

Erythrasma – A Red Herring in the Ongoing Epidemic of Tinea

Abstract

We describe the presentation of five adults with erythrasma, misdiagnosed as tinea and prescribed antifungal treatment which resulted in incomplete clearance. The lesions were restricted to axillary and/or inguinal folds. They were dry, brown macules with fine scaling. Except for one with moderate pruritus, they were asymptomatic. No fungal elements could be demonstrated in any of the patients in 10% KOH preparation. Gram stain revealed short gram-positive rods in varying proportions. All the patients showed a pink fluorescence on Wood's lamp examination. After treatment with topical clindamycin singly or in combination with oral azithromycin, there was complete clearance of the lesions leaving normal-appearing skin in three and residual hyperpigmentation in one. The overdiagnosis of tinea in the ongoing epidemic of dermatophytosis is a potential concern. Wood's lamp examination is very useful to confirm or exclude erythrasma.

Keywords: *Erythrasma, tinea, Wood's lamp*

Introduction

In the current spate of dermatophytic infections, one should be cautious of mistaking tinea for erythrasma as the present report shows.

Case Reports

A series of five referred patients were seen over 10 months beginning from 2021 with partial clearance to oral and/or topical antifungal drugs. As shown in Table 1, all were healthy adults between 22 and 40 years of age, consisting of four men and one woman. The axillary and inguinal folds were affected in two patients and only the axillary folds were affected in the remaining patients. Pruritus was not a significant complaint, except for mild to moderate itching in one. The macules had a varying brownish hue with some showing red-tinged edges. Fine scales were seen and the borders were well defined and wavy. Smaller satellite lesions were seen in two patients. In one, the lesions were seen to extend to the inner arms. No fungal structures were seen in 10% KOH preparations. Gram stain smear showed short gram-positive rods lying in groups and singly in varying numbers. Wood's lamp examination revealed pink fluorescence. Two patients received oral

azithromycin 500 mg/day for 5 days and topical clindamycin twice daily for 15 days. In others with erythrasma limited to the axillae only, topical clindamycin was given. Three cleared well and one showed slight hyperpigmentation. The woman did not show up after the first visit.

Discussion

Erythrasma is an uncommon superficial infection caused by the aerobic gram-positive non-spore forming bacillus, *Corynebacterium minutissimum*, a normal resident colonizing the warm and moist areas of the body. The infection when present is mild, limited to the toe-webs, asymptomatic, and often goes unnoticed. Onset is common in adults, rare in children, and the frequency escalates gradually with age. It is limited to the stratum corneum and the living layers of the skin remain unaffected. Even when disseminated, it remains asymptomatic.^[1] In those with interdigital problems,^[2] 40% were confirmed as erythrasma; desquamation was seen, followed by maceration and erythema; and a little over 50% had pruritus. Fissuring may be seen and at times erosions in other flexural sites.^[3] Pre-existing dermatoses like inverse psoriasis^[4] and hidradenitis suppurativa^[5] which hamper skin barrier function are susceptible to erythrasma. Erythrasma may be a fortuitous finding in

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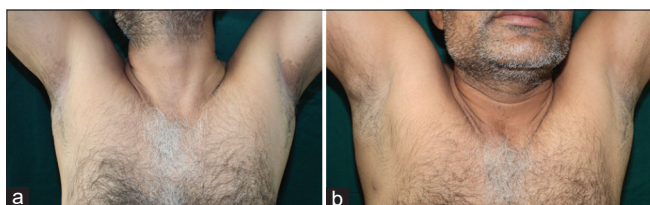
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Table 1: Clinical details of patients with erythrasma

Age/sex	Duration	Affected sites	Treatment	Response at end of therapy
40, M	4 months	Large brown macules, on each axilla, with wavy borders, small extensions and satellite lesions [Figure 1a]; vague macules in inguinal folds	Oral azithromycin 500 mg×5 days Topical clindamycin twice daily	Cleared completely [Figure 1b]
29, M	3 months	Dark brown coalescing macules with irregular borders in both axillae	Topical clindamycin twice a day	Residual slight hyperpigmentation
38, M	3 months	Brownish-red macules on axillae and inguinal folds; axillary lesions extending into the arms	Same as no. 1	Complete clearance leaving normal skin
22, M	2 months	Brown macules confined to the axillae	Clindamycin topically twice a day	Complete clearance
31, F	6 months	Brown macules with crenelated borders around normal-appearing skin in both axillae	Clindamycin topically	Not available

**Figure 1: Irregular brown macules in axillae (a) before and (b) normal skin after treatment**

those with other dermatoses.^[6] Obesity, diabetes mellitus, advancing age, and immunocompromised states can result in lesions appearing on non-flexural sites.^[7] The lesions wax and wane leaving behind hyperpigmentation, or lichenification. In elderly persons with asymptomatic toe-web infection, erythrasma has also spread subungually causing melanonychia.^[8] All in this report were adults with erythrasma confined to axillae or inguinal folds, or both. Except for one, they were asymptomatic, had no co-morbidities, received antifungal therapy without relief, and sought advice for the gradually progressing discoloration.

