Original Article

Incidence and identification of dermatophytes associated with patients of Tinea corporis in a tertiary care hospital

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Abstract

Background: Dermatophytosis is the most important group of superficial fungal infections caused by dermatophytes. Tinea corporis is ringworm of glabrous skin (non hairy skin) of body. The identification of the causative agent is necessary which provides information on the risk of spread to other members. Clinical lesions caused by the dermatophyte causing agents are highly variable and closely resemble other skin diseases making laboratory diagnosis and confirmation necessary. **Material and Methods:** The samples were examined for dermatophyte hyphae, arthroconidia by using 10% KOH. Specimens were then cultured on Sabouraud's Dextrose Agar with antibiotics and growth on obverse and reverse was noted. Colony was further observed microscopically with lactophenol cotton blue mount. **Results:** *T. rubrum*and *T. Mentagrophytes* were the dermatophyte species isolated from 187 patients. *T. rubrum* was isolated from 136 patients (72.7%) and *T. mentagrophytes* from 51 (27.3%).All 187 cases (100%) were positive by both microscopy and culture. **Discussion:** Dermatophyte infections are very common in this region where hot and humid climate in association with poor hygienic conditions play an important role in the growth of these fungi. Tinea corporis was the commonest clinical type. *Trichophyton* species forms the commonest aetiological agent of dermatophytosis and *T. rubrum* was the commonest isolate.

Key Words: Tinea corporis, KOH mount, Sabouraud's Dextrose Agar with antibiotics, lactophenol cotton blue mount

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INTRODUCTION

Dermatophytosis is the most important group of superficial fungal infections caused by dermatophytes, which is a group of fungi that are capable of growing by invading the keratin of skin, hair, and nail for obtaining nutrients. The causative fungi are moulds belonging to three asexual genera *Microsporum*, *Trichophyton*, and *Epidermophyton*[1]. Prevalence of superficial fungal infections has been estimated to be around 20-25% worldwide by World Health Organization (WHO)[2]. Dermatophytes are the most common agents of superficial fungal infections worldwide and widespread in the developing countries, especially in the tropical and subtropical countries like India, where the environmental temperature and relative humidity are high. Tinea corporis affecting glabrous skin of the trunk and limbs (i.e., skin regions other than the scalp, groin, palms, and soles) is the commonest clinical form of dermatophytosis[3-5]. Tinea corporis is ringworm of glabrous skin (non hairy skin) of body and results from extension of infection from scalp, groin or beard. The disease is characterized by erythematous scaly lesions, annular, sharply marginated plaques with raised border which may be single, multiple or confluent. There is partial central clearing with few pustules may be present. Although not life threatening, its severity can cause great discomfort. It remains a general public health problem, which is prevalent in all age groups and both the sexes[6]. The identification of the causative agent is necessary particularly in the case of tinea capitis which provides

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information on the risk of spread to other members at home or in the school. Clinical lesions caused by the dermatophyte causing agents are highly variable and closely resemble other skin diseases making laboratory diagnosis and confirmation necessary[7]. The diagnostic tests include potassium hydroxide (KOH) wet mount examination, wood's lamp examination, skin biopsy and fungal culture[1]. The present study was undertaken to assess the clinico-mycological profile of dermatophytoses associated with patients of tinea corporis.

MATERIAL AND METHODS

In this prospective epidemiological study, 187 patients of all ages and sexes, clinically diagnosed as tinea corporis (dermatophytosis of torso, extremities) and treatment naive patients at first visit were included. For sample collection, the affected area was swabbed with 70% alcohol and the active edge of lesion scraped with a sterile scalpel. The scrapings were collected from the margins of the lesion without injuring the skin surface. The scrapings were collected in a sterile petri dish[3]. The samples were examined for dermatophyte hyphae, arthroconidia by using 10% KOH. Specimens were then cultured on Sabouraud's Dextrose Agar (Merck, Germany) containing Chloramphenicol, Gentamycin and Cyclohexamide; and were kept at 26°C for four weeks. The growth on SDA was examined to study, the colony morphology based on colony characters on obverse for colour and nature of colony and reverse observed for presence or absence of pigment. One or two drops of lactophenol cotton blue were placed on the slide with fungal growth and cover-slip placed on it. Both the slides were examined under microscope. Character of hyphae, size, shape and arrangement of macroconidia, microconidia and other accessory vegetative structures were studied[1].

