



REVIEW ARTICLE

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Clinical Spectrum, Risk Factors, Diagnosis, and Management of Dermatophytosis: A Comprehensive Review

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ABSTRACT

Background: Dermatophytosis is one of the most common superficial fungal infections affecting humans. It is caused predominantly by keratinophilic fungi belonging to the genera *Trichophyton*, *Microsporum*, and *Epidermophyton*. Persistent and recurrent disease can significantly affect quality of life.

Objective: To summarize the clinical spectrum, epidemiological and predisposing factors, diagnostic approaches, and management principles of dermatophytosis.

Methods: A narrative review was prepared using the uploaded clinical study as the principal data source, with emphasis on clinical presentation, conventional laboratory diagnosis, epidemiological findings, and relevant management considerations.

Results: In the source clinical study, 95 clinical specimens were examined and 45 (47.4%) were positive for dermatophytes. *Tinea corporis* was the most frequent clinical presentation (17/45; 37.8%), while *Trichophyton* was the predominant genus (95.6%). *T. rubrum* was the most frequently identified species (44.4%). Twenty-nine positive specimens were detected by both direct microscopy and culture, while 16 were culture-positive alone.

Conclusion: Dermatophytosis remains an important clinical problem. Accurate diagnosis, appropriate treatment, recognition of predisposing factors, and prevention of reinfection are essential.

Keywords: *Dermatophytosis, Tinea, Dermatophytes, Trichophyton, KOH microscopy, Fungal culture, Antifungal therapy.*

INTRODUCTION

Dermatophytosis refers to superficial fungal infections caused by dermatophytes that utilize keratinized tissues. The principal sites of infection are the skin, hair, and nails. The major classical genera are *Trichophyton*, *Microsporum*, and *Epidermophyton*.

The condition is common worldwide and is particularly relevant in warm and humid environments. Clinical manifestations vary according to the anatomical site and may include *tinea corporis*, *tinea cruris*, *tinea capitis*, *tinea faciei*, *tinea pedis*, *tinea manuum*, *tinea unguium*, and *tinea barbae*.

Clinical diagnosis may be difficult in atypical or recurrent cases because several inflammatory and infectious disorders can mimic dermatophytosis. Laboratory confirmation using direct microscopy and culture therefore remains important.

Epidemiology and Risk Factors

Dermatophytosis is influenced by climatic, occupational, behavioral, and host-related factors. Warm and humid conditions favor fungal growth and transmission. Excessive sweating, occlusive clothing, overcrowding, close contact, occupational exposure, contact with infected animals, and sharing personal articles may facilitate transmission.

In the source clinical study, males represented 55.6% of positive cases and females 44.4%. The highest number of cases occurred in the 31–40-year age group.

Clinical Spectrum

Tinea corporis commonly affects glabrous skin and produces annular, scaly and pruritic lesions. *Tinea cruris* involves the groin, while *tinea pedis* affects the feet. *Tinea capitis* affects scalp and hair and is particularly important in children. *Tinea faciei* affects the face, *tinea manuum* the hands, *tinea unguium* the

nails, and tinea barbae the beard area.

In the source study, tinea corporis was the most frequent presentation, followed by tinea cruris.

Laboratory Diagnosis

Direct potassium hydroxide microscopy is a rapid and inexpensive method for demonstrating fungal elements in skin, nail, and hair specimens. Culture allows isolation and further identification of dermatophytes and may detect infections not demonstrated by direct microscopy.

The source study used direct microscopy, fungal culture, colony morphology, microscopic morphology, and urease testing as part of laboratory identification. The study found that 29 positive specimens were detected by both microscopy and culture, whereas 16 were positive by culture alone.

Management

Management depends on the anatomical site, extent and severity of infection. Localized superficial disease may be managed with topical antifungal agents, whereas extensive, scalp, nail, or refractory disease may require systemic therapy. Treatment should be selected according to clinical circumstances and appropriate prescribing guidance.

For recurrent disease, assessment should include treatment adherence, duration of therapy, possible reinfection, other affected anatomical sites, household contacts, and environmental exposure.

Prevention and Public Health Importance

Preventive measures include maintaining personal hygiene, keeping affected areas dry, changing damp clothing, avoiding shared towels and personal articles, maintaining clean footwear, and appropriately managing confirmed infections.

Although dermatophytosis is usually superficial, persistent lesions, nail disease, hair involvement, recurrence, and repeated healthcare visits may create a substantial clinical burden.

RESULTS

A total of 95 clinical specimens were evaluated, of which 45 (47.4%) were positive for dermatophytes. Twenty-five positive cases were male and 20 were female. The male-to-female ratio was 1.3:1.

Skin scrapings accounted for 73 specimens, nail specimens for 13, and hair specimens for 9. Among the 45 positive specimens, 29 were positive by both direct microscopy and fungal culture, whereas 16 were positive by culture alone.

