

## Original Research Article

# Clinical profile of *Tinea pseudoimbricata*: an observational study from a tertiary care institution in western Maharashtra, India

Ajay Kumar, Kalyani Milind Deshmukh\*, M. S. Deora, Shrea Kapoor, Shreya R. Deoghare

Department of Dermatology, Dr. D. Y. Patil Medical College, Hospital and Research Center, Pune, Maharashtra, India

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### \*Correspondence:

Dr. Kalyani Milind Deshmukh,  
E-mail: [kdesh92@gmail.com](mailto:kdesh92@gmail.com)

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## ABSTRACT

**Background:** Topical steroid-modified tinea corporis and tinea cruris is on the rise due to the ease of availability of over-the-counter potent topical corticosteroid preparations and their inappropriate use, alters the true morphology of lesion. As there is paucity of literature about increasing prevalence and varied presentation of this condition, we aimed to study the clinical profile and dermoscopic features of *Tinea pseudoimbricata* due to topical steroid abuse. We present a case-series of 77 cases of a distinct morphological pattern with central erythematous, scaly, pruritic concentrically spreading plaques with raised and scaly borders known as *Tinea pseudoimbricata*.

**Methods:** We evaluated 77 clinically diagnosed patients of *Tinea pseudoimbricata* with positive 10% potassium hydroxide examination and culture. Dermoscopy was performed in all patients. The demographic, clinical, and mycological features of each patient were recorded on a predesigned proforma.

**Results:** There were 52 male and 25 female patients with a mean age of 28.66 and a mean disease duration of 7.6 months. There was a history of application of potent or super-potent topical steroid for varying durations. Culture isolates were *Trichophyton rubrum* species. Dermoscopic analysis showed features of steroid abuse.

**Conclusions:** Injudicious and inappropriate use of topical steroid causes *Tinea pseudoimbricata*; a special subset of tinea incognito, which is very common now a days. This should alert the dermatologist about the steroid abuse and requires systemic anti-fungal treatment for prolong time.

**Keywords:** *Tinea pseudoimbricata*, Topical steroid abuse, Concentric rings

## INTRODUCTION

Superficial dermatophytoses has been on splurge in the past few years, accounting for approximately 50% of patients visiting dermatology OPD. There is unrestricted availability of over-the counter potent and super-potent topical steroids (alone or in combination with anti-fungals and antibiotics, leading to evaluation of atypical presentation of dermatophytosis, which is termed as tinea incognito. *Tinea pseudoimbricata* is thus named as it simulates tinea imbricata, with features of concentric rings, caused due to trichophyton concentricum. *T. pseudoimbricata* has morphologic similarity to *T.*

*imbricata* but is not caused due to *T. concentricum*. It is often seen in immunocompromised hosts or in patients with history of steroid abuse. This condition has been postulated to occur as a result of local immunosuppression induced by topical steroids.<sup>1,2</sup> This case series presents clinic-epidemiological and dermoscopic characteristics of this dermatophytoses.

## METHODS

This was a cross-sectional study conducted in the department of dermatology, Dr. D Y Patil Medical College and Hospital, Pune from September 2017 to

September 2019. A total of 185 patients of tinea incognito were diagnosed out of which 77 patients with the clinical diagnosis of *T. pseudoimbricata* were found. Potassium hydroxide (KOH) examination of skin scraping and culture was performed. A detailed history pertaining to the use of topical formulation (name and contents were ascertained either on seeing the tubes used or from the prescription), duration and frequency of application, and information about the source of prescription was noted. Skin scraping from the lesions was used for direct microscopic examination in 10% KOH and for culture on the Sabouraud's dextrose agar (SDA) with cycloheximide and chloramphenicol. Dermoscopy was done using the universal serial bus dermatoscope. The data was entered in Microsoft Excel and statistical analysis was done using "Epi Info 7" Software.

**RESULTS**

The mean age of the 77 patients was 28.66 (±18.3) years. There were fifty two males and twenty five females. The mean disease duration was 7.6 (±12.7) months. All patients gave history of using potent and super-potent topical steroids; topical steroid had been used in combination with antifungals like miconazole, clotrimazole, and terbinafine, antibiotics like ornidazole, ofloxacin in varying combinations 57.14%, clobetasol propionate (0.05%) was used by 11 out of 77 patients (14.28%), betamethasone dipropionate by 17 patients (22.07%), mometasone furoate by 5 patients (6.49%). About 35 out of 77 (48.05%) patients had done self-medication on suggestion from friends and family while steroid combination was prescribed by chemist in 30 (38.96%) and by unqualified registered medical practitioners in 12 (15.58%). None of the patients had visited a dermatologist for the treatment of their skin disease.

