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Case report

Contact dermatitis due to a henna tattoo

Allergic dermatitides caused by tattoos are not infrequent, and they are usually due to the metal salts used in the preparation of the pigments. We present the case of a 26-year-old woman who developed pruriginous vesicular lesions on the back of her left hand delineating the areas where a henna tattoo had been applied three days earlier. The clinical course was uneventful after antihistamine therapy. A contact allergologic study was carried out with epicutaneous tests with the standard European panel, with the hairdressing panel and with henna (1% and 10%). Positive results were observed for *para*-phenylenediamine (pPD), *p*-amino diphenylamine, *p*-aminophenol and O-nitro-*p*-phenylenediamine. The tests with the two henna dilutions were negative. The stain *p*PD, which is mixed with henna in order to shorten the time required for skin impregnation, is a powerful sensitising agent responsible for most of the allergic contact dermatitides caused by hairdressers' stains. Patients sensitised to *p*PD should be advised of the risks involved in having a henna tattoo applied.

Key words: Dermatitis. Henna. *Para*-phenylenediamine. Tattoo.

Dermatitis de contacto por tatuaje de henna

Las dermatitis alérgicas por tatuajes no son infrecuentes, y generalmente se deben a las sales metálicas utilizadas para preparar los pigmentos. Se describe el caso de una mujer de 26 años que presentó un eczema agudo en el dorso de la mano izquierda, que dibujaba las zonas donde tres días antes se había aplicado un tatuaje de henna; la evolución clínica fue correcta tras la administración de tratamiento con corticoides, antihistamínicos y antibióticos. Se realizó un estudio alergológico de contacto con pruebas epicutáneas con la batería estándar europea, con nuestra batería de peluquería y con tres hennas (al 1% y al 10%). Se obtuvo un resultado positivo para para-fenilendiamina (pPD), *p*-aminodifenilamina, *p*-aminofenol y O-nitro-*p*-fenilendiamina; las lecturas de las hennas fueron negativas. La *p*PD, un colorante que en ocasiones se mezcla con la henna para acortar el tiempo que el tinte precisa para impregnar la piel, es un potente sensibilizante y es la responsable de la mayoría de las dermatitis alérgicas de contacto por tintes de peluquería. Se debe advertir a los pacientes sensibilizados a *p*PD del riesgo que entraña tatuarse con henna.

Palabras clave: Dermatitis. Henna. *Para*fenilenodiamina. Tatuaje.

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Tattooing has become since some years ago increasingly frequent in Spain. Patterns or drawings engraved into the skin, which were traditionally characteristic of sailors and soldiers, have become popular to the point of constituting one more complementary detail in the image of many individuals. Although the origin of the art and practice of tattooing is lost in the mists of antiquity, the younger generations of today have recovered and repristinated this aesthetic concept, and there is increasingly less hesitation in displaying such body artistry. It has become frequent, since a few years ago, to see in the touristic places in our country street-side stalls or established premises at which the application of henna tattoos is advertised and performed. This particular type of "tattoo" is currently a la mode because of its short duration (it clears within one to two weeks) and its easy and bloodless application, as it is simply painted onto the skin with an artist's brush.

The henna pigment is prepared from the leaves of the shrub *Lawsonia inermis* (a synonym for *Lawsonia alba*), which is indigenous in North Africa, Iran and India. The dye is prepared from the dried leaves collected before the plant blooms. The use of this dyeing pigment dates back thousands of years, and was already popular in ancient times in the Islamic countries from Morocco to India. Henna was also used in ancient times as a dye for woollen and silken cloth and also for dyeing the manes and tails of horses. People would –and still do– apply it on the hair, the palms of the hands, the soles of the feet and the finger and toenails. In the Western countries, henna is used mainly as a hair dye, but it is also present in some shampoos and hair conditioners, as well as of course as a tattooing dye.

Fig. 1. The back of the patient's left hand: vesiculous lesions precisely in the areas where a henna tattoo had been applied.

Fig. 2. Close-up detail of Fig. 1 (the back of the thumb and first knuckle).

