

Glyceryl (mono)caprylate – a new contact allergen

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Facial contact dermatitis may be caused by constituents of skin care products, for example fragrances, preservatives, and emulsifiers. The present report describes the first case of allergic contact dermatitis caused by glyceryl (mono)caprylate, a widely used additive in cosmetics and pharmaceutical preparations.

Case Report

A 39-year-old woman presented with a history of facial eczema for several years. The lesions had occurred after

application of the skin care cream Linola Gesicht® (Fig. 1). Because of an osteosarcoma at age 14 years, she had undergone lower leg amputation, and reported having suffered from recurrent episodes of 'skin irritation' at the areas of contact with her knee prosthesis in the past. There was no history of atopy. Previous patch testing had shown reactions to common contact allergens, among them nickel sulfate and fragrances. Although she had strictly avoided contact with the incriminated allergens, her face dermatitis had relapsed.

After remission of the skin lesions, we performed patch tests according to international guidelines (1), using allergens provided by Almirall, Reinbek, Germany (German baseline series, external products series, preservatives series, and fragrances series) and several of the patient's own suspect cosmetics. We applied the

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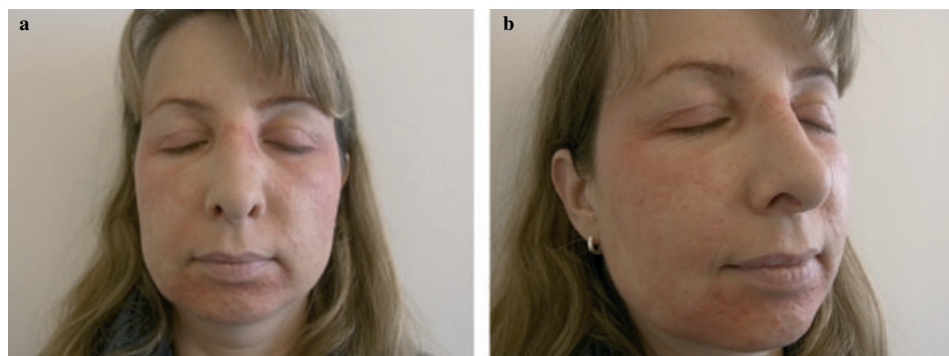


Fig. 1. Allergic contact dermatitis caused by Linola Gesicht®.

allergens to the patient's back according to standardized procedures with Finn Chambers® mounted on Scanpor® tape (24 hr, fully occlusive). After 72 hr, positive reactions were observed to potassium dichromate (+), nickel sulfate (++), colophonium (++), fragrance mix I (+) and its ingredient *Evernia prunastri* (+), propolis (+), and the patient's own external products Dermatop® Creme (Sanofi-Aventis, Frankfurt, Germany) (+) and the face cream Linola Gesicht® (Dr Wolff, Bielefeld, Germany) (+++). Subsequently, we performed a repeated open application test (2) with the aforementioned external preparations, which were applied twice daily for a week on the volar forearm. The patient showed a distinct reaction, with erythema and vesicles, on the day after the first application of Linola Gesicht®, whereas no reaction was seen to Dermatop® Creme. Patch testing with the ingredients of Dermatop® Creme and Linola Gesicht® yielded positive reactions to the active ingredient of Dermatop® Creme, prednicarbate 1% pet. (+), and to an ingredient of Linola Gesicht®, Dermosoft® GMCY (glyceryl caprylate) 5% pet. (+++) (Fig. 2).

We also performed patch testing with a corticosteroid series, which resulted in reactions to budesonide (+) and betamethasone-17-valerate (++) in the late reading after 7 days. To rule out an irritant reaction to glyceryl caprylate, further patch testing with lower concentrations was conducted. After 72 hr, reactions were observed to glyceryl caprylate 0.1% pet. (+) and 1% pet. (+++). None of 3 healthy control persons reacted to glyceryl caprylate 5% pet. Upon avoiding contact with cosmetics containing glyceryl caprylate, the patient remained symptom-free.

Discussion

Glycerly monocaprylate is the monoester of glycerol and caprylic acid (Fig. 3), and is manufactured from natural oils such as coconut oil.