All patients presented with multiple (>2) concentric erythematous rings that was associated with moderate-to-severe pruritus (Figure 1 a-d). Scaling was seen in 45 patients (58.44%).

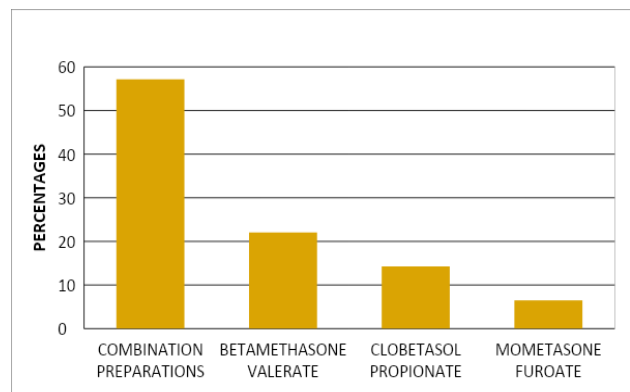
The most common clinical presentation was *Tinea corporis* (86.33%) followed by *Tinea cruris* (11%) and *Tinea faciei* (2.67%). KOH examination showed hyaline, long, branching septate hyphae in all the patients. The demographic, clinical, and mycological details are summarized in (Figure 2). Patients with *T. mentagrophytes* had a more widespread and multiple site infection as compared to *T. rubrum*. The inflammation and chronicity of the lesions were again greater in *T. mentagrophytes*.

Dermoscopy was done for all the patients and the most recent concentric lesion was chosen to document the dermoscopic features. Dermoscopy revealed background erythema; with dilated linear, tortuous, and/or dotted vessels; peripheral whitish scales; micropustules at the

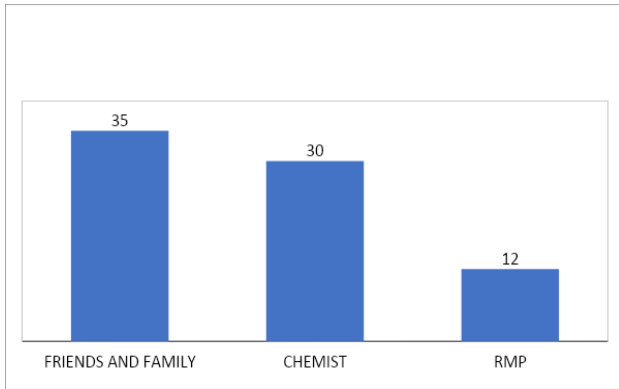
borders; *Tinea* of villous hairs; reddish brown hemorrhagic spots at the periphery.



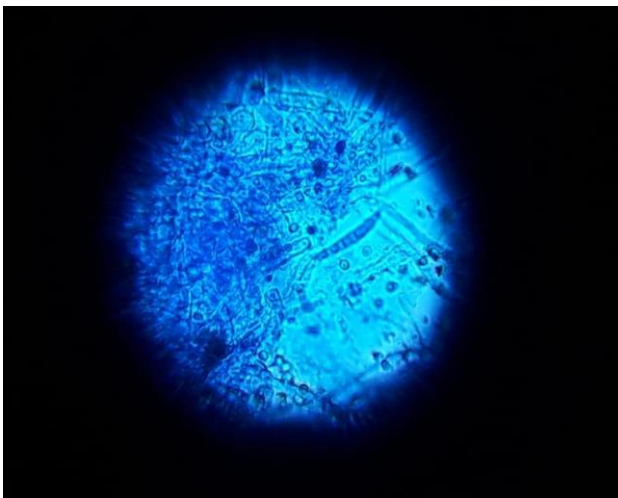
**Figure 1: Various presentations of *T. pseudoimbricata*; (a) multiple concentric rings with scaling and pustular lesions in right axilla and arm; (b) classic "ring within ring" appearance over face of *T. pseudoimbricata* in a young girl, (c) extensive lesions on trunk and groin following topical and systemic steroid abuse, (d) *T. pseudoimbricata* on abdomen after potent steroid application for over 7 months.**



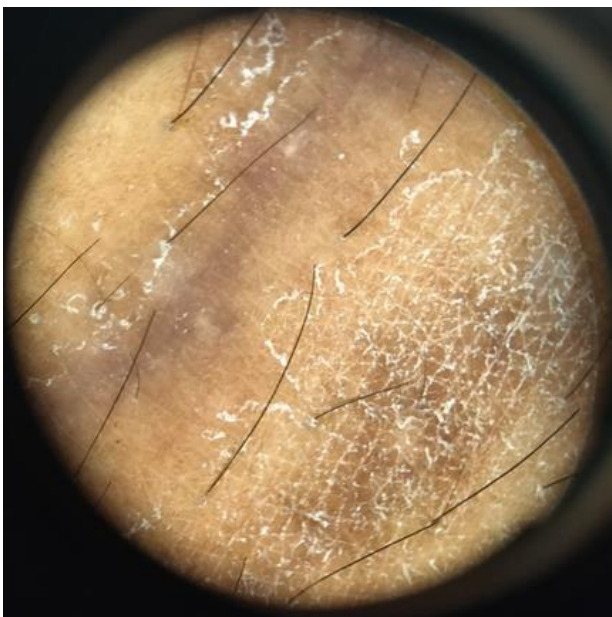
**Figure 2: Product used as a source of topical steroid abuse on skin.**



