

Changing Clinical Spectrum of Dermatophytosis: Impact of Topical Steroid Abuse in Patients with Tinea Incognito

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ABSTRACT

Objective: To evaluate the changing clinical spectrum of dermatophytosis with special emphasis on the impact of topical steroid abuse in patients presenting with tinea incognito.

Methods: This hospital-based observational study was conducted in the dermatology department of a tertiary care hospital over one year. A total of 220 patients with clinically and mycologically confirmed dermatophytosis were included. Detailed history regarding topical steroid use, clinical examination, and laboratory investigations including KOH mount and fungal culture were performed. Patients were categorized into classical dermatophytosis and tinea incognito groups for comparative analysis.

Results: Out of 220 patients, 134 (60.9%) presented with tinea incognito and 86 (39.1%) had classical dermatophytosis. Atypical clinical features such as loss of central clearing, diffuse erythema, and eczematous changes were significantly more common in the steroid-exposed group ($p < 0.001$). Self-medication was the most common source of topical steroid use (61.9%). Tinea incognito cases showed longer disease duration and more extensive involvement compared to classical cases. *Trichophyton rubrum* was the most frequently isolated organism.

Conclusion: The study demonstrates a strong association between topical corticosteroid misuse and the changing clinical spectrum of dermatophytosis, leading to a high burden of tinea incognito. Rational use of topical agents, strict regulation of steroid-containing formulations, and increased public awareness are essential to prevent disease modification and improve treatment outcomes.

Keywords: Dermatophytosis, Tinea Incognito, Topical Corticosteroids, Steroid Abuse, Fungal Infection, Clinical Spectrum.

INTRODUCTION

Dermatophytosis is a superficial mycosis of keratinized tissues, including nails, hair and skin and has been regarded as a very common and relatively easy-to-manage and diagnose disease.⁽¹⁾ Typically, it manifests with sharply circumscribed annular, erythematous areas of clearing that can easily be diagnosed clinically. ⁽²⁾In recent years, however, a definite change in the clinical behavior and presentation of these infections has been noticed. The clinical

spectrum of dermatophytosis has shifted with once-foreseeable cases becoming more atypical, long term and poorly controlled.⁽³⁾ One of the most significant reasons for this change is the increasing and sometimes unsupervised use of topical corticosteroids. ⁽⁴⁾These drugs can be purchased over the counter in many areas and are commonly used by patients to relieve itching and inflammation quickly without having been properly diagnosed.⁽⁵⁾ Immunosuppressive properties of

corticosteroids can briefly quell symptoms but the suppression will change the local immune responses of the skin, enabling the fungal infection to continue and replicate in a modified form.⁽⁶⁾

Consequently, dermatophytosis changes its classical appearance and develops a type called tinea incognito. The diagnosis of tinea incognito is a challenge because of its atypical morphology.⁽⁷⁾ Patients may have non-ring-like, less scaly, erythematous patches, plaques or even eczematous and psoriasiform lesions. The fact that inflammation is often not recognized worsens the issue, as it causes misdiagnosis and inappropriate treatments.⁽⁸⁾ In most instances, the infection spreads, becomes chronic and resistant to common antifungal drugs. This is an altered presentation which not only results in delay of appropriate management but also helps in increasing the risk of transmission in the community.⁽⁹⁾

The fact that fixed-dose combination creams, containing both anti-inflammatory agents (corticosteroids), anti-fungal agents and anti-bacterial agents are widely available and widely used without a doctor's prescription which is further compounding the problem.⁽¹⁰⁾ These may give temporary symptomatic relief and not cure the underlying fungal infection. Repeated and prolonged use has led to steroid modified dermatophytosis, which is defined as the recurrence of infection, failure of treatment and greater burden of care.⁽¹¹⁾ Furthermore, there is emerging evidence for a possible relationship between steroid use and development of antifungal resistance, complicating treatment.⁽¹²⁾

Public health implications of the increasing incidence of tinea incognito are not only the misuse of pharmacology but also the lack of awareness, regulation and healthcare access. Patients take medicines or follow treatments that are not prescribed by their doctor or nurse and not recommended by a qualified expert, which can cause misuse of medicines.⁽¹³⁾ Inappropriate use of medicines as patient self-medicate or follow advice from non-qualified practitioners may result in inappropriate drug use. Further, environmental factors like humidity, overcrowding and inadequate hygiene practices may also help spread and remain infection, especially in resource-poor environments.⁽¹⁴⁾

It is particularly important to evaluate the changing clinical spectrum of dermatophytosis in tertiary care hospitals where more complicated and treatment resistant patients

tend to present. This type of environment allows for a systematic documentation of patterns of steroid use, the characterization of diverse presentations of tinea incognito and an evaluation of their clinical implications.⁽¹⁵⁾

A knowledge of these changes is vital to achieving greater diagnostic accuracy, providing a way of guiding the right treatment approaches and developing effective preventive measures. The aim of this study is to examine changes in the clinical spectrum of dermatophytosis with a special focus on the effects of topical steroid abuse in patients presenting with tinea incognito. It aims to review clinical patterns, treatment history and associated factors, thereby stressing the rising problem of steroid modified fungal infections, and to add to the rational and evidence-based approach to management.

