

University of Groningen

Anaphylaxis caused by topical application of a sunscreen containing benzophenone-3

Spijker, Geert T; Schuttelaar, Marie-Louise A; Barkema, Laurens; Velders, Alex; Coenraads, Pieter Jan

Published in:
Contact Dermatitis

DOI:
[10.1111/j.1600-0536.2008.01337.x](https://doi.org/10.1111/j.1600-0536.2008.01337.x)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2008

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Spijker, G. T., Schuttelaar, M.-L. A., Barkema, L., Velders, A., & Coenraads, P. J. (2008). Anaphylaxis caused by topical application of a sunscreen containing benzophenone-3. *Contact Dermatitis*, 59(4), 248-249. <https://doi.org/10.1111/j.1600-0536.2008.01337.x>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Anaphylaxis caused by topical application of a sunscreen containing benzophenone-3

Contact Dermatitis 2008; 59: 248–249

Geert T. Spijker¹, Marie-Louise A. Schuttelaar¹, Laurens Barkema², Alex Velders² and Pieter-Jan Coenraads¹

¹Department of Dermatology, University Medical Centre Groningen, University of Groningen, 9700 RB Groningen, the Netherlands, and ²Department of Dermatology, Antonius Hospital, 8600 BA, Sneek, the Netherlands

Key words: anaphylaxis; benzophenone-3; contact urticaria; immediate-type hypersensitivity; oxybenzone; sunscreen.

Adverse reactions are increasingly reported for ultraviolet (UV) filters used in sunscreens. We report the third case in the literature of an anaphylactic reaction after topical application of a benzophenone-3-containing sunscreen.

Case History

About 15 min after applying a sunscreen (SunsprayTM SPF 15 water resistant; Hegrone Cosmetics[®], Purmerend, the Netherlands) all over her body and before sun exposure, a 44-year-old woman fainted with generalized wheals, an inspiratory stridor, low blood pressure (74/46 mmHg), and increased heart rate. She required resuscitation with epinephrine, dexamethasone, clemastine, and saline and was transferred to a hospital. Some months before, she had experienced pruritus, erythema, and nausea within 30 min of putting on her bathing suit, which she had also worn earlier while she applied the sunscreen. She had used

the sunscreen previously without apparent problem. She had no relevant past history.

Patch testing with benzophenone-3 (10% pet.; TrolabTM, Hermal, Reinbek, Germany) resulted in an urticarial reaction at the test site within 20 min. Patch tests with the European baseline series (TRUETM test; Mekos, Hillerød, Denmark) and textile, cosmetic, and perfume series were negative. Photo patch tests (without benzophenone-3) were negative. No specific immunoglobulin E (IgE) antibodies were found against inhalation allergens or latex. An assay for detection of IgE to benzophenone-3 was explored by incubating benzophenone-3 with human serum albumin immobilized to caps followed by specific IgE measurement (ImmunoCap; Phadia, Uppsala, Sweden), but no specific IgE to benzophenone-3 could be detected.

Discussion

Benzophenone-3 (INN oxybenzone, CAS number 131-57-7) has been commonly used as a UV filter. In the Netherlands, it was found in 49 of 162 (30%) tested samples of commercial sunscreens (1). Benzophenone-3 was the most frequent cause of photocontact allergy in several reports. Other types of hypersensitivity reactions to it have been reported: contact allergy, photocontact urticaria, and contact urticaria (2). Two earlier cases of contact anaphylaxis induced by benzophenone-3 have been reported (3, 4).

Contact urticaria is divided into immunological and non-immunological types. Non-immunological contact urticaria is often less severe and does not depend on specific IgE against the substance. In our case, the severity of the reaction and the observation that hypersensitivity was acquired are arguments to suggest an immunological mechanism. The severity of the clinical reaction experienced might depend partly on the amount of skin exposed to benzophenone-3; patch testing did not elicit anaphylaxis in our patient or in an earlier reported case. Although IgE specific against benzophenone-3 could not be shown, the methodology is not reliable for benzophenone-3 as it is a small lipophilic molecule and it is unknown to what extent it was bound to the caps; a positive control was lacking.

References

1. Dutch Food and Consumer Product Safety Authority. *Survey UV Filters in Sun Screens. Report: ND04o030 (Dutch)* (available from http://www.vwa.nl/cdlpub/servlet/CDLServlet?p_file_id=10605). Food and Consumer Product Safety Authority (VWA), Den Haag, the Netherlands, 2004 (accessed on 18 August 2008).
2. Landers M, Law S, Storrs FJ. Contact urticaria, allergic contact dermatitis, and photoallergic contact dermatitis from oxybenzone. *Am J Contact Dermat* 2003; 14: 33–34.
3. Yesudian P D, King C M. Severe contact urticaria and anaphylaxis from benzophenone-3 (2-hydroxy 4-methoxy benzophenone). *Contact Dermatitis* 2002; 46: 55–56.
4. Emonet S, Pasche-Koo F, Perin-Minisini M J, Hauser C. Anaphylaxis to oxybenzone, a frequent constituent of sunscreens. *J Allergy Clin Immunol* 2001; 107: 556–557.

Address:

Dr Marie-Louise A. Schuttelaar
Department of Dermatology
UMCG
University of Groningen
PO Box 30 001
9700 RB Groningen
the Netherlands
Tel: +31 50 3612520
Fax: +31 50 3619247
e-mail: m.l.a.schuttelaar@derm.umcg.nl