

## Original Research Article

# Clinico mycological study of dermatophytosis

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### ABSTRACT

**Background:** Dermatophytoses is common, more prevalent in tropical and subtropical countries including India. Though not life threatening as it can cause great discomfort particularly in immunosuppressive conditions. It remains a general public health problem, which is prevalent in all age groups and both sexes. Aims: To study clinicomycological profile of patients.

**Methods:** The Cross Sectional study was done on clinically diagnosed cases of Dermatophytosis with sample size of 200 cases for one and half year period.

**Results:** The males to female ratio are 1.86:1. The common age group affected was 31-40years. Dermatophytosis was common in active workers, more common in urban than rural population particularly in low socioeconomic group of people and in summer season. *Tinea corporis* was the common clinical variant. 133 cases were both KOH and culture positive. The KOH mount was positive in 90% cases. In the present study 144 patients (72%) had positive culture results and 47 cases were KOH positive but culture negative, 11 cases were culture positive but KOH negative and 9 cases were both KOH and culture negative. *Microsporum audouinii* was isolated in 2%, *Trichophyton mentagrophytes* in 14%, *Trichophyton rubrum* in 52% and *Trichophyton violaceum* in 4%.

**Conclusions:** *Tinea corporis* and *Tinea cruris* were the most common clinical types. *Tinea corporis* was predominantly a disease of adult males whereas *Tinea capitis* was seen mainly in pre-pubertal age group. Potassium hydroxide (KOH) wet mount and cultures were done for all the cases. *T. rubrum* was the commonest species isolated from most clinical types followed by *T. mentagrophytes* except *T. capitis* where *T. violaceum* was isolated.

**Keywords:** Dermatophytosis, *Tinea corporis*, *Tinea cruris*, *Tinea capitis*, *Trichophyton*, *Microsporum*

### INTRODUCTION

Dermatophytoses form over 16–75% of all the mycological infections. It is more prevalent in tropical and subtropical countries including India, where heat and moisture play an important role.<sup>1</sup> Although not life threatening, its severity can cause great discomfort particularly in immunosuppressive conditions. It remains a general public health problem, which is prevalent in all age groups and both the sexes.<sup>2</sup> Clinical lesions caused by the fungi are highly variable and closely resemble other skin diseases making laboratory diagnosis and

confirmation necessary.<sup>3</sup> The diagnostic tests include potassium hydroxide (KOH) wet mount examination, wood's lamp examination, skin biopsy and fungal culture.<sup>4</sup> The identification of the causative agent is necessary particularly in the case of *tinea capitis* which provides information on the risk of spread to other children at home or in the school.<sup>5</sup>

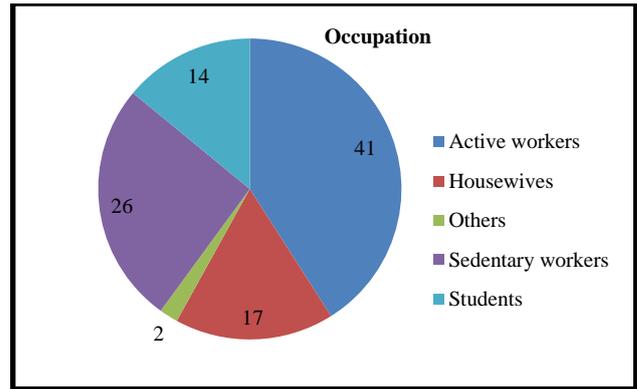
The present study is aimed to study various clinical presentations, mycological identification of dermatophytes and correlation between the site of involvement and causative agent.

**METHODS**

The study done was Cross Sectional observational study. The clinically diagnosed cases of Dermatophytosis reporting to Dermatology department at MediCiti Institute of Medical Sciences Hospital, Ghanpur, Medchal of sample size 200 cases for over one and half year period. The patients who have not taken any antifungal treatment (Topical and Systemic) in the last 4 weeks were included in his study. The detailed history, clinical examination and relevant lab investigations were done in all cases.

