

CLINICO INVESTIGATIVE PROFILE OF DERMATOPHYTOSIS IN
CENTRAL KARNATAKA

Dermatology

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ABSTRACT

Introduction: Dermatophytosis is the most important group of superficial fungal infections caused by dermatophytes infecting keratinised tissues of skin, nail and hair. It has emerged as a colossal public health problem in the recent years, due to various factors related to the host, environment, etiological agents, antifungal resistance and the rampant abuse of the irrational topical steroid, antibacterial and antifungal combination creams. **Aims And Objectives:** To assess the clinical profile of dermatophyte infections and to identify the causative species. **Materials And Methods:** It is a hospital record based retrospective study conducted in tertiary care centre from august 2018 to July 2022. Skin, hair and nail samples from suspected cases were collected and subjected to potassium hydroxide wet preparation (10% KOH for skin, 20% for hair and 40% for nails) and inoculated in a test tube containing sabouraud dextrose agar with 0.05% chloramphenicol and 0.5% cycloheximide. **Results:** Total of 917 cases were collected with male preponderance of male to female ratio 1:0.68. majority of patients were in third decade of life. Tinea corporis and cruris being the most common presentation (40.02%). Culture positive rate was 18.32% of which *trichophyton rubrum* being most common (51.78%) followed by *trichophyton mentagrophytes* (38.09%). **Conclusion:** In present study mixed infection of tinea cruris and corporis was the predominant clinical presentation. *Trichophyton rubrum* was the most common dermatophyte isolated with a raising trend of *trichophyton mentagrophytes*.

KEYWORDS

dermatophytosis ,Tinea corporis, Tinea cruris, Trichophyton rubrum.

INTRODUCTION

Dermatophytosis, or ringworm, is a major global public health concern, particularly in **tropical and subtropical regions** like India, where the climate marked by high heat and humidity creates favourable conditions for fungal growth. The primary **causative agents** of this infection belong to three fungal genera: *Epidermophyton*, *Microsporum*, and *Trichophyton*¹.

The incidence of dermatophytosis has surged notably in recent years, particularly about **tinea corporis** (ringworm of the body). This condition has become increasingly prevalent, with chronic and recurrent cases posing a significant public health burden¹. While dermatophytosis seldom results in mortality, it profoundly affects the **quality of life** due to the associated **social stigma**, persistent discomfort, and interference with daily activities².

Dermatophytes thrive by secreting **keratinolytic proteases** that degrade keratin, enabling the fungi to invade and colonize the **stratum corneum**, the outermost layer of the skin, as well as the hair shaft and nails. The host's response to infection varies considerably and is influenced by several factors, including:

The **host's immune response** to fungal metabolites.

The **virulence** of the fungal strain.

The **anatomic location** of the infection.

Environmental factors such as humidity and temperature.³

The immune system plays a pivotal role in determining the severity of infection. Individuals with compromised or weakened immune defences are at a higher risk for severe and persistent dermatophytic infections.

Numerous factors contribute to the rising incidence of dermatophytosis:

1. **Socioeconomic Conditions:** In densely populated regions with poor living standards, lack of adequate healthcare, and limited health education, the risk of fungal infections increases substantially.

2. **Personal Hygiene and Behaviour:** Sharing personal items such as footwear, clothing, and towels, along with inadequate hygiene practices, significantly amplifies the transmission of dermatophytes.

3. **Host Susceptibility:** Specific host-related factors such as age, diminished sebum production (which provides a natural barrier against fungal invasion), immune status, and conditions like **atopic dermatitis** increase susceptibility to infection. Children, adolescents, and the elderly are particularly vulnerable.

4. **Climate:** The persistent heat and high humidity in tropical and subtropical regions exacerbate the spread and persistence of dermatophyte infections.⁴

Dermatophytosis remains an under recognized but impactful public health issue, particularly in climates conducive to fungal growth. Addressing its spread involves tackling both biological and social determinants of health, from improving healthcare access and education to targeting underlying socioeconomic factors. With appropriate measures, the burden of this common but often debilitating condition can be significantly reduced.

AIMS AND OBJECTIVE

To evaluate the clinical profile of dermatophyte infections and to identify the causative species.

MATERIALS AND METHODS

After obtaining permission from the institutional ethical committee, the case records of patients with Dermatophytosis were retrieved from the medical records department.

