

Allergic contact dermatitis caused by 10-hydroxydecenoic acid contained in an emollient cream

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CASE REPORT

A 21-year-old man with a history of atopic dermatitis and asthma during infancy was referred for hand dermatitis of 3 years duration. He had noticed that his hand eczema, which mainly presented with pompholyx on the fingers, worsened after application of a moisturizing cream for the treatment of dry and atopic skin. In contrast, avoidance of this cream resulted in complete clearance. To investigate possible contact dermatitis related to this cream, patch tests were performed on the upper back with IQ Ultra patch test chambers (Chemotechnique Diagnostics, Vellinge, Sweden) occluded for 2 days with Opertape (Iberhospitex; Innovative Health Technologies, Barcelona, Spain). Patch tests were performed with the European baseline series and the patient's personal products, such as an emollient soap (5% aq.) and the above-mentioned cream tested "as is," along with scrapings from a leather ball used for American football moistened in ethanol, acetone, and water. Tests were read on day (D) 2 and D4 according to ICDRG criteria. All patch tests gave negative results, with the exception of the moisturizing cream (?+ on D2; ++ at D4) (Figure 1). In a second step, all ingredients of this cream, as kindly

provided by the manufacturer, were individually tested. Among the 13 tested ingredients, a positive result was found only for 10-hydroxydecenoic acid (0.01% pet). Eventually, a twice-daily repeated open application test (ROAT) was carried out on the volar aspect of the patient's forearm with this very ingredient, and a positive

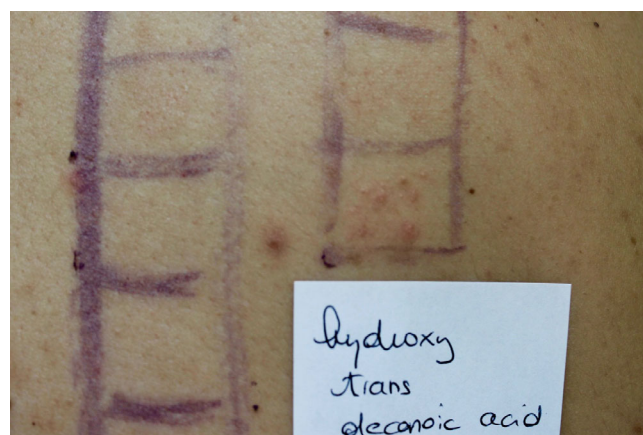


FIGURE 1 Positive patch test reaction to 10-hydroxydecenoic acid 0.01% pet.: ++ on day 4



FIGURE 2 Positive repeated open application test result with 10-hydroxydecenoic acid 0.01% pet. on day 4, with a follicular inflammatory pattern

reaction clearly evolved after 4 days, with a follicular pattern (Figure 2). Five control patients were also patch tested with this ingredient, and negative results were obtained in all cases.

DISCUSSION

10-Hydroxydecenoic acid (INCI name) or 10-hydroxy-*trans*-2-decenoic acid (10H2DA) (CAS no. 765-01-5) is a hydroxy fatty acid that is also called “royal jelly acid.” It is indeed the dominant (10% of the dry mass) and quite specific lipid component present in royal jelly (a substance secreted by the pharyngeal glands of honeybees), from which it was extracted for the first time in 1940 by Townsend and Lucas.¹ Several biological and pharmacological properties of 10H2DA have been reported, including antitumour, antibacterial, immunomodulatory, pro-oestrogenic and proneurogenic activities.²

In cosmetics, it is used as a skin-conditioning agent. More generally, unsaturated hydroxy fatty acids are frequently included in topical pharmaceutical or cosmetic ointments because of their anticollagenase, lipolytic or anti-acne properties.³ A number of molecules derived from 10H2A have also been developed to stimulate epidermal renewal and to delay skin ageing.⁴

Contact dermatitis caused by honeybee royal jelly has been reported only once so far, in a woman who had ingested honeybee

royal jelly as a nutrient. She subsequently experienced an exacerbation of foot dermatitis after topical applications of the same product, and had a positive patch test reaction to raw royal jelly.⁵ Furthermore, positive reactions to royal jelly were also found in two of 10 controls, one of whom was sensitive to propolis. Allergic contact dermatitis caused by fatty acids of other origins used in cosmetics such as lipsticks or moisturizing lotions is also very rare, although a few cases have been recorded with ricinoleic acid and 12-hydrostearic acid, which are present in vegetable-derived products such as castor oil, along with tallow-extracted stearic acid.^{6–8}

A ROAT can be very useful to establish the clinical relevance of a patch test result, particularly with a new allergen. We underline that, in our case, the ROAT gave a positive result, with erythematous follicular papules on D4, which can be considered a mild reaction.⁹

CONFLICTS OF INTEREST

The authors have no conflicts of interest to report.

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