

An outbreak of allergic contact dermatitis caused by citral in beauticians working in a health spa

Paola De Mozzi and Graham A. Johnston

Dermatology Department, University Hospitals of Leicester, Leicester, LE1 5WW, UK

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Single cases of allergic contact dermatitis in beauticians are well recognized, and epidemiological studies

Correspondence: Graham A. Johnston, Dermatology Department, Leicester Royal Infirmary, Infirmary Square, Leicester LE1 5WW, UK. Tel: +44 (0) 116 258 6736; Fax: +44 (0) 116 258 6792. E-mail: graham.johnston@uhl-tr.nhs.uk

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have confirmed that individual beauticians have a high risk of developing occupational allergic contact dermatitis (1).

Case Report

Over a period of 2 years, 9 beauticians working in the same high-end luxury health spa in the United

Table 1. Patient characteristics

Patient	Series tested	Contact allergens	ICD
1	BBS, cosmetics, own products	–	Own products
2	BBS, fragrance, own products	–	–
3	BBS, own products	–	Own products
4	BBS, fragrance, own products	FM II, citral, own products	–
5	BBS, fragrance	FM II, citral, lavender, geranium oil	–
6	BBS, fragrance, own products	Ylang-ylang	Own products
7	BBS, fragrance, cosmetics	FM II, citral	–
8	BBS, fragrance, cosmetics	FM II, citral, citronellol, geraniol, geranium oil, limonene	–
9	BBS, fragrance, cosmetics	FM I, FM II, citral	–

BBS, British baseline series; FM, fragrance mix; ICD, irritant contact dermatitis.

Kingdom were referred to our contact dermatitis clinic with recent onset of bilateral hand dermatitis. All had been referred separately and independently by their general medical practitioners rather than by their employer. The dermatitis was localized mainly to the dorsum of the hands and fingers, although, in some cases, there was spread to the wrists and forearms. The dermatitis was reported to improve with work avoidance. All were applying a wide variety of beauty treatments, including massages with essential oils, which were applied to clients' skin by direct, ungloved, hand contact. All were female and aged between 21 and 39 years; 7 of the 9 (78%) had a personal history of atopy (asthma, hayfever, or atopic dermatitis) on direct questioning. All had worked at the spa for a minimum of 4 months prior to the onset of their hand dermatitis (range 4–24 months).

Patch testing was performed with the British baseline series in all patients, with an additional fragrance series being applied to 7 patients, and a cosmetic series to 4 patients. Allergen series were supplied by Chemotechnique Diagnostics (Vellinge, Sweden), and applied with Finn Chambers® at D0; readings were performed at D2 and D4, according to International Contact Dermatitis Research Group guidelines.

Six of the 9 patients had positive patch test reactions, confirming allergic contact dermatitis. One of the 9 had a positive reaction to fragrance mix I 8% pet., with sorbitan sesquileate 5% as emulsifier. Five of the 9 had positive reactions to fragrance mix II 14% pet., and of these, all had positive reactions to citral 2.0% pet. The ingredients of fragrance mix II include citral 1.0% pet. Other allergens recorded were all plant-based, and included lavender absolute 2.0% pet., geranium oil 2.0% pet., ylang-ylang 2.0% pet., citronellol 1.0% pet., geraniol 2.0% pet., and d-limonene 10% pet. There were no positive reactions to preservatives in any of the cases reported.

The results are summarized in Table 1. Five of 7 beauticians tested with the extended fragrance series showed positive reactions at D4 to fragrance mix II 14% pet. and to citral 2.0% pet.

A site visit allowed us to ascertain that the predominant brand of product used, branded as natural and organic, consisted of a large range of essential oils and spa products. All contained citral. Appropriate advice was given and, following our visit, no further cases have been referred.

Discussion

Allergic contact dermatitis caused by the use of essential oils is being increasingly recognized as an occupational hazard (2–4).

Citral (CAS no. 5392-40-5) is a terpenaldehyde chemical compound that produces an intense lemon aroma. It is widely used in perfumes, and is a common component of many essential oils. Citral can be used as an intermediate to form other compounds. Citral can induce contact allergy and subsequent allergic contact dermatitis, and so is tested in many fragrance series (5).

Here, we describe the first series of occupational contact allergy caused by citral in beauticians working in a spa in the United Kingdom. We recommend that any patient who reacts to fragrance mix I or fragrance mix II should have the extended fragrance series applied, so that specific advice can be given, and that all patients handling essential oils should be tested with a baseline series plus an extended fragrance series from the outset, in addition to specific products to which they have been exposed. Beauticians should be aware of the potential to become sensitized to products handled, and the risk of this limiting their ability to continue employment.

References

- 1 Schwensen J F, Friis U F, Menné T et al. One thousand cases of severe occupational contact dermatitis. *Contact Dermatitis* 2013; **68**: 259–268.
- 2 Uter W, Schmidt E, Geier J et al. Contact allergy to essential oils: current patch test results (2000–2008) from the Information Network of Departments of Dermatology (IVDK). *Contact Dermatitis* 2010; **63**: 277–283.
- 3 Trattner A, David M, Lazarov A. Occupational contact dermatitis due to essential oils. *Contact Dermatitis* 2008; **58**: 282–284.
- 4 Bleasel N, Tate B, Rademaker M. Allergic contact dermatitis following exposure to essential oils. *Australas J Dermatol* 2002; **43**: 211–213.
- 5 Lalko J, Api A M. Citral: identifying a threshold for induction of dermal sensitization. *Regul Toxicol Pharmacol* 2008; **52**: 62–73.