

Allergic contact dermatitis caused by resorcinol following a temporary black henna tattoo

Emma Ormerod¹, Thomas M. Hughes² and Natalie Stone²

¹Dermatology Department, Bristol Royal Infirmary, Bristol BS2 8HW, UK and ²Dermatology Department, Royal Gwent Hospital, Newport NP20 2UB, UK

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Resorcinol (1,3-dihydroxybenzene, CAS no. 108-46-3) has a range of uses, such as a topical antiseptic, antimycotic, keratolytic, and antipruritic, as a colouring agent in the production of azo dyes and plasticizers, and in oxidative hair dyes as a 'coupler' of the *p*-phenylenediamine (PPD) group of dyes. Allergic contact dermatitis (ACD)

caused by resorcinol has been rarely reported (1). Positive patch test reactions to resorcinol can be found together with positive results to permanent hair dyes (2). To our knowledge, ACD caused by resorcinol has never been described in the context of black henna tattooing.

Case Report

A 9-year-old boy had a temporary black henna tattoo applied to his arm when on holiday in Ibiza. Two days later, it had already begun to fade, so he returned for a second tattoo, this time asking for it to be made darker

Correspondence: Dr Emma Ormerod, Bristol Dermatology Unit, Bristol Royal Infirmary, Marlborough Street, Bristol BS2 8HW, UK. Tel: +44 0117 9230000; Fax: +44 0117 342 2845. E-mail: Emma.ormerod@uhbristol.nhs.uk

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Fig. 1. Photograph taken by the patient of the skin reaction to black henna tattoo on the left forearm during the resolution phase.

Table 1. Patch test results for the dye series in our patient

Substance	Day 2	Day 4
<i>p</i> -Phenylenediamine 1%	–	–
Toluene-2,5-diamine sulfate 1%	–	–
Resorcinol 1%	++	+++
<i>m</i> -Aminophenol 1%	–	–
<i>p</i> -Aminophenol 1%	–	–

All allergens in pet.

to prolong the duration. A florid, itchy, erythematous, papular rash appeared at the site of the second tattoo

2 weeks later (Fig. 1). No previous skin contact with black henna tattoos or hair dyes and no other relevant history such as skin problems from clothing dyes were reported.

Patch testing was performed with the British Society for Cutaneous Allergy baseline series, and with a departmental hair dye series (Chemotechnique, Vellinge, Sweden). Patches were applied to the upper back for 2 days with Finn Chambers® on Scanpor® tape, and fixed with Hypafix® (BSN Medical, Hamburg, Germany). Readings were performed according to ESCD guidelines, and showed positive reactions only to resorcinol: ++ on D2, and +++ on D4 (Table 1).

Discussion

Black henna, which is usually a combination of traditional henna derived from *Lawsonia inermis* and PPD to darken and enhance the tattoo pattern, is well known to induce ACD. In the vast majority of cases, the responsible allergen is found to be PPD. Black henna may contain aromatic amines other than PPD (3), including the hair dye component toluene-2,5-diamine, which have also been identified as 'black henna' allergens. Chemically unrelated substances such as thiuram derivatives from tattoo adhesives have also been reported (4). In some cases, however, patch testing gives negative results, and the allergen remains unknown (4).

The black henna tattoo in this case was applied abroad by a street artist, so we were unable to determine whether it contained resorcinol. However, the overall clinical history and patch test findings strongly suggest that resorcinol was the culpable allergen. There was no other history to explain the positive patch test reaction to this rare allergen. In other reported cases of adverse black henna tattoo reactions, when patch testing gave negative results, it is therefore possible that resorcinol may have been the 'unknown' allergen. This case highlights the fact that patch testing is indeed necessary in order to accurately detect responsible allergens in 'black henna' tattoo reactions.

References

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