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Original Research Article

# A Clinico-Mycological Study of Patients with Tinea Corporis in a Tertiary Care Centre: A Retrospective Study

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**Conflict of interest: Nil**

**Abstract:**

**Background:** Tinea corporis is one of the most common superficial fungal infections affecting the skin. It is primarily caused by dermatophytes and presents as annular erythematous lesions with scaling and itching. Increasing incidence of chronic and recurrent dermatophytosis has been reported in recent years. Accurate laboratory diagnosis and antifungal susceptibility testing are essential for effective treatment. This study evaluated clinical characteristics, mycological profile, antifungal sensitivity pattern and biochemical parameters in patients with tinea corporis.

**Methods:** This retrospective study was conducted at a tertiary care hospital in Keonjhar over a period of one year. Medical records of 150 patients diagnosed with tinea corporis were analyzed. Skin scrapings were examined using potassium hydroxide mount and cultured on Sabouraud Dextrose Agar. Identification was performed using Lactophenol Cotton Blue staining. Biochemical parameters including fasting blood glucose, HbA1c and serum IgE were evaluated. Statistical analysis was performed using SPSS version 24.

**Results:** Dermatophytes were isolated in 112 patients (74.7%). The most common organism identified was *Trichophyton rubrum* (38%), followed by *Trichophyton mentagrophytes* (21%), *Microsporum* species (10%) and *Epidermophyton floccosum* (5%). Antifungal sensitivity testing showed highest sensitivity to itraconazole (90%), followed by terbinafine (84%), ketoconazole (76%) and fluconazole (68%). Mean fasting blood glucose and HbA1c levels were significantly higher in chronic cases compared to acute cases ($p = 0.01$ and $p = 0.002$ respectively). Serum IgE levels were also significantly elevated in chronic cases ($p < 0.001$).

**Conclusion:** Tinea corporis remains a significant dermatological problem with increasing chronicity. Dermatophytes, particularly *Trichophyton rubrum*, were the predominant organisms. Biochemical abnormalities such as hyperglycemia and elevated IgE levels were associated with persistent infection. Laboratory-based mycological diagnosis improves treatment outcomes.

**Keywords:** Tinea corporis, dermatophytes, clinico-mycological study, antifungal susceptibility, Sabouraud Dextrose Agar, biochemical parameters.

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## Introduction

Dermatophytosis represents one of the most common superficial fungal infections affecting humans worldwide [1]. Tinea corporis refers to dermatophyte infection involving glabrous skin excluding scalp, palms, and soles [2].

The disease is characterized by erythematous annular lesions with central clearing and scaling [3]. Pruritus is the most common symptom and may significantly affect quality of life in affected individuals [4].

Dermatophytes belong primarily to the genera Trichophyton, Microsporum, and Epidermophyton [5]. These organisms invade keratinized tissues and utilize keratin as a nutrient source [6].

An increasing prevalence of chronic and recurrent dermatophytosis has been reported in India over the past decade [7]. Misuse of topical corticosteroids and incomplete antifungal therapy are considered major contributing factors [8].

Laboratory diagnosis plays an important role in confirming dermatophyte infection. Direct

microscopy using potassium hydroxide mount provides rapid and cost-effective diagnosis [9]. Culture on Sabouraud Dextrose Agar remains the gold standard method for dermatophyte identification [10].

Lactophenol Cotton Blue staining allows accurate morphological identification of dermatophytes under microscopy [11].

Host factors such as diabetes mellitus and immunological abnormalities influence susceptibility to dermatophytosis [12]. Hyperglycemia promotes fungal growth and impairs host immune response [13].

Elevated serum IgE levels have been reported in patients with chronic dermatophytosis, suggesting an immunological basis for persistent infection [14].

Antifungal susceptibility testing is increasingly important due to emerging antifungal resistance [15]. Azole antifungals and allylamines remain the mainstay of treatment for dermatophytosis [16].

Recent studies emphasize the importance of clinico-mycological correlation in dermatophytosis for appropriate treatment planning [17–19].

However, limited data are available from rural populations in eastern India [20]. Therefore, this study was conducted to evaluate the clinical, mycological, antifungal susceptibility, and biochemical characteristics of patients with tinea corporis in a tertiary care centre in Keonjhar.

## Materials and Methods

**Study Design:** Retrospective observational study.

**Study Place:** Tertiary care hospital, Keonjhar.

**Study Duration:** January 2024 – December 2024.

**Sample Size:** 150 patients diagnosed with tinea corporis.

**Ethical Approval:** The study protocol was approved by the Institutional Ethics Committee. Patient confidentiality was maintained and anonymized data were used for analysis.