Trichophyton was the predominant genus, accounting for 95.6% of isolates. Microsporum and

Epidermophyton each accounted for 2.2%. *T. rubrum* was the most frequent species (20/45; 44.4%), followed by *T. mentagrophytes* (18/45; 40.0%) and *T. violaceum* (5/45; 11.1%). One *Microsporum* spp. isolate and one *Epidermophyton floccosum* isolate were identified.

Tinea corporis was the most frequent clinical form (17/45; 37.8%), followed by *tinea cruris* (11/45; 24.5%), *tinea capitis* (5/45; 11.0%), *tinea faciei* (4/45; 8.9%), *tinea manuum* (3/45; 6.7%), *tinea pedis* (2/45; 4.5%), *tinea unguium* (2/45; 4.5%), and *tinea barbae* (1/45; 2.2%).

Table 1. Demographic and specimen distribution

Parameter	Finding
Total specimens	95
Dermatophyte-positive specimens	45 (47.4%)
Male	25 (55.6%)
Female	20 (44.4%)
Skin specimens	73
Nail specimens	13
Hair specimens	9

Table 2. Distribution of dermatophyte species

Species	No. of isolates	Percentage
<i>T. rubrum</i>	20	44.4%
<i>T. mentagrophytes</i>	18	40.0%
<i>T. violaceum</i>	5	11.1%
<i>Microsporum</i> spp.	1	2.2%
<i>E. floccosum</i>	1	2.2%

Table 3. Clinical forms of dermatophytosis

Clinical form	No. of cases	Percentage
<i>Tinea corporis</i>	17	37.8%
<i>Tinea cruris</i>	11	24.4%
<i>Tinea capitis</i>	5	11.1%
<i>Tinea faciei</i>	4	8.9%
<i>Tinea manuum</i>	3	6.7%
<i>Tinea pedis</i>	2	4.4%
<i>Tinea unguium</i>	2	4.4%
<i>Tinea barbae</i>	1	2.2%

Table 4. Laboratory detection pattern

Detection method	No. of positive specimens	Percentage of positives
Microscopy + culture	29	64.4%
Culture alone	16	35.6%

Figure 1

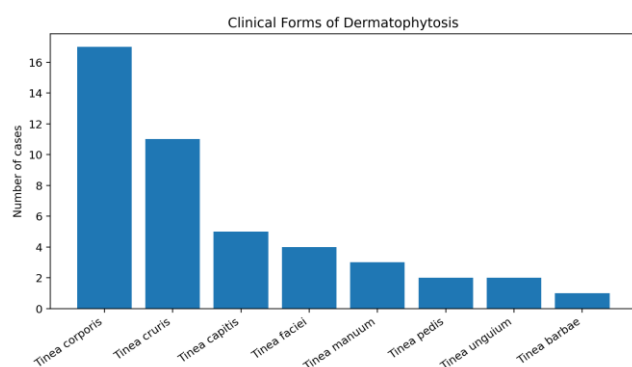


Figure 1. Distribution of clinical forms among dermatophyte-positive cases.

Figure 2

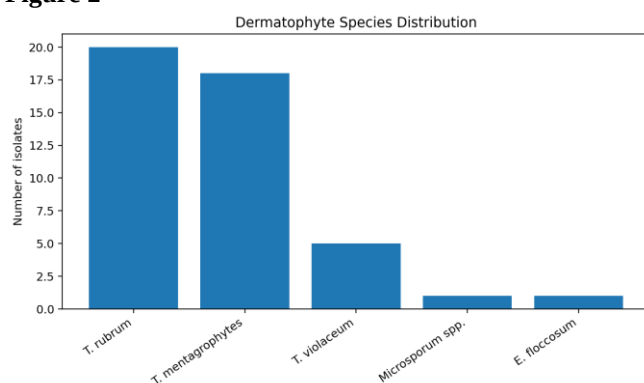


Figure 2. Distribution of identified dermatophyte species.

Figure 3

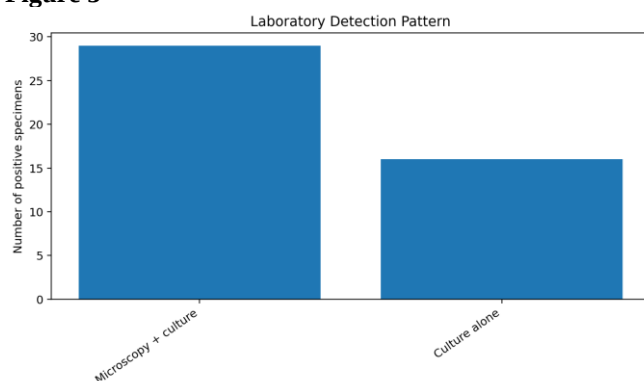


Figure 3. Comparison of laboratory detection patterns among positive specimens.