The diagnosis of erythrasma is mainly based on suspicion, particularly in the toe-webs. The most reliable is Wood's lamp examination which shows a pink to coral-red fluorescence due to the production of porphyrins by the corynebacteria.^[5,6] When risk factors for infection are present, Wood's lamp is considered safe, quick, and cost-effective.^[4] Other methods are the microscopic examination of a Gram's stained preparation, biopsy, and culture. Bent, short rod-like gram-positive filaments are seen in a smear preparation. Biopsy and culture are rarely needed. Since tinea and erythrasma can present as a mixed infection, scrapings should be performed for both, particularly the toe-webs. Suspicion of erythrasma affecting unusual sites like the palm has been confirmed by Wood's lamp examination.^[9] The fluorescence may be patchy but is limited to the affected area [Figure 2]. It is faintly positive in subungual erythrasma^[8] or false-negative after a recent bath since porphyrins are water-soluble. Entities mimicking erythrasma are enumerated in Table 2. Intertrigo has been excluded as it refers to inflammation between two opposing surfaces and any condition in Table 2

**Figure 2: Axillary fold showing pink fluorescence under Wood's lamp; unaffected skin appears normal**

could be the cause. These dermatoses predominantly affect the flexures, are common in a humid environment, and are recurrent; overweight individuals and those with diabetes mellitus are prone. Currently, tinea ranks as the most important differential diagnosis. Awareness would prevent unnecessary antifungal medications and along with Wood's lamp examination would enhance the diagnosis of erythrasma.^[7] Occasionally, other *Corynebacterium* species cause erythrasma^[1] or manifest in the person in diverse forms like pitted keratolysis and trichomycosis axillaris in addition to erythrasma.^[10]

Topical therapies score over oral with fewer adverse events.^[6] Occasionally, patients with co-morbidities require oral antibiotics.^[5] Topical antifungals have proved inconsistent and oral drugs have no role in erythrasma.^[6,11] Topical clindamycin and oral erythromycin have been most preferred,^[11] single-dose clarithromycin being cost-effective.^[3] We gave topical clindamycin, and in those with both axillary and inguinal folds involvement, oral azithromycin was added. The lesions cleared leaving normal skin except in one who had residual hyperpigmentation.

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Table 2: Differential diagnosis of erythrasma

Diagnosis	Erythrasma	Tinea	Candidiasis	Pityriasis versicolor	Seborrheic dermatitis/sebopsoriasis
Etiology	<i>Corynebacterium minutissimum</i>	Dermatophytes (<i>Trichophyton</i> , <i>Microsporum</i> , and <i>Epidermophyton</i>)	<i>Candida albicans</i>	<i>Malassezia furfur</i>	Overgrowth of <i>Pityrosporum ovale</i> in predisposed individuals
Symptoms	Often none; occasionally pruritus	Itching, usually severe, and troublesome	Itching and burning	None	Itching
Clinical features	Dry brown macules with diffuse scaling and little tendency to central clearing. Generally confined to axillae, groins, and toe-webs. Erythema is absent to mild	Varied presentations from localized to extensive, erythematous ring-shaped lesions, central clearing and peripheral prominent scales	A superficial erosive lesion, pustules may be seen at the periphery	Fawn colored to hypopigmented multiple coalescing macules mainly over trunk and back with profuse powdery scales	Erythematous plaques with greasy yellow scales in folds and flexures. Scalp and gluteal cleft are often involved. Additional features of psoriasis may be seen as dry micaceous scales; when it predominates, inverse psoriasis should be considered
Skin scrapings (KOH)	Fine filaments and rods, better appreciated with Gram's stain	Branching hyphae and spores	Budding yeasts and pseudohyphal forms	Clusters of thick hyphae and numerous spores described as meatballs in spaghetti	A profusion of yeast forms can be seen
Wood's lamp	Coral red or pink fluorescence clinches diagnosis	Not useful in glabrous skin infections	Not indicated	Greenish-yellow fluorescence	Not indicated
Culture	Difficult, not required for diagnosis	Necessary for speciation and drug sensitivity tests	Aids diagnosis	Not needed for diagnosis	Not relevant
Biopsy	Not recommended	Helpful in nail and scalp infections	Not mandatory	Not required	Important for establishing sebo and inverse psoriasis

Conflicts of interest

There are no conflicts of interest.

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