

Retinyl palmitate (RP) is a retinol ester used in cosmetics for its anti-aging properties. It is listed with the CAS numbers: 79-81-2 and 37340-08-2 and the synonyms: aquasol A, arovit, optovit-A, retinol palmitate, and vitamin A palmitate. It is a rare contact allergen, with only few reports of allergic reaction (1, 2).

Polycaprolactone (PCL) is a biodegradable polyester used in skin care formulations as part of so called solid lipid nanoparticles. By coating the active ingredient PCL enhances its penetration to the skin (3). We describe a case of contact allergy to RP in combination with PCL.

Case Report

A 54-year-old woman without history of allergy or atopy developed facial dermatitis after few days use of a new antiwrinkle cream (Lancôme Résolution D-contraxol[®], L'Oréal, Paris). She suspects the cream to be the cause of the dermatitis, and performs herself a use test on forearm skin with subsequent development of itchy erythema. By avoiding the cream, she presents with completely normal skin at the visit to our department.

Testing with the standard series (TRUE-test[™]), her own products, and selected ingredients from the Allergen Bank (4) showed positive reactions to thimerosal (no relevance) and her own product, Lancôme Résolution D-contraxol cream. A repeated open application test (ROAT) with the cream on the left forearm was positive after just 2 days (5 applications).

Testing with the cream ingredients supplied by L'Oréal showed a strong (++) reaction to RP in PCL.

Subsequent patch tests with RP 5% petrolatum (pet.) and PCL 5% pet. gave a positive reaction (+) to RP 5% pet., negative to PCL, and a stronger reaction to the RP in PCL (++) delivered by the product manufacturer. The patient performed a ROAT with RP 5% pet. and developed a strongly infiltrated and itchy reaction spreading to the forearm within 2 days (3 applications). RP in PCL and RP 5% pet. were both tested in consecutive controls. RP in PCL gave a doubtful reaction (+?) on day (D) 3 in 1 of 25 control patients. RP 5% pet. gave a doubtful reaction (+?) on D3 in 3 of 27 patients. All were negative on D7.

Allergic contact dermatitis from retinyl palmitate in polycaprolactone

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Comments

Although widely used in cosmetics and topical drugs, allergic contact dermatitis to vitamin A and its derivatives are uncommon. While several cases of contact allergy from retinoic acid have been reported (5, 6, 7), only two previous cases with RP as the allergen have been described (1, 2). On the contrary, topical vitamin A derivatives are well-known skin irritants, and differentiation between irritant and allergic reactions may be difficult, unless proper control tests are performed (8).

PCL may be used to encapsulate the RP in nanoparticles, and thereby increase the bioavailability in the skin. However, the manufacturer's data give particle size in the cream as >100 nm; therefore, they cannot be considered to satisfy nanotechnology criteria, but it is suspected that the combination of RP in PCL may have contributed significantly to the development of allergic contact dermatitis to a rare cosmetic allergen in this case. The concentration of RP in PCL is a confidential information, but it is much less than the 5% concentration used for patch testing in pet.

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