MATERIALS AND METHODS

This study was conducted in the Department of Dermatology of a tertiary care hospital over a period of one year. It was designed as a hospital-based observational study aimed at evaluating the changing clinical spectrum of dermatophytosis and assessing the impact of topical corticosteroid abuse in patients presenting with tinea incognito.

All patients presenting to the dermatology outpatient department with clinically suspected dermatophytosis were screened for inclusion. Patients of all age groups and both genders were considered eligible. Among these, individuals with a history of prior or ongoing use of topical corticosteroids either alone or in combination with antifungal or antibacterial agents and presenting with atypical or modified lesions suggestive of tinea incognito were included in the study.

Patients who had received systemic antifungal therapy within the past four weeks, those with other confirmed dermatological conditions mimicking dermatophytosis (such as psoriasis or eczema), and immunocompromised individuals (including HIV-positive patients or those on long-term immunosuppressive therapy) were excluded to minimize confounding factors.

A detailed clinical history was obtained from all participants, including duration of illness, site of involvement, symptoms such as itching or burning, prior treatment history and specific information regarding the use of topical medications. Particular attention was given to identifying the type of steroid preparation used, duration and frequency of application, source of

prescription (self-medication, pharmacist, or physician) and use of fixed-dose combination creams.

A thorough dermatological examination was performed in each case. Lesions were assessed for morphology, distribution, extent of involvement and any atypical features such as loss of central clearing, reduced scaling, diffuse erythema, pustulation, or eczematization. Based on clinical evaluation and treatment history, cases were categorized as classical dermatophytosis or tinea incognito.

Laboratory confirmation was carried out using potassium hydroxide (KOH) mount examination of skin scrapings obtained from active margins of lesions. In selected cases, fungal culture was performed on Sabouraud dextrose agar to identify the dermatophyte species. Dermoscopy was utilized in doubtful cases to support clinical diagnosis.

Data was recorded in a structured proforma and analyzed using SPSS version 22. Descriptive statistics were used to summarize demographic and clinical characteristics. Categorical variables were expressed as frequencies and percentages. Associations between topical steroid use and clinical patterns of

dermatophytosis were assessed using chi-square test. A p-value of less than 0.05 was considered statistically significant.

Ethical approval for the study was obtained from the institutional ethics committee of the hospital. Informed consent was taken from all participants and confidentiality of patient information was maintained throughout the study.

RESULTS

A total of 220 patients with clinically and mycologically confirmed dermatophytosis were included in the study. Among these, 134 patients (60.9%) had a history of topical corticosteroid use and were classified as cases of tinea incognito while 86 patients (39.1%) presented with classical dermatophytosis without prior steroid exposure.

The mean age of patients was 28.6 ± 12.4 years, with a slight male predominance (56.8%). The most commonly affected age group was 21–40 years (48.2%). No significant gender difference was observed between classical dermatophytosis and tinea incognito groups.

Table 1: Demographic Characteristics of Patients

Variable	Tinea Incognito (N=134)	Classical (N=86)	P-Value
Mean age (years)	29.1 $\pm$ 11.8	27.8 $\pm$ 13.2	0.42
Male (%)	58.2	54.6	0.61
Female (%)	41.8	45.4	

Clinical Presentation

Classical dermatophytosis most commonly presented as well-defined annular plaques with

central clearing (82.6%), while this typical morphology was significantly altered in tinea incognito cases.

Clinical Feature	Tinea Incognito (%)	Classical (%)	P-Value
Atypical morphology	88.1	14.0	<0.001
Loss of central clearing	76.1	11.6	<0.001
Diffuse erythema	69.4	18.6	<0.001
Pustular lesions	21.6	4.6	0.002
Eczematization	34.3	9.3	<0.001

Steroid Use Patterns

Among patients with tinea incognito, most had used topical corticosteroids in combination with antifungal agents.

Type of Topical Preparation Used	Percentage (%)
Steroid + antifungal combination	52.2
Steroid + antifungal + antibiotic	28.4
Potent topical steroid alone	19.4

Self-medication was the most common source of steroid use (61.9%), followed by pharmacist recommendation (24.6%) and physician prescription (13.5%).