**RESULTS**

The number of cases in this study was 200, of which 70 patients (35%) were females and 130 (65%) males, with a male to female ratio of 1.86: 1. The high incidence of dermatophytosis was in the age group 31-40 years with 64 patients (32%) and minimum incidence was in the 61 – 70 years age group with 4 patients (2%). The youngest patient reported was 5 years old and oldest patient was 75 years old. In the present study dermatophytosis is most prevalent in active worker (41%), sedentary workers (26%), house wives (17%), students (14%) and others (2%). (Figure 1) Regarding the place of living, 128 patients (64%) were from rural background and 72 patients (36%) were from urban cities. The highest incidence of dermatophytosis reported was seen in summer season with 128 cases (64%), this was followed by rainy season 56 cases (28%) and winter 16 cases (8%).



**Figure 1: Distribution of occupation.**

Maximum occurrence of dermatophytosis was in the lower socioeconomic status. The source of infection was unknown in the study in 159 cases (79.5%), from friends in 32 cases (16%) and family members in 9 cases (4.5%). Tinea corporis was the most common clinical type (45%) followed by tinea cruris (28%), tinea capitis (9%), tinea faciei (5%), tinea unguium (4%), tinea manuum (3%), mixed type (2%), tinea barbae (2%) and tinea pedis (2%).

Tinea corporis was the most common clinical presentation with males affected 64.44% and females 35.55%. In tinea cruris males were affected 82.14% and females 17.85%. In case of tinea capitis males were affected in 66.67% of cases while females were affected in 33.33% of cases (Table 1).

**Table 1: Sex distribution of clinical type.**

Clinical type	Sex				Total
	F	%	M	%	
Mixed type	2	50	2	50	4
<i>T.barbae</i>	0	0	4	100	4
<i>T.capitis</i>	6	33.33	12	66.67	18
<i>T.corporis</i>	32	35.55	58	64.44	90
<i>T.cruis</i>	10	17.85	46	82.14	56
<i>T.faciei</i>	6	60	4	40	10
<i>T.manuum</i>	4	66.67	2	33.33	6
<i>T.pedis</i>	4	100	0	0	4
<i>T.unguium</i>	6	75	2	25	8
Total	70	35	130	65	200

Patients belonging to 21- 50 years constituted 71 % of the present study population. Mixed type was distributed 50% in 21-30 years, 25% in 31-40 years, and 25% in 41-50 years. *T. barbae* was 25% each in 11-20 years, 31-40 years, 41-50 years and 71-80 years. *T. capitis* was 61.11% in 1-10 years group. *T.corporis* was distributed maximum between 21-50 years group. *T. cruris* was seen in 21-40 years group. *T. faciei* was 60% in 30-40 years age group. *T. manuum* was 66.67% in 31-40 years age group. *T.*

*pedis* was 75% in 31-40 years age group. *T. unguium* was 62.5% in 31-40 years age group. (Table 2) In the present study 2% were associated with Atopy, 22% with Diabetes Mellitus, 2% with HIV and 9% with Hypertension. Out of 200 patients, 90% had a positive KOH mount and 10% had negative mount, 144 patients (72%) had positive culture results and 56 patients (28%) had negative culture results. 133 cases were both KOH and culture positive, 47 cases were KOH positive but culture negative, 11

cases were culture positive but KOH negative and 9 cases were both KOH and culture negative (Table 3). Out of 90 cases of *T.corporis*, 57 cases were both KOH and culture positive, 25 cases were KOH positive but culture negative. In 3 cases KOH was negative but culture positive while in 5 cases both KOH and culture was

negative. Out of 56 cases of *T.cruris*, 43 cases were both KOH and culture positive, 7 cases were KOH positive but culture negative. In 3 cases KOH was negative but culture positive while in 3 cases both KOH and culture was negative.

**Table 2: Age distribution of clinical types.**

Clinical Type	1-10 years		11-20 years		21-30 years		31-40 years		41-50 years		51-60 years		61-70 years		71-80 years		Total
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Mixed type	-	-	-	-	2	50	1	25	1	25	-	-	-	-	-	-	4
<i>T.barbae</i>	-	-	1	25	-	-	1	25	1	25	-	-	-	-	1	25	4
<i>T.capitis</i>	11	61.11	7	38.88	-	-	-	-	-	-	-	-	-	-	-	-	18
<i>T.corporis</i>	-	-	4	4.44	19	21.11	22	24.44	26	28.88	6	6.67	4	4.44	9	10	90
<i>T.cruris</i>	1	1.78	2	3.57	15	26.78	22	39.28	7	12.5	9	16.07	-	-	-	-	56
<i>T.faciei</i>	-	-	2	20	-	-	6	60	1	10	1	10	-	-	-	-	10
<i>T.manuum</i>	-	-	-	-	1	16.67	4	66.67	1	16.67	-	-	-	-	-	-	6
<i>T.pedis</i>	-	-	-	-	-	-	3	75	1	25	-	-	-	-	-	-	4
<i>T.unguium</i>	-	-	-	-	1	12.5	5	62.5	2	25	-	-	-	-	-	-	8
Total	12	6	16	8	38	19	64	32	40	20	16	8	4	2	10	5	200

