

## CASE REPORT

# Necrolytic acral erythema associated with hypothyroidism in hepatitis C virus seronegative patient

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## Abstract

Necrolytic acral erythema (NAE) is a rare cutaneous sign of hepatitis C virus (HCV), which generally presents as circumscribed keratotic plaques on the extremities. Many studies reported NAE in the absence of HCV. This case presents a female diagnosed with NAE and hypothyroidism in the absence of HCV infection.

## KEYWORDS

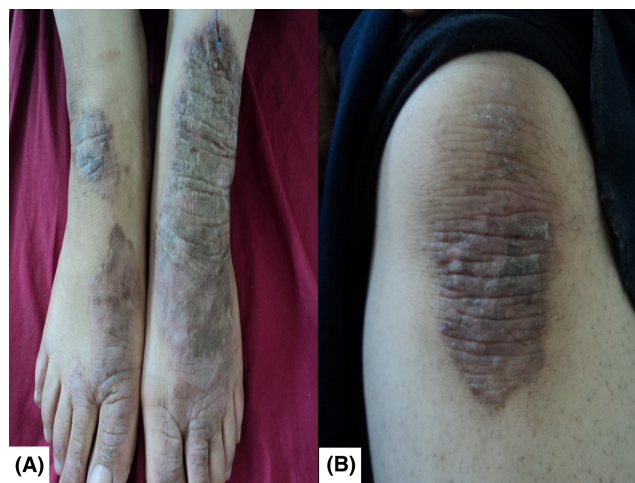
case report, hepatitis C virus seronegative, hypothyroidism, necrolytic acral erythema

## 1 | INTRODUCTION

Necrolytic acral erythema (NAE) is a rare cutaneous sign commonly associated with hepatitis C virus infection.<sup>1</sup> NAE lesions appear as erythematous to hyperpigmented plaques with variable scales and erosions. In addition, they tend to exist symmetrically on the lower extremities and would be painful, itchy, or burning.<sup>1,2</sup> To the best of our knowledge, a few cases of NAE associated with hypothyroidism were published in the literature. This case report describes NAE as a cutaneous marker of underlying hypothyroidism without accompanying hepatitis C infection.

## 2 | CASE REPORT

A 26-year-old woman came to the dermatology clinic complaining of itchy plaques with thick adherent scales on her lower extremities. She was treated with local corticosteroids for 1 year without any benefit. Dermatological examination appeared well-defined hyperpigmented and hyperkeratotic plaques. The erythematous lesions were covered with thick scales and extended over the dorsum



**FIGURE 1** Well-defined hyperpigmented and hyperkeratosis plaques with a rim of erythema over the dorsa of both feet and knees.

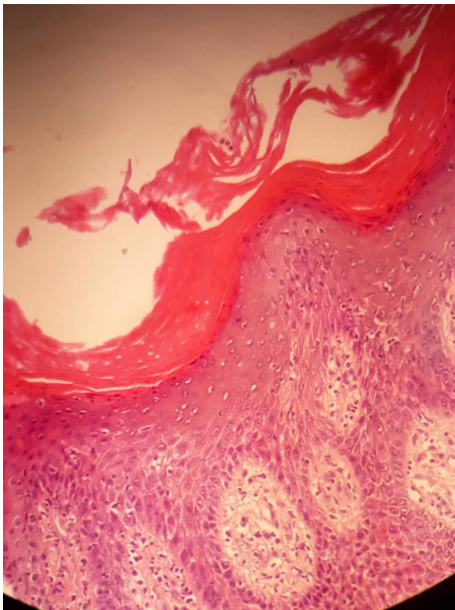
of both feet and knees (Figure 1). Laboratory studies revealed normal ranges of complete blood count, negative HCV and HBV antibodies, and normal levels of AST/ALT enzymes. Plasma zinc levels were at the low end of 72 µg/dL (normal 70–120 µg/dL). On investigations, the

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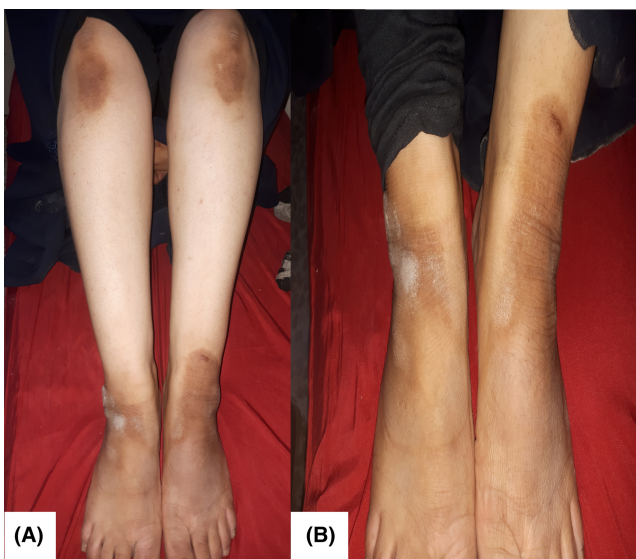
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TSH level was 16.6 mIU/L (normal 0.5–5 mIU/L). A 4 mm skin punch biopsy was taken and sent for histopathology. Histopathological examination showed hyperkeratosis, parakeratosis, focal subcorneal cleft with keratinocyte necrosis, and slight intracellular edema. Perivascular lymphocytic infiltrate was detected (Figure 2).

