

Is octocrylene a frequent contact allergen?

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Octocrylene (CAS no. 6197-30-4, INN: octocrilene, syn. 2-propenoic acid, 2-cyano-3,3-diphenyl-, 2-ethylhexyl ester) is a frequently used ultraviolet (UV) filter (1). In addition to photocontact allergy, octocrylene may also cause contact allergy, albeit in fewer patients (2), as extensively reviewed in (3). To examine the frequency of contact allergy to octocrylene in consecutively patch tested patients, data of the Information Network of Departments of Dermatology (IVDK) (www.ivdk.org, last accessed 28 November 2016) were analysed.

Methods

The IVDK is a network dedicated to the clinical surveillance of contact allergy, presently comprising 56 departments: 50 in Germany, five in Switzerland, and one in Austria. All departments are members of the German Contact Dermatitis Research Group (DKG) and adhere to international patch test guidelines (4), partly further refined (5). The IVDK approach has been described in detail (6). Briefly, anonymized data from all participating departments are transmitted twice yearly to the data centre in Göttingen, where they are quality-checked and pooled for further analysis.

The present analysis includes data from the subset of IVDK departments ($n = 12$; see footnote) applying version

17 of the so-called 'monitor series' (7) to all consecutive patients also tested with the DKG baseline series. In cases of duplicate consultations, the most recent consultation was chosen for analysis. Thereby, 2577 patients were patch tested between January 2015 and March 2016 with octocrylene 10% pet., supplied by Chemotechnique, Vellinge, Sweden. Patch tests were applied for 1 day by four departments, and for 2 days by eight departments, in 640 and 1996 patients, respectively. Ten departments used Finn Chambers[®] on Scanpor[®] tape, and the other two used Hayes Test Chambers and IQ Chambers[®], respectively. Reading results of day (D) 3 or, if no D3 reading was available, of D4 were aggregated as positive, comprising +, ++ and +++ reactions, and non-positive, including negative reactions, ?+ reactions, and irritant reactions (IR). Data were statistically analysed with the R software package, version 3.2.2 (www.r-project.org, last accessed 28 November 2016), following pertinent guidelines (8, 9).

Results

Octocrylene 10% pet. yielded three IR, five ?+ (doubtful), one follicular (doubtful), and 2 weak positive reactions (0.08% positive, 95% exact confidence interval: 0.01–0.28%). The 2 weak positive reactions were observed in 1 male patient with underlying atopic eczema, aged 46 years, and 1 female patient, aged 57 years. In both, cosmetics were considered as possible causes of allergic contact dermatitis. In the male patient, La Roche-Posay 50+ Ultra léger Anthelios[®] had been additionally tested (non-irradiated) 'as is', yielding a + reaction on D3; this sunscreen contains octocrylene, according to information on the Internet (November 2016).

Discussion

According to the above results, contact allergy to octocrylene is exceedingly rare in consecutive patients, despite its very common use, especially in sunscreens (e.g. in 58.2% of 462 products, according to a German survey dating from 2006 to 2009) (1). In a European photopatch test

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*This analysis includes data from the following IVDK contributors (departments in alphabetical order): Basel (A. Bircher), Berlin Charité (M. Worm), Dresden (A. Bauer, P. Spornraft-Ragaller), Erlangen (V. Mahler), Falkenstein (D. Vieluf), Halle (B. Kreft), Homburg/Saar (C. Pföhler), Jena (S. Schliemann), Minden (R. Stadler, J. Hoffmann), Münster (R. Brehler, M. Behring), Oldenburg (M. Padeken, O. Kautz), and Osnabrück (S. M. John, Ch. Skudlik).

study, contact allergy to octocrylene was observed in 0.7% of patients (and photocontact allergy in 4.0%) (2). The higher proportion of contact allergy (0.7% versus 0.08%) can most likely be explained by the more aimed testing, in the sense that, particularly, patients with a high *a priori* suspicion of UV filter (photo)contact allergy had been tested with the photopatch baseline series, both irradiated and non-irradiated.

There is compelling evidence that photosensitization to octocrylene is related to previous photosensitization to ketoprofen, both from epidemiological data and from animal experiments, as reviewed in (3). Combined reactivity of these substances has mainly been observed in those countries where topical therapeutics containing ketoprofen are extensively used, namely France, Belgium, Italy, and Spain (3).

It remains speculative, however, whether 'normal' contact allergy to octocrylene, that is, without additional UV exposure being necessary to yield the immune response, is also related to ketoprofen exposure and sensitization, as reaction products generated by octocrylene in its ground state and those created after irradiation of octocrylene or ketoprofen are very probably dissimilar (3).

In conclusion, the present analysis, with the limitation of not addressing photocontact allergy, but only contact allergy, has shown that at least contact allergy to octocrylene is very rare. Aimed (photo)patch testing, ideally of the full photopatch test baseline series (10), is recommended in cases of (photo-induced) intolerance reactions to cosmetics containing this UV filter.

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