

## CLINICO-MYCOLOGICAL STUDY OF DERMATOPHYTIC INFECTIONS IN SOUTHEAST RAJASTHAN

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### ABSTRACT

**Background:** Dermatophytosis is the cutaneous fungal infection of skin, hair and nails which are for aesthetic issue and discomfort due to consistent itching. This study was planned to observe the trend of dermatophytic infections in the area. **Materials and methods:** 360 skin samples from the suspected dermatophytic infections by clinical diagnosis were subjected to KOH mount and fungal culture and analysed. **Result:** 190 (52.77%) samples were found to be positive in KOH mount while 183 (50.83%) by fungal culture. Total number of positive cases by any test (culture or KOH mount) was 196/360 (54.44%). Maximum number of samples were received and found positive in the age group of 20-30 years followed by 10-20 years. Males outnumbered females with a male female ratio of 1.86 (119/64). The most common clinical presentation observed was tinea corporis followed by tinea cruris. The most common dermatophyte observed was *T. rubrum* followed by *T. mentagrophytes*. **Conclusion:** The present study shows that *Trichophyton rubrum* was the predominant dermatophyte observed in the study population followed by *T. mentagrophyte*. This finding revealed that the transmission of fungal infection was occurring by humans and the most common clinical presentation was tinea corporis followed by tinea cruris.

**KEYWORDS :** Dermatophytosis, tinea corporis, tinea cruris

### INTRODUCTION

Skin falls in the first line of defence against the pathogenic invasion on the body. The dry outer layers and regular shedding of these layers check the colonisation of pathogenic microbes (6). Many factors including loss of integrity of skin, hormonal imbalance, compromised immune status, increased environmental humidity, low hygiene, overcrowding predispose skin to infections. Fungal infections of skin can be grouped into superficial, cutaneous, subcutaneous and systemic mycoses. Dermatophytosis is the cutaneous fungal infection of skin, hair and nails. The fungi require keratin for growth and are unable to grow at 37°C or in

the presence of serum hence remain limited to the upper layers of skin and its appendages (4). The inflammation pattern of skin is characteristic in dermatophytosis having higher degree scaling and redness at the edges as compared to the centre unlike psoriasis or lichen planus in which the inflammation can be seen uniform all over the lesion (5). Dermatophytic infections are also termed as tinea and are further classified on the basis of the body site involved in infection such as tinea capitis (scalp), tinea corporis (trunk and extremities), tinea pedis (athlete's foot), tinea cruris (Jocks itch) and tinea unguium (nail/onychomycosis). More than one

dermatophytic species can exhibit similar clinical presentation and one species can present more than one type of clinical presentations. Though not causing severe health problem tinea is responsible for aesthetic issue and discomfort due to consistent itching. The symptoms of bacterial and dermatophytic infections or autoimmune responses at an affected site may be somewhat similar. So the characterization of clinical presentation and identification of infectious agents provide a baseline data and support differential diagnosis in a certain area. Not much information is available about the prevalent dermatophytic infection in the study area is available, so the present study was planned to observe the trend of dermatophytic infections in the area.

### Methodology

This prospective observational study was carried out in 360 patients dermatology department/ clinic in XYZ hospital during a period of 6 months (April-september) Udaipur after seeking the ethical approval.

**Inclusion criteria-** patients suspected to have dermatophytic infections on the basis of direct examination.

**Exclusion criteria-** patients who have been under any antifungal treatment in previous three month and patients who did not give consent for the study.

Data was collected in a predesigned information cum consent form in which the special identity number was allotted to each case and their age, gender, symptoms, history in infection and clinical presentation was collected.

**Sample collection-** On the basis of clinical examination the sample was collected from the patients. After cleaning the site with 70% alcohol, skin scrapings were collected with the scalpel from the edges of the lesions. The skin scrapings were treated with 10% KOH for 1 hour at room temperature and then were observed under microscope. Simultaneously all the samples were inoculated on Sabouraud's Dextrose Agar 0.05 mg/ml chloramphenicol and 0.5 mg/ml cycloheximide The culture was observed daily for fungal growth for 4 weeks at 27°C before it was taken as negative. The growth was identified by macroscopic examination of

colony morphology and microscopy after staining the fungal filaments with lactophenol cotton blue.

### RESULTS

Total 360 samples suspected of having dermatophytic infections were included in the study. 190 (52.77%) samples were found to be positive in KOH mount while 183 (50.83%) by fungal culture (Table-1). Total number of positive cases by any test (culture or KOH mount) was 196/360 (54.44%).

