

LETTER TO THE EDITOR

Case of allergic contact dermatitis caused by sorbitan derivatives included in an over-the-counter topical medicament

Dear Editor,

A 27-year-old male aircraft maintenance technician first visited our outpatient clinic because of pruritic eruptions on his neck for 3 weeks that had become exacerbated 3 days prior to presentation. He had no history of atopic dermatitis or contact dermatitis before. Since 3 weeks before presentation, he had been applying topical medicament A that he had used in the past, and topical medicament B that he used at the first time. These were over-the-counter medicaments. On the first medical examination, he had well-defined erythemas with infiltration, vesicles, papules and intense itching on the bilateral sites of the neck.

In the first patch testing, he showed a positive reaction to the topical medicament B at D7(+). In the patch testing of the ingredients, he positively reacted to sorbitan stearate 5% pet. and sorbitan sesquioleate 20% pet. He did not react to medicament A. The other allergens of glues or rubbers that he had the possibility of coming into contact with in his work were negative. Therefore, we diagnosed this case as allergic contact dermatitis caused by sorbitan derivatives included in topical medicament B.

Sorbitan sesquioleate ($C_{66}H_{126}O_{16}$, Chemical Abstracts Service [CAS] no. 8007-43-0), named Arlacel83 or Span83, is a mixture of mono- and diesters of sorbitol and its mono- and dianhydrides with oleic acid.

Both sorbitan sesquioleate and sorbitan stearate ($C_{24}H_{46}O_6$, CAS no. 1338-41-6, 5093-91-4, 56451-84-4) are Spans, a group of sorbitan derivatives that have similar chemical structures. The Spans are considered to be safe¹ and used in many kinds of cosmetics and medical preparations as emulsifiers.

Pasche *et al.*² reported several patients with leg ulcers who showed concomitant positive reactions to more than one

sorbitan derivative. Hannuksela *et al.*³ explained that sorbitan sesquioleate and other chemicals of Spans were structurally closely related, and this makes cross-reactions understandable. It is presumed that the chemical structures common in Spans worked as allergens in this case (Fig. 1).

Cressey *et al.*⁴ reported that 23 of 591 (3.9%) patients with consecutive dermatitis showed positive reactions to sorbitan sesquioleate. Asarch *et al.*⁵ also reported that 12 of the 112 (10.7%) patients suspected of having contact dermatitis caused by cosmetics were positive to sorbitan sesquioleate. In this report, they also reported that nine of 12 patients positive to sorbitan sesquioleate were using topical corticosteroids emulsified with sorbitan derivatives or sorbitol. Sorbitan derivatives are contained in lots of cosmetics, such as creams or milky lotions, and also included in topical medications as emulsifiers. Although sorbitan derivatives have been thought of as relatively safe emulsifiers, these chemicals are potentially sensitizing when they are applied to the patients who have a skin barrier dysfunction like atopic dermatitis. Since sorbitan derivatives have similar structures, they are possibly cross-reactive. Therefore, in cases of a consecutive dermatitis in spite of the proper therapy being performed, dermatologists should suspect allergic contact dermatitis by sorbitan derivatives included in the topical preparations or moisturizer that the patient had used.

CONFLICT OF INTEREST: None declared.

Aya YOKOI,¹ Kayoko SUZUKI,² Masayuki
TAKAHASHI,^{3,4} Akiko YAGAMI,⁴
Kayoko MATSUNAGA⁵



Figure 1. Clinical features. Well-defined erythemas with infiltration, vesicles and papules on the neck.

Correspondence: Aya Yokoi, M.D., Ph.D., Department of Dermatology and Plastic Surgery, Akita University School of Medicine, 1-1-1 Hondo, Akita, Akita 010-8543, Japan. Email: aya1208@med.akita-u.ac.jp

¹Department of Dermatology and Plastic Surgery, Akita University School of Medicine, Akita, ²Department of Dermatology, Kariya Toyota General Hospital, Kariya, ³Department of Dermatology, Nishio Municipal Hospital, Nishio, Departments of ⁴Dermatology, and ⁵Integrative Medical Science for Allergic Disease, Fujita Health University School of Medicine, Toyoake, Japan

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- 2 Pasche-Koo F, Piletta PA, Hunziker N, Hauser C. High sensitization rate to emulsifiers in patients with chronic leg ulcers. *Contact Dermatitis* 1994; **31**: 226–228.
- 3 Hannuksela M, Kousa M, Pirila V. Contact sensitivity to emulsifiers. *Contact Dermatitis* 1976; **2**: 201–204.
- 4 Cressey BD, Kumar N, Scheinman PL. Contact allergy to sorbitans: a follow-up study. *Dermatitis* 2012; **23**: 158–161.
- 5 Asarch A, Scheinman PL. Sorbitan sesquioleate, a common emulsifier in topical corticosteroids, is an important contact allergen. *Dermatitis* 2008; **19**: 323–327.

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

- Figure S1.** Positive reaction to medicament B (as is) is at D7.
Figure S2. Positive reaction to sorbitansesquioleate (20% pet.) at D7.
Figure S3. Positive reaction to sorbitan stearate (5% pet.) at D7.