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Original Research Article

CLINICAL AND MYCOLOGICAL STUDY OF TINEA CORPORIS

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ABSTRACT

Background
Tinea corporis is a superficial fungal infection of keratin tissue caused by Dermatophytes. According to observation worldwide Dermatophytes are the most common of the superficial fungal infection. It is common in tropics and may present in epidemic proportions in areas with high rate of humidity, over populations, and poor hygenic conditions. Raichur is a tropical area, hence the present study was taken to find out the clinical patterns of Tinea corporis and to find out fungal species affecting Tinea corporis in Raichur.

Methods
One hundred patients clinically suspected for Tinea corporis attending Dermatology outpatient and inpatient department of Navodaya Medical College and Research Centre ,Raichur from November 2009 to October 2010 were selected for study specimens. The patients having lesions of papules with scales over the glabrous skin excluding groin was selected for study and scraping from the lesions taken for KOH mount and fungus culture.

Results
Out of 100 patients the maximum were seen in the age group of 16-30 years (44%), male to female ratio was 1.6:1 ratio. Tinea corporis annular type was the commonest clinical type (45%), followed by Tinea incognito (7%) and Bullous type (4%). Overall positivity by culture was 40%, and direct microscopy (KOH) 96% . T.rubrum was the predominant species isolated(31%) followed by T.mentagrophyte (8%), 54.0% of culture report showed no growth.

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Conclusion

Tinea corporis annular type was the commonest clinical type followed by Tinea incognito and Bullous type.T.rubrum was the commonest organism isolated. The present study showed no significant difference in the clinical type, the age distribution, sex distribution and etiological agents causing Tinea corporis infection in this part of Karnataka in agreement of reports from other parts of India.

Keywords: Dermatophytes, Tinea corporis (annular), Tinea incognito, Bullous type, Trichophyton rubrum, Trichophyton mentagrophytes.

INTRODUCTION

Tinea corporis is a superficial fungal infection of keratinized tissue caused by dermatophytes.[1] The infection is commonly called as ringworm or 'tinea'. Dermatophytes are moulds belonging to three genera of fungi imperfectii i.e, 1. Microsporum 2. Trichophyton and 3. Epidermophyton.[2] According to observation worldwide, dermatophytoses are the most common of the superficial fungal infection. It is common in tropics and may present in epidemic proportions in areas with high rate of humidity, over population and poor hygienic conditions[3.] Raichur is a tropical area, hence the present study has been taken to find out the clinical patterns of Tinea corporis and to find out the fungal species affecting Tinea corporis in Raichur. During the 1920's studies of the dermatophytes by Benham and Hopkins formed the foundation of modern medical mycology. Emmons, Comamt and Geary consolidated these efforts. In 1934, Emmons critically reviewed the taxonomic status of the dermatophytes and he accepted only three genera Microsporum, Trichophyton and Epidermophyton. He also defined each of them according to the systematic rules of the nomenclature and taxonomy.[4] Under appropriate environmental conditions (warmth, humidity) a reservoir of infection on the feet or elsewhere maybe the source of Tinea corporis.[5] Children appear to have an increased incidence of Tinea corporis caused by zoophilic organism. Many of these infections are with Microsporum canis.[6] Powell, in 1900, reported the prevalence of dermatophytes infection in Assam, there after the incidence of dermatophytosis in different parts of India have been published.[7] Dermatophytoses are moulds belonging to 3 genera of fungi imperfectii i.e., Microsporum, Trichophyton and Epidermophyton.[2] Dermatophytoses is an infection of the skin, hair or nails caused by dermatophytes. Dermatophyte differentiation in the clinical setting begins with the source of the organism. Trichophyton can infect hair, skin and nails. Microsporum can infect hair and skin. Epidermophyton can infect skin and nails.[8]

MATERIALS AND METHODS

The patients attending out patient department of Navodaya Medical College and the patients admitted in Navodaya Medical College hospital from November 2009 to October 2010. One hundred cases would be taken for study. A detailed clinical history including age, sex, socio-economic status, occupation, duration of the disease, history of recurrence and type of lesion, similar complaints in the family and contacts with animals or soil were recorded in a proforma. General physical examination and systemic examination was conducted in all cases and investigations like hb%, TC, DC, ESR, Urine examination, Blood sugar was done wherever necessary.

