

“Clinicomycological Study of Dermatophytosis At Tertiary Care Hospital In Bhavnagar, Gujarat”

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Abstract

Introduction: Dermatophytes are the Infection of the skin, hair or nails caused by a group of keratinophilic fungi, called dermatophytes, also known as Tinea or ring worm. The study aimed to find Clinico-Mycological correlation of dermatophytosis and to find out various species of dermatophytes prevalent in & around Bhavnagar city.

Materials and Methods: Skin, hair and nail samples from 600 clinically suspected cases of dermatophytosis were screened by direct microscopic examination using 10% potassium hydroxide (KOH) mount and inoculated for culture in Sabouraud dextrose agar (SDA) and dermatophyte test medium (DTM).

Results: Out of total 600 Patients of Dermatophytosis, 510 (85%) patients were found Positive for dermatophytes either by KOH/Culture, 462(77%) cases were positive by direct microscopy and 384 (64%) cases were positive by culture..

Conclusion: Dermatophytosis is the most common type of cutaneous fungal Infection most commonly found in male patients, 21-30 years age group and patients from lower economical class most commonly affected.

Key words: Dermatophytosis, Tinea, Trichophyton, KOH, Microsporum

Introduction

Dermatophytosis is by far the most common disease in human beings. It is an infection of the skin, hair or nails caused by any of a group of keratinophilic fungus called 'Dermatophytes'. Dermatophytes produce circular lesions equal in all centers & become active and scaly at the periphery. These infections are also known as Tinea or Ring worm infection. The etiologic agents of dermatophytosis are classified into three genera based primarily on differences in microscopic morphology and modes of sporulation as - Epidermophyton, Microsporum and Trichophyton. The Trichophyton species usually infect skin, hair and nails, Microsporum species infect skin and hairs and not nails and Epidermophyton species infect skin as well as nails but not Hair¹⁻².

Dermatophytes have long been divided into anthropophilic, zoophilic, and geophilic species on the basis of their primary habitat associations²⁰. Anthropophilic Dermatophytes are primarily associated with humans. Those inhabiting with domestic and wild animals as well as birds are known as zoophilic. The third group frequently isolated from soil is known as geophilic. Dermatophytosis remains a significant public health problem affecting children, adolescents and adults and is also of cosmetic importance. Hot and humid climate in tropical and subtropical countries like India makes dermatophytosis or ringworm infection a very common superficial fungal skin infection.²⁻⁷.

Materials And Methods

After obtaining consent from patients, diagnosed clinically as having dermatophytosis randomly selected from the outpatient department of Dermatology and venerology, Sir.T.Hospital, Bhavnagar, samples were collected in sterile petridishes, labeled and brought to the laboratory for further processing. The skin scrapings were collected from the active edge of the lesions and roof of the vesicles if any. In case of Nail Clipping, after cleaning the nail with 70% alcohol, nail was clipped with sterile scalpel blade. Hair was epilated with the help of sterile forceps, Scales were also collected from scalp. For direct microscopy the sample collected was screened for the presence of fungal elements by KOH Mount, Culture media used are Sabouraud Dextrose Agar (SDA) with antibiotics and Dermatophytes Test Medium (DTM) with

supplements. All cultures were examined bi-weekly for growth and incubated for four weeks before declaring them negative.

Results

The present study comprises of a total 600 cases clinically suspected to be suffering from dermatophytosis, during a period of 9 months from November 2013 to July 2014

It can be seen that the majority of patients are male with 396(66%) while female with 246(34%).

Maximum number of patients were found in the age group of 21 – 30 years with 173(28.83%) & lowest in >60 years with 36(6%).

Majority of the cases were from low income group with 361 cases (60.16%) ,followed by middle income group with 192 cases (32%) and high income group with 47 cases (7.83%).

Labourer more prone to dermatophytic infections with 58.05%. The second most common group infected from Dermatophytosis were housewives with 15.83% and then agricultural workers with 12.16%.

Tinea corporis (246 cases), was the most common clinical condition found among 600 cases ,followed by Tinea unguium(132 cases), Tinea cruris (96cases),Tinea pedis and Tinea Capitis(24 cases),Tinea Faciae(18 Cases),Tinea manuum(12 Cases)and Tinea Barbae was least common with 6 cases. Mixed infection were also noted in 42 cases.

