

Research Article

Topical Therapy for Superficial Fungal Infections: An Observational Study

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Abstract: Background: Superficial fungal infections are among the most frequent dermatological diseases worldwide, affecting as many as one-quarter of the world population. They represent a significant health burden due to their chronic nature, tendency to relapse, and impact on quality of life. Topical antifungal therapy is even today the treatment of choice for uncomplicated infections due to its safety, easy accessibility, and low cost. The aim of this study was to assess the topical therapy for superficial fungal infections. **Methods & materials:** This observational study was conducted in the Department of Dermatology and Venereology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, from February 2014 to January 2015. Total 150 patients clinically diagnosed with superficial fungal infections were enrolled in the study. **Result:** A total of 150 patients with superficial fungal infections were studied. Most were aged 20–40 years (56.7%) with a male predominance (63.3%). The trunk (26.7%) and groin (23.3%) were the most affected sites, and tinea corporis was the leading clinical type (30%), followed by tinea cruris (20%). Major risk factors included sweating (30%), poor hygiene (20%), and diabetes (13.3%). Clotrimazole (40%) was the most prescribed topical agent, followed by ketoconazole (26.7%) and terbinafine (23.3%). Clinical cure was achieved in 66.7%, with minimal adverse effects (13.3%), mainly irritation, burning, or pruritus. Recurrence occurred in 6.7%. **Conclusion:** Topical antifungal therapy is effective and may be well tolerated in superficial fungal infections, with recurrence always in mind, emphasizing the importance of adherence and region-based treatment strategies.

Keywords: Topical Therapy, Superficial Fungal Infections, and Observational Study.

INTRODUCTION

Dermatophytoses, candidiasis, and pityriasis versicolor represent a large public health problem throughout the world. 20–25% of the world population are so infected at any given time, and therefore are among the most prevalent dermatological afflictions.^{1,2} Their occurrence is far more disproportionate in the tropics and subtropics due to climatic conditions like temperature and humidity, which are combined with socioeconomic and hygiene-related factors to create an ideal environment for their growth.^{3,4} The epidemiologic burden is also augmented by changing patterns of infection on the basis of globalization, migration, and lifestyle-associated modifications, which enhance their dynamic status.⁴ Historical reports also bear witness to the chronicity of the problem, with cutaneous mycoses being a major cause of morbidity since long before the advent of modern antifungal treatment.^{5,6}

Aside from their high prevalence, superficial fungal infections have serious clinical and public health consequences. While rarely fatal, the conditions seriously compromise quality of life, social functioning, and psychological well-being, especially because they are chronic, observable, and ordinarily recurring.^{1,2} They also cause significant healthcare expenditure and productivity losses, particularly in impoverished settings where delayed treatment and inappropriately targeted self-medication are common.⁷ Chronic or relapsing infection typically demands long-term treatment, once more overloading healthcare services and complicating patient compliance.⁸ Thus, seemingly harmless, these infections present a heavy hidden burden to healthcare services and patients.

Treatment has traditionally been therapeutically based on topical and systemic antifungals. Topical therapies, however, remain the therapy of choice for uncomplicated cases because they are available, have a benign side-effect profile, and are economically feasible.^{9,10} The key drug classes are the azoles (such as clotrimazole and ketoconazole), which are fungistatic, and allylamines (such as terbinafine and naftifine), which are fungicidal and often distinguished by reduced treatment durations and higher cure rates.^{8,11} While systemic antifungals are reserved for more refractory or complicated infection, they are limited by hepatotoxicity, drug interactions, and higher cost, and therefore topical treatment is the treatment of choice in routine clinical practice.^{9,10}

Despite their availability, there remain significant limitations and disadvantages. There has been growing worry regarding long-term efficacy on the basis of reported antifungal resistance, most particularly against terbinafine in *Trichophyton* spp.⁴ Relapse and failure remain common, typically from lack of treatment, non-compliance, or poor self-medication, perpetuating disease cycles and promoting chronic infection.^{2,8} The absence of large-scale observational research has therefore left wide knowledge gaps about how such treatments operate in different clinical and regional contexts.^{4,8} Observational research is therefore crucial to bridge the evidence gap. Therefore, the present study was designed to study the true clinical outcomes of topical antifungal therapy in superficial fungal infections.

Objectives

To assess the topical therapy for superficial fungal infections.

METHODS & MATERIALS

This observational study was conducted in the Department of Dermatology and Venereology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, from February 2014 to January 2015. Total 150 patients clinically diagnosed with superficial fungal infections were enrolled in the study. Patients of all age groups and both sexes who presented to the outpatient department during the study period and provided informed consent were included. The diagnosis was made on the basis of detailed clinical history, physical examination, and, where applicable, direct microscopic examination of skin scrapings in 10–20% potassium hydroxide (KOH) preparation. Patients with extensive disease requiring systemic antifungal therapy, those with known immunocompromising conditions such as HIV infection, diabetes mellitus, or long-term corticosteroid therapy, and those who had received systemic antifungal agents within the preceding four weeks were excluded from the study. Data on demographic variables, duration of illness, risk factors, clinical presentation, treatment modalities, and adherence patterns were recorded using a structured questionnaire. All patients received treatment with