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Inclusion Criteria

- Annular lesions of papules with scales
- Bullous lesions (KOH positive)
- Peri follicular , granulomatous lesion over legs (KOH positive)

Exclusion Criteria

- Annular lesions with micaceous scales
- Annular lesions formed by violaceous flat topped papules
- Annular lesions (KOH negative)

RESULTS

Sex	Frequency	Percentage
Male	62	62.0
Female	38	38.0
Total	100	100.0

Table 1: Distribution of study subjects according to sex

A total of 100 patients were enrolled in the study, comprising of 62 males and 38 females. Male to Female ratio was 1.6:1

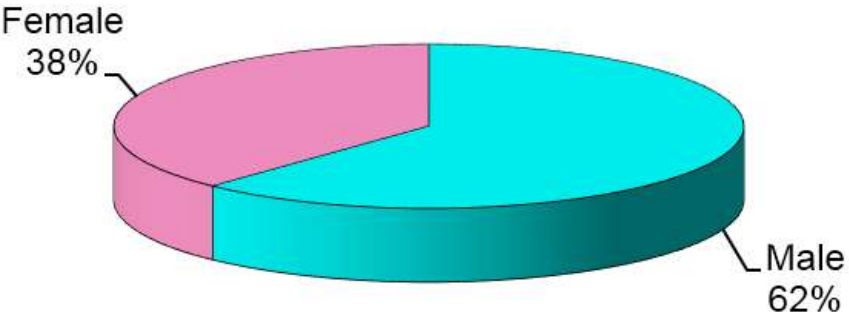

Figure 1

Age	Frequency	Percentage
0-15	7	7.0
16-30	44	44.0
31-45	26	26.0
46-60	23	23.0
Total	100	100.0

Table 2: Distribution of study subjects according to age (in years)

Out of the 100 patients, it is seen that the maximum number of cases were in the age group of 16-30 years (44 cases) followed by 31-45 years (26 cases) and 0-15 years (7 cases).

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The youngest patient was 6 year old boy and the oldest was 60 year old man.

