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Tinea cruris in female genital dermatoses: Clinical insights and dermoscopic correlates

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Abstract:

Introduction: Tinea, or dermatophytosis, is a common superficial fungal infection affecting the skin, hair, and nails. Among non-venereal genital dermatoses in females, Tinea cruris is a leading cause of morbidity, often presenting with varied clinical features that may mimic other dermatoses, making early diagnosis essential. Dermoscopy has emerged as a valuable adjunct in differentiating tinea from other inflammatory conditions.
Methodology: This prospective observational study was conducted on 100 female patients with genital dermatoses attending the dermatology outpatient department. Patients were clinically evaluated and subjected to dermoscopic examination. Relevant investigations such as KOH mount were conducted to confirm fungal etiology. Dermoscopic features were documented, and cases were categorized into venereal and non-venereal groups.
Results: Out of 100 cases, 85% were diagnosed with non-venereal dermatoses. Among these, Tinea cruris accounted for the highest proportion (27%). Common clinical features included itching with dark lesions (31%) and chronicity ranging from 1 month to 1.5 years. The most frequently involved sites were the labia majora and inguinal folds. Dermoscopic findings in Tinea cruris revealed peripheral scaling, reddish-brown pigmentation, and pseudonetworks. A significant proportion of patients (22%) with Tinea cruris were diabetic.
Conclusion:Tinea cruris is the most prevalent non-venereal genital dermatosis in females, frequently presenting with chronic itching and hyperpigmented plaques. Dermoscopy, coupled with clinical evaluation, significantly improves diagnostic accuracy, especially in differentiating fungal infections from other dermatoses. Routine use of dermoscopy can reduce misdiagnosis and facilitate timely, targeted therapy.

Keywords:
Dermatophytosis, Tinea cruris, Dermoscopy, Non-venereal dermatoses

Introduction

Tinea, also referred to as dermatophytosis, is a superficial fungal infection of keratinized tissues skin, hair, and nails caused primarily by dermatophytes belonging to the genera Trichophyton, Epidermophyton, and Microsporum. [1] These infections are among the most frequently encountered dermatologic conditions globally, with an increasing incidence particularly in tropical and subtropical regions were warm and humid climates favor fungal proliferation. [2]

Among the various clinical types of Tinea,Tinea cruris involving the groin, perineal region, and upper thighs is especially common in adult males but is increasingly seen in females as well, particularly due to tight clothing, obesity, poor hygiene, and immunosuppression. [3] The typical presentation includes well-demarcated, erythematous plaques with central clearing and active margins, often associated with pruritus and secondary pigmentation. [4]

Accurate clinical diagnosis can sometimes be challenging due to the overlapping features of tinea with other inflammatory genital dermatoses such as candidiasis, psoriasis, and lichen planus. [5] Traditional diagnostic methods such as potassium hydroxide (KOH) microscopy remain the gold standard, but they are operator-dependent and occasionally yield false negatives. [6]

In recent years, dermoscopy has emerged as a non-invasive adjunctive tool in dermatology, aiding in the visualization of subtle clinical features not visible to the naked eye. In tinea infections, dermoscopic features such as peripheral scaling, reddish-brown pigmentation, broken hairs, and pseudo networks have proven to be valuable for early diagnosis and treatment monitoring. [7,8]

Given the rising burden of tinea infections and the potential for misdiagnosis, it is essential to document and understand the clinical presentation of tinea, particularly in sensitive areas like the genital region. This study aims to highlight the clinical and dermoscopic presentation of Tinea cruris in female patients, thereby enhancing diagnostic confidence and guiding appropriate therapeutic strategies.

Methodology

Study Design
This was a prospective cross-sectional observational study aimed at evaluating the clinical and dermoscopic presentation of genital dermatoses, with particular emphasis on Tinea cruris, among female patients.
Study Setting and Duration
The study was conducted in the Department of Dermatology at MVJ Medical
College and Research Hospital (MVJMC & RH) over a two-year period.

Sample Size
A total of 100 female patients presenting with genital dermatoses were enrolled in the study. The sample size was calculated using the formula:
n=4pq / e2

Where p is prevalence 50%
p = 0.5
q is 1-p
q = 1-0.5
q = 0.5

e is allowable error
e= 20% of P
e=0.2×0.5
e=0.1
n=4×0.5×0.5 / (0.2×0.5)2
n=1/(0.1)2
n=1/0.001
n=100

Inclusion Criteria
- Female patients of all age groups presenting with lesions over the external genitalia.
- Patients who provided written informed consent for clinical and dermoscopic evaluation.

Exclusion Criteria
- Patients with painful or bleeding lesions that hindered dermoscopic evaluation.
- Patients already undergoing treatment for genital dermatoses.