**Table 3: Culture and KOH results.**

	KOH +ve Culture+ve	KOH +ve Culture-ve	KOH -ve Culture+ve	KOH -ve Culture-ve	Total KOH+ve	Total KOH-ve
No	133	47	11	9	180	20
%	66.5	23.5	5.5	4.5	90	10

In cases of *T.capitis* out of 18 cases, 10 were KOH and culture positive while 8 were KOH positive but culture negative.

culture positive, 3 was KOH positive but negative culture, 1 was KOH negative but culture positive and 1 was both KOH and culture negative.

Out of 10 cases of *T.faciei*, 8 were both KOH and culture positive and 2 were KOH negative but culture positive. There were 8 cases of *T.unguium*, 3 were both KOH and

There were 6 cases of *T.manuum*, 2 were both KOH and culture positive and 2 were KOH positive but culture negative and 2 were KOH negative but culture positive.

**Table 4: KOH and culture results compared to clinical types.**

Clinical Type	KOH +ve Culture +ve	KOH +ve Culture -ve	KOH -ve Culture -ve	KOH -ve Culture +ve	Culture +ve	Culture -ve
Mixed type	4	-	-	-	4	-
<i>T.barbae</i>	2	2	-	-	2	2
<i>T.capitis</i>	10	8	-	-	10	8
<i>T.corporis</i>	57	25	5	3	60	30
<i>T.cruris</i>	43	7	3	3	46	10
<i>T.faciei</i>	8	-	-	2	10	-
<i>T.manuum</i>	2	2	-	2	4	2
<i>T.pedis</i>	4	-	-	-	4	-
<i>T.unguium</i>	3	3	1	1	4	4
Total	133	47	9	11	144	56

There were 4 cases of mixed type, all were both KOH and culture positive. There were 4 cases of *T.pedis*, all were both KOH and culture positive.

There were 4 cases of *T.barbae*, 2 were KOH and culture positive and 2 were KOH positive but culture negative (Table 4).

**Culture**

Out of the 200 specimens inoculated into Sabouraud’s dextrose agar with chloramphenicol and cycloheximide, 144 positive cultures were obtained.

Different species were identified by their cultural characteristics and microscopy Culture was negative in 28%. *M.audouinii* was isolated in 2%, *T.mentagrophytes* in 14%, *T. rubrum* in 52% and *T.violaceum* in 4%.

***Tinea corporis***

Out of the 90 clinically diagnosed cases, 60 cases were culture positive *T.rubrum* was isolated in 44 cases and *T.mentagrophytes* in 16 cases (Figure 2).

***Tinea cruris***

Out of the 56 clinically diagnosed cases, 46 were culture positive. *T.rubrum* was isolated from 42 cases and *T.mentagrophytes* from 4 cases.

***Tinea capitis***

Out of the 18 clinically diagnosed cases, 10 were culture positive. *T.violaceum* was isolated in 6 cases and *M.audouinii* in 4 cases (Figure 3).

***Tinea pedis***

Only 4 cases were found in the present study and were culture positive. The species isolated was *T.mentagrophytes*.

***Tinea manuum***

Out of the 6 cases, 4 were culture positive and *T.rubrum* was isolated in all the cases.

***Tinea unguium***

4 out of 8 cases were culture positive and *T.rubrum* was grown in culture.

***Tinea faciei***

All 10 cases were culture positive, *T.mentagrophytes* was isolated in 4 cases and *T.rubrum* was isolated in 6 cases (Figure 4).

**Mixed type**

4 cases were culture positive and rubrum was isolated.

***Tinea barbae***

4 cases out of which 2 were culture positive and *T.violaceum* was the isolate.

