Sorbitan sesquioleate is a mixture of monoesters and diesters of oleic acid and hexitol anhydrides derived from sorbitol (1). It is an emulsifying agent that is widely used in cosmetic formulations and pharmaceutical products, including topical steroids (2). In the fragrance mix I obtained from Hermal (Reinbek, Germany), one of the main manufacturers of patch test ingredients, sorbitan sesquioleate 5% is added to aid the dispersion of the individual constituents. With the same purpose, sorbitan sesquioleate 1% is added to several of the specific fragrances for patch testing. Hence, sorbitan sesquioleate-allergic patients may erroneously be regarded as having a fragrance allergy if they are not concomitantly tested with sorbitan sequioleate.

**Case Report**

A 24-year-old woman, with a personal history of atopic dermatitis, presented with chronic hand eczema that she had suffered from for 3 years. During the last 1.5 years before she was seen in our clinic, she had been regularly treated with Dermovate® ointment (clobetasol propionate 0.05%, a very high-potency corticosteroid), with a cumulative amount of 30 g every second month. Moisturizers had also been used on a frequent basis, including a liver oil ointment. The hand eczema was characterized by accentuated skin folding on the knuckles, and xerosis on the dorsal aspect of the fingers. Hyperlinearity and a few vesicles were present on the palmar side. Genotyping for R501X and 2282del4 mutations in the filaggrin gene (FLG) was performed, and showed that the patient was a heterozygous FLG null mutation carrier (2282del4).

The treatment was initially changed to Protopic® (tacrolimus), which kept the hand eczema under control. However, 3 months later, the patient returned to the clinic with severe vesicular hand eczema and erythema sharply demarcated proximal to the wrists on both hands (Fig. 1). She had resumed treatment with Dermovate® ointment and liver oil ointment. Furthermore, she now wore rubber gloves in relation to tasks that involved prolonged contact with water, including showering.

Owing to the clinical presentation, allergic contact dermatitis caused by rubber gloves was considered. Patch testing was performed with the European baseline patch test series, an extended patch test series, a series with the 26 specific fragrance ingredients to be declared on cosmetic products in accordance with the EU cosmetics directive, an extended rubber ingredient series, and her own vinyl gloves, with Finn Chambers® (8 mm; Epitest Ltd, Oy, Finland) applied on the back with Scanpor® tape (Norgesplaster A/S Alpharma, Vennesla, Norway). Patch test ingredients obtained from Hermal were applied to the upper back and occluded for 2 days. Readings were performed on D2, D5 and D7, and results were graded according to the criteria of the International Contact Dermatitis Research Group (3). Furthermore,
In conclusion, allergy to topical medications, including vehicle ingredients, should be considered in recalcitrant cases of dermatitis, and it might be of special concern if the patient is an FLG mutation carrier.

Discussion

This case report shows that sorbitan sesquioleate can cause severe allergic contact dermatitis, and that knowledge about the individual constituents of the patch tests is crucial to draw meaningful conclusions from the results. Sorbitan sesquioleate has been recognized as a weak allergen that primarily causes contact allergy in patients with an impeded skin barrier, such as that resulting from chronic eczema or leg ulcers. In two large studies, dermatitis patients were patch tested with emulsifiers that are frequently found in topical preparations. Contact sensitization to sorbitan sesquioleate was an uncommon finding, with prevalence rates of 0.5% and 0.9%, respectively (4, 5). However, a more recent study found a prevalence of 8.9%, suggesting that sorbitan sesquioleate is an important allergen. Interestingly, this study also showed that 75% of the sorbitan sesquioleate-allergic patients were currently using a topical steroid emulsified with sorbitol or sorbitan derivatives, emphasizing the importance of identifying allergy to topical therapeutics (6).

Genotyping showed that the patient was an FLG null mutation carrier. FLG mutations result in structural abnormalities of the skin, leading to an impaired skin barrier and an increased risk of atopic eczema. Patients with FLG mutations seem to present with a distinct phenotype of hand eczema. In line with the present case, the eczema is characterized by xerosis and hyperkeratosis on the dorsal side of the hands and fingers, as well as palmar hyperlinearity (7). Previous studies have rejected an association between FLG null mutation carrier status and contact sensitization to common allergens (8), with nickel as an exception (9). On the other hand, a large population-based study found that FLG null mutation carriers with atopic dermatitis had a higher prevalence of contact sensitization to ethylenediamine, neomycin, and fragrance. The two former compounds are widely used in topical antibiotics and steroid preparations, and the findings seemed to reflect treatment exposure (10). However, it has also been considered whether individuals with dermatitis and FLG mutations are more prone to develop contact sensitization caused by their impaired skin barrier and the potentially increased penetration of allergens (11). This hypothesis was supported by a recent study in which it was shown that FLG mutation carriers with dermatitis (atopic dermatitis or hand eczema) had an increased prevalence of contact sensitization to common allergens. In contrast, FLG null mutation alone was not associated with contact allergy (12).

A review of the patient’s own products identified sorbitan sesquioleate as an ingredient in the Dermovate® ointment as well as in the liver oil ointment. Both preparations had been used frequently, and the vinyl gloves had often been applied immediately afterwards. It was concluded that the exposure to sorbitan sesquioleate in combination with the occlusive effect of the gloves explained the severity and configuration of the hand eczema. After avoidance of skin contact with sorbitan sesquioleate, the eczema improved.

Table 1. Positive or doubtful positive patch test results of a 28-year-old woman with allergic contact dermatitis caused by sorbitan sesquioleate

<table>
<thead>
<tr>
<th>Concentration (%) (pet.)</th>
<th>D2 reading</th>
<th>D5 reading</th>
<th>D7 reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorbitan sesquioleate</td>
<td>20</td>
<td>+</td>
<td>+?</td>
</tr>
<tr>
<td>Fragrance mix with sorbitan sesquioleate 5%</td>
<td>8.0</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td><em>Eucnion furfuracea</em> extract/tree moss with ethanol and sorbitan sesquioleate</td>
<td>1.0</td>
<td>+?</td>
<td>+?</td>
</tr>
<tr>
<td>Eugenol with sorbitan sesquioleate 1%</td>
<td>1.0</td>
<td>+?</td>
<td>+?</td>
</tr>
<tr>
<td>Cinnamal with sorbitan sesquioleate 1%</td>
<td>1.0</td>
<td>+?</td>
<td>+?</td>
</tr>
<tr>
<td>Hydroxycitronellal with sorbitan sesquioleate 1%</td>
<td>1.0</td>
<td>+?</td>
<td></td>
</tr>
<tr>
<td><em>Eucnion prunasti/oak moss</em> absolute with sorbitan sesquioleate 5%</td>
<td>1.0</td>
<td>+?</td>
<td></td>
</tr>
<tr>
<td>iso-Eugenol with sorbitan sesquioleate 1%</td>
<td>1.0</td>
<td>+?</td>
<td></td>
</tr>
<tr>
<td>Geraniol with sorbitan sesquioleate 1%</td>
<td>1.0</td>
<td>+?</td>
<td></td>
</tr>
<tr>
<td>Cinnamyl alcohol with sorbitan sesquioleate 1%</td>
<td>1.0</td>
<td>+?</td>
<td></td>
</tr>
</tbody>
</table>

+?, doubtful positive reaction.
References


6 Asarch A, Scheinman P L. Sorbitan sesquioleate, a common emulsifier in topical corticosteroids, is an important contact allergen. Dermatitis 2008: 19: 323–327.


