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The effect of sieving on Der p 1 levels

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Key words: allergens; house-dust mite; Der p 1; sieving.

• THE house-dust mite *Dermatophagoides pteronyssinus* produces a major group 1 allergen (Der p 1) which is associated with the development and exacerbation of atopic asthma (1). Collection of dust samples by vacuuming floors and bedding is an accepted technique for assessment of domestic exposure to Der p 1. As well as recommendations for standardized dust collection techniques, it has also been recommended that large particles be removed by sieving before extraction and analysis for Der p 1 (1). This can be a problem when dust samples are low in weight, such as those collected from smooth flooring or individual bedding items, such as pillows. The aim of this study was to investigate whether Der p 1 concentration is affected by sieving dust before analysis.

Not sieving dust samples does not affect analyses.

Dust was collected from 24 carpeted living-room floors and from 24 mattresses by vacuuming 1 m^2 for 1 min with a Hitachi CV-2500 vacuum cleaner (1100 W). After thoroughly mixing the sample, an aliquot (0.09–0.11 g) was removed, weighed, and coded. The remaining dust sample was sieved through a 425-μm steel mesh sieve, and an aliquot (0.09–0.11 g) of the fine sifted dust was removed, weighed, and coded. The unsieved and sieved dust samples were extracted with 1 ml of phosphate-buffered saline (containing 0.05% Tween-20) for 30 min at room temperature (2), and Der p 1 was measured in the supernatant by established double-monoclonal antibody ELISA (3). Der p 1 levels were log-transformed and expressed as geometric means with 95% confidence intervals (95% CI). Comparison of Der p 1 results was by linear regression analysis, and the differences between unsieved and sieved Der p 1 results were plotted against their mean values, as outlined by Bland & Altman (4).

Geometric mean Der p 1 (95% CI) for floor dust samples were 17.2 μg/g (9.8–30.2) and 19.5 μg/g (11.3–35.6) for unsieved and sieved dust samples, respectively. Corresponding levels for mattress dust samples were 57.9 μg/g (38.6–86.9) and 66.0 μg/g (43.4–100.3) for unsieved and sieved dust samples, respectively. These results were not statistically significantly different. Der p 1 levels were, on average, 16.4% (95% CI: 4.1-28.8) and 15.5% (95% CI: 6.9-24.2) higher in sieved dust samples from floors and mattresses, respectively, compared to corresponding unsieved dust samples.

Comparison of Der p 1 concentrations of unsieved and sieved dust samples yielded Pearson correlation coefficients (r^2) of 0.966 ($y = 0.951x + 0.114$) and 0.986 ($y = 1.017x + 0.027$), respectively, for floor and mattress dust samples. For floor dust samples, the mean difference was –4.18 μg/g, with limits of agreement of –20.44 to 12.08 μg/g. Correspondingly, for mattress dust samples, the mean difference was –10.59 μg/g, with limits of agreement of –36.67 to 15.49 μg/g. For both floor and mattress dust samples, the differences exceeded the 95% confidence limits in only one of the 24 dust samples.

This study has shown that, although yielding lower Der p 1 levels, not sieving dust did not result in significantly different Der p 1 concentrations, compared to sieving dust. Although only dust samples from floors and mattresses were compared in this study, we believe the results are applicable to other commonly sampled items, such as clothing and pillows, where the amount of dust collected is often small (5). Sieving dust takes time, and is an additional factor that may contribute to the total inaccuracy inherent in measuring Der p 1 levels in reservoir dust.

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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).

Reaction to *p*-phenylenediamine added for darkening.

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 nonglabarous 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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Figure 1. Henna tattoo over palms and wrists.