**Figure 3: Source of prescription for topical steroid abuse.**



**Figure 4: Macroconidia of *Trichophyton rubrum* seen under 10X.**



**Figure 5: Dermoscopy of a ring of *T. pseudoimbricata* showing scaling, erythema with hyperpigmentation.**

## DISCUSSION

*Tinea imbricata* is a superficial mycosis caused by *T. concentricum* with a characteristic pattern of concentric and/or annular plaques of erythema and scales. 'Imbrex' (latin) means overlapping roof tiles.<sup>3</sup> *T. pseudoimbricata* is thus called because it simulates but caused by species other than *T. concentricum*. *T. pseudoimbricata* has been caused by *Trichophyton tonsurans*, *T. rubrum*, *T. mentagrophytes*, *Microsporum audouinii*, and *Microsporum gypseum*.<sup>4</sup>

Most of our patients were young to middle-aged females. History of potent topical steroid application prior to appearance of lesions was present in all our patients. Our findings of this demographic data is similar to the finding by Singal et al, Verma et al, Verma et al, Jakhar et al and Kakkar et al.<sup>4-8</sup> This suggests that many women are seeking treatments in order to have fair skin. Lack of resources, wrong notion among the general population and especially the pharmacists that steroid application helps in brightening of skin, supply of drugs by pharmacists without prescription has lead to steroid misuse.

All our patients presented with multiple concentric or annular erythematous scaly plaques. Diagnosis was made visually by appearance of "ring-within-a-ring" lesions, similar to the study by Sonthalia et al.<sup>1</sup> Fungal culture in our patients revealed *T. rubrum* to be the predominant species.

Dermatophyte invasion of the skin is caused by the activation of specific genes which produce antigens such as proteinases. Both innate (e.g. b-defensins) and acquired T cell-mediated immunity is responsible for erythema and scaling. In *T. concentricum* infections, genetically determined variations led to weak expression of acquired immunity of dermatophyte modulation. The classic appearance of tinea is suppressed due to the anti-inflammatory effect of topical steroids. Erratic use of topical steroids leads to periods of active inflammation and apparent remission with the appearance of multiple rings and inadequate clearing of the fungus.<sup>5,6</sup>

A ring effect similar to that described here can be explained by the fact that although host reaction occurs in response to actively metabolizing fungal cells, these are only partially inhibited as a result of concomitant topical steroid treatment. When local immune responses decline below a key threshold, the fungal genes are switched on again and instigate another zone of host-induced inflammatory response. This may be repeated several times, resulting in concentric rings of scaling and inflammation that reflect the alternating activation and deactivation of defense mechanisms. The more widely known result of the unrestricted application of topical corticosteroids in dermatophytosis is *Tinea incognito*. However, the injudicious use of topical preparations containing steroids is also responsible for development of



the distinct clinical presentation of *Tinea pseudoimbricata*. We examined other sites for fungal infection, such as beneath the breasts in women, soles of the feet, and nails. We confirmed the diagnosis of *Tinea* by examining a skin scraping in 10% potassium hydroxide under a microscope for hyphae and spores of dermatophytes. Fungal culture was also performed in few patients.

All lesions were thoroughly examined under dermascope. As in the article by Jakhar et al, dermoscopy showed the presence of background erythema with dilated linear, tortuous, and/or dotted vessels, which may point toward the possible topical steroid abuse.<sup>7</sup> Also, the polygonal arrangement of these vessels may point toward the chronicity of topical steroid abuse.<sup>7</sup> In addition, we suggest that the presence of micropustules at the periphery indicate disease activity while the brownish hemorrhagic spots may indicate the excoriation marks secondary to pruritus. Dermoscopy may serve as a quick and non-invasive tool for identification of cases with topical steroid abuse.

Systemic antifungal is mandated in such situations for a prolonged period of at least 6 to 8 weeks. The prognosis is good if the patient adheres to the treatment and further steroid abuse is halted. It is of equal importance to treat the family members to decrease the chances of reinfection and to counsel regarding the separate washing of infected clothes and avoidance of sharing of towels, clothes, bed linen, and soaps.

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