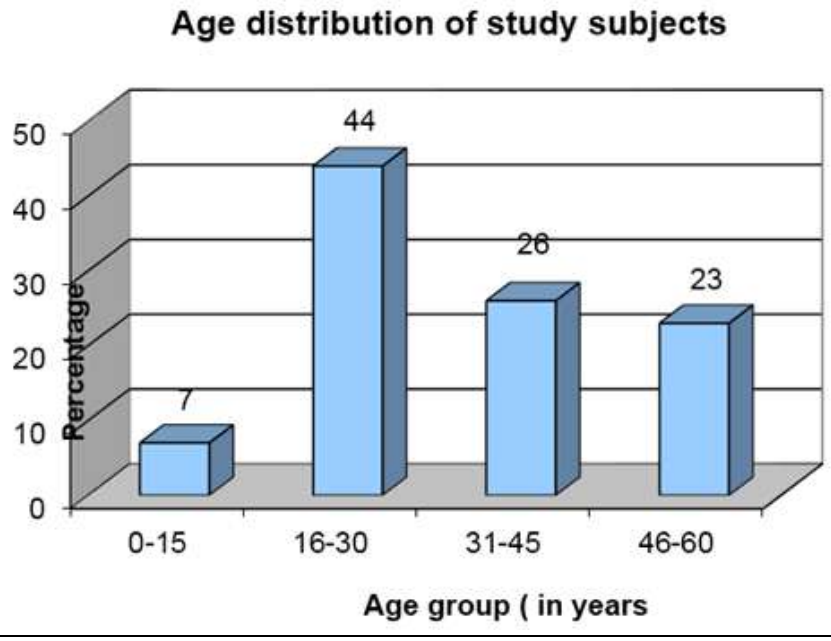

Figure 2

Clinical Pattern	**Male** (%)	**Female** (%)	**Total**
Tc (annular)	23 (51.1)	22 (48.9)	45
Tc (annular) +LSC	0 (0)	1 (100)	1
Tc (annular) extensive	4 (80)	1 (20)	5
Tc(annular)+pyoderma	1 (100)	0 (0)	1
Tc (annular)+LSC	1 (50)	1 (50)	2
Tc (annular)+Tcr	16 (76.2)	5 (23.8)	21
Tc (annular)+Tcr+LSC	1 (100)	0	1
Tc(annular)+Tcr+ Scabies	1 (100)	0	1
Tc (annular)+Tcr+Tm	0 (0)	1 (100)	1
Tc (annular)+Tcr+Tv	1 (100)	0	1
Tc(annular)+Tcr+ pyoderma	1 (100)	0	1
Tc(annular)+Tcr+ scabies	1 (100)	0	1
Tc (annular)+Tf	0	1 (100)	1
Tc (annular)+Tm	1 (100)	0	1
Tc (annular)+Tp	0	1 (100)	1
Tc(annular)+acanthosis nigricans	1 (100)	0	1
Tc(annular)+folliculitis	1 (100)	0	1

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Tc(annular)+furunculosis	1 (100)	0	1
Tc (annular)+scabies	1 (100)	0	1
Tc (bullous)	3 (75)	1 (25)	4
Tc (incognito)	3 (42.9)	4 (57.1)	7
Tc (incognito)+Tcr	1 (100)	0	1
Total	62 (62)	38 (38)	100

Table 3: Distribution of clinical pattern according to sex

χ^2 =4.162 , df=2, p=0.125, Not significant

Present study revealed that Tinea corporis was more common in males (62%) than in females (38%) as shown above.

Tinea corporis (annular type) was the commonest clinical pattern seen in both males and females, (51.1% and 48.9% respectively)

Chi-square values and P values however showed no significant correlation between the variables.

