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Original Research Article

CLINICO-EPIDEMIOLOGICAL PROFILE OF DERMATOPHYTOSIS IN A TERTIARY CARE HOSPITAL IN NORTH INDIA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Dermatophytosis has emerged as a major public health concern in India over the last decade, with changing clinical patterns, increasing chronicity, recurrence, and widespread misuse of topical corticosteroid-containing combinations. Limited data are available from North India describing the clinico-epidemiological profile of dermatophytosis across all age groups in the current epidemic scenario. **Materials and Methods:** This hospital-based cross-sectional observational study was conducted over a period of 6 months in the Department of Dermatology of a tertiary care hospital in North India. A total of 320 clinically diagnosed cases of dermatophytosis of all age groups were enrolled. Detailed demographic, clinical, and treatment-related history was recorded, including prior treatment and topical corticosteroid use. Clinical examination was performed to classify the pattern and extent of disease. Skin scrapings, nail clippings, and hair samples were collected for direct microscopy using 10% potassium hydroxide mount. Data were analyzed using descriptive statistics and expressed as frequency and percentage. **Results:** A total of 320 patients were included, comprising 156 (48.75%) males and 164 (51.25%) females, with a maleratio of 1:1.05. The most commonly affected age group was 21–30 years (26.25%), followed by 31–40 years (24.38%). Tinea corporis was the most common clinical presentation (15.63%), while mixed dermatophytosis was seen in 60% of cases, with tinea corporis et cruris being the predominant pattern (50.63%). Family history was present in 26.25% of patients. Disease duration of 0–3 months was seen in 60.63%, while recurrence was noted in 10%. Prior treatment had been taken by 82.5% patients before presentation. Topical corticosteroid abuse was highly prevalent, contributing to atypical morphology, chronicity, and extensive disease. Diabetes mellitus was the most common associated systemic comorbidity (4.38%). **Conclusion:** Dermatophytosis in North India shows a changing clinico-epidemiological trend characterized by predominance of young adults, high frequency of mixed infections, frequent prior treatment, and rampant topical corticosteroid misuse. These findings highlight the need for stricter regulation of irrational steroid combinations, patient education, and early institution of appropriate antifungal therapy.

INTRODUCTION

Dermatophytosis is a superficial fungal infection involving keratinized tissues such as the skin, hair, and nails, caused by dermatophytes belonging to the genera Trichophyton, Microsporum, and Epidermophyton.[1] It remains one of the most common infectious dermatoses worldwide and is particularly prevalent in tropical and subtropical countries such as India, where hot climate, high humidity, overcrowding, and poor hygienic conditions provide an ideal environment for fungal proliferation.[1,2]

In recent years, India has witnessed a significant epidemiological shift in dermatophytosis, with increasing prevalence of chronic, recurrent, extensive, and treatment-modified disease.[3,4] This changing pattern has been attributed to multiple

factors including irrational use of fixed-dose combination creams containing potent topical corticosteroids, incomplete treatment, poor compliance, familial transmission, occlusive clothing, and associated systemic comorbidities.[3-5] Such modified infections often present with atypical morphology, extensive body surface involvement, reduced therapeutic response, and increased recurrence, posing a major therapeutic challenge to dermatologists.[4,6]

Traditionally, tinea corporis and tinea cruris have been the most common forms of dermatophytosis in Indian adults, while tinea capitis predominated in children.[7] However, recent Indian studies have shown a shift toward mixed dermatophytosis, especially tinea corporis et cruris, with Trichophyton mentagrophytes complex replacing Trichophyton rubrum as the predominant pathogen in several regions.[8-10] This evolving trend has transformed dermatophytosis into a significant public health issue in India.[3,16]

Despite the growing burden of dermatophytosis in North India, region-specific clinico-epidemiological data involving all age groups remain limited. Most available Indian studies are either pediatric, microbiological, or region-specific with smaller sample sizes.[10,12,15,20] The present study was undertaken to evaluate the clinico-epidemiological profile of dermatophytosis in patients attending a tertiary care hospital in North India, with particular emphasis on clinical pattern, prior treatment, topical corticosteroid abuse, and associated comorbidities.

Objectives: To study the clinical, epidemiological, and therapeutic profile of dermatophytosis in patients attending a tertiary care hospital in North India, with special emphasis on steroid abuse and associated clinico-demographic factors.