**Distribution of isolated species of dermatophytes**

Of the total 104 cases of *T.rubrum*, 44 were from *T.corporis*, 42 from *T.cruis*, 6 from *T. faciei*, 4 from *T.manuum*, 4 from *T.unguim*, and 4 from mixed type. Out of the 28 cases of *T.mentagrophytes*, 16 were from the tinea corporis, 4 from tinea cruris, 4 from tinea pedis and 4 from tinea faciei.

Out of the 8 cases of *T.violaceum*, 6 were from tinea capitis and 2 from tinea barbae.

All 4 cases of *M.audouinii* were isolated from tinea capitis. Maximum number of isolates of *T.rubrum* and *T.mentagrophytes* were from 21-50 years age group whereas *T.violaceum* was isolated mainly from 1-10 years age group and *M.audouinii* was isolated mainly from 11-20 years age group.

**Table 5: Dermatophytes isolated from different clinical types.**

Clinical type	Species					Total
	Culture -ve	<i>M.audouinii</i>	<i>T.mentagrophytes</i>	<i>T. rubrum</i>	<i>T.violaceum</i>	
Mixed type	-	-	-	4	-	4
<i>T.barbae</i>	2	-	-	-	2	4
<i>T.capitis</i>	8	4	-	-	6	18
<i>T.corporis</i>	30	-	16	44	-	90
<i>T.cruis</i>	10	-	4	42	-	56
<i>T.faciei</i>	-	-	4	6	-	10
<i>T.manuum</i>	2	-	-	4	-	6
<i>T.pedis</i>	-	-	4	-	-	4
<i>T.unguim</i>	4	-	-	4	-	8
Total	56	4	28	104	8	200

## DISCUSSION

In this study we analyzed the clinico- epidemiological characteristics of 200 clinically diagnosed cases of dermatophytoses and correlated them with the species of fungi responsible.

### Age

In the present study, maximum numbers of cases of dermatophytoses were noted between the ages of 31-40 years (32%) followed by 41-50 years (20%) age group. Verenkar et al in their study on dermatophytoses reported infection to be common in 21-30 years group.<sup>1</sup> S. Sumathi et al reported highest incidence in age group of 15- 30 years.<sup>6</sup> U.S. Agarwal et al in their study reported highest incidence in age group of 21-30 years.<sup>7</sup> Hanumanthappa et al in their study reported highest incidence in age group of 21- 30 years.<sup>8</sup> Sumit kumar et al reported highest incidence in age group of 21-30 years.<sup>8</sup> Gupta et al reported highest incidence in age group of 21-30 years.<sup>13</sup> Poria et al reported incidence in age group of 21-50 years.<sup>14</sup> Siddappa et al reported highest incidence of dermatophytoses in the age group of 11-50 years.<sup>11</sup> The exact reason for highest incidence in young adults and low incidence in two extremes of age group i.e., children and aged persons is not known. The higher incidence may be due to increased physical activity and increased perspiration.

### Sex

In the present study males (130 cases with 65%) were more commonly affected than females (70 cases with 35%). Male to female ratio was 1.86: 1. In almost all studies done by Verenkar et al, Gupta et al, Poria et al, Hanumanthappa H, et al, Sumathi S et al, U.S. Agarwal et al, Sumitkumar et al, Bhavsar Hitendra K et al, Mathur M et al and Jain N et al reported male preponderance.<sup>1,6-9,13,14,20,21</sup> This may be due to increased outdoor physical activity and increased opportunity for exposure in men than women.

### Seasonal

In the present study, highest incidence of dermatophytosis was reported in summer season (128 cases with 64%) followed by rainy season (56 cases with 28%). Siddappa et al observed similarly in their study.<sup>11</sup> Higher incidence in summer season may be due to the increased heat which in turn leads to increased perspiration.

### Occupation

In this study majority of patients were active workers (82 cases with 41%) followed by sedentary workers (52 cases with 26%), house wives (34 cases with 17 %) and students (28 cases with 14%) Amma et al and Sumana et al have reported same.<sup>15</sup>

### Duration

In this study majority of patients (34 cases with 17%) reported 4 week duration while only 1 case (0.5%) presented with disease of more than 1 year duration. U.S. Agarwal et al in their study, classified patients into three disease duration groups, i.e.: <1 month, 1-3 months, >3 months. Most patients 163 (62.5%), had disease for longer than 3 months.<sup>7</sup>

### Background

In the present study, maximum number of patients came from rural areas (128 cases with 64%) while only 72 cases (36 %) of patients were from urban areas. Sumana et al have reported same.<sup>15</sup> The higher incidence in rural areas may be due to more outdoor exposure to environmental dust, improper personal hygiene and ignorance.