**Table 1- results of fungal culture and KOH mount**

	Culture positive	Culture negative	Total
<b>KOH positive</b>	177/360	13	190 (52.77%)
<b>KOH Negative</b>	6	164	170 (47.22%)
<b>Total</b>	183/360 (50.83%)	177/360 (49.16%)	360

Patients were grouped in 6 age groups. Maximum number of samples were received and found positive in the age group of 20-30 years followed by 10-20 years. The distribution of total samples and culture positive samples is shown in Table 2.

**Table 2- Age wise distribution of total patients and culture positive cases**

s. No	Age group	total samples	Positive	%
1	Below 10	14/360	3/196	1.5
2	10 yrs – 20 Yrs	60/360	37/196	18.87
3	20 yrs – 30 Yrs	89/360	75/196	38.27
4	30 yrs – 40 Yrs	64/360	43/196	21.93
5	40 yrs – 50 Yrs	50/360	29/196	14.79
	Above 50 Yrs	20/360	9/196	5.5

Males outnumbered females with a male female ratio of 1.86 (119/64). The most common clinical presentation observed was tinea corporis followed by tinea cruris. The various clinical presentations observed in the culture positive samples are shown in Table 3.

**Table 3- Clinical presentation of culture positive samples**

S. No	Clinical presentation	Number of cases	%
1	Tinea corporis	86	43.87
2	Tinea cruris	76	38.77
3	Tinea capitis	18	9.18
4	Tinea pedis	9	4.59
5	Tinea barbae	7	3.57
<b>Total</b>		196	

Among the 183 isolates identified on culture, the most common dermatophyte observed was *T. rubrum* followed by *T. mentagrophytes*. The number of various isolates is given in Table 4.

**Table 4- Distribution of isolated dermatophyte species**

S. No	Fungal species	Number of cases	%
1	<i>T. rubrum</i>	71	38.7
2	<i>T. mentagrophyte</i>	63	34.4
3	<i>T. violaceum</i>	29	15.8
4	<i>T. floccosum</i>	13	7.1
5	<i>T. tonsurans</i>	7	3.8
<b>Total</b>		183	

## DISCUSSION

Dermatophytic infections are prevalent all over the world. Though these infections mostly remain limited to skin and do not end up serious health problems they cause continuous itching and uneasiness. Areas with high temperatures and humidity are more severely affected. Fungal infections reflect the low hygiene

conditions and some type of treatments last long (5). Current study was planned to detect the trend of dermatophytic infections in the area. Out of 363 cases included 196 (54.44%) samples were positive for dermatophytic infection by either KOH mount or fungal culture. More samples were detected positive by KOH (190/360, 52.77%) mount than fungal culture (183/360, 50.83%). Thirteen samples were found negative by culture were positive for KOH while only 7 samples positive for culture were negative in KOH mount. Similar results were reported by Kalita et al (8), Modi et al (3), Poyyamozi et al (12), Lyngdoh et al (9). The overall male female ratio was 1.86 which in line with many studies (2,3,8,10). More involvement in outside activities or occupational exposure and more physical activity resulting in raised body temperature and sweating may be some of the responsible factors for the higher incidence of infection in males. The maximum number of infections was seen in the age group of 20-30 years followed by 10-20 years. These results are in agreement with studies (1, 3, 8) reported in other parts of the country. Heavy physical work, sweating and exposure to the environment for predispose the age group for higher infection rate.

*Tinea corporis* was the the most common (43.87%) clinical type seen in our study followed by *T. cruris* (38.77%). These results are well corroborated with other studies (11) from the same region and many other regions of state (1,7,8). However the clinical presentation and site of involvement varies with the life style, age group and site of exposure. In the present study the most common dermatophyte isolated by culture was *Trichophyton rubrum* (71/183, 38.7%) followed by *T. mentagrophyte* (63/183, 34.4%). Similar results were reported previously in another study (11) from the area. These isolates are anthropophilic and spread by human contact. Other isolated dermatophytes were *T. violaceum*, *T. floccosum*, *T. tonsurans*. The incidence of the causative agents varies with the geographical conditions. Dermatophytic infections may present symptoms common with other aetiology such as alopecia areata mimics tinea capitis and eczema may be confused with tinea corporis. Hence the clinical diagnosis of suspected cases should be confirmed with KOH mount and fungal culture and microscopy.

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