



A STUDY ON TINEA CORPORIS INFECTION IN PATIENTS ATTENDING A TERTIARY CARE HOSPITAL, TIRUPATI

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ABSTRACT **Purpose:** Tinea corporis (Ringworm) is a form of Dermatophytosis, which is a superficial fungal infection involving the trunk, legs, arms, commonly seen in countries like India. Although it is non-invasive and curable, its widespread nature and recurrence rates impose an economic burden on society in developing countries like India. This study aims at isolating different species causing this infection and studying their clinical patterns.

Method: The study included the samples from the outpatients attending the Dermatology department of SVRRGGH, Tirupati, who were suspected of having Tinea corporis based on the clinical details, during the period from August 2018 to August 2019. The scrapings are examined by KOH mount and inoculated on Sabouraud's Dextrose agar and Dermatophyte test medium. The species are identified by colony morphology, Lactophenol cotton blue mount, biochemical reactions and standard procedures.

Results: Out of 110 samples, overall positivity on direct microscopy is 78.2% (82), for Culture is 38.2%(42) and positive for both KOH and Culture are 38(34%). Out of 7 species isolated, the commonest isolate is *Trichophyton mentagrophytes* 19(45%), followed by *Trichophyton rubrum* 12(28%).

Conclusion: Tinea corporis infections are more common in the 16-30 years age group, most of the patients belonging to low socioeconomic status with male predominance. *Trichophyton* species are commonly isolated from lesions in the waist and lower limbs, while *Microsporum* species from lesions on lower limbs. *T. mentagrophytes* was found to be the most common isolate and *T. rubrum* in case of extensive lesions.

KEYWORDS : Tinea corporis, Dermatophytes, KOH mount, Culture, LPCB mount.

INTRODUCTION

Superficial Mycoses refer to the diseases of skin, hair & nail caused by fungal agents. A rising trend has been observed in the prevalence of these infections over the past decades. They have affected 20-25% of the population in the world. These diseases are more common in tropical and subtropical countries like India; due to humidity, elevated temperature and sweating¹. One of the major examples of superficial mycoses is Dermatophytosis /'Tinea/' 'Ringworm.' Dermatophytes are hyaline septate molds with more than 100 species, classified into three major genera: *Epidermophyton*, *Microsporum*, and *Trichophyton* on the basis of their conidial morphology¹.

Dermatophytosis is mainly confined to the non-living superficial keratinized tissues as its fungal agents cannot penetrate into the deeper tissue of a healthy host². The dermatophytic infection spreads easily by direct contact with the infected humans and animals or through fomites¹. It clinically presents at different sites of the body as single/multiple, annular/polycyclic plaques with a variable inflammatory response. 'Tinea corporis' refers to a clinical type of Dermatophytosis involving glabrous skin of trunk and extremities³.

In India and worldwide, the common species are *Trichophyton rubrum*, *Trichophyton mentagrophytes* and *Microsporum canis*⁴. Though non-invasive, its widespread nature and recurrence due to inappropriate treatment impose an economic burden on the country¹.

AIM:

To study the clinico-etiological profile of Tinea corporis.

OBJECTIVES

- To isolate different species causing Tinea corporis.
- To identify the clinical patterns of the disease.

METHODOLOGY

The study was conducted after getting Institutional Ethical Committee approval from August 2018 to August 2019, including a total of 110 samples obtained from the outpatients attending the Dermatology department of SVRRGG Hospital, Tirupati.

Inclusion Criteria :

Patients with Tinea corporis who give written informed consent [OR] informed consent taken from the guardian.

Exclusion Criteria :

Patients who are already on treatment for Dermatophytosis

Statistical Analysis: Chi-square test using SPSS 11.1 software.

Specimen collection: From the skin, the affected area was first thoroughly swabbed with 70% alcohol to remove surface contaminants. After the alcohol dries, the skin scrapings were collected from the border of the active lesions with a beard parker blade in a sterile black paper envelope.

Direct microscopic examination: The scraped material was placed on a glass slide. A few drops of freshly prepared 10% KOH were added to the material, and a coverslip was placed. The slide was then left at room temperature for 10-15 minutes in the case of skin scrapings. On microscopic examination, branching hyphae or arthrospores were looked for.

Culture: The specimens collected were inoculated on Sabourauds Dextrose agar containing Chloramphenicol and Cycloheximide irrespective of demonstration of fungal elements on KOH mount. Each sample was inoculated into two tubes. One tube with antibiotic and the other without antibiotic and were incubated at 27°C. The cultures were examined daily for a period of 4 weeks. Slopes showing no growth for 4 weeks were discarded. If growth was obtained on Sabourauds Dextrose agar, identification was made based on colony morphology, microscopic appearance and biochemical tests.

Microscopic Examination of Culture was done using LPCB preparation, and slide culture was done in case the morphology was not clear in LPCB preparation.

Biochemical Tests:

Urease Test: This test was done on Christensen's medium to

differentiate *T. mentagrophytes* from *T. rubrum*. *T. mentagrophytes* hydrolyses urea, and the medium becomes deep red while *T. rubrum* does not hydrolyze urea⁵.

Dermatophyte Testing Medium (DTM): DTM is a selective media with a phenol red indicator that changes from yellow to red in the presence of dermatophytes. The medium contains chlortetracycline, gentamycin and cycloheximide. Dermatophytes release alkaline metabolites into the medium, which results in an increase in pH within 10 to 14 days.

RESULTS

Out of 110 patients, it is seen that the maximum number of cases were in the age group of 16-30 years (45), followed by 31-45 years (37) (Table 1).

