



**CONTACT POINTS****Contact urticaria to ethanol contained in a hand sanitizer**

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Hand disinfection is a milestone of hand hygiene highlighted in the context of the COVID-19 pandemic. Many hand sanitizers are alcohol-based products, the antimicrobial activity of alcohols resulting from their ability to denature proteins.

We describe the case of a woman presenting contact urticaria induced by ethanol.

**CASE REPORT**

A 39-year-old woman with atopic background was referred to the department of allergology with a history of cutaneous eruptions located to her hands after applying hand sanitizer. A challenge test was performed using ethanol-based hand sanitizer (Aniosgel 85 NPC, Laboratoires Anios, Lezennes, France) containing ethanol, water, thickening agents, emollients and no perfume nor colouring agents.

Urticarial papules associated with intense pruritus appeared 5 min after the application of the products to the hands (Figure 1).

Open tests were performed 3 months later. Since allergens in alcohol may be ethanol itself or impurities, we tested ethanol (minimum purity 99.8%; Cooper, Melun, France), methanol (min. 99.8%; Carlo Erba reagents, Val-de-Reuil, France) and acetaldehyde (min. 99.5%; Merck KGaA, Darmstadt, Germany). We also tested isopropyl alcohol (min. 99.8%; Carlo Erba reagents, Val-de-Reuil, France) because this compound may replace ethanol in alternative formulas of alcohol-based hand sanitizers, and tert-butyl alcohol (min. 99.5%; Merck KGaA, Darmstadt, Germany) that may be included in alcohol-based sanitizers as a bitter ingredient. One drop of each compound was applied to the volar forearm and readings were made at regular intervals within 1 h after the application according to the guideline of European Society of Contact Dermatitis.<sup>1</sup> Urticarial papules were only observed with ethanol, but all tested substances induced pruritus



**FIGURE 1** Urticarial papules on the back of the right hand (A) and on the right thumb (B)

being more prominent with acetaldehyde and tert-butyl alcohol. A diagnosis of contact urticaria induced by ethanol was made.

## DISCUSSION

Alcohol is widely used in beverages, antiseptics, detergents, pharmaceuticals and cosmetics. Cutaneous reactions induced by ethanol include contact dermatitis and urticaria.<sup>2,3</sup> Contact urticaria seems very rare and to the best of our knowledge, two cases were reported after application of alcohol-based perfumes and hand sanitizers.<sup>4,5</sup> The mechanisms are partially understood and could be immunological contact urticaria that reflects type I hypersensitivity reactions or non-immunological contact urticaria that is caused by vasogenic mediators.<sup>6</sup> Most commercial ethanol preparations are not pure and cross-reactions with impurities such as acetaldehyde and other primary alcohols including methanol, propyl alcohol, isopropyl alcohol are common, whereas cross-reactions with secondary and tertiary alcohol including tert-butyl alcohol seem less frequent.<sup>7</sup> Here, none of the tested alcohol induced urticarial papules, except ethanol. However, we could not exclude a cross reactivity because of the pruritus that resulted few minutes after the application of all these compounds.

The patient did not consume alcohol beverages but reported burning and itching after applying deodorant. We recommended avoiding alcohol consumptions, using alcohol-free cosmetics, and disinfecting her hand with alcohol-free hand sanitizers. To date, alcohol-free sanitizers based on benzalkonium chloride, silver polymer or lactic acid are available for hand hygiene.

Our case illustrates a rare cause of contact urticaria and highlights the need to strictly check the composition of cosmetics as well as hand sanitizers.

## CONFLICT OF INTEREST

None to declare.

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