topical antifungal agents as per routine departmental practice, and the choice of drug was individualized according to lesion type, extent, and physician discretion. Commonly used agents included azole derivatives (such as clotrimazole, ketoconazole) and allylamines (such as terbinafine, naftifine). Patients were followed up at regular intervals to monitor clinical response, adherence to therapy, adverse effects, and recurrence of infection. The primary outcomes were clinical improvement (measured as reduction or resolution of symptoms and signs), treatment adherence, and recurrence rates during the follow-up period. Data were analyzed descriptively to summarize demographic and clinical characteristics, with results presented in terms of frequencies, percentages, and proportions. Ethical clearance was obtained from the Institutional Review Board (IRB). Written informed consent was secured from each participant. Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 20.

RESULTS

The study enrolled a total of 150 patients with superficial fungal infections. The baseline characteristics are shown in Table I. The majority of patients (56.7%) belonged to the 20–40 years age group, followed by 23.3% above 40 years and 20% below 20 years. There was a male predominance (63.3%) compared to females (36.7%). In terms of duration of illness before presentation, 36.7% had disease for 1–3 months, 33.3% for less than 1 month, 20% for 3–6 months, and only 10% for more than 6 months. The most common sites of involvement were the trunk (26.7%) and groin (23.3%), followed by the feet (16.7%), face (13.3%), scalp (10%), and hands (10%). These distributions are further illustrated in Figure 1.

With respect to clinical types (Table II), tinea corporis was the most frequent presentation (30%), followed by tinea cruris (20%), pityriasis versicolor (16.7%), and cutaneous candidiasis (13.3%). Less frequent types included tinea pedis (13.3%) and tinea capitis (6.7%).

The distribution of risk factors is summarized in Table III. The most commonly identified risk factor was excessive sweating (30%), followed by poor hygiene (20%), use of occlusive clothing (16.7%), and diabetes mellitus (13.3%). A positive family history of fungal infection was observed in 10% of patients.

Regarding topical agents used (Table IV), the most frequently prescribed drug was clotrimazole (40%), followed by ketoconazole (26.7%) and terbinafine (23.3%). Naftifine was less commonly used, being prescribed in 10% of cases.

The post-treatment outcomes are presented in Table V. A clinical cure was achieved in 66.7% of patients, while 20% showed partial improvement. No response was observed in 6.7% of cases, and recurrence

was documented in another 6.7%. In terms of safety, topical antifungal therapy was well tolerated, with 86.7% reporting no adverse effects. Minor local adverse events

included irritation in 6.7%, burning sensation in 3.3%, and pruritus in 3.3%.

Table-I: Baseline characteristics of the study patients (N=150)

Characteristics	Number of patients	Percentage (%)
Age group (years)		
< 20	30	20
20–40	85	56.7
> 40	35	23.3
Sex		
Male	95	63.3
Female	55	36.7
Duration of illness		
< 1 month	50	33.3
1–3 months	55	36.7
3–6 months	30	20
> 6 months	15	10

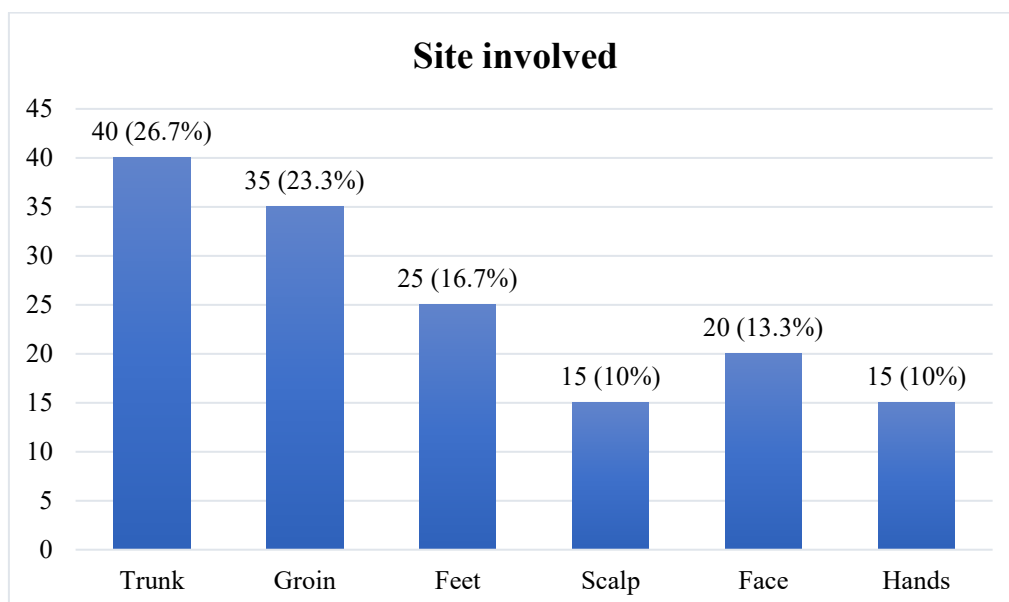


Figure 1: Distribution of site involved among the study patients (N=150)

