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Allergic contact dermatitis to henna

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Key words: allergic contact dermatitis; henna; *p*-phenylenediamine; tattoo.

● HENNA, or mehndi, is a dry powder derived from the leaves of a small shrub (*Lawsonia inermis*) (1). As an aqueous or oily paste, it is used to tattoo the skin reddish brown temporarily in exotic artistic designs. Contact dermatitis to pure henna is extremely rare despite its frequent and repeated use (1-4).

A 27-year-old housewife developed itching and redness over her hands tattooed 2 weeks before. She attributed this to a special variety of henna called "Arabian mehndi" (a mixture of henna and black hair-dye powder). Examination revealed erythema, swelling, and mild scaling, in a patterned distribution along the lines of the tattoo over the volar aspect of both wrists and forearms (Fig. 1), suggestive of subacute dermatitis. There was a sharp demarcation of the dermatitis marked at the nonglabrous skin. A diagnosis of contact dermatitis to henna was made, and the patient was advised to apply betamethasone dipropionate 0.05% cream twice daily for 2 weeks.

A patch test with the Indian standard series approved by the Contact and Occupational Dermatitis Forum of India (CODFI) was positive (+++) to PPD 1% pet. at 72 h. Patch testing with 10% Arabian mehndi powder in both aqueous and pet. bases was strongly positive (+++) on day 3, but negative for 10% pure henna in aqueous and pet. bases. A photopatch test to 10% pure henna was also negative.

The application of henna as a ritual at various religious and wedding functions is extremely common among Hindus and Muslims.⁵ In order to achieve a darker shade, which is in fashion these days, a black powder (PPD) is mixed with henna.

The paucity of reports of contact sensitization to pure henna suggests that its allergenic potential is low (1). However,

more than 20 cases of contact dermatitis to henna mixed with PPD and other additives have been reported (2-4). In the present patient, allergic contact dermatitis was confirmed to be due to PPD, but the negative photopatch tests excluded a photoallergic reaction.

With the increased fashion of temporary tattooing with darker shades, using henna mixed with synthetic chemicals, the number of cases of contact dermatitis caused by this decorative art is likely to rise in the future.

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**Reaction to
p-phenylenediamine
added for
darkening.**



Figure 1. Henna tattoo over palms and wrists.

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Accepted for publication 26 June 2001
Allergy 2001; 56:1013–1014
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ISSN 0105-4538

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Allergy to cow bone dust

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Key words: cow bone dust; occupational asthma.

● ALLERGIC reactions to bone dust are extremely infrequent and are described only in patients who work closely with it. A 17-year-old male butcher complained of rhinoconjunctival symptoms, with cough, dyspnea, and wheezing, a few minutes after cow bones had been cut in the butchery. He became asymptomatic during weekends and holidays.

A case of occupational inhalation allergy.

In the allergologic study, skin prick testing was negative to common inhalants, beef, and milk, and positive to cow's epithelium and *Tyrophagus putrescentiae*.

Prick and intradermal tests to bone dust extract (BDE) were positive in our patient and negative in 10 controls. Specific IgE was detectable against BDE, *T. putrescentiae*, beef, and cow dander, and undetectable against BSA, bovine fetal serum, or cat and dog dander. In an ELISA-inhibition study, cow dander and beef extracts inhibited by 45% and 35% the specific IgE to BDE, respectively, and no antigenic relationship was found between BDE and *T. putrescentiae*. A 12% polyacrylamide gel was carried out with BDE, cow dander, and beef extracts. Allergens of 32, 47, and 100 kDa were detected in BDE; 20 and 65 kDa in cow-dander extract; and 32, 47, and 200 kDa in beef.

The specific bronchial challenge test was performed with bone extract. In the first 10 min, a 21% drop of the basal VEMS was observed, and the patient developed moderate dyspnea. The VEMS returned to normal value after salbutamol treatment, and no late-phase reaction appeared. This test was negative in a different asthmatic control patient.

Allergy to mammalian bone is extremely rare. We have found only one report of recurrent anaphylaxis in a scrimshander (bone carver) due to deer bone dust (1). Allergy to cow epithelium and dander is not common, but it has been identified as a cause of occupational allergy among farmers and veterinarians in a few reports (2). Although our patient seemed to be sensitized to other cow proteins (dander, meat), he had no symptoms after eating beef, and he did not remember any exposure to cow dander. ELISA inhibition studies demonstrated cross-reactivity among bone, epithelium, and beef. At least some bone allergens were present in the epithelium and meat extracts. These common proteins are

probably heat sensitive or not clinically relevant. In spite of the fact that shared allergens have been described in cow epithelium and milk, we failed to detect IgE antibodies specific to milk, and our patient tolerated it completely.

BSA (3), a common allergen in mammalian products, causes cross-reactivity among various animals. We could not demonstrate specific IgE to BSA in the blot analysis, perhaps because of the boiling step of the procedure. The allergologic study found the allergen of *T. putrescentiae* to be positive. This house-dust mite is a contaminant of jam (4). At our patient's workplace, jam was not present, and he had no symptoms at the butchery if bones were not being cut. In view of these clinical data and the absence of cross-reactivity revealed by *in vitro* tests, we excluded this allergen as the cause of occupational asthma in our patient. The nonclinically relevant mite protein tropomyosin may explain the specific IgE in our patient to *T. putrescentiae*.

In conclusion, we present the first case of occupational asthma by inhalative exposure to cow bone dust, based on clinical symptoms after exposure, positive skin tests, specific IgE against cow bone dust, and positive specific bronchial challenge.

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Accepted for publication 31 May 2001
Allergy 2001; 56:1014–1015
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ISSN 0105-4538

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