CASE REPORT

Our case was a 26-year-old woman. She reported having had some years back one episode of dermatitis after the application of a hair dye, and because of this she usually dyed her hair with henna.

The patient worked in the hostelry branch and had never worked in hairdressing parlours or in any other occupation implying manipulation of beauty products. She first came to the Emergency Ward because of pruritic vesiculous lesions on the back of her left hand precisely in the areas where she had had a henna tattoo applied three days earlier (Figs. 1 and 2). Oedema of the whole hand was also present and, to a lesser degree, also oedema of the whole left upper limb. She was admitted to the Hospital and therapy was instituted with H_1 and H_2 antihistamines, oral corticosteroids and cloxacillin. The evolution was the usual one for an acute eczema, with later desquamation and complete clearing with no residual lesions in a matter of weeks. Both she and her sister, who had not developed any cutaneous reaction whatsoever, had had the tattoos applied by an ambulant artist in Turkey.

A contact allergy study was carried out with epicutaneous tests read after 48 and 96 hours using the standard European panel and our own hairdressing panel (Table I). Further to these standard tests, the henna the patient used for hair dyeing and two further samples of tattooing henna from North Africa were tested. The three henna samples were tested at 1% and 10% concentration in water.

Table I. Allergens in the "hairdressing" panel.

p-Phenylenediamine
p-Aminophenol
Ammonium persulfate
Ammonium thioglycolate
Chloroacetamide
Gliceryl monothioglucolate
Hydrogen peroxide
Hydrochinone
O-nitro-*p*-phenylenediamine
Pyrogallol
Resorcinol
Tetramethyl-thiuram disulfide
p-Toluenediamine sulfate

Positive results were seen with *para*-phenylenediamine (pPD) (+++), *p*-amino-diphenylamine (+++), *p*-aminophenol (++) and O-nitro-*p*-phenylenediamine (+). The readings of the tests with the three henna samples were negative.

DISCUSSION

Allergic dermatitides induced by tattoos are not infrequent, and are usually caused by the metal salts used in the preparation of the dyes. There have been reports of cases caused by a number of different pigments: red (mercury), green (chrome), yellow (cadmium), blue (cobalt) and black (India ink, titanium oxide or iron oxide)[1]. The resulting lesions may be both localised and generalised.

In recent times, and originating in the Islamic countries, henna "tattoos" have become fashionable. Henna is a plant dye that is usually employed as a hair dye; it is often recommended to patients sensitised to synthetic hair dues because of its low allergenicity. Despite this, there have been reports of rhinitis and/or bronchial asthma and of allergic contact dermatitis (ACD) caused by this substance[2-5]. The henna dye is applied directly, both on the hair and on the skin; the resulting colour is reddish brown. In order to achieve other hues the henna may be mixed with indigo or with walnut rind, and lemon or red beet juice can be used as intensifiers. Because the time required for the dye to impregnate the skin may be long, *p*PD is sometimes added in order to shorten it[3-5].

The topical application of henna has been associated, in a number of cases, to severe complications such as renal failure due to glomerulonephritis caused by the percutaneous absorption of *p*PD[6], and also to tattoo contact dermatitis[7-9]. Para-phenylenediamine (*p*PD) is an azo pigment that is widely used as a hair and industrial dye. It is a potent sensitiser and is the responsible agent in most cases of hairdressing dye ACD. In our case, because the tattoo had been applied in Turkey, it was impossible to find out the actual composition of the dye used. As the epicutaneous tests with henna were negative, we suppose that the dye used contained *p*PD as an additive.

This case differs from those in which the tattoo contact dermatitis was actually due to the henna dye, as in those cases the *p*PD test in the standard panel had negative results.

Considering that the composition of tattooing dyes is not under official control and regulation, all patients who are sensitised to *para*-phenylenediamine should be warned of the risk they run if they have a henna tattoo done. The results in the present case lead us to stress the importance, in all and any studies of contact dermatitis, of testing always the complete standard panel and not only the suspect product.

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