

The Dark Side of Beauty: Contact Dermatitis with Post-Inflammatory Hyperpigmentation Following Temporary Henna Tattooing

A Face Negra da Beleza: Dermate de Contato com Hiperpigmentação Pós-Inflamatória Após Tatuagem Temporária com Henna

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Palavras-chave: Dermate de Contacto Alérgica/etiologia; Fenilenediaminas/efeitos adversos; Hiperpigmentação/induzida quimicamente; Tatuagem/efeitos adversos

A healthy 25-year-old female patient received a black henna tattoo on her left hand during a trip to Morocco. Subsequently, she developed a pruritic vesicular erythema at the tattoo site that progressively worsened with development of hand edema (Fig. 1A). Ten days later, she was treated with systemic corticosteroids, antihistamines, and paracetamol at an emergency department, with slight improvement. Upon discharge, the patient was prescribed daily topical hydrocortisone, antihistamines, and analgesics as needed. Although the symptoms resolved one month later, hyperpigmentation at the tattoo site persisted for 16 months thereafter (Fig. 1B).



Figure 1 – Acute reaction with vesicular erythema and hand edema at the site of the henna tattoo (A). Hyperpigmentation at the tattoo site that persists 16 months after the reaction (B). Patch tests results at 72 hours (C). Patch tests were performed using the Portuguese Contact Dermatitis Research Group Baseline Series, applying IQ ultra™ (Chemotechnique MB Diagnostics AB) applied on the upper back for 48 hours. A positive reaction was observed p-phenylenediamine (PPD) (+++; blue arrow), N-isopropyl-N-phenyl-4-phenylenediamine (IPPD) (++; black arrow), paraben mix (+; green arrow), disperse orange (+; orange arrow) and textile dye mix (+++; grey arrow).

Allergic contact dermatitis (ACD) to para-phenylenediamine (PPD), N-isopropyl-N-phenyl-4-phenylenediamine (IPPD), paraben mix, disperse orange, and textile dye mix was diagnosed after performing a patch test, namely the baseline series from the Portuguese Contact Dermatitis Research Group (Fig. 1C). The patient was advised to avoid these substances. However, despite this advice, she applied a hair dye that she had previously tolerated to the tips of her hair and developed facial edema 12 hours later, without any other symptoms.

Allergic contact dermatitis is an inflammatory skin condition induced by an immune reaction after sensitization to an allergen, diagnosed through patch tests.¹ Henna, derived from the leaves of *Lawsonia inermis*, is commonly used as a dye for coloring hair, nails and creating temporary henna tattoos, which are increasingly popular worldwide.² Henna can be combined with PPD to create black henna, which accelerates the dyeing process and enhances pattern definition. It is estimated that approximately 2.5% of black henna tattoos users can become sensitized to PPD, leading to ACD to other PPD-containing products such as hair dyes.³ Additionally, post-inflammatory hyperpigmentation, a reported side effect, can persist over time, resulting in aesthetic repercussions.¹

Sensitizations to allergens other than PPD may be due to cross-reactivity, and could occur due to the metabolic conversion of textile dyes in the skin to PPD.^{1,4} The subsequent reaction to a hair dye containing PPD highlights the importance of reinforcing avoidance measures.

Although henna is considered to have low allergenicity, the addition of PPD can trigger ACD. Para-phenylenediamine in skin products is strictly prohibited in the European Union.² However, in some regions such as the Arab nations, the concentration of PPD in henna tattoos varies widely and

may lack regulation. Travelers should be aware that black henna tattoos, despite their temporary nature, pose an increased risk of ACD, due to the incorporation of PPD.⁵

AUTHOR CONTRIBUTIONS

MB: Conceptualization, methodology, investigation, drafting, and critical review of the manuscript.

MJV, APC: Conceptualization, methodology, investigation, and critical review of the manuscript.

All authors approved the final version to be published.

PROTECTION OF HUMANS AND ANIMALS

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the Helsinki Declaration of the World Medical Association updated in 2013.

DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

PATIENT CONSENT

Obtained.

COMPETING INTERESTS

The authors have declared that no competing interests exist.

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