RESULTS

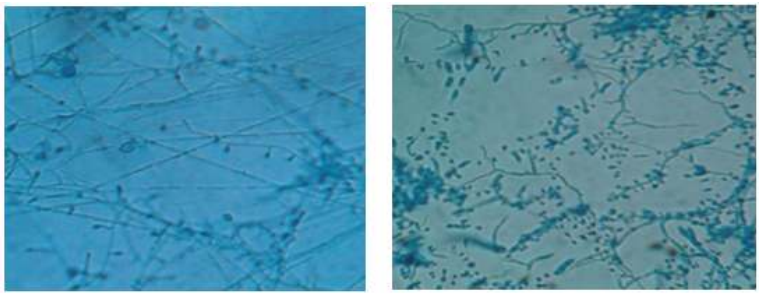
The study included patients who were positive for dermatophyte culture. T. rubrumand T. Mentagrophytes were the dermatophyte species isolated from 187 patients. T. rubrum was isolated from 136 patients (72.7%) and T.mentagrophytes from 51 (27.3%). Most of the patients i.e. 66 (35.3%) were in the age group of 21-30 years. Out of 187 patients, 109 were males and 78 were females. Overall abdomen 142 (75.9%) was the commonest site of infection, followed by back 112 (59.9%). Face 27 (14.4%) was the least commonly affected site. Among the total 187 patients studied only 4 patients (2.10%) had single lesion on body and 183 patients (97.9%) had multiple lesions. T. Rubrum and T. mentagrophyteswere the dermatophyte species isolated from 187 patients. Trichophyton rubrum was isolated from 136 patients (72.7%) and Trichophyton mentagrophytes from 51(27.3%). All the 187 patients of tinea corporis had typical signs and symptoms of scaling, raised border of lesion and itching. Papulovesicular rash and pain were complained by 3.7% of patients. Satellite lesions were observed in 4.8% of patients. There was no statistically significant difference in the signs and symptoms of *T. rubrum* infection and *T. mentagrophytes* infections. It was observed that at first visit, 103 out of 187 patients (55.1%) had duration of symptoms >3 months and 44.9% of patients had duration of symptoms < 3 months. All 187 cases (100%) were positive by both microscopy and culture. Fungal hyphae were seen on KOH mount, culture was done SDA (Fig. 1 and 2 a, b) and lactophenol cotton blue mount (LCB mount) was done from the growth (Fig. 3 a, b).

a b

Figure 1: a and b: T. rubrum- Colony on SDA (a= obverse side; b= reverse side)

a b

Figure 2 a and b: T. mentagrophytes- Colony on SDA (a= obverse side; b= reverse side)



a b

Figure 3 a and b: LCB mount showing T. rubrum and T. mentagrophytes

DISCUSSION

In present study, highest incidence of dermatophytosis was observed in the age group of 21-30 years and in males, it is comparable with other studies done by Sen *et al*[8], Jain *et al*[9] Kamothi *et al*[10]. The highest incidence in young adults may be due to increased physical activity and increased opportunity for exposure. *T. rubrum* was the most common dermatophyte to cause all clinical types of dermatophytoses followed by *T. mentagrophytes*. This was in correlation with other studies[11,12]. The standard medium for growing dermatophyte is Sabouraud's dextrose agar containing chloramphenicol and cycloheximide, which inhibit contaminating bacteria and saprophytic fungi respectively. The identification of dermatophytes is based mainly on morphology of fungal colony and microscopic appearance on LCB mount. LCB mounts are examined under the microscope for characters and shape of hyphae such as, nodular organs (knots of twisted hyphae), racquet hyphae, spiral hyphae, and size, shape, number and arrangement of macroconidia and microconidia. *T. rubrum* were identified by observing growth on SDA after 2 weeks of incubation. Colony types which vary from white downy to pink granular; rugal folds are common; reverse yellow when colony is young however wine red color develops with age. On LCB mount, microconidia usually appear tear drop, most commonly borne along sides of hyphae, macroconidia usually absent when present are smooth thin walled and pencil shaped. *T. mentagrophytes* were identified by white granular and fluffy colonies; yellow on obverse and buff to reddish brown on reverse on SDA after 7-10 days of incubation. On LCB mounts, many round to globose microconidia most commonly borne in grape like clusters or laterally along the hyphae. In few of isolates spiral hyphae were seen. In our study, the commonest affected site in T. corporis was the abdomen (75.9%) followed by back (59.9%) and buttocks (47.1%). The least affected site was the face. However, there was no significant difference in predilection for sites in *T. rubrum* and *T. mentagrophytes* infections. Trunk as the most commonly affected site has been reported by Das *et al* and Heidrich *et al*[13,14]. In a study by Bhaduria *et al*, hips and waist involvement was seen in 10% of patients[15]. Heidrich *et al* have reported 62% patients with arm involvement, in our study it was 21.9%[14]. Das *et al* reported 14% patients with forearm involvement which was comparable in our study (19.8%)[13]. Thigh was affected in 42.8% of our patients. Thigh involvement was reported by Gupta *et al*to be 6.67%.Their study was from Jaipur, climate differences, sweat factor, clothing material could be contributory factors[16]. There is a significant correlation between number of lesions and chronicity as stated in a study by Prasad *et al*[17]. There was found to be a very high prevalence of multiple lesions in our study (97.9%). In a

2014 study by Al-Khafaji, 60.8% of patients had one lesion, 31% of the patients had two lesions and others had more than two[18]. In our study, almost all patients exhibited erythema, scaling, itching as clinical signs and symptoms and raised borders of the lesion. Similar findings were reported in their study by Gupta *et al*[16]. Two types of lesions are commonly encountered in T. corporis[1]. One is dry and scaly annulare (annular patches) and the other vesiculare (iris form). T. corporis resulting from *T. rubrum* is particularly extensive and inflammatory, margins difficult to distinguish[1]. *T. mentagrophytes* produces vesicular type of lesions, vesicles appear irregularly or immediately behind advancing hyperaemic and elevated margins, crust is formed, healing follows in centre of lesion to leave a pigmented area. Chronic lesions are uncommon[1]. In our study, there was no significant difference between signs and symptoms in patients infected with *T. rubrum* and *T. mentagrophytes.* The results of present study indicate that dermatophyte infections are very common in this region where hot and humid climate in association with poor hygienic conditions play an important role in the growth of these fungi. Tinea corporis was the commonest clinical type. *Trichophyton* species forms the commonest aetiological agent of dermatophytosis and *T. rubrum* was the commonest isolate, concluding that it is the most common cause of dermatophytic infection.

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