A retrospective record-based study, done at tertiary care centre from August 2018 to July 2022. All the required data like demographic, clinical and investigative details were collected from the case records.

Prestructured recorded proformas showed that the patients with suspected dermatophytic infections were thoroughly examined with detailed clinical history including their demographical details, symptoms and its duration, associated comorbidities, hygienic practices, prior treatment details, similar complaints in family and cutaneous examination findings.

Skin, hair and nail samples from suspected cases were collected and subjected to potassium hydroxide wet preparation (10% KOH for skin, 20% for hair and 40% for nails) and inoculated in a test tube containing sabouraud's dextrose agar with 0.05% chloramphenicol and 0.5% cycloheximide and observed for 4 weeks. Reports were recorded.

Descriptive analysis was carried out by the mean and standard deviation for quantitative variables, frequency and proportion for categorical variables.

Inclusion Criteria

Clinically confirmed cases of Dermatophytosis

Exclusion Criteria

Cases with culture of non dermatophytic fungi were excluded

RESULTS

Total 917 subjects' data was collected from the case records. Among 547 (59.7%) were males and 370(40.3%) were females. Most common age group affected was 21-30 (22.6%), followed by 41-50 (20.6%), 31-40 (22.2%) respectively.

Table-1: Comparison To Different Age Groups Among Gender

Age group	Male	Female	Total
0-10	20(2.9%)	9(1.3%)	29(3.2%)
11-20	75(8.2%)	44(4.8%)	119(13%)
21-30	125(13.6%)	83(9%)	208(22.6%)
31-40	96(10.5%)	89(9.7%)	185(20.2%)
41-50	104(11.3%)	88(9.6%)	192(20.9%)
51-60	69(7.5%)	36(3.9%)	105(13.4%)
61-70	44(4.8%)	18(1.9%)	62(6.7%)
71-80	12(1.3%)	3(0.3%)	15(1.6%)
81-90	2(0.2%)	0(0%)	2(0.2%)
Total	547(59.7%)	370(40.3%)	917(100%)

Most common clinical phenotypes was combination of Tinea corporis and Tinea cruris (40%), followed by Tinea cruris (19.2%), Tinea corporis (18.1%).Tinea pedis was least common phenotype (0.7%)

Table-2:

Serial number	Clinical type	male	female	total
1	Tinea corporis	103(11.2%)	63(6.8%)	166(18.1%)
2	Tinea cruris	110(11.9%)	66(7.2%)	176(19.2%)
3	Tinea corporis + Tinea cruris	221(24%)	146(16%)	367(40%)
4	Tinea facies	3(0.3%)	5(0.6%)	8(0.9%)
5	Tinea corporis + Tinea facies	40(4.5%)	12(1.2%)	52(5.7%)
6	Tinea unguium	28(3%)	40(4.4%)	68(7.4%)
7	Tinea corporis + Tinea cruris + Tinea unguium	11(1.2%)	8(0.9%)	19(2.1%)
8	Tinea corporis + Tinea pedis	8(0.9%)	9(0.9%)	17(1.8%)
9	Tinea corporis + Tinea manuum	10(1.1%)	17(1.8%)	27(2.9%)
10	Tinea pedis + Tinea manuum	4(0.4%)	2(0.3%)	6(0.7%)
11	Tinea capitis	9(0.9%)	2(0.3%)	11(1.2%)
	Total	547(59.7%)	370(40.3%)	917(100%)

Among 917 subjects, 845(92.15%) were KOH positive, 72 (7.85%) were KOH negative. Among KOH positive subjects 165 (19.5%) were culture positive and 680 (81.5%) were culture negative. T. rubrum was predominant cause (51.58%), followed by T. mentagrophytes (38.1%).

Table-3 Distribution Of Dermatophytes Among Various Clinical Phenotypes

Clinical phenotype	T. rubrum		T. mentagrophytes		T. violaceum		M. gypseum	
	Male	Female	Male	Female	Male	Female	Male	Female
Tinea corporis	9	12	8	5	1	2	0	0
Tinea cruris	14	4	10	6	1	1	0	0
Tinea corporis + Tinea cruris	19	14	14	8	1	2	0	0
Tinea facies	2	1	0	1	0	1	0	1
Tinea corporis + Tinea facies	0	1	1	0	1	0	0	0
Tinea unguium	2	1	1	1	0	0	0	0