Table 1: Distribution Of Study Subjects According To Age

Age (years)	No. of Patients	Percentage (%)
0-15	7	6.4
16-30	45	40.9
31-45	37	33.6
>45	21	19.1
Total	110	100

Among the total 110 patients, 57 patients were males, and 53 were females. The male to female ratio was – 1.1:1 (Table 2)

Table 2: Distribution Of Subjects Based On Gender

Sex	Frequency	Percentage
Male	57	52%
Female	53	48%
Total	110	100%

The commonest site of infection was the lower limb (42), and the least affected was the neck (2) (Table 3).

Table 3: Distribution Of Subjects By Infection Site

Site	No. of patients
Neck	2 (1.8%)
Chest	13 (11.8%)
Back	16 (14.5%)
Upper Abdomen	18 (16.4%)
Upper Limb	23 (20.9%)
Lower Abdomen	23 (20.9%)
Waist	34 (30.9%)
Lower Limb	42 (38.2%)

The commonest pattern of Tinea Corporis observed was Annular pattern 57 (51.8%). The least common pattern observed was Multiple polycyclic Concentric Rings 1 (0.9%). The extensive involvement was seen in 83.6% of patients.

Out of 110 samples, overall positivity on direct microscopy is 78.2% (86), for Culture is 38.2% (42). Positive for both KOH and Culture was 31% (34). 52 cases were positive on direct microscopy and negative on Culture. 8 cases were negative on direct microscopy but showed culture positive. 16 cases were negative for both KOH and Culture. (Table 4)

Table 4: KOH And Culture Positivity

	Frequency	Percentage
KOH +ve, Culture +ve	34	31
KOH +ve, Culture –ve	52	47.2
KOH –ve, Culture +ve	8	7.3
KOH –ve, Culture –ve	16	14.5
Total KOH +ve	86	78.2
Total Culture +ve	42	38.2

Among 42 culture-positive cases, 7 different species of dermatophytes were identified with *T. mentagrophytes* (19) was the commonest, followed by *T. rubrum* (12), *M. canis* (5), *M. audouinii* (3), *T. tonsurans* (1), *T. concentricum* (1) and *E. floccosum* (1). (Table 5)

T. mentagrophytes was the most common isolate recovered from Annular and polycyclic types of lesions. *T. rubrum* was the commonest isolate recovered from pustular type of lesions. *M. canis* was the commonest isolate recovered from the eczematous type of lesions. (Table 6)

Table 5: Different Species Isolated From Culture Of Specimens

Dermatophyte species	No. of Isolates
<i>T. mentagrophytes</i>	19 (45.2%)
<i>T. rubrum</i>	12 (28.6%)
<i>M. canis</i>	5 (11.9%)
<i>M. audouinii</i>	3 (7.1%)
<i>T. tonsurans</i>	1 (2.4%)
<i>T. concentric</i>	1 (2.4%)
<i>E. floccosum</i>	1 (2.4%)

Table 6: Isolates Associated With Different Clinical Patterns

Pattern	Common Isolate	Percentage
Annular	<i>T. mentagrophytes</i>	19
Pustular	<i>T. rubrum</i>	12
Eczematous	<i>M. canis</i>	4
Polycyclic	<i>T. mentagrophytes</i>	4

DISCUSSION

The maximum number of patients of Tinea corporis belonged to the **age group** of 15-30 years. This is due to greater physical activity and increased sweating. A study done by R.Tokbipi Phudang et al.⁶ Mumbai, 2019 showed that the commonest age group affected was 21-30 years(30%). Similar results were seen with other studies K. Ramesh et al.⁷ Amalapuram, Andhra Pradesh, 2018.

In our study, male to female ratio was 1.1:1. High Incidence of Tinea Corporis in males has been reported from other studies like R.Tokbipi Phudang et al.⁶ Mumbai, 2019 and K. Ramesh et al.⁷ Amalapuram, Andhra Pradesh, 2018.

In our study, overall positivity on KOH mount was 78.2%, correlating with the studies by B.S.Manjunathswamy et al.⁸ 2018, in which it was 78.4% and 79.6% in Soniya Mahajan et al.³ 2017 study.

Overall positivity on Culture was 42(38.2%). In a study by R.Tokbipi Phudang et al.⁶ Mumbai, 2019, Culture was positive in 45%, and it was 52.4% in a study by Soniya Mahajan et al.³ 2017.

In our study, the most frequent isolate was *T. mentagrophytes*. Similar results are shown by other studies like R.Tokbipi Phudang et al.⁶ 2019 (28.9%), Mayuri Bhise et al.⁹ 2018 (66%), B.S.Manjunathswamy et al.⁸ 2018 (48.15%), Jegadeesan et al.¹⁰ 2017 (43.24%). In studies by K. Ramesh et al.⁷, Clarissa J.Lyngdoh et al.¹¹, and Suman Singh et al.¹², *T. rubrum* was reported as the most common isolate. In the present study, *E. floccosum* has also been isolated, which accounts for 2.4% which correlated with other studies like Mayuri Bhise et al.⁹ (2.7%) and in Jegadeesan et al.¹⁰ study, it was 2%.

CONCLUSION

Tinea corporis infections are more common in the 16-30 years age group, most of the patients belonging to low socioeconomic status with male predominance. The commonest type of lesion was annular. In our study setting, *T. mentagrophytes* was found to be the most common isolate. In case of extensive lesions, *T. rubrum* was the commonest isolate, followed by *T. mentagrophytes*.

Culture isolates in the annular and polycyclic type of lesions were *T. mentagrophytes* followed by *T. rubrum*. The isolate commonly associated with the pustular pattern was *T. rubrum*. *Microsporium canis* was the most common isolate recovered from the eczematous type of lesions. *T. rubrum* is the most common isolate from patients with past history and extensive lesions.

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