MATERIALS AND METHODS

Study Design: Hospital-based cross-sectional observational study

Study Setting: Department of Dermatology, tertiary care hospital, North India

Study Duration: 6 months

Study Population: Patients of all age groups clinically diagnosed with dermatophytosis

Sample Size: 320 patients

Sampling Method: Consecutive sampling

Inclusion Criteria

- Clinically diagnosed cases of dermatophytosis
- Patients willing to participate in the study

Exclusion Criteria

- Patients unwilling to provide consent
- Patients already receiving systemic antifungal treatment for other conditions

Data Collection

- Detailed demographic and clinical history was recorded
- Information regarding duration, recurrence, family history, previous treatment, and topical corticosteroid use was obtained
- Clinical examination was performed to identify type and extent of dermatophytosis
- Skin scrapings, nail clippings, and hair samples were collected for direct microscopy using 10% KOH mount

Statistical Analysis

Data were entered in Microsoft Excel and analyzed using SPSS software. Descriptive statistics were applied, and results were expressed as frequency, percentage, mean, and standard deviation wherever applicable.

RESULTS

A total of 320 consecutive patients with clinically suspected dermatophytosis attending the Dermatology Outpatient Department of a tertiary care hospital in North India over a period of 6 months were included in the study. All patients were evaluated clinically and subjected to mycological investigations for confirmation.

Of the 320 patients, 156 (48.8%) were males and 164 (51.2%) were females, with a male-to-female ratio of 1:1.05. The age of the patients ranged from 5 months to 75 years, with the highest number of cases observed in the 21–30 years age group (84; 26.3%), followed by 31–40 years (78; 24.4%) and 11–20 years (56; 17.5%). Most patients belonged to the economically productive age group (21–40 years), accounting for 50.7% of the total study population. A positive family history of dermatophytosis was elicited in 84 patients (26.3%) (as shown in Table 1).

Tinea corporis was the most common clinical presentation and was seen in 50 patients (15.6%), followed by tinea cruris in 36 (11.3%), tinea faciei in 18 (5.6%), onychomycosis in 16 (5.0%), tinea capitis in 6 (1.9%), tinea pedis in 2 (0.6%) and tinea manuum in 2 (0.6%). Mixed dermatophytic infection involving more than one anatomical site was observed in 192 patients (60.0%) shown in Table 2. Among the mixed infections, tinea corporis et cruris was the most common pattern, seen in 162 patients (50.6%), followed by tinea corporis et cruris et faciei in 22 (6.9%), tinea corporis et faciei in 4 (1.3%) and tinea corporis et pedis in 4 (1.3%). [Table 3]

The duration of disease ranged from 1 week to 15 years, with the majority of patients presenting within 3 months of onset (194; 60.6%). Recurrent dermatophytosis was noted in 32 patients (10.0%). [Table 4]

A history of prior treatment from various sources before presentation to the tertiary care center was obtained in 264 patients (82.5%). Topical medication use prior to consultation was common, with frequent use of over-the-counter creams, combination preparations, and indigenous remedies. Of these, 186 patients (58.1%) had used topical corticosteroid-containing combinations, either alone or in

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combination with antifungal and antibacterial agents. Steroid abuse was particularly common among patients with chronic, recurrent, and extensive dermatophytosis. [Table 5]

The most common source of prior treatment was over-the-counter medication obtained directly from pharmacists in 124 patients (38.8%), followed by treatment from local practitioners in 78 (24.4%), registered medical practitioners in 42 (13.1%), and self-medication/home remedies in 20 (6.3%).

Among the patients with prior topical therapy, clobetasol propionate-based fixed drug combinations were the most frequently used preparations, followed by betamethasone-containing creams. Commonly used combinations included steroid-antifungal-antibacterial preparations containing clobetasol propionate with ofloxacin, ornidazole, terbinafine and itraconazole, and betamethasone valerate with clotrimazole and gentamicin. Prolonged and unsupervised use of such preparations was associated with atypical morphology, extensive involvement, chronicity, recurrence, and treatment modification.

