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Original Research Article

A Clinical and Mycological Study of Tinea Corporis: A Hospital Based Study

Swetha Sridhar[1], Dilip Kumar N R[2], Laxmi Horatti[3]

[1,3]Assistant Professor, Dept of Dermatology, Venereology and Leprosy, Shri Atal Bihari Vajpayee Medical College & Research Institute

[2]Associate Professor, Dept of Dermatology, Venereology and Leprosy, Shri Atal Bihari Vajpayee Medical College & Research Institute

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Corresponding Author: Dr. Dilip Kumar N R

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Abstract

Tinea corporis is a superficial fungal infection of keratin tissue caused by Dermatophytes. It is exceedingly common worldwide. It is very common in tropics and may present in epidemic proportions in areas with high rate of humidity, over population, and poor hygienic conditions. Hence the present study was undertaken to find out the clinical patterns of Tinea corporis and to find out fungal species causing Tinea corporis in Bangaluru.

Materials and Methods: One hundred patients clinically presenting with Tinea corporis attending the Dermatology outpatient Department of Dermatology, Venereology and Leprosy, Shri Atal Bihari Vajpayee medical college & research institute were enrolled for the study. Scraping was taken from scaly plaques and papules over the glabrous skin excluding groin for KOH mount and fungal culture.

Results: Out of 100 patients, maximum were in the age group of 16-30 years (44%), male to female ratio was 1.6:1 . 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.

Conclusion: Tinea corporis annular type was the commonest clinical type followed by Tinea incognito and bullous type. Trichophyton 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 with 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 known 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 worldwide observation, dermatophytoses are the most common cause 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].

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 organisms. Many of these infections are caused by Microsporum canis. [6] Powell, in 1900, reported the prevalence of dermatophytes infection in Assam, thereafter the incidence of dermatophytosis in different parts of India have been published. [7]

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]

The present study was undertaken to find out the clinical patterns of Tinea corporis and to find out the fungal species affecting Tinea corporis in Bengaluru.

Materials and Methods

One Hundred patients attending the outpatient Dept of Dermatology, Venereology and Leprosy, Shri Atal Bihari Vajpayee medical college & research institute were enrolled for the 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 Hemoglobin %, TC, DC, ESR, Urine examination, Blood sugar, HIV, HbA1c were done wherever necessary.

Inclusion Criteria:

- Annular scaly plaques.
- 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 which are KOH negative.

Results

Table 1: Distribution of study subjects according to sex

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

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

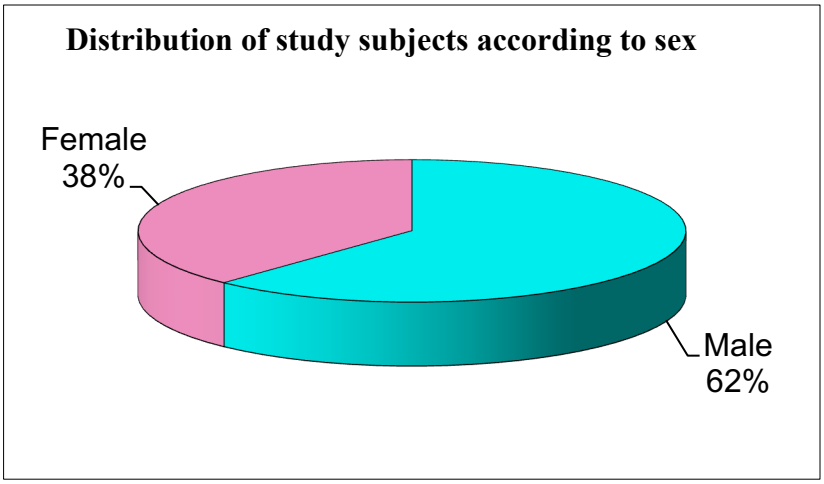

Figure 1: Distribution of study subjects according to sex

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

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

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

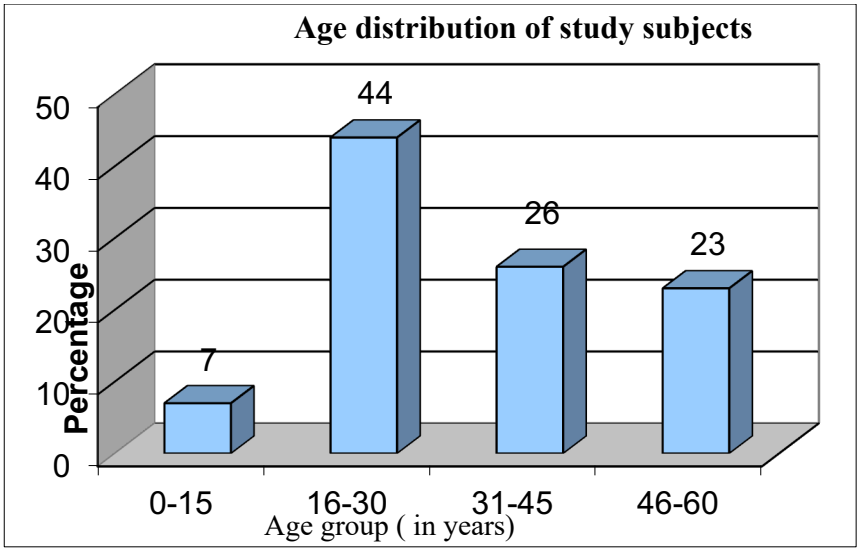

Figure 2: Age distribution of study subjects

Table 3: Distribution of clinical pattern according to sex

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
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

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 test and P value however showed no significant correlation between the variables.