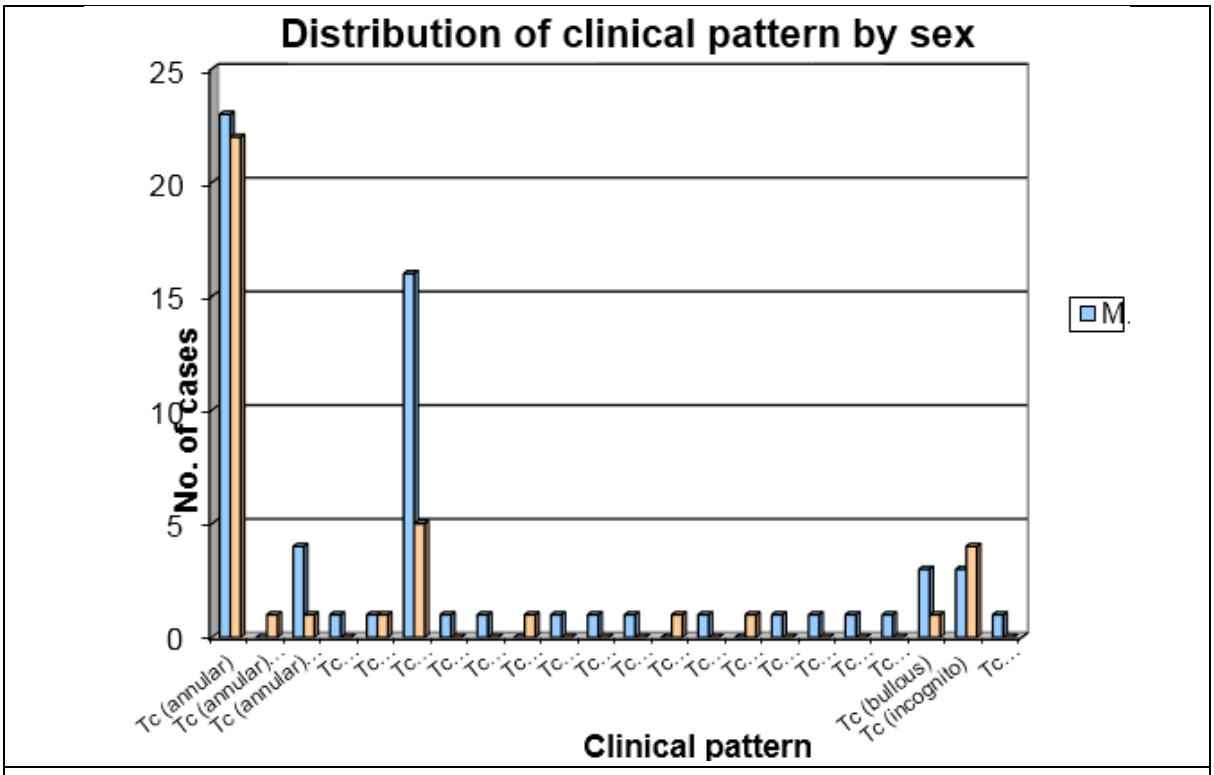

Figure 3

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Organism isolated	Frequency	Percent
Epidermophyton floccosum	2	2.3
Microsporum audouini	1	1.1
Microsporum canis	1	1.1
No growth	47	54.0
Trichophyton mentagrophytes	7	8.0
Trichophyton rubrum	27	31.0
Trichophyton rubrum/ Trichophyton mentagrophytes	1	1.1
Trichophyton schoenleinii	1	1.1
Total	87	100.0

Table 4: Distribution of incidence of isolated

In the present study all the 3 genera of dermatophytes i.e, Trichophyton, Epidermophyton and Microsporum were isolated as causative agents of infection.

A total number of 6 different species of dermatophytes were isolated with T.rubrum(31.0%) was the highest followed byT.mentagrophytes (8.0%), E.floccosum (2.3%), T.schoenleinii (1.1%) M.canis(1.1%), M.audouini(1.1%).

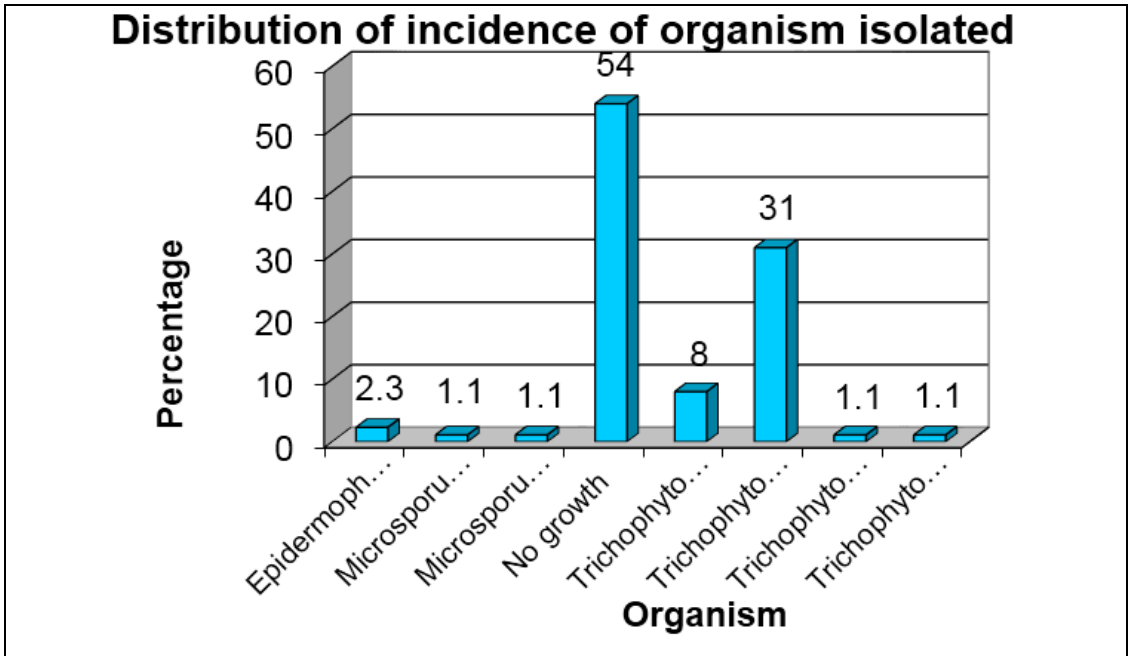

Figure 4

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KOH	Culture			Total
	Positive	Negative	C	
+ve	36	47	13	96
-ve	4	0	0	4
Total	40	47	13	100