Tinea corporis + Tinea cruris + Tinea unguium	0	0	1	3	3	1	0	0
Tinea corporis + Tinea pedis	3	1	0	0	0	0	0	0
Tinea corporis +Tinea manuum	0	2	0	2	0	0	0	0
Tinea pedis + Tinea manuum	0	1	0	1	0	0	0	0
Tinea capitis	0	0	1	0	0	0	0	0

Table-4: Causative Organisms Isolated

Organisms	frequency
T.rubrum	87(51.78%)
T.mentagrophytes	64(38.1%)
T.violaceum	14(8.33%)
M.gypseum	3(1.8%)

Most common risk factor was history of dermatophytosis among family members and close contacts (39%) followed by sharing of clothes & footwear and unhygienic conditions. 45.5% of the patients were abused topical corticosteroids.

Table-5: Comparison Of Risk Factors Associated With Dermatophytosis

Risk factor	Frequency (%)
family history of dermatophytosis	358(39%)
sharing of clothes	199(21.7%)
Sharing of footwear	21(2.3%)
Not bathing daily	319(34.8%)
Past history of dermatophytosis	198(21.6%)
Seasonal exacerbation	205(22.4%)
Corticosteroid application	416(45.5%)

DISCUSSION

Dermatophytic infections are more prevalent in the developing world. Dermatophytosis is a common disease in India due to factors like heat and humidity⁵. The current study was done to evaluate clinical profile of dermatophyte infections and to identify the causative species.

This study comprises total 917 clinically suspected cases of dermatophytosis. Out of these 59.7% were males and 40.3% were females. high prevalence may be due to more occupational exposure of males in outside activities than females and outdoor work predisposes men to hot, humid, and sweaty conditions favourable to the growth of dermatophytes. The study done by Aishiya Ishrat¹, Varsha Saxena et al² and Hasanga Gamage et al³ also showed more prevalence among males.

Most common clinical phenotypes was combination of Tinea corporis and Tinea cruris (40%), followed by Tinea cruris (19.2%) and Tinea corporis(18.1%). Tinea pedis was the least common phenotype (0.7%). In study done by Aishiya Ishrat et al¹, Tinea corporis was the commonest clinical presentation accounting for 66 (63.4%) of the total study subjects which was followed by Tinea cruris 19 (18.3%). This finding can be credited to the tropical climatic condition of India. However, predominant clinical manifestations of dermatophytosis vary considerably in different studies reported in literature.

Most common affected age group was 20-30 years (22.6%), followed by 41-50 years (20.9%). Study done by Varsha Saxena et al² showed 20-30 (41%) age group were affected. This can be attributed to their increased outdoor physical activity.

Among 917 subjects 845(92.15%) were KOH positive, 72(7.85%) were KOH negative. Among KOH positive subjects 165 (19.5%) were culture positive and 680 (81.5%) were culture negative. In the present study T.rubrum was predominant cause (51.58%), followed by T mentagrophytes (38.1%). Similar results were found in study by Aishiya Ishrat et al¹ and Hasanga Gamage et al³. Similar results were observed in other researches where T. rubrum was commonest

followed by *T. mentagrophytes*.

Table-6: Comparison Of Our Study With Similar Studies

Clinical profile	Our study	Aishiya Ishra et al ¹	Varsha Saxena et al ²	Hasanga Gamage et al ³
Prevalence among males	59.7 %	66.3 %	66%	54.09%
Prevalence among females	40.3%	33.7 %	34%	43.9%
Most common age group	21-30 (22.6%)	31-45 (46.2%)	20-30 (41%)	61-80 (37.5%)
Most common clinical type	Tinea Cruris (19.2)	Tinea Corporis (63.4%)	NA	onychomycosis (33%)
Most common organism	Trichophyton rubrum	Trichophyton rubrum (77.4%)	Trichophyton mentagrophytes (57.3%)	Trichophyton rubrum (73.3%)

Limitations Of The Study

As this was retrospective study, there is chance of information bias and selection bias. Also a more systematic study covering larger population over a longer period of time would give better insight into clinic mycological profile of dermatophytosis.

CONCLUSIONS

Dermatophytic infections remain prevalent in India. The current study highlights the prevalence and distribution pattern of dermatophytosis. Because of the psychological effects and high morbidity in terms of loss of working days and treatment, dermatophytosis is a public health problem. Therefore, to obtain a true representation of the overall disease pattern of the country more such types of studies should be conducted.

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Conflict Of Interest: Nil

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