history of treatment with topical steroids because of missing the diagnosis as eczema and psoriasis. Microscopical examination revealed hyphae spores in most of the cases n=84 (84%). Mycological culture were positive in 93 cases (93%). The most frequently isolated dermatophyte had been *Trichophyton rubrum*, n= 53 cases (56% out of 93). This case series revealed *Trichophyton rubrum* as the most frequent agent of a wide spread tinea corporis. Immunological assay revealed no changes in the serum level of IgM and IgA, in IgG and C3 serum levels increase in 40 cases, normal in 50 cases, and decrease in 10 cases, whereas C4 serum level increase in 20 cases, normal in 40 cases, and decrease in 40 cases.

Keywords: Superficial mycosis, Host defense, Dermatophytes.

INTRODUCTION

Tinea corporis includes all superficial dermatophyte infections of the skin other than those involving the scalp, beard, face, dorsum of hands and feet and groin. In which wide spread infection occurs due to immunocompression especially in children resulting from changes in the medical practice, such as the use of intense

chemotherapy and immunosuppressive drugs. Although healthy individual have strong natural immunity against fungal infection, then also Tinea corporis infections are increasing very fast^{1,2}. Tinea incognito is a previously misdiagnose as superficial dermatophytes infection, which mimic different dermatological disease, because of improper use of a systemic or topical

steroids, as well as calcineurin inhibitors such as pimecrolimus or tacrolimus²⁻⁴. Lesions usually lose their classic annular appearance. Instead of characteristic the features of dermatophytosis including peripheral activation, central clearing, and prominent scaling, papules, pustules, nodules or, Majocchi's granuloma may develop⁵. Thus, the disease is likely confused with different diseases like eczema types, seborrheic dermatitis, and psoriasis causing delay in itching an accurate diagnosis^{6,4,2,7}. On the other hand, suppression of the itch of the anti-inflammatory effects of steroids or immunomodulator agents also help the patient to neglect the disease. Some of the superficial Mycosis elicit a greater inflammatory response than others, and the non-inflammatory ones are generally more chronic. The immune system is involved in the defense against these infections, and cell mediated immunity appears to be particularly important. The mechanisms involved in generating immunologic reactions in the skin are complex, with epidermal Langerhans cells, other dendritic cells, lymphocytes, microvascular endothelial cells, and the keratinocytes themselves all participating in one way or another. A variety of defects in the immunologic responses to the superficial Mycosis have been described. In some cases the defects may be found, whereas in others the infection, it may interfere with protective cell-mediated immunity against the microorganisms. A number of different mechanisms may underlie these immunologic disorders and lead to the development of chronic superficial Mycosis in individual patients. Although the immunologic defects appear to be involved in the chronicity of certain types of Cutaneous Mycosis⁸. In the last decade, it has been shown that humoral immunity can protect against fungal infection if certain

types of protective antibodies are available in sufficient quantity. The main recognized functions of antibodies in mycotic infections include prevention of adherence, toxin neutralization, antibody opsonization and antibody- dependent cellular cytotoxicity⁹. The aim of this study was to evaluate; the clinical and immunological characteristics of a wide spread Tinea corporis infection including tinea incognito.

MATERIAL AND METHODS

A total of 100 outpatients visited the Department of Dermatology in Mirjan Teaching Hospital between June 2012 to November 2013 complaining of skin rash with or without itching on the trunk and or extremities, diagnosed clinically tinea corporis, and some of them had another type of tinea infection especially tinea facie , and tinea cruris. Sixty patients had a history of treatment with topical steroids because of missing the diagnosis as eczema and psoriasis. Together with determining fungal elements of the direct KOH examination, or by the positive Mycological culture of Sabouraud's dextrose agar (SDA) media were included in this study. Direct 20% potassium hydroxide (KOH), Microscopical examination of skin scrapings from the lesions and Mycological culture were performed in each patient¹⁰. Characteristic colony morphology and pigmentation on SDA together with lactophenol cotton blue (LPCB), microscopically prepared for the identification of the conidia morphology were used for dermatophyte typing. Blood was sent to the hospital lab. For immunological assay including; IgG, IgM, C3, and C4.

RESULTS

Hundred patients, 60 were females and 40 males, with a range of age of 2-76

years, were included in the study. Tinea corporis was most prevalent in the thirties. Before visiting our department, 60 (60%) of the patients had been followed by a diagnosis of eczema (contact dermatitis, atopic dermatitis, neurodermatitis), and psoriasis. The other 40 patients, either used self treatments, like topical steroids, antibiotics, or others, or delay treatment because of poverty or careless. The mean duration of the disease was 9.5 (range 6-12) months. The size of the individual skin lesion was more than 5cm up to 50 cm. Lesions were generalized in 70 (70%) of the cases (Fig.1), and localized in 30 (30%) of the cases (Fig. 2, 3). The non-exposed area 56.7% was more frequently affected than exposed area 43.3%, and the forearm was the most common site 21.2% (Fig. 2). Coexisting fungal infection was found in 40% of the cases, especially tinea facie and tinea cruris.