Table 5: Result of Direct Microscopy and culture

$\chi^2 = 6.25$, df=2, p=0.044, Significant

Sensitivity = 90 %

Out of 100 cases, 96 cases were positive on direct KOH mount of which 40 cases were culture positive and 47 negative, 13 samples were contaminated. The overall positivity by culture was 40% and direct microscopy was 96%.

36 cases were KOH positive and culture positive.

47 cases were positive on direct microscopy and negative on culture.

4 cases were negative on direct microscopy but all 4 showed culture positive.

Fungal Culture	Frequency	Percentage
Positive	40	40.0
Negative	47	47.0
Contaminated	13	13.0
Total	100	100.0

Table 6: Fungal culture

Out of 100 cases, culture positivity was seen in 40 cases. 47 cases showed no growth on culture.13 tubes were contaminated.

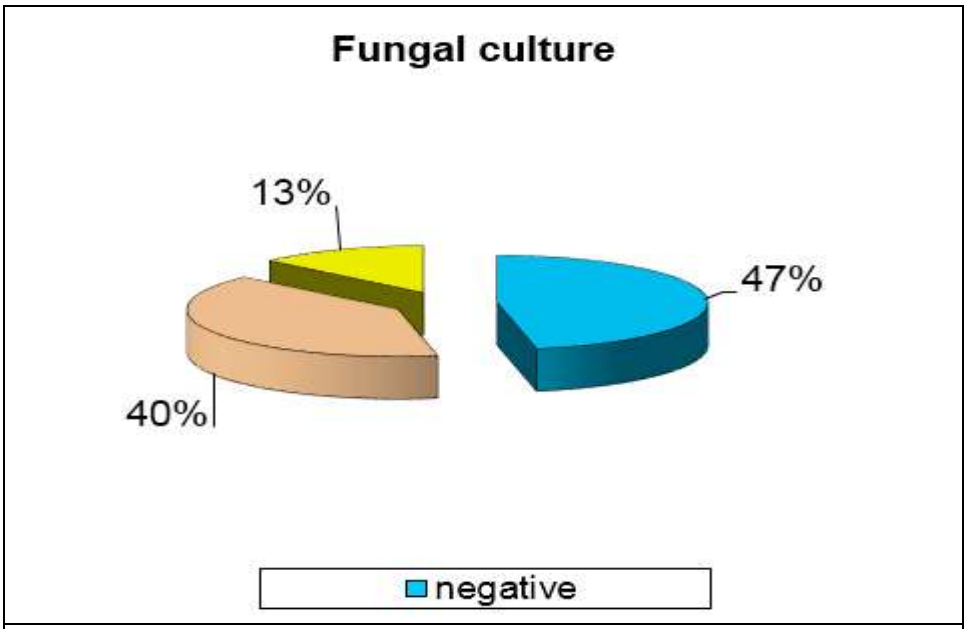

Figure 5

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DISCUSSION

In the present study of 100 cases of Tinea corporis, the following clinical patterns were observed:-

