

ALLERGIES IN THE WORKPLACE

SENSITISATION FROM PPD IN TEMPORARY HENNA TATTOOS AND SUBSEQUENT SEVERE ALLERGIC CONTACT DERMATITIS FROM HAIR DYE

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SUMMARY

The use of henna for body adornment goes back 5000 years. Allergic reactions to pure henna have hardly ever been reported. However, the recent addition of certain dyes to henna, giving it a black colour and allowing it to stain more quickly and to last longer, has been associated with allergic reactions not only to the modified henna, but later to hair dyes containing the same chemical. Hairdressers should ask their clients whether they have ever had a henna tattoo on their skins. If so, they should warn their clients that an allergic reaction to hair dye is possible.

HENNA

Henna grows as a woody shrub, reaching heights up to 3 metres, mainly in the warm, moist regions of North Africa and South Asia. It is often grown as a hedge. The Latin name of henna is *Lawsonia inermis* and it is a member of the botanical family Lythraceae. Cousins of henna include clove, eucalyptus, myrtle, loosestrife, pomegranate and fuchsia. Henna bushes have clusters of small, intensely fragrant flowers, which are usually white, but may be pink or red. Perfume made from henna flowers is very sweet. Henna is the Arabic name of the plant. In India and Pakistan, the plant is called Mehndi.¹

History

The history of henna goes back 5000 years. Papyrus scrolls show that henna was used in ancient Egypt to colour the nails and hair of mummies. In the scorching heat of Arabia, henna was often used on the skin for its coolant properties. Henna has been used by Muslims since the earliest days of Islam, having been condoned as a form of decoration by the prophet Mohamed, who used it on his hair and beard. He also encouraged his wives to use it. The fact that the prophet Mohamed was and remains a model of perfection for Muslims has ensured the continuing popularity of henna as a decorative art within Islam.

In Persian art, miniatures dating from between the 13th and 15th centuries show women taking part in wedding processions and dancers are depicted with henna decoration on their hands. In the 12th century, the Mughals (Moguls) introduced it from Persia into India, where it had become most popular with the Rajputs of Mewar (Udaipur) in Rajasthan, who mixed it with aromatic oils and applied it to the hands and feet to beautify them. Since then, henna has been regarded as essential on auspicious occasions, particularly weddings. Hindu goddesses are often represented with

henna tattoos on their hands and feet.

It was only after reaching India that henna gained real cultural importance, its use by the rich and royal making it popular with the people. Servants who had learnt the art of henna by painting the hands and feet of princes and princesses (with fine gold and silver sticks) were very much sought after in towns and villages for their skills. As the use of henna spread, recipes, application methods and designs grew in sophistication.¹

Traditional uses of henna

Henna has been used traditionally for medicinal purposes and as a cosmetic. For medicinal purposes, it has been used as a bitter tea for stomach or intestinal problems, as a paste for fever and headache, as a paste to cure ringworm or nail fungus, to reduce chafing and prevent blisters and to soothe irritated, dry or chapped skin.

As a cosmetic, henna has been used as a hair thickener and conditioning treatment, as a nail colorant and conditioner and as a decorative stain for the body

In addition, henna has been used as a brown dye for wool, cotton, and silk, and as a marker to ward off evil.¹

Henna wedding customs

Henna (mehndi) has great significance in all Eastern wedding traditions, and no wedding is complete without the decoration of the bride's hands and feet – in many cultures on both the front and back of the hands right up to the elbow, and on the bottom half of the legs, with all the bride's female friends and relatives getting together to celebrate. They spend the evening singing traditional mehndi songs, which tell of the good luck and blessings that mehndi will bring, and of its significance with different in-laws.¹

How henna is used

Commercially, henna is available as a green powder, obtained from crushing dried leaves. This powder is mixed with various substances including tea, coffee, sugar, lemon juice, eucalyptus and clove oils, and sometimes tamarind paste to a thick paste. To apply the henna, cones are more often used today rather than sticks, made out of polythene bags and used as one ices a cake. The skin is usually cleaned with rose or orange flower water and then prepared with oil such as eucalyptus. The henna is left on the skin for at least 2 hours and preferably up to 8 hours, to ensure the darkest possible colour. It is kept damp with a mixture of sugar and lemon juice and crumbled off when ready. The pattern on the skin will be an orange-red colour but will darken to brown, and last several weeks.