Fifteen cases (16%) out of 93 culture positive cases had a history of contact with animals, that were thought to be infected source. Among 100 cases, dermatophytes were isolated in 93 cases, they were; *Trichophyton rubrum* 53 cases, *Trichophyton mentagrophytes* 15 cases, *Microsporum canis* 15 cases, *Trichophyton tonsurans* 5cases, and *Trichophyton violaceum* 5 cases (Table1). *M. canis* was more commonly isolated from the smaller lesions. Immunological assay revealed no changes in the serum level of IgM and IgA, in IgG and C3 serum level increase in 40 cases, normal in 50 cases, and decrease in 10 cases, whereas C4 serum level increase in 20 cases, normal in 40 cases, and decrease in 40 cases (Table 2).

DISCUSSION

Tinea corporis is traditionally described as an annular eruption (inflammatory or non-inflammatory), with

fine scales represent approximately 40% of tinea infections, is a term ascribed to a dermatophyte infection with a typical appearance resulting from previous immunosuppressive treatment with steroids, topical tacrolimus, or pimecrolimus¹¹⁻¹³. Tinea incognito often presented a diagnostic challenge for clinicians because it mimics other dermatological conditions. In an Italian survey of 200 cases of tinea incognito, this disease was found to mimic, eczema, impetigo, lupus erythematosus, rosacea and psoriasis¹⁴. In our patients topical corticosteroid therapy was initially prescribed for 60 patients as a preliminary clinical diagnosis of contact dermatitis, atopic dermatitis, neurodermatitis, and psoriasis (Fig.1, 2, 3). There are a number of studies on tinea incognito^{11,15,16}, this relevant data include too many sporadic case reports^{12,14-16}. This is the first study in Iraq that highlights the clinical, Mycological and immunological features of patients with tinea incognito. The easy availability of steroids, as well as prescription of steroids without considering superficial fungal infections in the differential diagnosis usually by physicians of primary health care, pharmacists, dressers, general people, or dermatologists may be the factor that facilitates the inappropriate steroid usage. The most frequently isolated and reported agents in adult patients with tinea incognito and a wide spread tinea corporis infection is *Trichophyton rubrum*.¹⁴ found *Trichophyton rubrum* (50.5%) as the most common agent of tinea incognito in a series of 200 consecutive patients followed by *Trichophyton mentagrophytes*, *Epidermophyton floccosum*, *Microsporum canis*, *M. gypseum*, *T. violaceum*, and *T. erinacei*, in descending frequency. In this series, culture positivity has been reported to be approximately 100%. However, a recent series of 56 cases with tinea incognito from

Iran revealed *T. verrucosum* as the most frequent agents in 33.9% of cases. The detection of a zoophilic agent in most of the cases was attributed to living in rural areas¹⁵. In our series *T. rubrum* was the most common agent accounting for 56% of analyzing cases. Cultures were positive in 93% of cases. Detection of *T. rubrum* in the majority of cases was attributed to its frequency as being the most common agent of chronic dermatophytosis in our country¹⁷.

In addition to topical immunosuppressive therapy other risk factors for a wide spread tinea corporis infection and tinea incognito with atypical presentations also been proposed. The virulence of the organism and its invasive capacity, the site of infection, the host resistance, physiology and acquired host factors may all have a role to play¹⁵. Poor hygiene and unsanitary conditions associated with superficial dermatophyte infection¹⁸. Such risk factors with poverty, and inability to visit dermatologists, easily getting topical steroids by hands, together with overcrowding of housing, and living with animals in the same houses may have contributed to the wide spreads infection and a typical appearance of our patients eruptions.

Predispositions to the superficial fungal infections include warmth and moisture, natural or iatrogenic immunosuppression, and perhaps some degree of inherited susceptibility. In this study, the variation in the immunological findings (table 2) has been supported, for example by experiment, the identification of protective and non-protective antibodies for both *C. neoformans* and *C. albicans*, indicating that the humoral immune response to fungi could elicit antibodies of variable efficacy. Although a few studies¹⁹ suggested that antibody might have a role in protection, the role of humoral immunity was uncertain because of inconsistent results.

CONCLUSIONS

These cases highlight the unusual appearance of a widespread tinea corporis following delays in the treatment or inappropriate treatment with local steroid and the value of obtaining scrapings for potassium hydroxide examination and sometimes punch biopsy, culture and or PCR examination to confirm the diagnosis. It also underscores the importance of entertaining tinea incognito in the differential diagnosis of an atypical skin rash that changes or worsen during a course of topical immunosuppressive therapy. Dermatophyte infections should be kept in mind in the differential diagnosis of a variety of dermatitis, mainly erythematous squamous diseases, particularly before prescribing topical or systemic steroids. Finally the conclusion was that the cell-mediated immunity was important, whereas humoral immunity had little or no role.