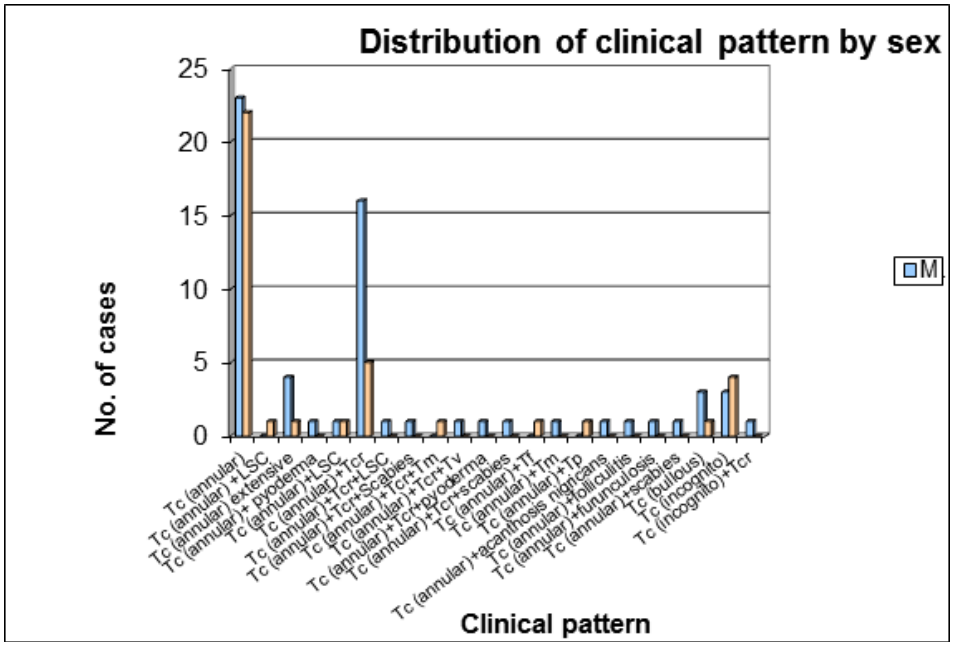

Figure 3: Distribution of clinical pattern by sex

Table 4: Distribution of incidence of isolated

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

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%) which was the highest followed by T. mentagrophytes (8.0%), E. floccosum (2.3%), T. schoenleinii (1.1%) M. canis(1.1%), M. audouini (1.1%).

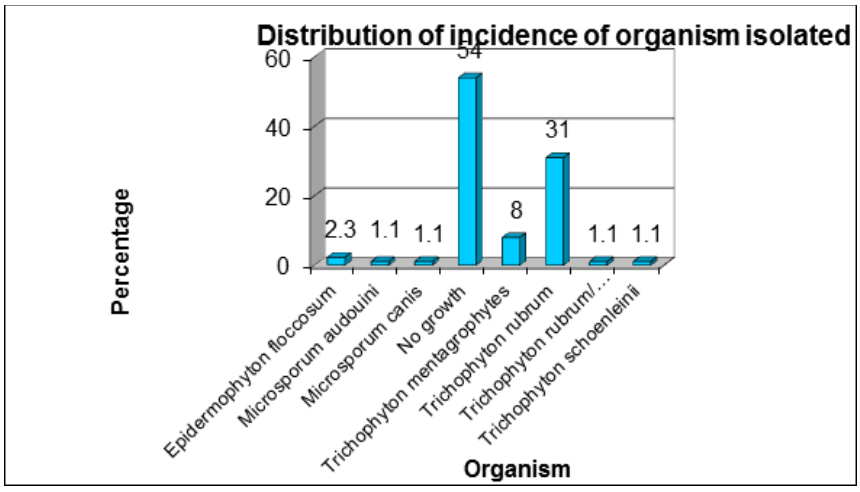

Figure 4: Distribution of incidence of organism isolated

Table 5: Result of Direct Microscopy and culture

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

$\chi^2 = 6.25$, 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.