Data Collection Procedure

1. Clinical Evaluation: All enrolled patients underwent a thorough clinical examination including history-taking (age, marital status, duration of symptoms, hygiene practices, diabetes status, and previous treatments).

2. Dermoscopic Evaluation: A handheld dermoscope (DermLite DL4 3rd Gen) with a polarized light source and 20x–75x magnification was used for all dermoscopic examinations. Features such as pigmentation, scaling, vessel morphology, and peripheral margins were recorded.

3. Diagnostic Confirmation: Specific investigations were performed based on clinical suspicion, including:
- oKOH mount for fungal infections

- oTzanck smear for viral lesions
- oGram stain, VDRL, and HIV serology when indicated
- oSkin biopsy for atypical or suspicious lesions

4. Categorization:
Patients were grouped into venereal and non-venereal dermatoses based on clinical and dermoscopic findings. Those diagnosed with Tinea cruris were analyzed in detail regarding clinical presentation and dermoscopic features.

Ethical Considerations

- Institutional Ethical Committee clearance was obtained prior to commencement.
- Informed consent was obtained from all participants, with assurance of confidentiality and privacy.

Statistical Analysis

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- Data were compiled in Microsoft Excel and analyzed using descriptive statistics.
- Categorical variables were expressed as percentages, while continuous variables were reported as mean ± standard deviation (SD).
- Comparative analysis was done to evaluate the frequency and pattern of presentation of Tinea cruris relative to other dermatoses.

Results

Demographic Profile

- Age: Most patients (38%) were aged 31–45 years, followed by 16–30 years (29%), and 46–60 years (21%). Only 2% were above 60.
- Occupation: Majority were homemakers (68%), followed by students (15%); others included teachers, engineers, and bankers.
- Marital Status: 77% married, 23% unmarried.

Table no. 1: Demographic profile of patients (Age Distribution, occupation and marital status)

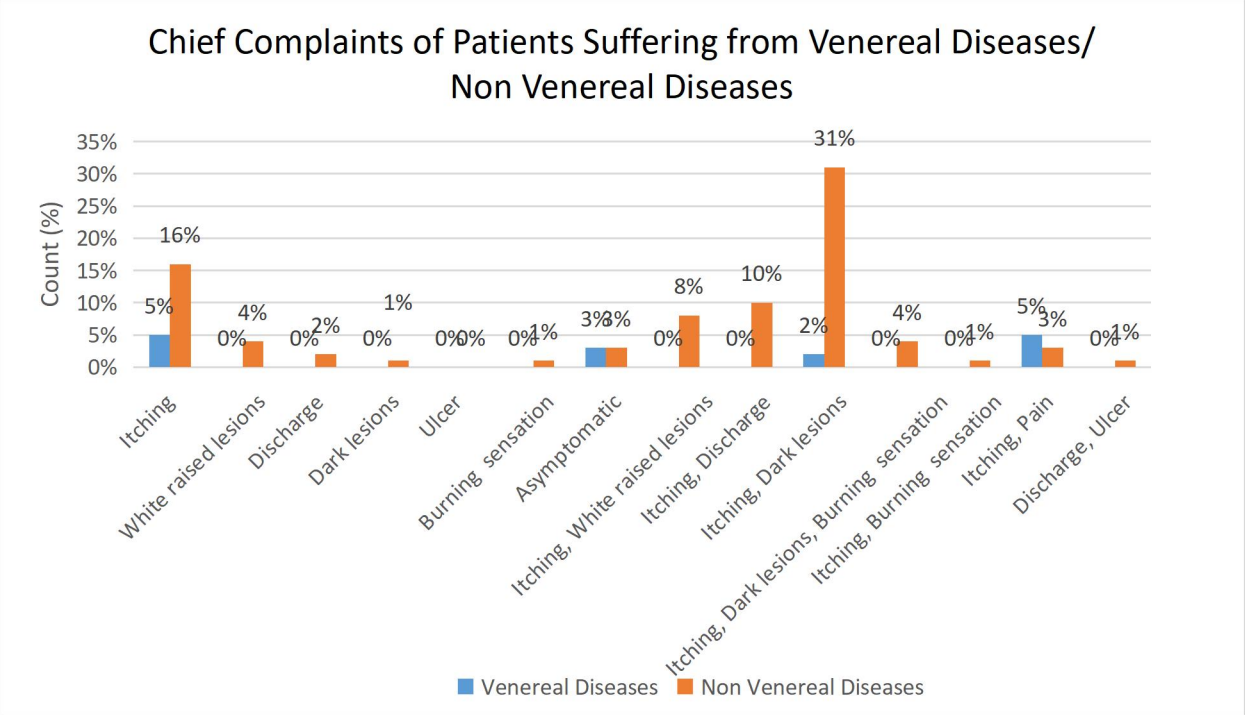
Parameter	Category	Count (%)
Age (in years)	1–15	10 (10%)
	16–30	29 (29%)
	31–45	38 (38%)
	46–60	21 (21%)
	61–75	2 (2%)
Occupation	Homemaker	68 (68%)
	Student	15 (15%)
	Engineer	4 (4%)
	Banker	3 (3%)
	Teacher	3 (3%)
	Other	3 (3%)
	Pharmacist	1 (1%)
	Shopkeeper	1 (1%)
	Farmer	1 (1%)
	Babysitter	1 (1%)
Marital Status	Married	77 (77%)
	Not Married	23 (23%)

