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# Severe type IV hypersensitivity to 'black henna' tattoo

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## Summary

A 16-year-old Bangladeshi girl presented with a 9-day history of an extensive pruritic, erythematous, papulovesicular skin eruption to both forearms. Appearance was 5 days following application of a home-made henna preparation. Examination revealed ulceration and scabbing along the whole henna pattern and early keloid formation. A diagnosis of type IV delayed hypersensitivity reaction superimposed by infection was initially made. As in this case, home-made henna preparations commonly combine commercial henna with black hair dye, paraphenylenediamine (PPD). PPD, widely known as 'black henna', darkens the pigment and precipitates the drying process. PPD is a potent contact allergen associated with a high incidence of hypersensitivity reactions. Despite treatment the patient was left with extensive keloid scarring in the pattern of the henna tattoo.

## BACKGROUND

The case highlights the potential dangers of using henna skin dyes containing contact allergens in hypersensitive individuals. The scarring may be extensive and will be permanent and usually in an exposed area. There is little that can be done to minimise appearances. Since this is a common practice in many cultures we felt there was an important public health message to be highlighted from this case

and in addition, the appearances of this young girl's forearms produced some very striking pictures.

## CASE PRESENTATION

A 16-year-old Bangladeshi girl presented with a 9-day history of an extensive pruritic, erythematous, papulovesicular skin eruption to both forearms. Appearance was 5 days following application of a home-made henna preparation.



**Figure 1** The patient's skin eruption 2 days following treatment with intravenous antibiotics and oral steroids. The papulovesicular rash and erythema have settled. 1083 × 812 mm (72 × 72 DPI).



**Figure 2** Scabbing and keloid scarring along the henna borders. 1083 × 812 mm (72 × 72 DPI).

Three previous applications of commercial henna were uneventful but she had past history of allergic dermatitis to silver. Examination revealed ulceration and scabbing along the whole henna pattern and early keloid formation. A diagnosis of type IV delayed hypersensitivity reaction superimposed by infection was initially made and intravenous flucloxacillin and benzylpenicillin given as a precautionary measure. Subsequently, the C reactive protein (CRP) was <5, and there was no leucocytosis, suggesting the fever (38.7°C) was secondary to the hypersensitivity reaction. She was treated with systemic and topical corticosteroids, antibiotics and an antiseptic lotion (figure 1). Repeated superficial corticosteroid injections would be required to minimise keloid scarring (figure 2).

As in this case, home-made henna preparations commonly combine commercial henna with black hair dye, PPD. PPD, widely known as 'black henna', darkens the pigment and precipitates the drying process. PPD is a potent contact allergen associated with a high incidence of hypersensitivity reactions. Patients with contact dermatitis are at higher risk of severe reactions.<sup>1</sup> The extent of reaction depends on the concentration and duration of exposure to PPD<sup>1 2</sup> and can lead to keloid formation. The treatment of this is often challenging, with high reoccurrence despite therapy.<sup>3</sup> Subsequent allergic sequelae with PPD sensitisation are frequently observed. This is important since PPD and PPD like substances are found in many products used in daily life. Public health messages of the risks of 'black henna' should be emphasised in communities of high

traditional significance, particularly to those with underlying chemical allergies.

### INVESTIGATIONS

Full blood count, blood cultures, CRP are the relevant investigations.

### TREATMENT

Intravenous then oral flucloxacillin and benzylpenicillin, oral prednisolone, Dermol 500 topically, an antiseptic lotion.

### OUTCOME AND FOLLOW-UP

Extensive keloid scarring in the pattern of the henna tattoo was present at follow-up. The patient was seen in the plastic surgery clinic for follow-up where local corticosteroid injections were being considered as possible therapy.

### DISCUSSION

Gregory Sonnen from The Baylor University Medical Center reported a Type IV hypersensitivity reaction to a temporary black henna tattoo in a 6-year-old boy in 2007. Jacob Urkin wrote an article "Henna tattooing dermatitis: consider an additive as the culprit" in the *British Journal of General Practice* in 2006 and Wolf *et al*, wrote about cutaneous reactions to temporary tattoos in the *Online Dermatology Journal* in 2003. The latter two articles were reviews rather than case reports.

## Learning points

- ▶ PPD widely known as 'black henna', is a potent contact allergen associated with a high incidence of hypersensitivity reactions.
- ▶ The public should be made aware of potential hypersensitivity reactions which may result in permanent scarring.
- ▶ Retailers and manufacturers should advise customers to perform a skin patch test before using these products.

**Competing interests** None.

**Patient consent** Obtained.

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