

## Allergic Contact Dermatitis Due To Henna Tattoo: Four Cases with One Different Patch Test Result

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### Abstract

**Observation:** Henna dye is frequently used for hair dyeing and skin decoration instead of permanent tattoos. Some substances are combined with henna to improve the efficiency. Even though paraphenylenediamine is one of the most common sensitizer in henna tattoo as additive, the other additives and henna itself may cause allergic contact dermatitis reactions. In here; 4 cases that had allergic contact dermatitis due to henna tattoo from different regions of western side of Turkey were reported. Differ than other patients one had nickel and cobalt positivity in patch test beside phenylenediamine sensitization. Considering the review of literature; we recommend for the patients with allergic contact dermatitis reactions diagnosis due to henna tattoo as well as p-phenylenediamine, patch tests for heavy metals should be conducted.

### Introduction

Henna dye is a dark green powder of Lawsonia Inermis leaves, which is used for hair dyeing and skin decoration instead of permanent tattoos [1, 2]. The usage of henna alone for these purposes may have limits such as extent of color. Some substances are combined with henna to speed up dyeing and improve tattoo pattern definition for extending limitations. Allergic contact dermatitis reactions to temporary henna tattoos are generally due to the additives such as paraphenylenediamine (p-phenylenediamine) and essential oils but also in minority of cases it can be due to henna itself. In diagnosis of allergic contact dermatitis due to temporary tattoos, patch test can be used. In allergic contact dermatitis cases due to henna tattoos frequently phenylenediamine is positive in patch test. In here we present 4 cases that had allergic con-

tact dermatitis due to henna tattoo from different regions of western side of Turkey and 3 of these patients had phenylenediamine positivity. Only in one patient beside phenylenediamine positivity, nickel and cobalt positivity was observed in patch test.

### Case Reports

**Case 1:** 15-year-old boy developed itchy, erythematous, vesicobullous lesion consistent with tattoo area, 10 days after receiving henna tattoo on his right shoulder (Figure 1a). All lesions revealed after 10 days topical steroid treatment. 3 weeks after treatment; patch test showed positivity to phenylenediamine (+).

**Case 2:** 9-year-old boy received temporary henna tattoo on his left hand dorsum. Two weeks after tattooing; he had erythematous vesicles on that area (Figure 1b). After three weeks of these symptoms without any treatment; he diagnosed al-



**Figure 1 (a, b, c, d).** Four patients with eczematous eruptions in different locations after henna tattooing

allergic contact dermatitis due to henna tattoo-phenylenediamine (++) according to patch test positivity.

**Case 3:** 28-year-old male who had henna tattoo on his right forearm 15 days ago, developed itchy, erythematous, vesicobullous lesion consistent with tattoo pattern (**Figure 1c**). He had five days systemic prednisolone treatment and the patient did not give consent for patch testing. According to clinical findings he diagnosed allergic contact dermatitis due to henna tattoo.

**Case 4:** 25-year-old female received two henna tattoos on her left scapular area and waist. After two weeks; she had itchy, erythematous, bullous lesions consistent with tattoo patterns and had one-week systemic prednisolone treatment (**Figure**

**1d**). Three weeks after treatment she had patch test and showed positivity for nickel (++) , cobalt (+) and phenylenediamine (++) .

### Discussion

P-phenylenediamine is one of the most common sensitizer in henna tattoo as additive that causes allergic contact dermatitis reactions. Beside this additive there had been several case reports presenting other additives as sensitizer in this disease. *Martin* et al reported a young girl that presented allergic contact dermatitis reaction due to henna tattoo and had positive reactions not only phen-

ylenediamine but also thiurams and natural rubber latex [3]. In another separate two reports; after repetitive henna tattoos beside p-phenylenediamine three patients had patch test positivity for hair and organic dyes [4, 5]. One patient also had rubber, sulfonamide and local anesthetics positivity. *Temesvari* et al reported a 22-year-old patient with henna-related allergic contact dermatitis and had patch test positivity for fragrance mix. [6] They suggested performing patch test of essential oils for these cases.

As mentioned above; the double sensitization and cosensitization of p-phenylenediamine and other additives in henna tattoos were questioned for a while in literature. Also heavy metals had been questioned for. According to a finding of a patient similar to the fourth case of present report, *Kang* et al investigated additive substances of 15 different henna tattoos in Korea [7]. They quantitatively analyzed the henna tattoos and found out that additives may consist heavy metals such as nickel and cobalt. They pointed out that additives like nickel and cobalt could also be responsible substances from allergic contact dermatitis due to henna tattooing. The patch test findings in fourth case of present report could also guide us to investigate the heavy metal additives of henna tattoos in Turkey.

In conclusion, henna tattoos are frequently used for skin decoration and hair dyeing. Rather than well known additive-p-phenylenediamine that causes allergic contact der-

matitis reactions to temporary henna tattoos, there could be other responsible sensitizers as additives in henna. For this reason; as well as p-phenylenediamine, patch tests for heavy metals should be conducted when allergic contact dermatitis reactions diagnosed due to henna tattoo. Further researches are needed to specify the responsible material that may cause henna related allergic contact dermatitis reactions.

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