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Hesperidin methyl chalcone – a new cosmetic contact allergen

Klaus E. Andersen

Department of Dermatology and Allergy Centre, Odense University Hospital, University of Southern Denmark, Sdr. Boulevard 29, 5000 Odense, Denmark

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The composition of cosmetic products is under continuous development. The Cosmetics Regulation requires that cosmetic products be composed of substances present in the inventory published in the Cosing database (<http://ec.europa.eu/consumers/cosmetics/cosing/>), which contains >15 000 cosmetics ingredients that industry can choose from. Furthermore, a common nomenclature of ingredients must be employed for use on cosmetic product labels (INCI).

This case report describes, for the first time, allergic contact dermatitis caused by hesperidin methyl chalcone (HMC) in a face cream.

Case Report

A 70-year-old healthy woman with no known allergies developed, over the course of a year, recurrent dermatitis on the face and neck, which was regarded as seborrheic dermatitis and treated with mild topical corticosteroids. However, because of suspected allergic contact dermatitis, patch tests were performed with the department's baseline series supplemented with her topical products, tested 'as is'. The only positive reactions were caused by her facial cosmetic products, Decubal® eye cream, and Avene® antirougeurs forte and jour creams. Subsequent confirmatory patch tests with the products reproduced positive reactions. The department's standard procedure was used, encompassing TRUE Test® panel 1–3 supplemented with the remaining allergens of the European baseline series, tested in Finn Chambers® on Scanpor® tape (SmartPractice, Phoenix, AZ, USA). Readings were performed on D3, D4, and D7.

The patient was interested in finding the culprit ingredient. The product manufacturers supplied product ingredients for further patch testing. The results are shown in Table 1. At the second test, the only reaction to ingredients was a doubtful (+?) reaction to HMC (Fig. 1) 0.2% aq. at D3 and D7. On the basis of this finding, the patient agreed to perform a repeated open application test with the 0.2% solution, and she developed a mild positive reaction on the marked area on the volar aspect on the forearm at D14, with erythematous papules covering >25% of the test area (1). The product manufacturer was asked why a patch test concentration of 0.2% aq. had been selected, and replied that this was the concentration used in the product. HMC as raw material together with the safety data sheet was subsequently provided for further testing, and, based on the information in the safety data sheet, 1% and 3% aq. were selected as patch test concentrations. The patient had strong positive reactions to both concentrations. Tests with ingredients from Decubal® eye cream gave negative results. Thirteen consecutive controls were subsequently tested with HMC 3% aq., and showed no reactions.

Discussion

The work-up of such a case requires a very dedicated and collaborative patient, and a collaborative product manufacturer who supplies ingredients and relevant information. In this case, it took a year to complete the investigations.

Pierre Fabre® supplied 24 product ingredients prepared in patch test concentrations selected according to the available information. Actavis® supplied raw materials as is, and this required the ingredients to be prepared for patch testing at the hospital pharmacy.

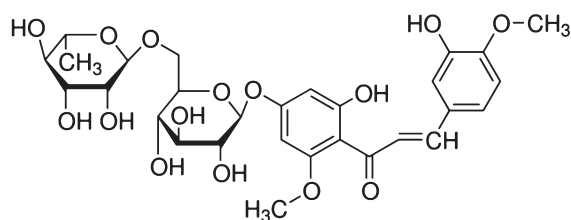
The testing did not reveal the cause of the repeated positive patch test reactions to Decubal® eye cream. Compound allergy is a possibility (2).

Correspondence: Klaus E. Andersen, Department of Dermatology and Allergy Centre, Odense University Hospital, DK-5000, Odense, Denmark. E-mail: keandersen@health.sdu.dk

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Table 1. Patch test results

	First test		Second test		Third test	
	D3/D4	D7	D3/D4	D7	D3/D4	D7
Patient						
Baseline series	Negative	Negative	–	–	–	–
Avene® antirougeur cream	++	+	++	+	++	+
Hesperidin methyl chalcone 0.2% aq.	–	–	+?	+?	–	–
Hesperidin methyl chalcone 1% aq.	–	–	–	–	++	++
Hesperidin methyl chalcone 3% aq.	–	–	–	–	++	++
Patch tests on 13 consecutive controls						
Hesperidin methyl chalcone 3% aq.	–	–	–	–	Negative	Negative



Hesperidin methyl chalcone

Fig. 1. Hesperidin methyl chalcone.

HMC is an antioxidant belonging to the flavone family. The CAS no. is 024292-52-2, and the chemical name is 1-[4-[[6-O-(6-deoxy- α -L-mannopyranosyl)- β -D-

glucopyranosyl]oxy]-2-hydroxy-6-methoxyphenyl]-3-(3-hydroxy-4-methoxyphenyl)prop-2-ene-1-one. It is a yellow powder with a molecular weight of 624, and it is easily soluble in water. The safety data sheet states that it is non-irritant and slightly sensitizing according to the results of a guinea-pig maximization test. The compound is apparently used in many facial cosmetics (<http://www.skinstore.com/hesperidin-methyl-chalcone.aspx?ft=Hesperidin+Methyl+Chalcone&ppp=24&c=True#BreadCrumbAnchor>) (accessed February 2015). HMC is a derivative of hesperidin, a plant chemical classified as a bioflavonoid that is found primarily in citrus fruits and also used in alternative medicine.

References

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