Introduction of henna to the West

The pop icon Madonna was one of the first celebrities to publicly wear henna tattoos. Sting, Alanis Morissette, Gwen Stefani of No Doubt, the alt-pop band Cornershop, and many other entertainment stars have recently drawn public attention to such Eastern arts and philosophies as henna tattooing. But it's not just musicians who are discovering the beauty of henna. Actresses like Liv Tyler, Academy Award winner Mira Sorvino, and Demi Moore have also been seen

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adorned with henna designs. Top fashion designers are decorating their models with it. Make-up artists use it. Painless and temporary – the henna colour lasts for up to 3 weeks – it is the perfect way of creating a fashionable look without the drastic consequences of a permanent tattoo.

BLACK HENNA

Following its introduction to the west, the addition to henna of paraphenylenediamine (PPD), the active substance in hair dye, has become an increasingly common practice. This imparts a black colour to the henna and allows staining to occur more rapidly and deeply and to last longer. However, the presence of PPD in black henna tattoo mixtures in high concentration poses a health hazard and a risk of allergic contact sensitisation with potential long-term consequences.²

A 15-year-old patient recently presented with this problem. She had to be admitted to hospital with severe swelling of the eyelids (Fig. 1) and inflammation of the scalp and ears (Fig. 2), following the use of hair dye containing PPD. On closer examination, it was noted that the patient had had a black henna tattoo applied on the right forearm 6 months earlier. She had developed a rash at the tattoo site 2 weeks after application. The post-inflammatory hyperpigmentation from the tattoo reaction was still evident at the time of presentation with the hair dye allergy (Fig. 3). Intravenous corticosteroids were required to reverse the symptoms of the hair dye allergy (Fig. 4). This is just one example of PPD in henna causing sensitisation, followed by a severe reaction to hair dye several months later. Recognition of the rash at the tattoo site as sensitisation to PPD would have alerted the patient to a possible allergic reaction to the subsequent use of hair dye.

Reports of severe hair dye allergy from PPD following sensitisation to PPD from streetside temporary tattoos are abundant in the dermatological literature.³⁻⁵



Fig. 1. Severe eyelid swelling following the use of hair dye 6 months after sensitisation to PPD in a temporary henna tattoo.



Fig. 2. Rash on the scalp (acute allergic contact dermatitis to PPD) from hair dye.



Fig. 3. Post-inflammatory hyperpigmentation following sensitisation at the site of the black henna tattoo applied 6 months earlier.



Fig. 4. Result of treatment with intravenous corticosteroids. The allergy settled completely within 2 days.

Paediatric Dermatology reports a case of a 17-year-old girl who developed a severe reaction to hair dye. Eight months earlier, she had a temporary tattoo applied with black henna. The active sensitising ingredient was found to be PPD. She developed post-inflammatory hyperpigmentation at the tattoo site and permanent sensitisation to PPD.⁴

For this reason, before using hair dye, it is important to find out whether a temporary henna tattoo using black henna was ever applied on the individual and whether this tattoo resulted in a rash a few days later. Such a rash implies sensitisation to PPD. One would then expect a severe reaction to the hair dye subsequently used.⁶

CONCLUSION

It must be stressed that total avoidance of black henna tattoos is strongly recommended, in order to avoid the devastating consequences of sensitisation.

REFERENCES

1. www.castleart.com
2. Brancaccio RR, Brown LH, Chang YT, *et al.* Identification and quantification of para-phenylenediamine in a temporary black henna tattoo. *Am J Contact Dermat* 2002; **13**(1):15-18.
3. Chung WH, Chang YC, *et al.* Clinicopathologic features of skin reactions to temporary tattoos and analysis of possible causes. *Arch Dermatol* 2002; **138**(1):88-92.
4. Sensitization to para-phenylenediamine from a streetside temporary tattoo. *Pediatr Dermatol* 2002; **19**(6): 498-502.
5. Lauchli S, Lautenschlager S, Lauchl S. Contact dermatitis after temporary henna tattoos - an increasing phenomenon. *Swiss Med Wkly* 2001; **131**(13-14): 199-202.