

Key words: aliphatic alcohol; allergic contact dermatitis; hexyldecanol; medicaments; OTC cream; topical drugs.

Case Report

A 44-year-old man was referred to our outpatient clinic because of severe swelling of the right leg. The patient had applied an over-the-counter (OTC) cream, Berybear cream® (Daiichi Sankyo Co Ltd., Tokyo, Japan), for a pruritic eruption on the neck. As the cream had no effect, he consulted a dermatologist 6 days after he had started to apply it. The eruption was successfully treated with a steroid ointment prescribed by the dermatologist. At this time, the patient noticed a new pruritic eruption on his right popliteal fossa, to which he also applied the steroid ointment. But, when the steroid ointment ran out, he started reapplying the Berybear cream. Over a period of 2 weeks, however, the eruption gradually got worse. The right leg showed diffuse erythema associated with severe tenderness and pruritus (Fig. 1a). Unilateral tender swelling of the leg indicated the possibility of deep vein thrombosis. Subsequent ultrasonography, laboratory data, and angiography excluded deep vein thrombosis, although stricture of the right femoral vein with bypass was detected (Fig. 1b). A skin biopsy showed numerous spongiotic vesicles with lymphoeosinophilic infiltration in the epidermis, and predominant

numerous eosinophilic infiltrations intermingled with lymphocytes and histiocytes were present throughout the dermis and subcutaneous fat (Fig. 1c). Therefore, we diagnosed contact dermatitis and prescribed 20 mg of oral prednisolone and topical clobetasol propionate ointment. The symptoms resolved within 6 days.

A 2-day closed patch test on the left upper arm with Berybear cream (as is) using Finn Chambers® on Scanpor® (Epitest, Tuusula, Finland) was performed. Pet. was used as negative control. Three healthy volunteers were also applied same materials. We assessed the reaction on D2, D3, and D7. International Contact Dermatitis Research Group (ICDRG) (++) reaction was noted on D7, although negative on D2 and D3. Three volunteers did not show any positive reactions. A second closed patch testing using ingredients of Berybear cream, kindly provided by Daiichi Sankyo Co Ltd. and Ikeda Mohando Co Ltd. (Toyama, Japan) was performed. Among them, ICDRG (++) reaction was noted on D7 only to a pure product of hexyldecanol [INCI name; 2-hexyldecanol is the CAS name; CAS number: CAS (2425-77-6)] (10% pet.). The reaction lasted until D21. The test for cetyl alcohol (6.5% pet.; concentration in Berybear cream) was negative, although it is structurally an isomer of hexyldecanol (Fig. 2). Three volunteers showed no positive reactions. The names of other ingredients have been withheld from this publication on instructions from the provider.

Severe dermatitis mimicking deep vein thrombosis caused by hexyldecanol

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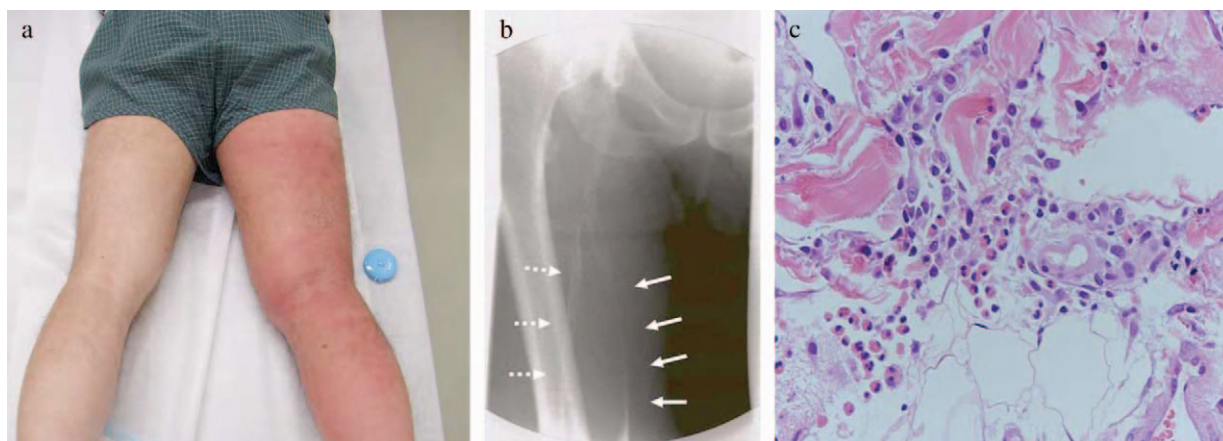


Fig. 1. (a) Clinical image. (b) Leg angiography. There was no thrombosis in the right femoral vein. Note the stricture (solid line arrow) in the right femoral vein with bypass (dotted line arrow), which may be because of the massive infiltration of the inflammatory cells around the vein. (c) Hematoxylin–eosin staining (×200). There are numerous spongiotic vesicles associated with lymphocytes and eosinophils in the epidermis. Perivascular and deep, mixed inflammatory infiltrate of lymphocytes, histiocytes, and conspicuous eosinophils were seen.

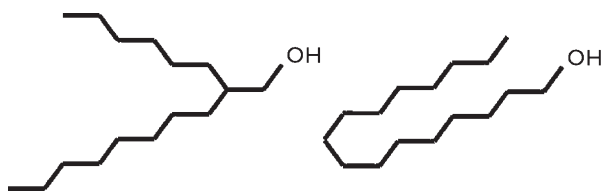


Fig. 2. The chemical structure of (2-)hexyldecanol (left) and cetyl alcohol (right) ($C_{16}H_{34}O$).

Discussion

This is, to our knowledge, the first report of allergic contact dermatitis because of hexyldecanol. Hexyldecanol is an aliphatic alcohol and is often used as an emollient in proprietary medicines and cosmetics. Allergic reactions to alcohols are not as rare as formerly believed (1), particularly to oleyl alcohol (2). Although some cases of allergic reaction to cetyl alcohol, a constitutional isomer of hexyldecanol, were reported previously (3–5), in this case, patch testing with cetyl alcohol was negative. Therefore, a cross-reaction between hexyldecanol and cetyl alcohol was excluded in this case. As is often true with constitutional isomers, we speculate that cetyl alcohol and hexyldecanol do have a completely different structural configuration, although their chemical formula is the same.

Deep infiltration of eosinophils was seen in the upper part of the subcutaneous fat. As hexyldecanol has a low molecular weight, it may be able to penetrate deeply into the skin and persist for a prolonged period in the subcutaneous fat because of its high lipophilicity.

This report shows a potential risk of using a product that contains hexyldecanol.

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