Table 1: Incidence of Different Species of Dermatophytes

Species	No. Of Cases	Percentage
T.mentagrophytes	158	41.17
T. rubrum	105	27.45
T.tonsurans	41	10.78
T.verrucosum	36	9.41
M.gypseum	4	0.98
M.audounii	7	1.76
M.nanum	5	1.37
E.flocosum	2	0.39
Candida albicans	20	5.09
Fusarium	6	1.56
Total	384	

Table 1 indicates isolation rates of Dermatophytes in processed samples. The isolation rate of the Dermatophytes is 64% (384).

Figure no1:Trichophyton mentagrophyte on SDA



Figure no 2:LCB Mount of Trichophyton mentagrophyte showing cigar shaped macroconidia

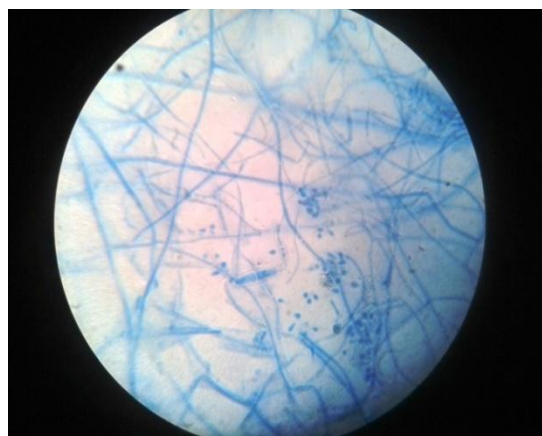


Figure no. 3: Colony reverse of Trichophyton rubrum on SDA

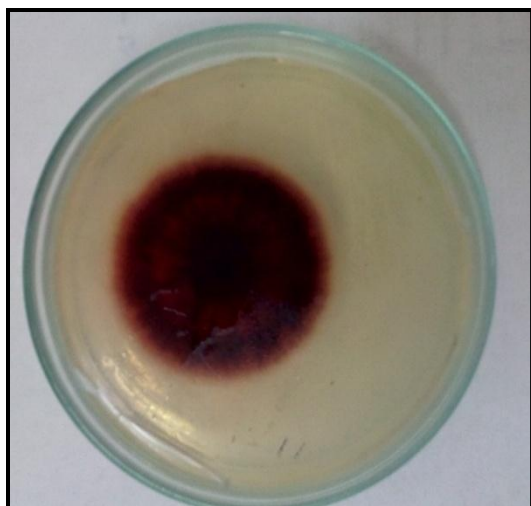
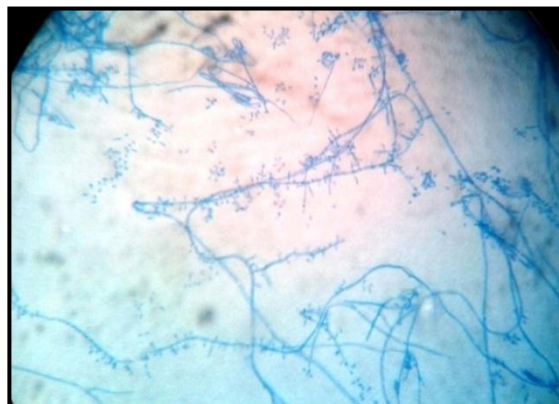


Figure no. 4: LCB mount of Trichophyton rubrum



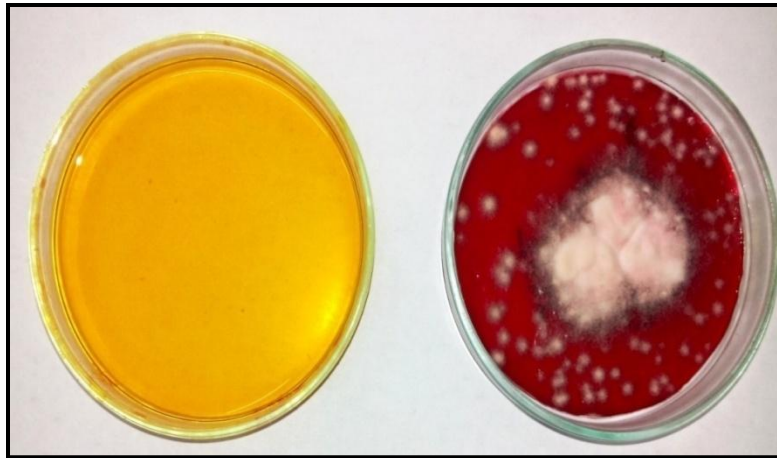


Figure no. 5:DTM Medium uninoculated(left side) and with colony(Rightside)

Out of total 600 cases maximum positivity of cases were found from skin scraping samples-420 Positive out of 444 cases, followed by nail Samples-84 Positive Out of 132 cases and then from Hair or Scalp Scraping Samples-6 Positive out of 24 cases, either by direct microscopy or culture. Total 510 cases(85%) out of 600cases were positive either by microscopy or culture.

