

Short Communication

Severe contact urticaria and anaphylaxis from benzophenone-3 (2-hydroxy 4-methoxy benzophenone)

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Topical sunscreens are an essential armament for the protection of the human skin against acute and chronic adverse effects of solar radiation. All sunscreen groups have been reported to cause allergic reactions, which may be either contact or photocontact in nature (1). Contact urticarial reactions, however, are relatively rare (2). We report the occurrence of severe contact urticaria and anaphylaxis from benzophenone-3 (2-hydroxy 4-methoxy benzophenone), a common sunscreen ingredient.

Case Report

A 40-year-old childcare assistant developed an acute itchy rash on her face, trunk and limbs a short time after applying a sunscreen to her daughter's skin in May 2000. She described the rash as a 'nettle rash' which settled spontaneously within 3–4 h. Since then she noted that a number of different sunscreens caused a similar reaction. In June 2000 she applied a 'false tan' product on her skin and developed a violent reaction which was associated with stomach cramps, an extensive rash, swelling of lips and tongue and eventually syncope. She recovered spontaneously with complete resolution of the rash within an hour. Subsequently, she developed contact urticaria associated with certain lipsticks and shampoos. She gave a past medical history of hayfever but was not on any medication. Her daughter suffered from atopic eczema. On examination, there was no rash evident when she presented to clinic as she had avoided all the implicated sunscreens, lipsticks and shampoos for a few weeks.

She was patch tested with the standard series, the steroid series and the sunscreen series and the latter was read at 20 min after application. An acute urticarial wheal and flare (50 mm) reaction to benzophenone-3 (2-hydroxy 4-methoxy benzophenone) was seen at the 20-min reading which settled within 1 h after treatment with oral chlorpheniramine maleate. Patch testing with the other allergens proved negative at 48 and 96 h, thus excluding delayed type hypersensitivity. Testing of five controls with benzophenone-3 did not reveal any reactivity at 20 min, 48 h and 96 h.

On review of the 4 cosmetics that the patient brought along, we were able to establish the presence of benzo-

phenone-3 in 3 of them. It was variably labelled as 'oxybenzone' and 'benzophenone' in different cosmetics. We have advised our patient to carefully peruse ingredient labels before purchasing any cosmetics in future.

Discussion

Benzophenone-3 (2-hydroxy 4-methoxy benzophenone, CAS RN chemical ID No. 131-57-7) is frequently used in sunscreens (3) and is known variously as oxybenzone, Eusolex 4360, methanone and diphenylketone. Benzophenones have been used for more than 30 years not only as UV-A filters in sunscreens but also to protect against discolouration of cosmetics exposed to sunlight. They are often incorporated in textiles and plastics to impart colour fastness on exposure to ultraviolet radiation (4).

Benzophenones are known to cause contact and photocontact allergies (5). However, the occurrence of contact urticaria with benzophenone-3 is rare (2). Recently, there has been a case report of contact-mediated anaphylaxis from benzophenone-3 with a similar clinical presentation to our case (6). In a previous report of contact urticaria from another sunscreen, sulisobenzonate (2-hydroxy 4-methoxy benzophenone 5-sulphonic acid), the authors identified the 2-hydroxy 4-methoxy benzophenone molecule (found in benzophenone-3) as eliciting the urticarial reaction (4).

Up to this year (2001), regulations in the EEC permitted the use of benzophenone-3 in concentrations of up to 0.5% without declaring its presence in the list of ingredients (7). This could account for its absence on the labels of one of the products brought along by our patient.

It has been shown that benzophenone-3 can penetrate the epidermal barrier and its metabolites are excreted in the urine after widespread application on the surface of the body, as used in sunscreen formulations. The extent of the body surface area to which the antigen is applied is therefore important in determining the severity of an allergic contact reaction (6). Our patient applied a 'false tan' product on most of her body and experienced a severe cutaneous and systemic anaphylactic reaction.

As benzophenone-3 has various other names, the patient should be advised to read the ingredient labels on

all cosmetic products and to be aware of the synonyms by which the allergen may be recognized. In addition, dermatologists should be aware that a sunscreen formulation may be altered seasonally without any change in its trade name (3).

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