Table-II: Distribution of clinical types among the study patients (N=150)

Clinical type	Number of patients	Percentage (%)
Tinea corporis	45	30
Tinea cruris	30	20
Tinea pedis	20	13.3
Tinea capitis	10	6.7
Pityriasis versicolor	25	16.7
Cutaneous candidiasis	20	13.3

Table-III: Distribution of risk factors among the study patients (N=150)

Risk factor	Number of patients	Percentage (%)
Excessive sweating	45	30
Poor hygiene	30	20
Use of occlusive clothing	25	16.7
Diabetes mellitus	20	13.3
Family history of fungal infection	15	10

Table-IV: Topical agents used on the study patients (N=150)

Topical agent	Number of patients	Percentage (%)
Clotrimazole	60	40
Ketoconazole	40	26.7
Terbinafine	35	23.3
Naftifine	15	10

Table-V: Post-treatment outcomes of the study patients (N=150)

Outcome	Number of patients	Percentage (%)
Clinical cure	100	66.7
Improvement	30	20
No response	10	6.7
Recurrence	10	6.7
Adverse effect		
Local irritation	10	6.7
Burning sensation	5	3.3
Pruritus	5	3.3
No adverse effect	130	86.7

DISCUSSION

This observational study provides valuable data on the demographic, clinical, and therapeutic trends of superficial fungal infections in a tertiary dermatology clinic. The findings indicated that the majority of patients were in the 20-40 years age group with a clear male preponderance. This age pattern is consistent with Brazilian and other tropical nation reports, in which young adults are most affected due to heightened outdoor activity, occupational exposure, and excessive perspiration.^{3,8} Male predominance has also been widely reported, possibly due to greater environmental contact and lifestyle-related risk factors.^{2,4} The pattern of distribution of lesions in our study, most commonly the trunk, groin, and feet, supports other local and international reports of these being the sites of predilection.^{1,7}

Clinical types in this population manifested in a pattern observed in tropical and subtropical climates, with tinea corporis being the most frequent manifestation, followed by tinea cruris, pityriasis versicolor, and cutaneous candidiasis. These findings are in accordance with studies that have described dermatophytoses as the dominant clinical type, with variations in relative frequency based on climate and sociocultural characteristics.^{3,8} The lower rates of tinea capitis in our series are consistent with reports in adult populations because this infection is predominantly pediatric.² Analysis of risk factors identified excessive sweating, poor hygiene, and the use of occlusive clothing as major contributors. These are factors that are repeatedly implicated in the literature as major drivers of infection persistence and recurrence, particularly in hot, humid environments.^{4,7} The association with diabetes mellitus, which was present in 13.3% of cases, has also been observed in earlier studies, as impaired immunity and altered skin physiology predispose diabetic patients to common fungal infections.¹¹

With regard to treatment practices, clotrimazole was the most commonly prescribed medication in this study, followed by ketoconazole and terbinafine, with less frequent prescription of naftifine. The preference for clotrimazole is supported by its wide availability, cheapness, and established efficacy in dermatophytoses.⁹ Ketoconazole and terbinafine were also commonly prescribed, in line with international practice for the primary treatment of superficial fungal infections.^{10,11} Though naftifine was less utilized in our setting, the literature suggests that it is fungicidal with strong activity and has excellent anti-inflammatory properties, making it an effective option for treatment.¹² Prescribing variation can therefore be attributed to drug availability locally, drug cost, and physician preference.

The responses to treatment in this study, clinical cure in 66.7% of patients, partial improvement in 20%, non-response in 6.7%, and recurrence in 6.7%, are overall comparable to those in systematic reviews and clinical trials. The Cochrane review by El-Gohary and van Zuuren¹³ stated cure rates of 65–80% for clotrimazole, ketoconazole, terbinafine, and naftifine, which is very comparable to our results. Importantly, our findings confirm that recurrence, though comparatively low, remains a persistent problem, reflecting challenges with adherence and reinfection from reservoirs in the environment.^{1,3} The safety profile here was favorable, with 86.7% of patients having no adverse effects and only mild local irritation, burning, or pruritus in the remainder. This agrees with past research that topical antifungals are safe and well tolerated for general use.^{9,11}

Together, the results of this study point out that while topical antifungal therapy remains highly effective for superficial fungal infections, issues such as recurrence and variability in therapeutic choice still persist.

Limitations of the study

In our study, there was small sample size and absence of control for comparison. Study population was selected from one center in Dhaka city, so may not represent wider population. The study was conducted at a short period of time.

CONCLUSION

This report of case series stresses that superficial fungal infections are found mostly among young adults with a male predominance and widespread involvement of the trunk and groin. The most common clinical presentation was tinea corporis, with habits of sweating, hygiene, and clothing being significant risk factors. Topical antifungal treatment, particularly clotrimazole, produced good cure rates with minimal side effects. Recurrence continues to be a issue despite an optimal outcome. These findings underscore the importance of region-specific observational data to inform useful practical management action.

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