In this study 462(77%) samples were positive by KOH while 384(64%) samples were positive by Culture. Out of 600 patients 48 were negative by KOH but yielded growth on Culture while 126 though showed fungal element on KOH but did not grow on Culture. Out of these 90 samples were negative by both KOH & Culture. So, total 77% samples were KOH positive, 23% KOH negative, 64% Culture positive & 36% culture negative.

Table 2 : Clinico mycological correlation :

Clinical Types	T.mentagrophyte	T.rubrum	T.verrucosum	T.tonsurans	M.gypseum	M.audouinii	M.nanum	E.floccosum	Candida	Fusarium	Total Positive	Total Cases
Tinea Corporis	103	50	21	19	1	3	2	-	-	-	199	246
Tinea Cruris	20	21	8	7	-	-	-	-	13	-	69	96
Tinea Capitis	-	-	-	-	1	2	1	-	-	-	4	24
Tinea Pedis	4	4	2	1	-	1	-	-	-	-	12	24
Tinea unguium	14	22	6	8	-	-	-	02	-	06	58	132
Tinea Barbae	02	-	-	-	1	-	-	-	-	-	03	6
Tinea Mannum	04	01	-	-	-	-	1	-	-	-	06	12
Tinea Faciei	04	04	1	1	-	-	-	-	-	-	10	18
Mixed Tinea Infection	07	03	3	-	1	1	1	-	7	-	23	42
Total	158	105	41	36	4	7	5	2	20	6	384	600

Table 2 suggests that T.mentagrophyte was found to be most common in T.corporis 103 cases, and T.cruis 20 cases and least in T.barbae 2 cases.

Discussion

Present study shows that out of 600 clinically diagnosed cases of dermatophytosis 64% were affected by Dermatophytes. Our results are comparable to studies conducted by Abu Elteen et al¹¹ (1999) Bindu V et al¹⁶ (2002) and Seema Bose et al¹³ (2013). Variation in isolation rate in few other studies may be due to differences in techniques used for sample collection, culture and other methods of identification like PCR Fingerprinting and Chitin Synthase 1 (CHS1) Gene Analysis OF dermatophytes^{2,8,16}. Delayed proceeding is also responsible for this^{7,16}.

In the present study, incidence was seen to be highest in age group 21-30 years . This is probably due to the heavy physical activity predisposing to increased perspiration^{13,14,17,18}.

As from our study & from other reports, it is shown that *T. capitis* is an infection of childhood. Bindu V., Calicut¹⁶ recorded similar finding.

Male to female ratio was 1.94:1 which is comparable with previous studies,^{6,7,15,16,19-22}, the reason is heavy outdoor physical activity with bare foot or wearing occlusive footwear for longer periods of time.

Due to prevalence of poor hygienic practices, overcrowding and less awareness about this type of Infections, low socioeconomic strata of society is more affected¹⁶.

Labourers formed majority of cases 351 (58.5%). This is due to heavy physical work which predisposes them to excess perspiration in a humid environment.

Of the 600 patients 31% gave history of similar complaints in the family which is due to increased number of sharing of fomites among the family members²⁶.

Tinea corporis was the commonest clinical type 246 (41%)^{12,15,16,23,24}. In *Tinea cruris* less aeration due to tight clothing, maceration and high rate of sweating in groin and waist region make this site more vulnerable to dermatophytosis²⁵.

The findings of results of KOH and culture positivity are comparable with other studies done by Karmakar S et al, Singh S et al, Sumana V et al.

The microbiological confirmation in our study could be obtained in 42% of the patients.. *T. mentagrophytes* was the most commonest species identified on culture being positive in 158(41.17%) this was followed by *T. rubrum* which was positive in 105(27.45%) of patients^{9,10,20,21}.

Conclusion

Dermatophyte infections are very common in our country where hot and humid climate in association with poor hygienic conditions play an important role in the growth of these fungi, most commonly found in male patients, 21-30 years age group and patients from lower economical class. There is varying difference in isolation of different species from southern and northern part of India. Early diagnosis and early treatment helps in effective management of these cases.

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