Among the 100 cases, 85% were diagnosed with non-venereal dermatoses, while 15% had venereal conditions.

Table 2: Chief Complaints of Patients Suffering from Venereal Diseases / Non-Venereal Diseases

Chief Complaints (N=100)	Venereal Diseases (n1=15)	Non-Venereal Diseases (n2=85)
Itching	5 (5%)	16 (16%)
White raised lesions	0 (0%)	4 (4%)
Discharge	0 (0%)	2 (2%)
Dark lesions	0 (0%)	1 (1%)
Ulcer	0 (0%)	0 (0%)
Burning sensation	0 (0%)	1 (1%)
Asymptomatic	3 (0%)	3 (3%)
Itching, White raised lesions	0 (0%)	8 (8%)
Itching, Discharge	0 (0%)	10 (10%)
Itching, Dark lesions	2 (2%)	31 (31%)
Itching, Dark lesions, Burning sensation	0 (0%)	4 (4%)
Itching, Burning sensation	0 (0%)	1 (1%)
Itching, Pain	5 (5%)	3 (3%)
Discharge, Ulcer	(0%)	1 (1%)

Graph 2.1: Chief Complaints of Patients Suffering from Venereal Diseases/ Non-Venereal Diseases



Chief Complaints:
Non-venereal cases commonly presented with: Itching (16%), Itching with dark lesions (31%), Itching with discharge (10%). Other symptoms included white raised lesions, burning, and asymptomatic presentations.

In venereal cases, itching (5%) and pain with itching (5%) were common.

Clinical Presentation

Out of 100 female patients evaluated for genital dermatoses:

- Tinea cruris was diagnosed in 27 patients (27%).
- Tinea incognito was diagnosed in 3 patients (3%).
- Thus, a total of 30% of all non-venereal genital dermatoses in this cohort were due to Tinea infections.

Table 3: Clinical Presentation of Tinea (n = 30)

Presenting Complaint	Number of Patients	Percentage
Itching + Dark lesions	27	90%
Itching + Burning sensation	1	3.3%
Discharge + Ulcer	1	3.3%
Asymptomatic	1	3.3%

Table 4: Duration of Tinea Symptoms (n = 30)

Duration	Number of Patients	Percentage
1 day – 3 weeks	7	23.3%
1 month – 1 year 6 months	18	60%
1 year 7 months – 3 years	3	10%
3 years 1 month – 4 years 6 months	2	6.7%

Table 5: Sites Involved in Tinea Infection (n = 30)

Site Involved	Number of Patients	Percentage
Labia majora + Inguinal folds	27	90%
Labia majora only	3	10%

Investigative Findings for Tinea

Among the 30 patients diagnosed with Tinea infections:

- KOH mount was the primary diagnostic test used to confirm fungal etiology.
- A total of 17 out of 30 patients (56.7%) underwent KOH examination, which was positive in all tested cases.
- 4 patients (13.3%) also underwent Random Blood Sugar (GRBS) testing, particularly those with a known history or suspicion of diabetes.
- 1 patient (3.3%) had additional investigations like HbA1c for glycemic control assessment.
- No biopsy, Tzanck smear, or serological tests (like VDRL or HIV) were indicated for tineacases, as the diagnosis was clinically and dermoscopically confirmed and supported by KOH.

Table 5: Investigations Performed in Tinea Cases (n = 30)

Investigation	Number of Patients	Percentage
KOH mount	17	56.7%
GRBS	4	13.3%
HbA1c	1	3.3%
No investigation performed	8	26.7%

These findings highlight the reliance on clinical evaluation, dermoscopy, and KOH microscopy for diagnosing Tinea cruris in the genital region. Notably, a significant proportion of patients (26.7%) were diagnosed based on classical clinical and dermoscopic features alone, without laboratory confirmation.