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Table 1. The type of isolated dermatophytes, number and percentages

Name of dermatophyte	Number of cases	Percentage out of 93 culture positive cases
<i>T. rubrum</i>	53	56%
<i>T. mentagrophyte</i>	15	16.1%
<i>M. canis</i>	15	16.1%
<i>T. tonsurace</i>	5	5.4%
<i>T. violaceum</i>	5	5.4%

Table 2. The results of immunological assay

Type	Increase value	Normal value	Decrease value
IgG	40cases	50cases	10cases
IgA	-	100cases	-
IgM	-	100cases	-
C3	40cases	50cases	10cases
C4	20cases	40cases	40cases



Figure 1. Generalized cases. This child was treated for a long time with topical steroid and has cushioned appearance on the face, he looks larger than his age (3years)

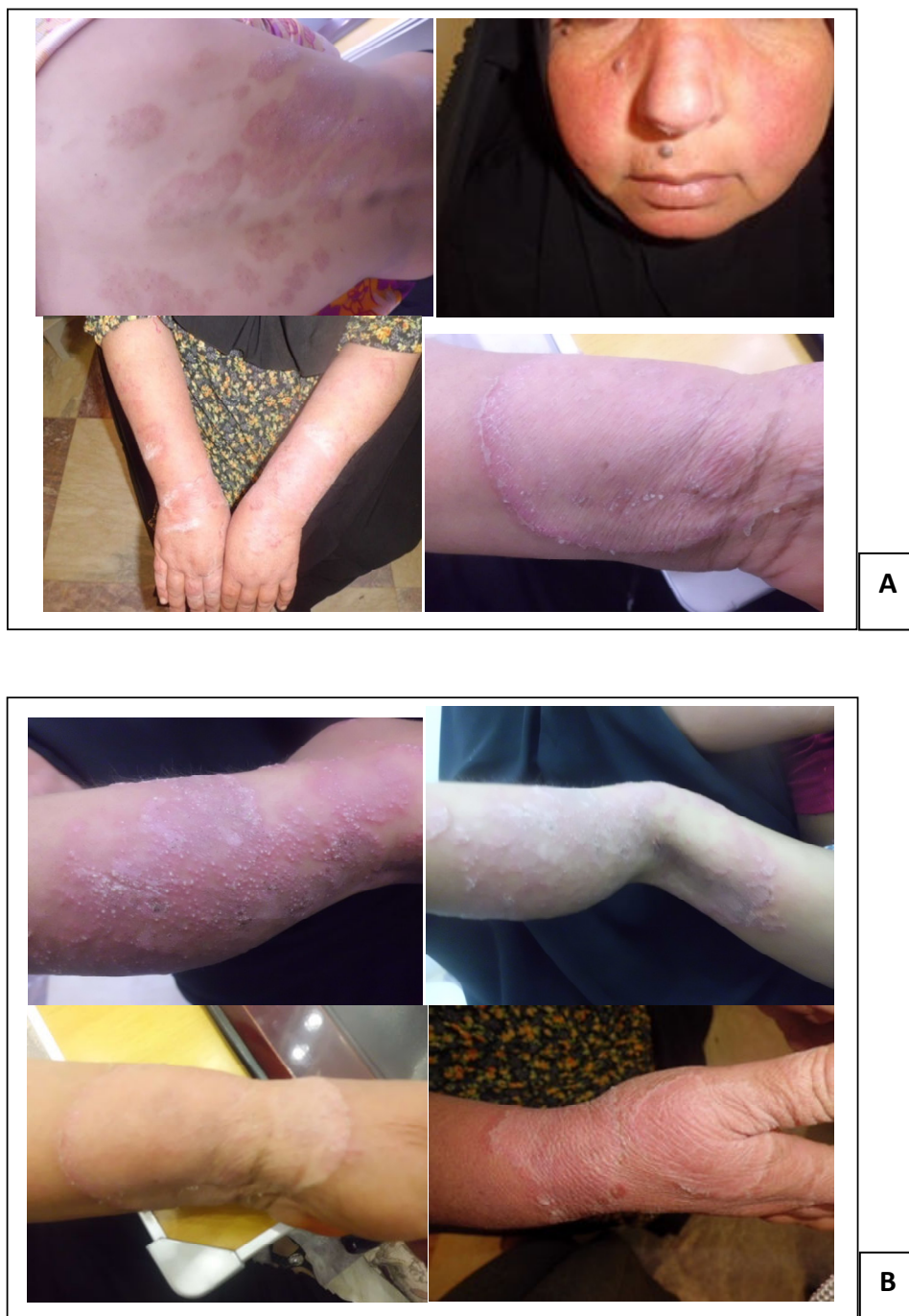


Figure 2. A&B localized case on the forearm. This female has wide spread tinea corporis with cushingoid appearance



Figure 3. Presence of other type of tinea infection (tinea facie and tinea capitis)