The most common associated systemic comorbidity was diabetes mellitus in 14 patients (4.4%), followed by hypertension in 10 (3.1%), hypothyroidism in 6 (1.9%), psoriasis in 4 (1.3%), and asthma and chronic hepatitis in 2 patients (0.6%) each. [Table 6]

Direct microscopy with potassium hydroxide (KOH) mount was positive in 226 patients (70.6%), while fungal culture positivity was seen in 148 patients (46.3%). Among culture-positive isolates, Trichophyton mentagrophytes complex was the predominant organism isolated in 84 cases (56.8%), followed by Trichophyton rubrum in 42 (28.4%), Microsporum gypseum in 12 (8.1%), Trichophyton tonsurans in 6 (4.1%) and Epidermophyton floccosum in 4 (2.7%). [Table 7]

Table 1: Demographic profile of study population (n=320)

Variables	Number (n)	Percentage (%)
Sex		
Male	156	48.8
Female	164	51.2
Age Group (years)		
0–10	18	5.6
11–20	56	17.5
21–30	84	26.3
31–40	78	24.4
41–50	42	13.1
51–60	28	8.8
>60	14	4.4
Family History Present	84	26.3

Table 2: Clinical pattern of dermatophytosis (n=320)

Clinical Type	Number (n)	Percentage (%)
Tinea corporis	50	15.6
Tinea cruris	36	11.3
Tinea faciei	18	5.6
Onychomycosis	16	5
Tinea capitis	6	1.9
Tinea pedis	2	0.6
Tinea manuum	2	0.6
Mixed infection	192	60

Table 3: Pattern of mixed dermatophytosis (n=192)

Mixed Clinical Pattern	Number (n)	Percentage (%)
Tinea corporis et cruris	162	84.4
Tinea corporis et cruris et faciei	22	11.5
Tinea corporis et faciei	4	2.1
Tinea corporis et pedis	4	2.1

Table 4: Duration and recurrence of disease (n=320)

Variable	Number (n)	Percentage (%)
0–3 months	194	60.6
4–6 months	48	15
>6 months	46	14.4
Not recalled	32	10
Recurrent disease	32	10

Table 5: Prior treatment and topical steroid abuse (n=320)

Variable	Number (n)	Percentage (%)
Prior treatment taken	264	82.5
Topical steroid abuse	186	58.1
OTC/pharmacist prescribed	124	38.8
Local practitioner	78	24.4
Registered medical practitioner	42	13.1

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Self-medication/home remedies	20	6.3

Table 6: Associated comorbidities (n=320)

Comorbidity	Number (n)	Percentage (%)
Diabetes mellitus	14	4.4
Hypertension	10	3.1
Hypothyroidism	6	1.9
Psoriasis	4	1.3
Asthma	2	0.6
Chronic hepatitis	2	0.6

Table 7: Mycological profile (n=320)

Variable	Number (n)	Percentage (%)
KOH positive	226	70.6
Culture positive	148	46.3

Table 8: Fungal isolates among culture positive cases (n=148)

Isolate	Number (n)	Percentage (%)
Trichophyton mentagrophytes complex	84	56.8
Trichophyton rubrum	42	28.4
Microsporum gypseum	12	8.1
Trichophyton tonsurans	6	4.1
Epidermophyton floccosum	4	2.7

DISCUSSION

The present study provides a comprehensive overview of the changing clinico-epidemiological profile of dermatophytosis in a tertiary care setting in North India and reflects the ongoing epidemic of altered and treatment-modified dermatophytosis in India.[3,16,19] The study included 320 patients over a period of 6 months, with all age groups represented, thereby providing a broader perspective than pediatric-only or microbiology-centered studies.[12,15,20]

A slight female preponderance was observed in the present study, with females constituting 51.25% of cases, yielding a male ratio of 1:1.05. This finding contrasts with several earlier Indian studies that reported male predominance, likely due to greater outdoor exposure, sweating, and occupational predisposition among males.[10,12] However, recent studies have increasingly reported comparable or even higher female involvement, which may be explained by greater healthcare-seeking behavior among women, increased household transmission, and rising use of occlusive clothing in both sexes.[11,15]

The majority of patients in the present study belonged to the 21–30 years age group, followed closely by the 31–40 years age group. This predominance of young adults is consistent with previous Indian studies and may be attributed to increased physical activity, excessive sweating, occupational exposure, and greater social contact in this age group.[10,12,13] The economically productive age group thus appears to be the most vulnerable, contributing significantly to disease transmission and socioeconomic burden.