Table 6: Fungal culture

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

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

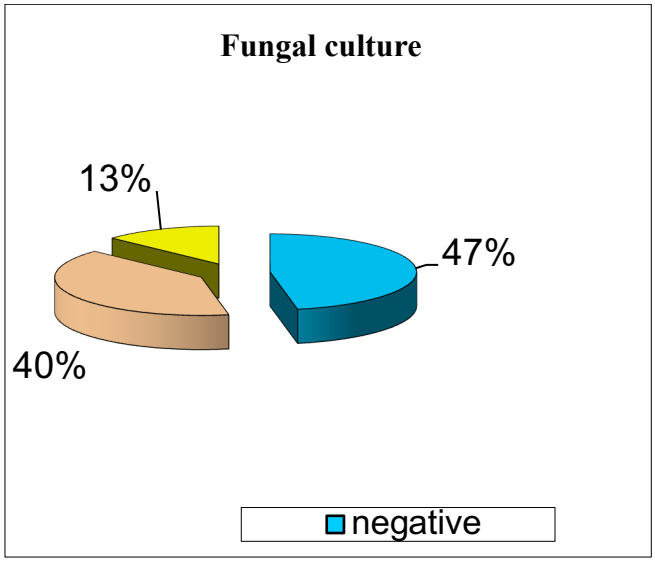

Figure 5: Fungal culture

Discussion

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

- Annular type
- Bullous type
- Incognito

Coexisting Tinea cruris, Tinea pedis, Tinea manuum, Tinea versicolor, Tinea faciei were seen.

With 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 studies conducted by Peerapur BV et al in Bijapur [7], Singh S et al in Baroda [9], Sentamilselvi G et al [10] and 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 Bindu1 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 were 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 in other studies, 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%)followed by 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 fungus on direct microscopy with potassium hydroxide in 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 which showed culture positivity of 71% which was at a higher rate, and study done at Aurangabad[13] which showed lower rate of culture positivity (22.8%). In the present study culture positivity was 40% and this variation was probably due to laboratory mistakes.

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] it showed 64% and in Aurangabad [13] positivity was seen in 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 i.e. 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.

Study area	Present study, Bengaluru, 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%

References

1. Bindu V, Pavithran K, clinico-mycological study of dermatophytosis in Calicut .Indian J dermatol Venereol Leprol 2002;68:259-261.
2. Kanwar AJ, Mamta, Chander J, Superficial fungal infections In: Valia RG Editor. IADVL Text book and atlas of dermatology 2nd ed, Mumbai: Bhalani Publishing House; 2001. P215-258.
3. Nelson MM, Martin AG, Heffernan MP. Superficial fungal infection In: Freedberg IM, Eisen AZ, Wolff K, Austen FK, Gold smith LA, Katz SI Editors. Fitzpatrick's Dermatology in general medicine 6th ed. New York: Mc Graw-Hill Medical Publishing Division; 2003. P1989-2005.
4. Emmons CW Dermatophytosis In: Emmons CW, Binford CH, Utz JP editors. Medical mycology 2nd ed. Philadelphia: Lea and Febiger; 1970. P109.
5. Sanyal M Dermatophytosis in India. Bull Cal Sch Trop Med 1969;17:54.
6. Hay RJ, Moore MK. Mycology In: Burns T, Breathnach S, Cox N, Griffiths C Editors. Rook's text book of dermatology 7th ed. Oxford: Blackwell Scientific Publications ; 200 4. P31.19-31.60.
7. Peerapur BV, Inamdar AC, Pushpa PV, Srikant B. Clinico mycological study of

Dermatophytosis in Bijapur. Indian J Dermatol Venereol Leprol 2004;22:273-274.
8. Jolly HW , Carpenter CL: oral glucose tolerence studies in recurrent Trichophyton rubrum infection Arch Dermatol 100:26, 1969.
9. Singh S, Beena PM. Profile of Dermatophyte infections in Baroda. Indian J Dermatol Venereol lepro (Serial on line) 2003 (cited 20 05 July 6); 69:281-283.
10. Sentamilselvi G, Kamalam A, Ajithadas K, Janaki C, Thambiah AS. Scenario of Chronic Dermatophytosis: an Indian study. Mycopathologia 1997; 140:129-135
11. Belukar DD, Barmai RN, Karthikeyan S, Vadhavkar RS. A Mycological study of Dermatophytosis in Thane. Bombay Hospital Journal 2004; 46:2.
12. Prasad PV, Priya K, Kaviarasan PK, Aanandhi C, Sarayu L. A study of Chronic Dermatopyte Infection in Rural Hospital. Indian J Dermatol Venereol Leprol 2005; 71:129-30.
13. Patwardhan N, Dave R. Dermatophytosis in and around Aurangabad. Indian Journal of Pathology and Microbiology 1999; 42(4): 455-62.
14. Rani V. Study of Dermatophytosis in Punjabi population. Ind J Pathol Microbiology 1983; 26(4): 243-247.
15. Alsogair SM, Moawad Mk, Al-Humaidan YM. Fungal infection as a cause of skin disease in the eastern province of Soudi Arabia: Prevailing fungi and pattern of infection. Mycosis 1991; 34 :333-337.