### Inclusion Criteria

- Clinically diagnosed tinea corporis
- Age 10–65 years
- Complete laboratory records

### Exclusion Criteria

- Immunocompromised patients
- Systemic antifungal therapy within one month
- Incomplete records

### Mycological Methods

**Direct Microscopy:** Skin scrapings were collected from the active margin of lesions using sterile scalpel blades after cleaning the area with 70% alcohol. Specimens were examined using 10% potassium hydroxide mount.

**Fungal Culture:** Samples were cultured on Sabouraud Dextrose Agar containing chloramphenicol and cycloheximide and incubated at 25–28°C for 2–3 weeks.

**Identification:** Macroscopic colony characteristics including surface texture, pigmentation and growth rate were recorded.

Microscopic identification was performed using Lactophenol Cotton Blue staining.

Organisms identified included:

- Trichophyton rubrum
- Trichophyton mentagrophytes
- Microsporum species
- Epidermophyton floccosum

### Antifungal Sensitivity Testing

Antifungal susceptibility testing was performed according to CLSI guidelines.

Antifungal drugs tested included:

- Fluconazole
- Itraconazole
- Terbinafine
- Ketoconazole

### Biochemical Parameters

The following biochemical parameters were recorded:

- Fasting blood glucose (mg/dL)
- HbA1c (%)
- Serum IgE (IU/mL)

Biochemical investigations were performed using an automated clinical chemistry analyzer.

### Clinical Assessment

Patients were categorized into:

- Acute infection
- Chronic infection (>6 months)

Chronic infection was defined as persistence of lesions for more than six months.

**Statistical Analysis:** Statistical analysis was performed using SPSS software version 24. Continuous variables including fasting blood glucose levels, HbA1c values and serum IgE concentrations were expressed as mean ± standard deviation, while categorical variables such as fungal isolates and antifungal sensitivity patterns were expressed as frequencies and percentages. Comparisons between acute and chronic infection groups were performed using Student's t-test for continuous variables and Chi-square test for

categorical variables. A p-value of less than 0.05 was considered statistically significant.

## Results

A total of 150 patients clinically diagnosed with tinea corporis were included in the study. All patients underwent clinical evaluation, mycological investigation, antifungal susceptibility testing, and biochemical assessment.

**Demographic Characteristics:** The mean age of patients was 34.2 ± 13.4 years, with the majority belonging to the 20–40 year age group. Male patients constituted 88 (58.7%), while females accounted for 62 (41.3%), showing a male predominance in the study population.

The demographic characteristics of the study population are summarized in Table 1.

**Table 1: Demographic Distribution**

| Variable | Value |
|---|---|
| Mean age | 34.2 ± 13.4 years |
| Male | 88 (58.7%) |
| Female | 62 (41.3%) |

**Clinical Duration of Infection:** Based on duration of illness, patients were categorized into three groups. The largest proportion of patients 54 (36%) had disease duration between 3–6 months, followed by 48 (32%) patients with duration less than 3 months and 48 (32%) patients with duration greater than 6 months, representing chronic infection.

Clinical duration distribution is shown in Table 2.

**Table 2: Clinical Duration**

| Duration | Patients |
|---|---|
| <3 months | 48 (32%) |
| 3–6 months | 54 (36%) |
| >6 months | 48 (32%) |

**Mycological Findings:** Direct microscopic examination using 10% potassium hydroxide mount demonstrated fungal elements in the majority of cases. Culture on Sabouraud Dextrose Agar yielded dermatophyte growth in 112 patients (74.7%), while 38 patients (25.3%) showed no growth.

Among the dermatophytes isolated, Trichophyton rubrum was the most common organism identified in 57 patients (38%), followed by Trichophyton mentagrophytes in 32 patients (21%). Other isolates included Microsporum species in 15 patients (10%) and Epidermophyton floccosum in 8 patients (5%).

The distribution of fungal isolates is presented in Table 3 and illustrated in Figure 1.

**Table 3: Fungal Isolates**

| Organism | Number (%) |
|---|---|
| Trichophyton rubrum | 57 (38%) |
| T. mentagrophytes | 32 (21%) |
| Microsporum spp | 15 (10%) |
| Epidermophyton floccosum | 8 (5%) |
| No growth | 38 (26%) |

Dermatophytes were isolated in 112 patients (74.7%).