Tinea corporis was the most common clinical type in the present study, followed by tinea cruris and tinea faciei. This finding is in concordance with multiple Indian studies in adults, where tinea corporis remains the most frequent presentation.[10,12,13] However, the most striking finding in our study was the high prevalence of mixed dermatophytosis, seen in 60% of patients. Among these, tinea corporis et cruris was the most common pattern. This observation is consistent with recent Indian reports that describe mixed infection as the predominant pattern in the current epidemic of dermatophytosis.[8,14,19] The high rate of mixed infection may be due to delayed treatment, autoinoculation, shared clothing, poor hygiene, and steroid-modified atypical spread.[3,19]

Family history was present in 26.25% of patients, indicating significant household transmission. Familial clustering has been reported as an important contributor to chronicity and recurrence in dermatophytosis due to shared fomites, close contact, and simultaneous untreated infection in family members.[14,15] This finding underscores the need for family screening and simultaneous treatment of affected contacts to prevent reinfection.

Most patients presented within 3 months of disease onset; however, a substantial proportion had prolonged disease duration, and 10% had recurrent infection. Chronicity and recurrence are hallmarks of the current Indian dermatophytosis epidemic and are often related to incomplete treatment, irrational steroid use, reinfection from family members, and poor adherence to hygiene measures.[3,14,16] The prolonged duration observed in some patients in the present study likely reflects delayed specialist consultation and prolonged unsupervised treatment.

A major finding of this study was that 82.5% of patients had taken prior treatment before presenting to the tertiary care center, indicating widespread self-medication and irrational treatment practices. This observation is consistent with contemporary Indian studies, which report high rates of prior treatment, often involving over-the-counter antifungals and steroid-containing creams.[10,14,19] Such treatment often suppresses inflammation temporarily without

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eradicating infection, resulting in atypical morphology, extensive disease, and recurrence.[4,19]

Topical corticosteroid abuse emerged as one of the most significant contributors to altered dermatophytosis in the present study. Steroid misuse was associated with extensive lesions, atypical morphology, chronicity, and recurrent disease. The widespread use of over-the-counter fixed-dose combination creams containing corticosteroids, antifungals, and antibacterials has significantly altered the clinical presentation of dermatophytosis in India.[3,4,19] These preparations produce transient symptomatic relief, leading to continued use and delayed diagnosis while simultaneously suppressing local immunity and facilitating fungal proliferation.[4,19] The resultant "steroid-modified tinea" is often extensive, less inflammatory, difficult to diagnose, and more resistant to treatment.[17,19] This remains one of the most pressing concerns in contemporary dermatology practice in India.

Among associated comorbidities, diabetes mellitus was the most common systemic association, followed by hypertension and hypothyroidism. Diabetes is a well-recognized risk factor for dermatophytosis due to impaired host immunity, hyperglycemia-induced immune dysfunction, and altered skin barrier integrity.[18] The presence of metabolic comorbidities may contribute to chronicity and treatment resistance and warrants screening in persistent or recurrent cases.

Overall, the findings of the present study are in agreement with recent Indian literature demonstrating a changing epidemiological and clinical profile of dermatophytosis characterized by predominance of young adults, mixed infection patterns, chronicity, recurrence, and rampant topical steroid misuse.[8,10,14,19] These changing trends emphasize the need for stronger regulatory control over irrational topical steroid combinations, patient education regarding treatment adherence and hygiene, and early dermatologic intervention to reduce disease burden.[3,16,19]

CONCLUSION

The present study highlights the evolving clinico-epidemiological profile of dermatophytosis in North India. Young adults constituted the most commonly affected group, with tinea corporis being the predominant clinical type and mixed dermatophytosis emerging as the most frequent pattern of presentation. A high proportion of patients had prior treatment exposure, and topical corticosteroid misuse was alarmingly common, contributing to chronic, recurrent, and extensive disease. Family history and associated systemic comorbidities, particularly diabetes mellitus, further contributed to disease persistence and transmission.

The findings of this study reinforce the need for early diagnosis, rational antifungal therapy, screening of family contacts, and strict regulation of over-the-counter steroid-containing fixed-dose combinations. Public awareness regarding hygiene, adherence, and avoidance of unsupervised steroid use is essential to curb the growing burden of dermatophytosis in India.

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