

Contact Dermatitis Due To A Henna Tattoo: A Case Report

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Submitted: 26 Aug 2017; Accepted: 09 Oct 2017; Published: 15 Oct 2017

Abstract

Allergic contact dermatitis is a late hypersensitivity reaction caused after the skin is exposed to a specific allergen. Temporary henna tattoos have become very popular in children and adults. The organic compound, p-phenylenediamine (PPD) is frequently added to the henna pigment to make it darker.

A 13 year old patient with a personal history of asthma and allergic rhinitis with immunotherapy for sensitization to *Dermatophagoides farinae* and *Dermatophagoides pteronyssinus* who presented since once week prior to consultation, skin lesions consisting of pruritic erythematous papules on his right forearm 3 days after applying a henna tattoo. During the physical examination, the skin lesions were marked in the shape and definition of the tattoo and mild desquamation was observed.

Skin patch tests (Bial Aristegui Standard Contact Dermatitis Panel, Spain) were applied with positive results to p-phenylenediamine 1% with 2++ (strong positive reaction with vesicular erythema, infiltration and papules) in the first reading 48 hours later. The second reading was performed upon 96 hours of applying the tests, finding a 3 +++ (extreme positive reaction with intense erythema and infiltration, coalescing vesicles, bullous reaction) result and confirming it 7 days later. The patient was treated with a medium potency topical corticosteroid, mometasone 0.1% and cetirizine 10 mg twice a day for 7 days showing resolution of his skin lesions and symptoms. Temporary henna tattoos have been associated with a variety of inflammatory skin reactions.

Introduction

Allergic contact dermatitis is a late hypersensitivity reaction caused after the skin is exposed to a specific allergen [1]. The reaction starts with a sensitization phase in which the allergic skin reaction is acquired after being in contact with the allergen. The repeated exposure causes skin inflammation, initiating the elicitation phase [1]. The dose and amount of time exposed are the most important exogenous factors for the development of sensitization [1].

In recent years, temporary henna tattoos have become very popular in children and adults. Henna pigment is obtained from the *Lawsonia inermis* plant which belongs to the Lythraceae family [2]. The original henna ink is a dark green powder made from the leaves of the plant and commonly used for hair dyes and body tattoos [2]. When it comes in contact with the skin, the color tone turns orange-brown [3]. However the organic compound, p-phenylenediamine (PPD) which is a strong sensitizer, is frequently added to the henna pigment to make it darker [4].

Case report

A 13 year old patient with a personal history of asthma and allergic rhinitis with immunotherapy for sensitization to *Dermatophagoides farinae* and *Dermatophagoides pteronyssinus* who presented since one week prior to consultation, skin lesions consisting of pruritic erythematous papules on his right forearm 3 days after applying a henna tattoo. During the physical examination, the skin lesions were marked in the shape and definition of the tattoo and mild desquamation was observed. Skin patch tests (Bial Aristegui Standard Contact Dermatitis Panel, Spain) were applied with positive results to p-phenylenediamine 1% with 2++ (strong positive reaction with vesicular erythema, infiltration and papules) in the first reading 48 hours later. The second reading was performed upon 96 hours of applying the tests, finding a 3 +++ (extreme positive reaction with intense erythema and infiltration, coalescing vesicles, bullous reaction) result and confirming it 7 days later. The patient was treated with a medium potency topical corticosteroid, mometasone 0.1% and cetirizine 10 mg twice a day for 7 days showing resolution of his skin lesions and symptoms.

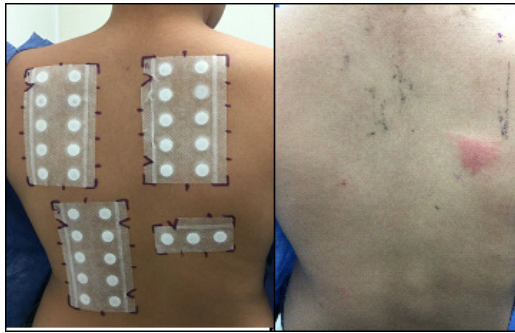


Figure 1: A) Skin patch tests applied to patient. B) Positive result to p-phenylenediamine observed 7 days after applying allergens.



Figure 2: shows the skin lesions caused by the temporary henna tattoo before and after treatment with topical corticosteroids.

Discussion

Temporary henna tattoos have been associated with a variety of inflammatory skin reactions. In spite of it being uncommonly associated with reactions due to the plant *Lawsonia inermis*, the majority of the lesions are caused by the p-phenylenediamine. This compound is used to make the ink dry faster, last longer on the skin and obtain a darker color [5]. Local and generalized contact dermatitis reactions that progress to erythema multiforme and postinflammatory pigmentation lesions have been described, making henna tattoos not as harmless as they seem [6].

Patients who develop sensitization to PPD are at risk of developing reactions to other products containing this compound. The PPD appears to be a hapten that interacts like a systemic drug, activating a hypersensitivity response. In patients sensitized to CD4⁺ and CD8⁺ T cell clones specific for PPD, cytokines like IL-4, IL-5, IL-6, IL-8, IL-10 and IL-13 have been found in vitro [7].

The treatment of contact dermatitis is avoiding the trigger factor and applying topical corticosteroids to control the inflammation process as well as antihistamines to control pruritus, like the ones used with this patient. However, in some cases when the skin lesions are severe, oral corticosteroids may also be necessary [8]. The skin patch tests are the diagnostic method of choice in order to detect the causing allergen [5].

References

1. Ditmar Daan, Schuttelaar Marie (2017) Immunology and genetics of tumour necrosis in allergic contact dermatitis. *Contact Dermatitis* 76: 257-271.
2. Jovanovic Dragan, Slovkojic-Jovanovic Maja (2009) Allergic

3. Calogiuri G, Di Leo E, Butani L, Pizzimenti S, Incorvaia C, et al (2017) Hypersensitivity reactions due to black henna tattoos and their components: are the clinical pictures related to the immune pathomechanism? *Clinical and molecular allergy* 15: 8.
4. Ramirez Andreo, Hernández Gil, Brufau C, Marín N, Jiménez N, et al (2007) Allergic contact dermatitis to temporary henna tattoos. *Actas Dermosifiliográficas* 98: 91-95.
5. E. Juhas, JC. English III (2013) Tattoo-Associated Complications *J Pediatr Adolesc Gynecol* 26: 125-129.
6. Kang II, Lee MH (2006) Quantification of para-phenylenediamine and heavy metals in henna dye. *Contact Dermatitis* 55: 26-29.
7. Calogiuri G, Di Leo E, Butani L, Pizzimenti S, Incorvaia C, et al (2017) Hypersensitivity reactions due to black henna tattoos and their components: are the clinical pictures related to the immune pathomechanism? *Clin Mol Allergy* 15: 8.
8. L Fonacier, D Bernstein, K Pacheco, L Holness, Blessing-Moore J, et al (2015) Contact Dermatitis: A Practice Parameter Update 2015 *J Allergy Clin Immunol Pract* 3: 1-39.

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