- Annular type
- Bullous type
- Incognito

Coexisting Tinea cruris, Tinea pedis, Tinea manuum, Tinea versicolor, Tinea faciei were seen. The above cases were selected from patients attending OPD of Navodaya Medical College and Research Centre, Raichur. As regards to the age incidence, maximum number of cases were encountered in the age group of 16-30 years (44%). This was in accordance with the findings of other workers, Peerapur BV et al in Bijapur[7] ,Singh S et al in Baroda[9], Sentamilselvi G et al[10] , Belukar DD et al in Thane[11]. This was followed by the age group of 31-45 years (26%). Although the majority of studies have observed higher incidence in the 3rd decade, the study done at Calicut by Bindu[1] and other co-workers observed higher incidence in 2nd decade. In the present study higher incidence was in 2nd decade. Tinea corporis was more common in males below 30 years and in females more cases wer seen above 30 years. Similar findings were noticed in a study done by Sentamilselvi[10]. Sex incidence in this study showed males (62%) outnumbering females (38%) and male to female ratio was 1.6:1. Similar findings have been reported by other workers, Bindu V et al[1] ,Peerapur BV et al[7], Sentamilselvi G et al[10], Belukar DD et al[11], Prasad PV et al[12]. The higher incidence in males could be due to greater physical activity and increased sweating. In the present study Tinea corporis(annular) has the highest percentage (45%), Tinea corporis with Tinea cruris(21%), Tinea corporis (incognito) (7%), Tinea corporis (bullous) (4%), Tinea corporis (extensive) (5%), Tinea corporis with L.S.C (3%), Tinea corporis with pyoderma(1%), Tinea corporis with acanthosis nigricans(1%), Tinea corporis with folliculitis(1%), Tinea corporis with furrunculosis(1%), Tinea corporis with scabies(1%), Tinea corporis with Tinea cruris with LSC(1%), Tinea corporis with Tinea cruris with pyoderma(1%), Tinea corporis with Tinea cruris with scabies (2%), Tinea corporis with Tinea cruris with Tinea Manuum(1%), Tinea corporis with Tinea cruris with Tinea versicolor (1%),Tinea corporis with Tinea faciei(1%), Tinea corporis with Tinea Manuum (1%), Tinea corporis with Tinea pedis(1%), Tinea incognito with Tinea cruris(1%). In the present series out of 100 clinical cases it was possible to demonstrate fungi on direct microscopy with potassium hydroxide with 96 cases. Overall positivity by culture was 40%. The variations in KOH positivity and culture positivity in several studies[1,11], have been outlined in Table:7 In comparison, the study done at Thane showed culture positivity of 71% which was at a higher rate, and study done at Aurangabad[13] showed low rate of culture positivity (22.8%). In the present study culture positivity was 40%, this variations are probably due to laboratory mistakes.

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Study area	Present study, Raichur Karnataka	Belukar et al, Thane[11], Maharashtra	Bindu V et al, Calicut[1], Kerala	Patwardhan N et al[13] Aurangabad Maharashtra
Predominantly affected age group	16- 30 years	21-30years	11-20 years	21-30years
Male to Female ratio	1.6:1	0.6:1	2.06:1	2:1
Tineacorporis(annular)	45%	20.19%	54.6%	24.50%
KOH positivity	96%	68.34%	64%	37.40%
Culture positivity	40%	71.00%	45.3%	22.81%

Table 7

Out of 100 cases 96 cases were KOH positive and 4 were negative in comparision with studies done at Thane[11] which showed 68.34%, at Calicut[1] 64% and Aurangabad[13] which showed 22.81%. In all clinical patterns, T. Rubrum was the commonest organism isolated with a percentage of 31%, next in frequency was T. Mentagrophyte (8%), epidermophyton flocosum (2.3%), M.Canis (1.1%), M.Audounii (1.1%), T.Schoenlenii (1.1%), Trichophyton Rubrum/T.Mentagrophytes (1.1%). Culture report showing no growth were 54.0%. It is therefore observed that T.Rubrum was the main organism isolated from the infections of glabrous stain followed by T.Mentagrophyte. This is an agreement with majority of other studies reported from India and other countries, Bindu V et al[1], Kanwar AJ et al[2], Singh S et al[9], Rani V[14], Patwardhan N et al[13], Alsogair SM et al[15]. Chi-Square test showed no significant value in correlation between clinical and mycological study.

CONCLUSION

The present clinico-mycological study shows Tinea corporis (annular type) as the commonest clinical pattern followed by Tinea incognito. Trichophyton rubrum was found to be the commonest causative agent of Tinea corporis in this region of Karnataka.

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