Dermosoft® GMCY (Dr Straetmans Chemische Produkte GmbH, Hamburg, Germany) is the brand name of glyceryl caprylate used in Linola Gesicht®. It is composed of 90% glyceryl monocaprylate, 6% glyceryl dicaprylate, 4% free glycerol, and <0.1% glyceryl tricaprylate. According to the information supplied by the manufacturer, contamination of the formulation, for example by metal salts, was ruled out by graphite furnace atomic absorption spectrometry according to the European pharmacopoeia (Henkel AG & Co. KGaA, Corporate Analytics & Microbiology, Düsseldorf, Germany). As we saw a distinct reaction even to very low concentrations of glyceryl caprylate in our patient, we did not suspect contact allergy to the diester or the triester contained in the formulation.

Glyceryl caprylate (INCI, CAS no. 26402-26-6) is used mostly as a skin conditioning agent, having antimicrobial and moisturizing properties. Topical application of glyceryl caprylate is commonly well tolerated. Repeated application of the closely related glyceryl caprate (15%) did not lead to skin sensitization or irritation in 58 human subjects (3). Cases of allergic contact dermatitis caused by medium-chain triglycerides (glyceryl tricaprylate) and by a synthetic diester (dicaprylyl maleate) contained in skin care creams have been described in 2 patients (4, 5). Like glyceryl caprylate, both substances are considered to be non-toxic and non-irritant, and are commonly used as emulsifiers in cosmetic products; medium-chain triglycerides are additionally used for parenteral nutrition.

Our patient showed patch test reactions to unrelated contact allergens, and may be considered a polysensitized individual. Polysensitization is considered to be a phenotypic marker of increased susceptibility to contact sensitization (6). This concept is confirmed by the results of studies focusing on gene polymorphisms that are relevant for contact allergy. Reich et al. showed that the homozygous combination of the rare interleukin-16

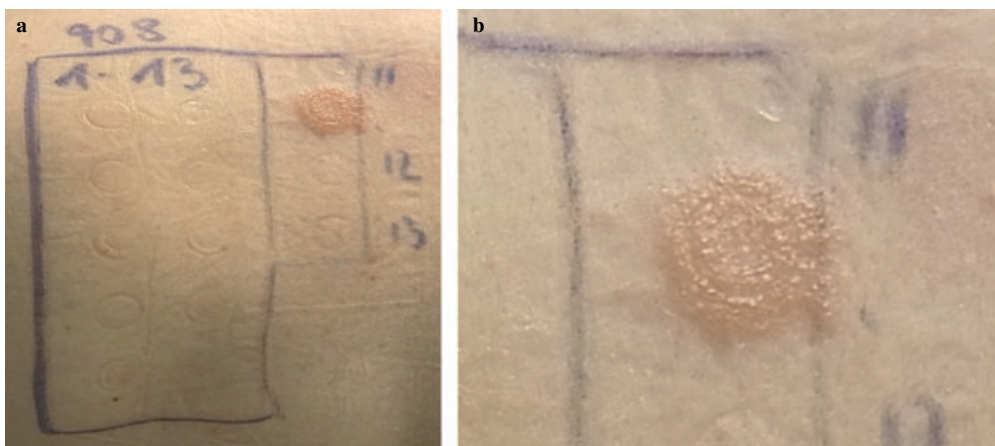


Fig. 2. Positive patch test reaction to Dermosoft® GMCY (glyceryl caprylate) 5% pet.

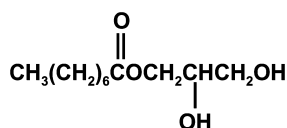


Fig. 3. Glyceryl monocaprylate.

–295°C allele is more common among polysensitized than among healthy individuals (7). Moreover, multiple allergen exposures and cofactors such as pre-existing irritant contact dermatitis may favour sensitization (8).

Polysensitization has to be differentiated from an 'angry back' reaction with multiple false-positive patch test reactions, which may occur when patch testing is performed while the patient is still symptomatic. In our case, an 'angry back' is unlikely, as the test was performed 4 weeks after the skin lesions had healed.

This is the first report of allergic contact dermatitis caused by a glyceryl (mono)caprylate. As shown, the patient's own products should always be considered for patch testing if contact dermatitis caused by constituents of cosmetics is suspected.

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