Elevated TSH levels with the clinicopathological findings established the diagnosis of NAE associated with hypothyroidism. The patient received 200 mg daily zinc oral supplementation and levothyroxine. Lesions resolved, leaving hyperpigmented plaques (Figure 3).



**FIGURE 2** Hyperkeratosis, slight intercellular edema, epidermal hyperplasia, and perivascular lymphocytic infiltrate.



**FIGURE 3** Hyperpigmented plaques after appropriate treatment with zinc oral supplementation.

### 3 | DISCUSSION

Necrolytic acral erythema is a rare dermatologic condition first described in 1996 in Egypt.<sup>1</sup> The cause of NAE is uncertain, but it may be related to hepatic dysfunction, hypoalbuminemia, hypoglucagonemia, hypoaminoacidemia, zinc deficiency, diabetes, and vitamins B12, B7, and B3 deficiency.<sup>1,2,3</sup> The primary studies indicated a strong association between NAE and HCV, but subsequent studies confirmed that NAE happened in many hepatitis C virus seronegative patients.<sup>2,3,4</sup>

Zinc deficiency increases NAE incidence because it reduces serum retinol-binding protein and prealbumin. These proteins are necessary to deliver Vitamin A to tissues where vitamin A is essential for epidermal proliferation and differentiation.<sup>5</sup> Zinc deficiency can occur due to hypothyroidism, chronic inflammatory bowel disease, pancreatic insufficiency, and steatorrhea.<sup>2,4</sup> The metabolism of zinc and thyroid hormones is closely interlinked. Many studies indicate that hypothyroidism reduces intestinal zinc absorption. On the contrary, zinc deficiency affects the T3 receptors, causing impairment in the work of T3 and insufficiency of thyroid function.<sup>6</sup> Therefore, hypothyroidism and zinc deficiency can be considered significant contributing factors to NAE occurrence.

The lesions of NAE generally present as well-circumscribed hyperkeratotic plaques. In addition, these lesions have many appearances according to their clinical stages. Initial stages appear as scaly erythematous plaques, while late stages are hyperpigmented plaques. NAE lesions usually extend over the dorsum of feet, toes, and knees. In rare cases, some lesions affect hands, elbows, and genitalia without palms and soles.<sup>1</sup> The NAE lesions, in this case, appeared as bilateral, different sizes of hyperkeratotic plaques over the lower extremities.

The differential diagnoses of NAE include psoriasiform, lichenoid lesions, atopic dermatitis, and necrolytic migratory erythema.<sup>7</sup> Clinical presentation and histopathologic findings lead to the probable diagnosis.

The management of this condition depends on the underlying abnormality. Some of the therapeutic options in the literature include antiviral therapy for HCV (Interferon-alpha with or without ribavirin) in patients with HCV infection and oral zinc supplementation, which are the most effective treatment even in the absence of zinc deficiency.<sup>1</sup> Additional probable treatments include systemic, intralesional, topical corticosteroids, topical tacrolimus, and phototherapy. Variable efficiency of these treatments existed between people.<sup>1</sup>

Our patient had been wrongly diagnosed with psoriasis and treated for 1 year with topical corticosteroid

without any benefit. After investigations, laboratory tests in our patient revealed unremarkable findings except for zinc level at the lower borderlines and high TSH level. Histopathological findings confirmed the diagnosis of NAE. A suitable dosage of zinc oral supplementation and levothyroxine-induced lesions cure.

## 4 | CONCLUSION

It is evident from our case report and previous cases that necrolytic acral erythema is not an exclusive sign of hepatitis C disease. In addition, it may also be associated with many diseases and by various mechanisms. Clinicians should consider hypothyroidism in NAE patients who are seronegative for HCV.

### AUTHOR CONTRIBUTIONS

**Ihsan Baroudi:** Writing – original draft; writing – review and editing. **Ola Alakhras:** Writing – original draft. **Alaa Alkasem:** Writing – original draft. **Thaer Douri:** Conceptualization; supervision; writing – review and editing.

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### CONFLICT OF INTEREST STATEMENT

All authors declare no conflict of interest.

### DATA AVAILABILITY STATEMENT

All data and material collected during this study are available from the corresponding author upon reasonable request.

## CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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