DISCUSSION

The findings demonstrate a substantial proportion of dermatophyte-positive specimens among the clinical samples examined. The predominance of *Trichophyton* and the high frequency of *tinea corporis* are consistent with the clinical importance of these infections.

The finding that 16 positive specimens were culture-positive alone also demonstrates why direct microscopy should not necessarily be considered sufficient in every suspected case. Culture can provide additional diagnostic yield and may allow species-level identification.

The epidemiological distribution observed in a single tertiary-care setting should not be generalized to all populations. Local studies remain valuable because species distribution and clinical patterns can differ geographically.

CONCLUSION

Dermatophytosis remains a common superficial fungal infection involving skin, hair, and nails. The source clinical study demonstrated a 47.4% positivity rate among the specimens examined, with *Trichophyton* as the predominant genus and *tinea corporis* as the most frequent clinical presentation.

A combined clinical and laboratory approach using direct microscopy and fungal culture can improve diagnostic assessment. Appropriate treatment, attention to predisposing factors, and prevention of reinfection are important for reducing the burden of disease.

REFERENCES

1. Rabell G, Taplin D. *Dermatophytes: Their Recognition and Identification*. Florida: University of Miami Press; 1974.
2. Ménan EI, Zongo-Bonou O, Rouet F, et al. *Tinea capitis* in schoolchildren from Ivory Coast (western Africa): A 1998-1999 cross-sectional study. *Int J Dermatol*. 2002;41(4):204-7.
3. Sharma S, Borthakur AK. A clinico-epidemiological study of dermatophytosis in north east India. *Indian J Dermatol Venereol Leprol*. 2007;73:427-8.
4. Peerapur BV, Inamdar AC, Pushpa PV, Srikant B. Clinico-mycological study of dermatophytosis in Bijapur. *Indian J Med Microbiol*. 2004;22(4):273-4.
5. Dogra S, Pathania S, Rudramurthy SM, Narang T, Saikia UN. A prospective study of the epidemiological and clinical patterns of recurrent dermatophytosis at a tertiary care hospital in India. *Indian J Dermatol Venereol Leprol*. 2018;84:678-84.
6. Chander J. *Textbook of Medical Mycology*. New Delhi: Jaypee Brothers Medical Publishers; 2017.
7. Sastry AS, Bhat S. *Essentials of Medical Microbiology*. New Delhi: Jaypee Brothers Medical Publishers; 2018.
8. Sentamilselvi G, Kamalam A, Ajithadas K, Janaki C, Thambiah AS. Scenario of chronic dermatophytosis: An Indian study. *Mycopathologia*. 1997;140:129-35.
9. Dogra S, Uprety S. The menace of chronic and recurrent dermatophytosis in India: Is the problem deeper than we perceive? *Indian Dermatol Online J*. 2016;7:73-6.
10. Havlickova B, Czaika VA, Friedrich M. Epidemiological trends in skin mycoses worldwide. *Mycoses*. 2008;51(Suppl 4):2-15.

11. Bhatia VK, Sharma PC. Epidemiological studies on dermatophytosis in human patients in Himachal Pradesh, India. SpringerPlus. 2014;3:134.
12. Khan SA, Shamsuzzaman SM, Rahman AKMS, Ashekin NAK, Mahmud R, Sharmin R, et al. Isolation and identification of dermatophytes causing dermatophytosis at a tertiary care hospital in Bangladesh. Arch Clin Biomed Res. 2021;5:437-51.
13. Dammu RKM, Saileela K. Clinico-microbiological study of dermatophytosis in the tertiary care hospital, KMC & H, Chinakondrupadu, Guntur. Indian J Microbiol Res. 2020;7:258-64.
14. Kalyanappa R, Sureka RV. Isolation and identification of dermatophytes in a tertiary care teaching hospital. MedPulse Int J Microbiol. 2021;17:1-7.
15. Kaur P, Awal G, Singh A, Kaur R, Kaur P. Spectrum of dermatophytes in a tertiary care centre in Northern India. Indian J Microbiol Res. 2021;8:297-301.
16. Amin N, Shenoy MM, Pai V. Clinical and mycological characterization of chronic and recurrent dermatophytes using various staining and microscopic methods. J Pure Appl Microbiol. 2023;17:2598-608.
17. Mahajan S, Tilak R, Kaushal S, Mishra R, Pandey S. Clinico-mycological study of dermatophytic infections and their sensitivity to antifungal drugs in a tertiary care center. Indian J Dermatol Venereol Leprol. 2017;83:436-40.
18. Jha B, Bhattarai S, Sapkota J, Sharma M, Bhatt C. Dermatophytes in skin, nail and hair among the patients attending outpatient department. J Nepal Health Res Counc. 2019;16(41):434-7.