

Airborne contact dermatitis due to an electric ultrasonic diffuser

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Airborne contact dermatitis appears as a result of exposure to allergens or irritants in the form of dust, droplets, or gas. It is a common cause of occupational dermatitis, but there are few published cases in the domestic setting.

CASE REPORT

A 63-year-old man consulted our outpatient clinic because of dermatitis on the neck, chest, both axillae, and genitals associated with pruritus lasting 6 months (Figure 1). He reported frequent use of different perfumes daily but not any topical cream. He had no history of atopy and no changes in his medication.

Suspecting allergic contact dermatitis in response to fragrances, we performed patch tests with the Spanish baseline series, a perfumes series (AllergEAZE), and the cosmetics used by the patient tested “as is.” Readings were performed at day (D) 2 and D4, according to the International Contact Dermatitis Research Group guidelines. The only positive result was to salicylaldehyde 2% pet. (D2 +; D4 ++), whereas other allergen results, including vanillin, were negative. We informed the patient that he was sensitized to an aldehyde that was chemically similar to vanilla; however, we were unable to find these fragrances among his perfumes and the other cosmetics that he used.

Some days later the patient brought in an air freshener with an electric ultrasonic diffuser that dispersed an aromatic compound with vanilla (Figure S1). He had been using this for 6 months, coinciding with the beginning of the symptoms. He would plug it in next to his couch and lie down nude next to it, which explained the location of the dermatitis. We recommended that he stop using this diffuser and the vanilla compound. One week later, the dermatitis had completely cleared and did not reappear in the 2 years following.

DISCUSSION

Airborne contact dermatitis (ABCD) is an inflammatory reaction caused by the deposition of aerosolized particles on the skin. Most cases are

related to occupational exposures.¹ In relation to the use of fragrances in diffusers there are few case reports of occupational² and non-occupational^{2,3} ABCD, and none of them related to salicylaldehyde.

Salicylaldehyde (2-hydroxybenzaldehyde; CAS no. 90-02-8) is an oil with an almond scent used in perfumes and food. It is also found in the larval sections of leaf beetles such as the red leaf beetle *Chrysomela populi*. It has been reported as the cause of allergic contact dermatitis in a researcher that handled aspen leaves.⁴

The aromatic substance provided by the patient only stated among its components vanilla (methoxy-hydroxybenzaldehyde), but we suspect that it may contain residues of 2-hydroxybenzaldehyde, which could explain the contact dermatitis in our patient. Another



FIGURE 1 Mild dermatitis on the chest of the patient

explanation could be that the final metabolism of methoxyhydroxybenzaldehyde produces a catechol and a phenol, whereas the final metabolism of salicylaldehyde produces a phenol. Phenols and catechols, both having a similar chemical structure and being metabolized as prohaptens in different ways, may produce different reactive intermediates that can trigger skin sensitization.

Finally, we think that it is important to have in mind the use of the novel electric air fresheners and diffusers in patients with fragrance contact dermatitis, as demonstrated in our case.

CONFLICT OF INTERESTS

None to report.

AUTHOR CONTRIBUTIONS

Marcela Valverde-Monge: Supervision; validation; visualization; writing-original draft; writing-review and editing. **Deysy E Cieza-Díaz:** Conceptualization; writing-review and editing.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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