Duration and Extent of Disease

Patients with tinea incognito showed significantly longer disease duration and more extensive involvement compared to classical cases.

Variable	Tinea Incognito	Classical	P-Value
Mean duration (weeks)	10.8 ± 4.6	5.2 ± 2.3	<0.001
Extensive involvement (%)	67.9	28.0	<0.001

Laboratory Findings

KOH mount was positive in 91.8% of all cases which confirmed dermatophyte infection. Fungal culture (performed in selected cases)

most commonly isolated *Trichophyton rubrum* (63.5%), followed by *Trichophyton mentagrophytes* (28.7%).

DISCUSSION

The present study shows an important and alarming change in the clinical manifestation of dermatophytosis, mainly due to the excessive and improper use of topical corticosteroids. In this study, tinea incognito was the most common diagnosis (more than half of the patients), highlighting the increasing prevalence of steroid modified fungal infections in daily practice. Over the last few years, the classical dermatophytic infections are giving way to atypical, chronic and often therapy resistant infections. One of the findings in this study was the high correlation between topical steroid use and changes in the clinical morphology.

Most patients that had been diagnosed with tinea incognito had a loss of the classical ring-like configuration, decreased scaling, diffuse erythema and eczematous or pustular changes. The results are consistent with the known immunomodulatory activity of corticosteroids that leads to inhibition of local inflammatory reaction and fungal proliferation. The findings are also echoed by Verma et al., who highlighted that steroid use can obscure the typical inflammatory border of dermatophytosis, creating clinical diagnosis difficulties and thus potentially leading to misdiagnosis and mismanagement.⁽¹⁶⁾

Alarming, the fact that self-medication was the main source of steroid exposure in this study is especially concerning. Many of the patients purchased topical products without a doctor's prescription, which suggests that the products were readily available over-the-counter and not well-regulated. This pattern has been known to happen in other studies in India and even in other developing countries, where it is common to use fixed-dose combination creams with steroids, antifungals and antibiotics in an irrational manner. This can

not only change the presentation of disease, but can also lead to chronicity and relapses.

The other interesting result was that tinea incognito had a much longer duration and more extensive of disease than classical dermatophytosis. This could be explained due to late diagnosis, partial control of symptoms with the use of steroids and fungal proliferation. The long disease course contributes to the risk of community and household transmission, thus maintaining the disease cycle. Ely et al. reported similar observations, that steroid modified tinea is frequently extensive and difficult to treat and needs long-term treatment with an antifungal agent.⁽¹⁷⁾

The results of the microbiological profile in this study showed that the most common isolates were *Trichophyton rubrum* followed by *Trichophyton mentagrophytes*. This is similar to the epidemiological situation worldwide and across the region for dermatophytosis. New evidence, however, indicates that there may be a trend towards altered species distribution and the appearance of antifungal resistance, especially in chronic and steroid-induced cases. This can further muddy a treatment trail and continue to be monitored. The results of this study are very relevant from a public health point of view.⁽¹⁸⁾

The rise in the occurrence of tinea incognito is not only the result of misuse of drugs but also the lack of knowledge, access and regulation of pharmaceuticals among patients. Strong prescription-strength topical steroids are still easily accessible. Moreover, patients' lack of knowledge about the dangers of self-medication makes a substantial contribution to the disease modification and to delay seeking treatment. These findings have implications for clinical practice by dermatologists. A high index of suspicion is suggested in patients who have a history of topical steroid use and in patients

when the skin is involved in an atypical, widespread or treatment-resistant manner. Prompt diagnosis of tinea incognito is essential to avoid continued use of corticosteroids and to start treatment with an antifungal agent. Also, patient counseling is important in preventing re-infection and community transmission. This study also highlights the importance of regulating more strongly the sales of the topical corticosteroid combination. Awareness creation through public campaigns and patient and pharmacist education are crucial to address irrational use. Improving the primary healthcare system and early dermatological referral can also minimize the effects of steroid-induced fungal infections.

CONCLUSION

This study showed a clear and significant impact of topical corticosteroid misuse on the changing clinical spectrum of dermatophytosis which leads to an increasing number of tinea incognito cases with atypical, chronic and extensive presentations. The findings highlight that self-medication and indiscriminate use of steroid-containing topical preparations are major contributing factors to disease modification, delayed diagnosis and prolonged treatment courses. Such altered clinical patterns not only complicate recognition and management but also increase the risk of transmission within the community. There is an urgent need for stricter regulation of topical steroid availability, along with improved patient education and awareness among healthcare providers and pharmacists and to ensure rational use of antifungal therapy and to curb the rising burden of steroid-modified dermatophytic infections.

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