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Facial Angioedema Induced by Paraphenylenediamine in Black Henna : A Case Report

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ABSTRACT

Angioedema is a potentially serious hypersensitivity reaction that may be life-threatening. Paraphenylenediamine (PPD), a common component of black henna, is a potent sensitizer responsible for various cutaneous reactions. We report the case of a 21-year-old patient who developed isolated facial angioedema following first-time use of black henna. The clinical course was favorable with systemic corticosteroids and antihistamines. This case highlights the importance of early recognition to avoid diagnostic errors and optimize therapeutic management.

KEYWORDS :

Angioedema, Black henna, Paraphenylenediamine, Hypersensitivity, Facial edema

MAIN ARTICLE

INTRODUCTION

Paraphenylenediamine (PPD) is a strong allergen widely used in hair dyes and frequently added to henna to obtain a darker, black coloration. Unlike natural henna, which produces a reddish stain, black henna is associated with a higher risk of sensitization and allergic reactions.

Clinical manifestations induced by PPD are variable, ranging from allergic contact dermatitis to more severe reactions such as urticaria, angioedema, and even anaphylaxis. Angioedema is an immediate (type I) hypersensitivity reaction characterized by deep swelling involving the dermis and subcutaneous tissues, which may extend to the upper airways and become life-threatening.

OBSERVATION

We report the case of a 21-year-old woman with no significant past medical history who presented with progressively developing facial swelling following first-time application of black henna containing paraphenylenediamine.

Exposure occurred on a Sunday, with symptom onset over the following days, leading to consultation on Wednesday.

Clinical examination revealed isolated facial angioedema, predominantly involving the periorbital region (Figure 1), without associated urticaria. No signs of severity were observed: the patient was hemodynamically stable, with no respiratory distress, no neurological impairment, and no features suggestive of anaphylactic shock.

Initial management included intravenous administration of methylprednisolone at a dose of 120 mg, followed by short-term admission to the emergency department for clinical monitoring. Laboratory investigations were unremarkable.

Figure 1 *: clinical photography showing severe facial and periorbital angioedema.*

After clinical improvement, the patient was discharged with the following treatment:
* prednisone 60 mg daily for 7 days
* cetirizine 10 mg twice daily for 7 days
The outcome was favorable, with progressive resolution of the facial edema.
A standard patch test performed subsequently was positive for paraphenylenediamine, confirming the allergic origin of the reaction.

DISCUSSION :

Henna is a plant-derived green powder traditionally used to dye the skin a reddish-brown color, hence the term red henna [1]. It is generally considered safe, although rare cases of allergic contact dermatitis have been reported. In contrast, black henna is not a natural product; it results from the addition of paraphenylenediamine (PPD) to henna. PPD is a well-known sensitizing agent capable of inducing allergic reactions that may, in some cases, be severe or even fatal. Sensitization has been documented even after a single exposure, particularly following black henna tattoos [2,3].

Adverse reactions to hair dyes are common and exhibit a wide clinical spectrum, ranging from mild manifestations to severe, potentially life-threatening conditions. These reactions primarily include allergic contact dermatitis, angioedema, and anaphylaxis, most often attributable to PPD contained in these products. Among the most serious complications is upper airway obstruction. Furthermore, systemic PPD toxicity may lead to severe conditions such as rhabdomyolysis, methemoglobinemia, toxic myocarditis, and acute renal failure [4].

In our case, the patient presented with isolated facial angioedema without associated symptoms. Similar clinical presentations have been reported in the literature, highlighting the variability of PPD-induced reactions [5].

From a therapeutic perspective, systemic corticosteroids remain the mainstay of treatment for allergic reactions related to hair dyes, often in combination with antihistamines [6–7].

Finally, in patients with confirmed sensitization to PPD, strict avoidance of further exposure is essential. The use of alternative hair dyes, particularly semi-permanent products that are free of PPD, is strongly recommended to prevent recurrence [8–9].

CONCLUSION :

This case highlights the potential of paraphenylenediamine in black henna to induce isolated angioedema, even after a first exposure and in the absence of severe systemic features. It underscores the importance of considering this diagnosis in cases of acute facial swelling to avoid misdiagnosis. Early recognition and appropriate management lead to favorable outcomes, while patient education and avoidance of PPD-containing products remain essential to prevent recurrence.

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The authors declare that they have no conflicts of interest.

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