In this study highest incidence was seen in low socioeconomic status (14 cases with 70.5%) followed by middle socioeconomic status (55 cases with 27.5%) and high socioeconomic status (4 cases with 2%). Ranganathan S et al in their study reported that 35% of patients were from very low income group and 34.2% from low income group.<sup>2</sup> Bindu in her study reported a higher incidence in patients belonging to middle socioeconomic group.<sup>16</sup> Higher incidence may be due to the poor hygiene conditions i.e., common practice of sharing clothes, bathing towels, poor nutritional status and overcrowding.

### Clinical types

#### *Tinea corporis*

The most common clinical type encountered in this study was *Tinea corporis* – 90 cases (45%), followed by *Tinea cruris*- 56 cases (28%) (Figure 2). Other common type was *Tinea capitis*- 18 cases (9%) followed by *Tinea faciei*- 10 cases (5%), *Tinea unguium*- 8 cases (4%) and *Tinea manuum*- 6 cases (3%). *Tinea barbae* (4 cases), *Tinea pedis* (4 cases) and Mixed type (4 cases)- (2% each). In the present study, the commonest clinical type was *Tinea corporis*- 90 cases (45%).

The most common age group affected was 41 to 50 years- 26 cases (28.8%) followed by 31 to 40- 22 cases (24.4%). In the present study- (58 cases) 64.44% of patients with *tinea corporis* were males while 32 cases (35.55%) were females. Poria et al reported *tinea corporis* as common in age group of 21 to 50 years (32.65%).<sup>14</sup> Siddappa et al reported a higher incidence of *tinea corporis* in males (55.55%) when compared to females (44.45%).<sup>11</sup> Bhavsar Hitendra K et al and Mathur et al reported *tinea corporis* as the most common clinical type in their study.<sup>10,21</sup> Among the females who had *tinea corporis*, common site involved was the waist area where the patterns of clothing worn by the women in the catchment area –

saree and salwar suits - act as precipitating factors due to friction, increased sweating, collection dust particles and fungal spores at belt line.



**Figure 2: Tinea corporis (Waist and inframammary area).**

#### *Tinea cruris*

In this study the incidence of Tinea cruris was the second highest – 56 cases (28%). The most common age group affected was 31 to 40 years 22 cases (39.28%) followed by 21 to 30 years 15 cases (26.78%). There were no cases in 61 to 80 years age group. 46 cases (82.14%) of patients with tinea cruris were males and 10 cases (17.85%) were females. Siddappa et al and Kumar S et al in their study, reported tinea cruris as second most common type.<sup>8,11</sup> Karmakar et al, Kumari et al, Poria et al, Verenkar et al and Siddappa et al reported high incidence of tinea cruris.<sup>1,11,12,14,17</sup>

#### *Tinea capitis*

In the present study tinea capitis was the 3rd most common clinical type with an incidence of 9% - 18 cases. (Figure 3) The age group affected more was 1 to 10 years- 11 cases (61.11%). Boys 12 cases (66.67%) were affected more than girls 6 cases (33.33%) Siddappa et al in their study reported incidence of tinea capitis as 6.93 %.



**Figure 3: Tinea capitis with dermatophytid/id reaction.**

The most common age group affected was 0 to 10 years.<sup>11</sup> Only boys were affected. Karmakar et al reported

high incidence of tinea capitis (16.8%).<sup>12</sup> Huda et al reported low incidence of tinea capitis (3%).