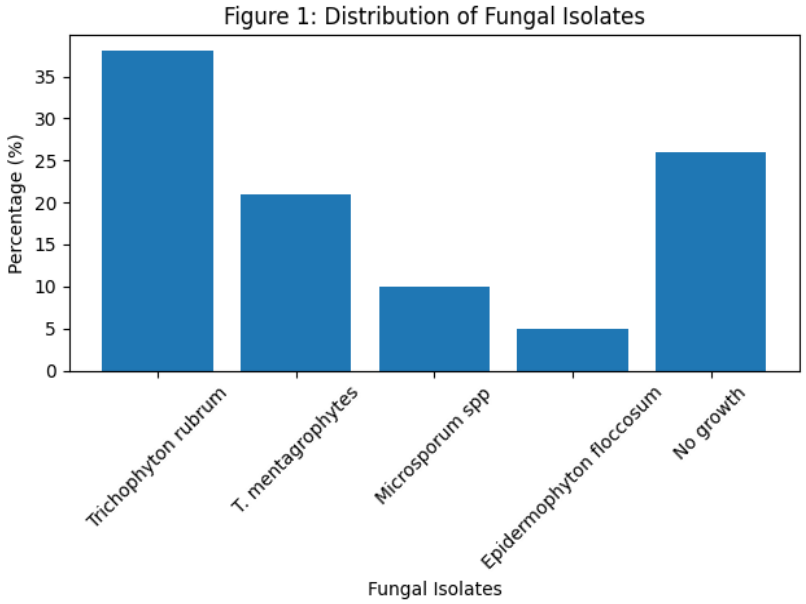


**Figure 1: Fungal Isolates Distribution**

**Antifungal Sensitivity Pattern:** Antifungal susceptibility testing was performed according to CLSI guidelines.

Itraconazole demonstrated the highest sensitivity (90%), followed by terbinafine (84%), ketoconazole (76%), and fluconazole (68%).

The antifungal sensitivity pattern is summarized in Table 4 and illustrated in Figure 2.

**Table 4: Antifungal Sensitivity**

| Drug | Sensitive (%) |
|---|---|
| Fluconazole | 68 |
| Itraconazole | 90 |
| Terbinafine | 84 |
| Ketoconazole | 76 |

Itraconazole showed the highest antifungal sensitivity among dermatophyte isolates.

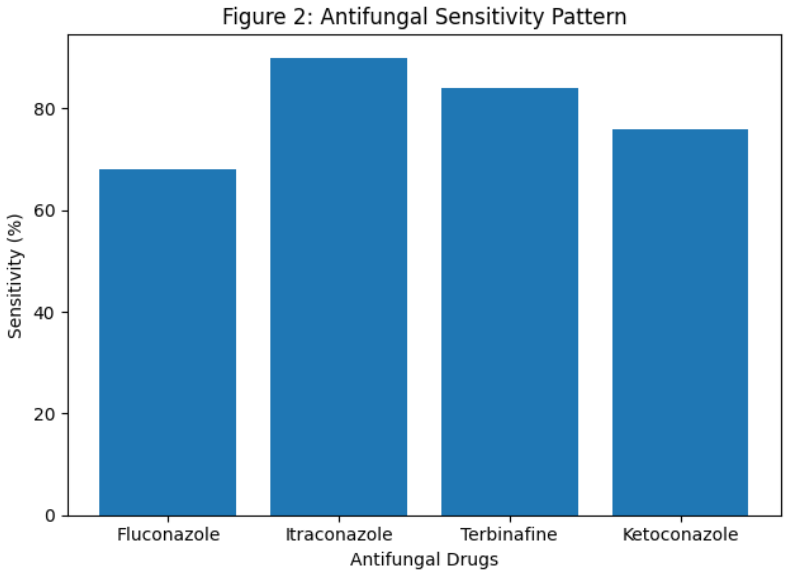


**Figure 2: Antifungal Sensitivity Pattern**

**Biochemical Parameters:** Biochemical parameters including fasting blood glucose (FBG), HbA1c, and serum IgE were compared between acute and chronic infection groups.

Patients with chronic infection showed significantly higher biochemical values.

Mean fasting blood glucose was 128 ± 24 mg/dL in chronic cases compared to 102 ± 18 mg/dL in acute cases (p = 0.01).

Mean HbA1c was 6.8 ± 1.1% in chronic cases compared to 5.6 ± 0.7% in acute cases (p = 0.002).

Mean serum IgE levels were significantly elevated in chronic cases (520 ± 180 IU/mL) compared to acute cases (280 ± 110 IU/mL) (p < 0.001).

Biochemical parameters are summarized in Table 5 and illustrated in Figure 3.

**Table 5: Biochemical Parameters**

| Parameter | Acute | Chronic | p value |
|---|---|---|---|
| FBG (mg/dL) | 102 ± 18 | 128 ± 24 | 0.01* |
| HbA1c (%) | 5.6 ± 0.7 | 6.8 ± 1.1 | 0.002* |
| IgE (IU/mL) | 280 ± 110 | 520 ± 180 | <0.001* |

Statistically significant differences were observed between acute and chronic infections.

