

A new case of allergic contact dermatitis caused by 3-o-ethyl ascorbic acid in facial antiageing cosmetics

Myriam Mamodaly | Olivier Dereure | Nadia Raison-Peyron 

Department of Dermatology and INSERM U1058, University of Montpellier, Montpellier, France

Correspondence

Dr Nadia Raison-Peyron, Department of Dermatology, University of Montpellier, Hôpital Saint-Eloi, 80 avenue Augustin Fliche, 34295 Montpellier Cedex 5, France.
Email: n-raison@chu-montpellier.fr

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A new case of allergic contact dermatitis caused by a facial serum and a day cream used to hide dark spots, both containing 3-o-ethyl ascorbic acid, is reported.

CASE REPORT

A 50-year-old non-atopic woman was referred because of a 2-month history of relapsing swelling and erythematous itchy rash localized on her face, neckline, and neck, combined with perioral swelling. Allergic contact dermatitis was suspected along with photo-induced allergic contact dermatitis, owing to at least one occurrence of the eruption after the use of a sunscreen cream.

Patch tests were first performed with the European baseline series, additional test series from the REVIDAL group, a cosmetics series, and the patient's personal cosmetics applied "as is," with IQ Ultra patch test chambers (Chemotechnique Diagnostics, Vellinge, Sweden) occluded for 2 days with Opertape (Iberhospitex; Innovative Health Technologies, Barcelona, Spain), and read on day (D) 2 and D4 according to ICDRG criteria. Weak positive reactions (+ on D4) were observed only with the serum Clarité Fondamentale Essence (CARITA; L'Oréal, Paris, France), and with a cream of the same brand (Crème de jour Clarité Fondamentale). To investigate photocontact allergy, photopatch tests were also performed with a photoallergen series (Chemotechnique Diagnostics) and the patient's own cosmetics, including the sunscreen cream; all gave negative results.

In a second step, patch tests with the ingredients of both incriminated products (kindly provided by the manufacturer) at the concentration and with the vehicle used in the products showed only a doubtful result with 3-o-ethyl ascorbic acid 5% in 50 aq./50 ethanol (vol/vol), which was present in the two products (?+ on D4). The patient was requested to perform repeated open application tests (ROATs) on the volar aspect of her forearm with the two products

and with 3-o-ethyl ascorbic acid 5% in 50 aq./50 eth (vol/vol). The patient noticed a clearly positive reaction after two applications, with itchy erythema and papules (Figure 1). The erythema was still present 10 days after the ROAT with the serum (Figure S1).

It is of note that a patch test with ascorbic acid (Laroscobine 1 g/5 mL aq.; Bayer Healthcare, Loos, France) remained negative on D2 and D4, and that the patient tolerated oral vitamin C. Discontinuation of the use of both involved cosmetics resulted in complete resolution of the skin lesions with no recurrence.



FIGURE 1 Repeated open application test: erythema and papules after two applications of 3-o-ethyl-ascorbic acid 5% in 50 aq./50 ethanol (vol/vol) on the left forearm

DISCUSSION

3-o-Ethyl ascorbic acid (INCI name) or vitamin C ethyl (CAS no. 86404-04-8) is an ether derivative of ascorbic acid with higher stability than the initial molecule. This lipophilic and hydrophilic material, which is more easily absorbed through the skin than other vitamin C derivatives, is used as skin-conditioning agent, but is also considered to have whitening and antioxidant properties, which are particularly interesting for antiageing cosmetics.

Allergic contact dermatitis related to 3-o-ethyl ascorbic acid in cosmetics has already been described in three previous cases.^{1–3} Different concentrations and vehicles have been used for patch testing, ranging from 1% to 10% aq., with 20 negative controls with the latter concentration.^{1,3} In one case, the substance was tested, with positive results, from 0.05% to 5% pet. (+ on D3 and D7), with three negative controls.²

In our patient, a ROAT with 3-o-ethyl ascorbic acid gave a clearly positive result, whereas a patch test gave only a doubtful result on D4. This discrepancy quite well illustrates that a ROAT with a suspected ingredient of a cosmetic product can be very useful in doubtful cases, and that patch testing with the ingredients diluted at the concentration and in the vehicle used in the product may result in false-negative results. To date, the adequate concentration and vehicle for testing this allergen have not been established. Cross-reactivity with ascorbic acid itself was not observed in our patient, as in previous reports of allergic contact dermatitis caused by other vitamin C derivatives, such as ascorbyl tetraispalmitate present in a cream used for the treatment of atopic dermatitis and in an antiageing lotion.^{4,5} It is of interest that allergic contact dermatitis caused by ascorbic acid used in an antiageing cream has also been reported previously, in a case in which oral vitamin C was well tolerated.⁶

CONFLICTS OF INTEREST

The authors have no conflicts of interest to report.

ORCID

Nadia Raison-Peyron  <https://orcid.org/0000-0002-7991-3165>

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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