High incidence of tinea capitis may be due to poor scalp hygiene and relative neglect in hair dressing and sharing of fomites like towels, combs and lack of sebum.<sup>18</sup>

#### *Tinea unguium*

In the present study the incidence of tinea unguium was 4% (8 cases). The highest incidence was in 31 to 40 years age group 5 cases (62.5 %), followed by 41 to 50 years 2 cases (25%). Male patients comprised 2 cases (25%) and females' 6 cases (75%). Gupta et al reported the incidence of tinea unguium as 4.4%. Huda et al reported the incidence of tinea unguium as 6 %.<sup>18</sup>

#### *Tinea barbae*

In the present study the incidence was 2% (4 cases). All were males. The age groups affected were 11-20 (1 case), 31-40 (1 case), 41-50 (1 case) and 71-80 years (1 case), each constituting 25%. Poria et al reported the incidence of tinea barbae as 2% and the most common age group was 21 to 50 years.<sup>14</sup>

#### *Tinea manuum*

In the present study, the incidence was 3% (6 cases). The most common age group was 31 to 40 years- 4 cases (66.67%). 2 Males (33.33%) and 4 females (66.67%) were affected. Siddappa et al reported the incidence of tinea manuum as 1.53%. The most common age group was 21-30 years (50%) and 31-40 years (50%).<sup>11</sup> only males were affected. (100%) This could be attributed to chances of occupational trauma which is a precipitating factor.

#### *Tinea pedis*

The incidence in the present study was 2% (4 cases). The age group affected was 31 to 40 years 3 cases (75%). All were females. Siddappa et al reported the incidence of tinea pedis as 1.53%. Huda et al reported the incidence of tinea pedis as 7%.

Bindu reported incidence of tinea pedis as 3.3%.<sup>16</sup> Amma et al reported tinea pedis to be most common in 21 to 30 years age group. The low incidence of tinea pedis may be due to the habit of going barefoot or due to wearing open sandals. No *T. pedis* was observed in males in our study.

#### *Tinea faciei*

In the present study the incidence was 5% (10 cases) (Figure 4). The age group commonly affected was 31 to 40 years, 6 cases (60%). 4 males and 6 females were affected. Gupta et al reported the incidence of tinea faciei as 3.8%.<sup>13</sup> Karmakar et al reported the incidence of 6%.<sup>12</sup>



**Figure 4: Tinea faciei.**

#### Mixed type infection

In the present study, the incidence was 2% (4 cases) and was seen, 2 cases in 21-30 years age group and one each in 31 to 40years (25%) and 41 to 50years (25%) age groups. 2 patients were males (50%) and 2 patients were females (50%). The extensive dermatophytosis is seen in immunosuppressive conditions like Diabetes and HIV etc. Siddappa et al reported the incidence of mixed type as 0.77%.<sup>11</sup>

#### Mycological studies

In present study, out of 200 cases of dermatophytosis, 180 cases (90%) were positive by KOH and 144 (72%) cases were positive by culture. 133 cases (66.5%) were positive by both KOH and culture. 47 (23.5%) cases were KOH positive but culture negative. 11 cases (5.5%) were KOH negative but culture positive. 9 cases (4.5%) were both KOH and culture negative.

Siddappa et al reported 100% positivity by KOH and 49% positivity by culture. karmakar et al reported 86% positivity by KOH and 41.6% positivity by culture. 39.2% of cases were positive by both methods and 2.4% negative by microscopy but positive by culture. Huda et al reported 57.14 % positive both by KOH and culture and 8 % negative by both methods. 34.52% of cases were negative by KOH but positive by culture and 1.19% positive by KOH but negative by culture (Figure 5).



**Figure 5: KOH preparation of skin scrapings showing hyaline septate hyphae.**

#### Incidence of various species of dermatophytosis

In the present study, *T.rubrum* was the commonest isolate 104 cases (52%) followed by *T. mentagrophytes* 28cases (14%), *T. violaceum* 8 cases (4%) and *M. audouinii* 4 cases (2%). Siddappa et al reported *T. rubrum* in 54 cases (81.82%), *T. violaceum* in 3 cases (4.54%). *T. mentagrophytes* in 1 case (1.51%), *E. floccosum* in 6 cases (9.09%) and *M.audouinii* in 2 cases (3.03%) Verenkar et al reported. *T.rubrum* as the commonest species (55%) followed by *T.mentagrophytes* (31.03%) *E.floccosum* (6.89%) and *M.gypseum* (3.4%) Gupta et al reported *T.rubrum* as commonest isolate followed by *E.floccosum* (15.15%) Bindu reported *T.rubrum* as the predominant species followed by *T. mentagrophytes*. Huda et al 55 reported *T.rubrum* as commonest isolate (88.15%) followed by *T. mentagrophytes* (16.7%) *T.violaceum* (8.8%) *M.audouinii* (5.9%) and *M. gypseum* (2.9%)