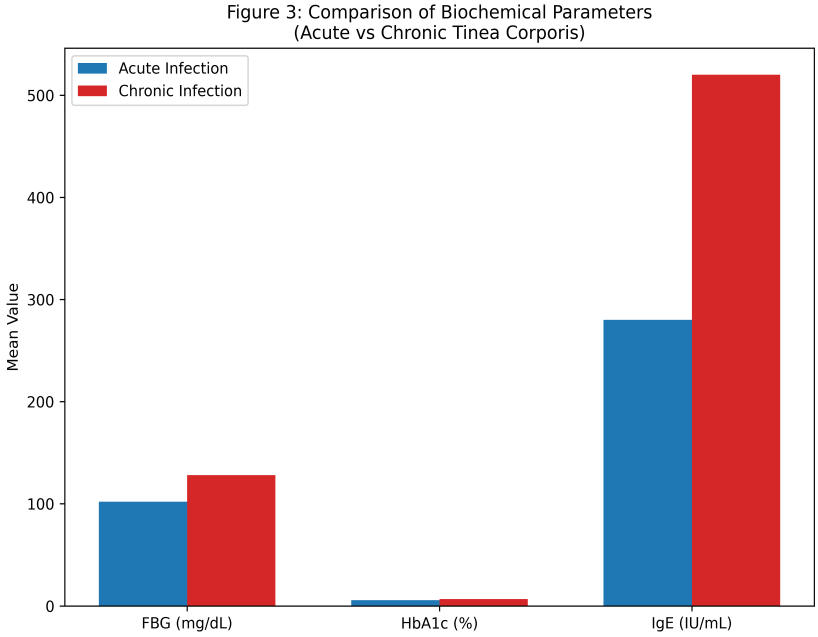


**Figure 3: Biochemical Differences**

## Discussion

Tinea corporis is one of the most frequently encountered superficial fungal infections in dermatological practice, particularly in tropical and subtropical regions where climatic conditions favor fungal growth[21]. The present study evaluated the clinical, mycological, antifungal susceptibility, and biochemical characteristics of patients with tinea corporis in a tertiary care setting.

In the present study, dermatophytes were isolated in 74.7% of patients, which is comparable to previously reported culture positivity rates ranging from 60% to 80% in dermatophytosis [22]. The remaining cases with negative culture may be attributed to prior antifungal treatment, inadequate sampling, or nonviable fungal elements.

Among the dermatophytes isolated, Trichophyton rubrum was the most common species, accounting for 38% of cases, followed by Trichophyton mentagrophytes. Similar findings have been reported in previous studies where Trichophyton rubrum was identified as the predominant pathogen responsible for tinea corporis [23]. The predominance of Trichophyton rubrum may be related to its ability to adapt to human hosts and establish chronic infection.

Antifungal susceptibility testing in the present study demonstrated that itraconazole showed the highest sensitivity (90%), followed by terbinafine and ketoconazole. These findings are consistent with earlier studies which reported good efficacy of itraconazole in the treatment of dermatophytosis [24]. Reduced sensitivity to fluconazole observed in

this study may reflect emerging antifungal resistance patterns.

Biochemical parameters showed significant differences between acute and chronic infection groups. Patients with chronic infection demonstrated significantly higher fasting blood glucose and HbA1c levels, indicating an association between hyperglycemia and persistent dermatophyte infection. Elevated blood glucose levels are known to impair immune responses and facilitate fungal growth.

Serum IgE levels were also significantly higher in chronic cases compared to acute infections. Increased IgE levels have been reported in patients with persistent dermatophytosis and may indicate an altered immune response to fungal antigens [25]. These findings suggest that both metabolic and immunological factors contribute to chronic dermatophytosis.

The present study highlights the importance of combined clinical and laboratory evaluation in the diagnosis and management of tinea corporis. Identification of dermatophyte species along with antifungal susceptibility testing and biochemical assessment provides valuable information for individualized treatment planning.

**Limitations**

This study had certain limitations. It was retrospective in design and conducted at a single tertiary care centre, which may limit generalizability of the findings. The sample size was moderate and long-term follow-up of patients was not available.

**Conclusion**

Dermatophytes remain the principal cause of tinea corporis with Trichophyton rubrum being the predominant species. Laboratory confirmation using Sabouraud Dextrose Agar culture and Lactophenol Cotton Blue staining provides reliable diagnosis. Biochemical abnormalities such as hyperglycemia and elevated IgE levels were associated with chronic infection. Clinico-mycological correlation improves treatment outcomes and supports rational antifungal therapy.

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