

Tinea Pseudoimbricata: A Striking “Ring-Within-a-Ring” Form of Corticosteroid-Modified Dermatophytosis

Seven patients presented to Dermatology Outpatient Department (OPD) from September 2017 to January 2018 with pruritic lesions from last 2 months to 18 months. Morphology of the lesions was quite similar in the form of multiple erythematous, scaly, concentric rings [Figures 1-3]. The groins were the commonest site clinically involved (in 5 patients; 4 males, 1 female), followed by abdomen (in 4 patients; 3 males, 1 female) and face (3 patients; 2 males, 1 female). Two patients had associated diseases: first one had type 2 diabetes mellitus (this case was referred by General Medicine OPD of our hospital for evaluation of cutaneous lesions). The second case had type 2 diabetes mellitus and hypertension for which he was on treatment from outside. Both patients' diseases were well controlled. The patients had not consulted a dermatologist earlier, and were taking medicines either on their own or on advice of friends/family/local pharmacy.



Figure 1: Multiple concentric erythematous rings on the right shoulder of a 2-year-old child

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All of the patients were applying highly potent corticosteroid topically, either alone or as combinations (i.e., with antibacterials and/or antifungals). Two of the patients were also taking Tab. Terbinafine on and off for variable durations. A 10% potassium hydroxide (KOH) examination demonstrated septate fungal hyphae in all but 1 patient. Fungal culture was negative in all the patients.

Tinea imbricata (Tokelau), caused by *Trichophyton concentricum* species, is a geographically restricted, morphologically unique form of dermatophyte infection, characterized by multiple concentric rings. Steroid-modified tinea (tinea incognito or “tinea atypica”) may morphologically present in variable clinical forms, e.g., rosacea-like dermatitis, psoriasiform eruptions, eczematous lesions, bacterial infections, etc.^[1] However, tinea imbricata-like or a “ring-within-a-ring” appearance of the incognito tinea has been reported rarely secondary to topical corticosteroid-misuse or some form of immunosuppression and termed tinea pseudoimbricata or tinea indecisiva.^[2,3] In our series, except two (well-controlled) diabetic patients, others were healthy with no systemic comorbidity/



Figure 2: Erythematous concentric rings on the right hand in a 20-year-old patient

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Naveen Kumar Kansal

Department of Dermatology and Venereology, All India Institute of Medical Sciences, Rishikesh, Uttarakhand, India

Address for correspondence:
Dr. Naveen Kumar Kansal,
Department of Dermatology
and Venereology, All India
Institute of Medical Sciences,
Rishikesh - 249 203,
Uttarakhand, India.
E-mail: kansalnaveen@gmail.com

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Figure 3: Multiple concentric erythematous rings on the abdomen of a 32-year-old patient

immunosuppression. Therefore, pathomorphosis of this specific form of tinea incognito seems certainly due to local immunosuppression induced by continued use of potent topical corticosteroids.

During dermatophytic invasion, digestion of the keratin by the fungus is associated with secretion of multiple proteases, which play their particular specialized roles to colonize and degrade keratinized host structures during the infection. Host's defense depends on both innate (e.g., β -defensins) as well as acquired T-cell-mediated immune mechanisms.^[4] In genetically susceptible population of endemic geographical zones, multiple concentric rings of tinea imbricata are hypothesized to result from negative delayed type hypersensitivity to *T. concentricum* cytoplasmic antigens and T-lymphocyte hyporeactivity.^[1,2] A ring effect (similar to tinea imbricata) seen in topical corticosteroid misuse cases may be explained by the fact that although host reaction occurs in response to actively metabolizing fungal cells, initially the fungal cells are only partly inhibited as a result of concomitant topical corticosteroid application. When host's local immune responses decline below a certain threshold, the fungal genes are switched on again and initiate another zone of host-induced inflammatory response. This repeated many times, results in several concentric rings of inflammation, which manifests clinically as rings of erythema and scaling and reflects the alternate

activation and deactivation of defense mechanisms at the site of topical corticosteroid usage.^[2,3]

The unregulated over-the-counter sale of many prescription medications, including topical corticosteroids, remains a longstanding significant problem in India.^[5] With this brief report, we wish to highlight this relatively uncommon but distinctive morphology of topical corticosteroid-modified tinea and increase its awareness as to diagnose topical corticosteroid misuse.

Declaration of patients' consent

The author certifies that he has obtained all appropriate patients' consent forms. In the forms, the patients have given consent for the images and other clinical information to be reported in the journal. The patients understand that names/initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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