Discussion

Tinea infections, particularly Tinea cruris, have emerged as one of the most common non-venereal genital dermatoses in the present study. Among 100 female patients evaluated for genital dermatoses, 30 cases (30%) were diagnosed with tinea infections, including 27 cases of Tinea cruris and 3 cases of Tinea incognito. These findings are consistent with reports by Verma et al. and Welsh, who identified dermatophytosis as a leading cause of genital pruritus in tropical climates due to factors like high humidity, friction, and tight clothing, which promote fungal growth in the groin area. [9,10]
The most frequent clinical presentation in our study was itching with dark lesions (90%), consistent with earlier studies that describe Tinea cruris as presenting with well-demarcated erythematous plaques, often accompanied by peripheral scaling and post-inflammatory hyperpigmentation. [11,12]. Similar symptom profiles were reported in a study by Nenoff et al., emphasizing that the classical morphology of Tinea cruris often overlaps with other chronic dermatoses, posing diagnostic challenges. [3]

The site distribution in our patients showed a predominance of lesions on the labia majora and inguinal folds (90%), which correlates with findings from Schwartz et.al., who emphasized the predilection of tinea infections for moist, occluded areas. [13]

Regarding duration of illness, 60% of patients had symptoms persisting between 1 month to 1.5 years, indicating a chronic or recurrent disease course. This trend is comparable to findings by Rudramurthy et al., who noted that chronicity in dermatophytosis is often associated with self-treatment, misdiagnosis, or underlying comorbidities such as diabetes mellitus, which impairs local immunity. [14] In our study, 22% of patients with non-venereal dermatoses had co-existing diabetes, consistent with previous research by Al-Nasrawi et.al., who established a direct link between poorly controlled diabetes and recurrent tinea infections. [15]

Dermoscopy proved to be a highly useful, non-invasive tool in this study, aiding diagnosis in all tinea cases. Key dermoscopic findings included peripheral white scaling, reddish-brown background pigmentation, and pseudonetwork patterns. These are in agreement with the dermoscopic features described by Ankad BS et al. and Errichetti & Stinco, who noted that such patterns are typical of Tinea corporis and Tinea cruris[7,16] In addition, Kamat and Vinay highlighted the clinical utility of dermoscopy in differentiating tinea from mimickers such as psoriasis or candidiasis, further supporting our findings. [5]

Interestingly, although KOH examination was available, it was only performed in 56.7% of tinea cases in our study. The remaining cases were diagnosed confidently through clinical and dermoscopic correlation. This finding underscores a diagnostic gap but also affirms the value of dermoscopy, particularly in resource-limited or high-patient-load settings, where laboratory testing may not always be feasible.

In comparison to earlier studies, our results reinforce the importance of a multimodal diagnostic approach, integrating clinical judgment, dermoscopy, and selective laboratory tests. This strategy not only enhances diagnostic accuracy but also minimizes unnecessary investigations and promotes early therapeutic intervention.

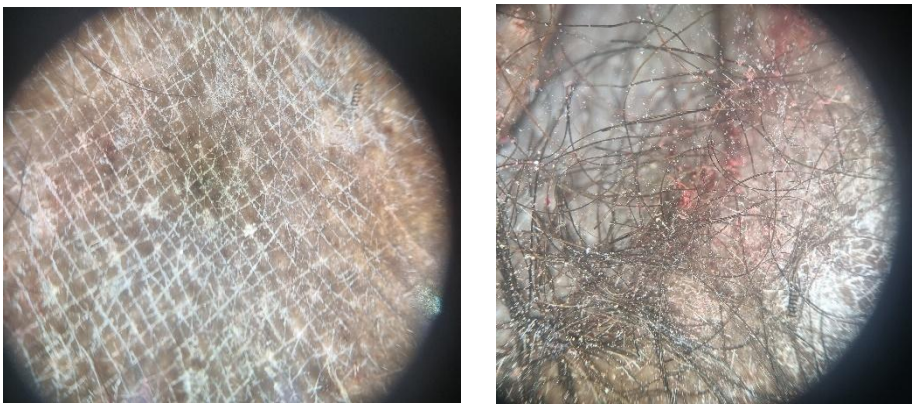


Figure no. 1: Dermoscopic view of Tinea Cruris

Conclusion

This study establishes Tinea cruris as the most common non-venereal genital dermatosis in females, often presenting with chronic itching and hyperpigmented lesions, primarily over the labia majora and inguinal folds.

The role of dermoscopy proved crucial, offering a non-invasive and reliable tool for diagnosis, especially where laboratory testing like KOH was limited. Characteristic dermoscopic patterns, including peripheral scaling and brownish pigmentation, aided in accurate differentiation from other dermatoses.

Given the frequent association with diabetes and chronicity, early recognition using combined clinical and dermoscopic evaluation is essential. This approach enhances diagnostic accuracy and ensures timely, appropriate management in female patients with genital fungal infections.

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