#### Dermatophytes isolated from different clinical types

##### *Trichophyton rubrum*

*T.rubrum* was the predominant isolate in the present study comprising 104 cases (52%) of the total isolates. *T.rubrum* was the major isolate in 31 to 40years (37 cases) age group *T.rubrum* was the most common isolate in *T.corporis* (44 cases) and *T.cruris* (42 cases). Siddappa et al 11 reported *T.rubrum* as the major isolate (81.82%) from all clinical types except tinea capitis. Verenkar et al 1 reported *T.rubrum* as commonest etiological agent (55.18%) from all clinical types. Gupta et al 13 reported *T.rubrum* as commonest etiological agent (Figure 6 and 7).

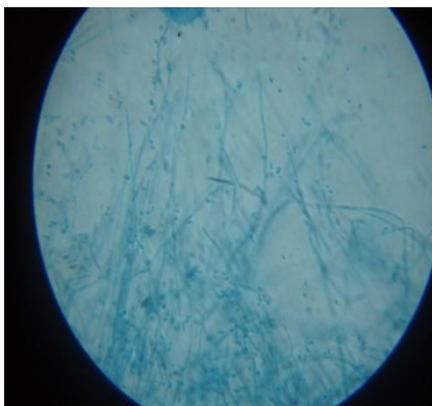


**Figure 6: Trichophyton rubrum culture on SDA.**

##### *Trichophyton mentagrophytes*

*T. mentagrophytes* was 2<sup>nd</sup> most common isolate in the present study comprising 28 cases (14%) of the total isolate. *T. mentagrophytes* was the second most common isolate from tinea corporis and tinea cruris and the only isolate from tinea pedis. Patwardhan et al reported *T.mentagrophytes* as the second most common (25.2%)

in their study.<sup>19</sup> Bindu reported *T.mentagrophytes* as the second most common isolate (25%).<sup>16</sup>



**Figure 7: Lactophenol cotton blue mount - *Trichophyton rubrum*.**

#### *Trichophyton violaceum*

*T. violaceum* was the 3<sup>rd</sup> most common isolate in 8 cases (4%) in the present study. *T. violaceum* was the major isolate from tinea capitis (6 cases). 2 cases of tinea barbae were also caused by *T.violaceum* in the present study. Siddappa et al in their study have reported *T.violaceum* as the third most common isolate (4.54%). *T.violaceum* was the most common isolate from tinea capitis.<sup>11</sup>

#### *Microsporum audouinii*

In the present study *M. audouinii* was isolated from 4 cases (2%) all the cases being tinea capitis. Siddappa et al reported *M. audouinii* from 3.03% of cases and was isolated only from tinea capitis.<sup>11</sup> Thus the various isolates detected in the present study are similar to those detected in many of the studies.

#### Associated diseases

44 (22%) patients are diabetics. There is an association reported between diabetes and *T. rubrum* infection. Atopy was found in 4 (2%) patients in our study. One study has reported that chronic dermatophytic infections are approximately 3 fold more frequent in atopics. 4 cases (2%) were HIV positive in present study.

#### CONCLUSION

Dermatophytosis mainly a disease of young and middle age adults, particularly males due to chances of exposure to the risk factors are more due to physical exertion and contact with infected persons. Patients from lower socioeconomic group predominated in the study group due to poor personal hygiene, overcrowding and poor nutritional status. Tinea corporis and Tinea cruris were the most common clinical types. Tinea cruris was predominantly a disease of adult males whereas Tinea capitis was seen mainly in pre pubertal age group.

Dermatophytosis when associated with diabetes mellitus and HIV patients was chronic and extensive probably due to immunological factors. The other associated conditions were Hypertension, atopy and HIV infection. KOH preparation and cultures were done for all the cases. There was variation in isolation of different species from different parts. Trichophyton species formed the commonest etiological agents of dermatophytosis.

*T. rubrum* was the commonest species isolated from most clinical types except *T. capitis* where *T. violaceum* was the most common isolate. Dermatophytoses are very common infections which are commonly seen in patients who work in hot atmospheric conditions and those indulgent in strenuous work. Clothing patterns also play a part in their initiation. By taking proper precautionary measures the incidence and extent of lesions can be brought down. Personal hygiene also appears to be an important factor, improvisation of which can result in decreasing incidence.

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