

Allergic contact dermatitis caused by sodium chondroitin sulfate contained in a cosmetic cream

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The oligosaccharides (from the Greek *oligos*, 'a few', and *sacchar*, 'sugar') are saccharide polymers containing a small number of component sugars, also known as monosaccharides.

Oligosaccharides can have many functions; for example, they are commonly found on the plasma membranes of animal cells, where they can play a role in cell–cell recognition. In general, they are found either O-linked or N-linked to compatible amino acid side-chains in proteins or to lipid moieties (glycans). They can be used in cosmetic products (1), and they have rarely been reported as sensitizers.

Case Report

A 64-year-old non-atopic woman was referred to us in November 2011 because of an erythematous, well-limited dermatitis affecting her face, particularly the lower eyelids, chin, and neck, which had been present for the previous 7 months, without any improvement with various treatments.

Patch tests were performed with the European baseline, fragrance and cosmetic series (Chemotechnique, Vellinge, Sweden), as well with her personal hygiene and cosmetic products, and topical pharmaceutical products. Finn Chambers® on Scanpor® tape (Stallergenes, Antony, France), covered on the upper back with Mefix® (Molnÿcke Health Care, Göteborg, Sweden) were used.

The patch tests, read on D2 and D4, only resulted in a positive reaction (++/+) to her cream 'soin de nuit'. We cannot give the full name, for confidentiality reasons.

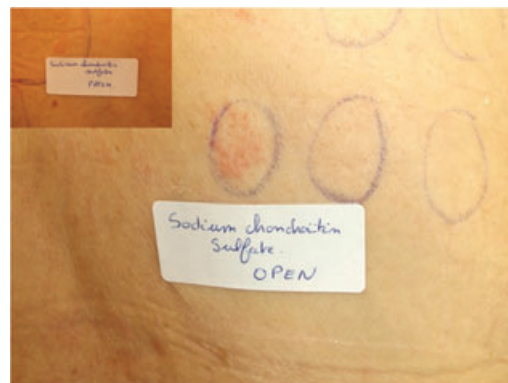


Fig. 1. Positive test reactions (open and patch tests) to sodium chondroitin sulfate.

A repeated open application test with this cream in the left elbow induced an eczematous reaction after 3 days. Further tests (open test and patch test, read at D2 and D4) were performed in January 2013, with all ingredients provided by Cosmalia Laboratories, Fouras, France.

Each ingredient had been diluted in accordance with the concentrations and vehicles reported in the literature, except for sodium chondroitin sulfate, which was diluted at 1% in pet., and a mix of aqua/chitosan succinamide, which was tested 'as is'. The tests read on D2 and D4 were positive for sodium chondroitin sulfate (open tests, ++/++; patch tests, +/++) (Fig. 1). On D2, the patient noted a flare-up of her previous lesions, which had resolved following the first patch testing session by avoiding her cream. We tested sodium chondroitin sulfate 1% in pet. in 50 patients, without seeing any positive test reactions, excluding irritancy.

Discussion

This is the first documented case of allergic contact dermatitis caused by sodium chondroitin sulfate. This oligosaccharide (CAS no. 9007-28-7; EC 232-696-9)

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is used in cosmetic products for its antistatic, hair-conditioning and skin-conditioning properties, and as an emollient (1); it is also claimed to have 'anti-aging' properties (2). It is manufactured from fish cartilage (in our case, provided by Copalis, Boulogne-sur-Mer, France) or from cartilage from other animals. In France, and perhaps in other countries, sodium chondroitin sulfate, taken by mouth, is also used to reduce osteoarthritis pain. Some cutaneous adverse reactions have been reported, but patch testing was not performed (3). It is approved by the Food and Drug Administration for ophthalmological uses. It can be used in food supplements, and there is some concern that chondroitin sulfate might make asthma worse. Sodium chondroitin sulfate is different from sodium chondroitin persulfate, which has been shown to be responsible

for anaphylactic shock (4). We advised our patient to avoid all cosmetic products, and drugs and food supplements containing sodium chondroitin sulfate. Contact with sodium chondroitin sulfate is not common in daily life – the patient started to use this cream in 2010, and presented with dermatitis in 2011. This particular cream most likely induced the sensitization to this ingredient, so the patient was unable to re-use it. According to the new European regulation of cosmetics, contact allergy is a severe side effect and this case was reported to the Agence Nationale de Sécurité des Médicaments (5). Our observation is reminiscent of our previously reported case of dermatitis caused by fructo-oligosaccharide, in which we also did not have any certainty regarding the purity of such ingredients (6).

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