



Anaphylactoid reaction to benzophenones, with recurrence during patch testing

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Benzophenones are commonly used in sunscreens as ultraviolet (UV) absorbers; anaphylactic reactions to these chemicals are rare.¹⁻³ We report a case of anaphylactoid reactions to benzophenone-3, benzophenone-8, and benzophenone-10.

CASE REPORT

A 49-year-old woman was referred for patch testing after recurrent episodes of dermatitis and systemic symptoms. She had no medical problems, but did take oral supplements. The first episode occurred in summer 2017, 24 hours after the application of a sunscreen. The patient described an oedematous, painful, pruritic eruption on her arms and neck. She also experienced an increased amount of phlegm, voice changes, and tachycardia, and required hospitalization. There was a similar episode in spring 2018.

The patient was instructed to discontinue taking supplements. UV-A phototesting, completed at 10, 5 and 2.5 J/cm², gave normal results. The following patch test allergen panels were applied: North American Contact Dermatitis Group (NACDG) 2018, supplemental panels, NACDG 2018 photopatch, and personal care products. Two hours after application, and 1 hour after the patient left the office, she reported a raspy voice, dry mouth, difficulty in swallowing, and a "racing heart." She removed her patches, was evaluated in the Emergency Department, and received oral prednisone and diphenhydramine. On the next day, the 24-hour patch test reading showed the following: fragrance mix I +, 2(2-hydroxy-5-methylphenyl)benzotriazole ++, triclosan

+, and urticarial reactions at benzophenone-3, benzophenone-8 and benzophenone-10 test sites. Because of the severe reaction, UV-A irradiation was not completed. Two days after patch application, the patient experienced recurrent symptoms of dry mouth, lip swelling, and lip numbness, and started taking prednisone. At the day 4 final reading, while she was on prednisone, her symptoms had resolved, and the only positive reaction was to propyl gallate (+). The results were interpreted as immediate urticarial reactions to benzophenone-3, benzophenone-8, and benzophenone-10, and a + delayed reaction to propyl gallate. The patient was instructed to avoid benzophenones and propyl gallate. At her 2-month follow-up appointment, her symptoms had resolved.

DISCUSSION

Benzophenones are UV light absorbers. Benzophenone-3 (oxybenzone) is present in 68% of sunscreens.⁴ In 2013, the NACDG documented it as the most common cause of sunscreen allergy, representing 70.2% of sunscreen reactions.⁵ Recent NACDG benzophenone-3 reaction rates in the general patch test patient population remain low, at 0.4%.⁶ Benzophenone-8 and benzophenone-10 are not routinely patch tested.

Cross-reactions within the benzophenone family have not been proven; however, they are feasible, given the similar chemical structures.⁷ All of the three previously reported cases of benzophenone-3 anaphylactic reactions included only one benzophenone, whereas our patient had reactions to three benzophenones.¹⁻³ Additionally, this

case is unique in that our patient experienced an anaphylactoid reaction during patch testing.

We report a case of anaphylactoid reactions to benzophenones; specifically, benzophenone-3, benzophenone-8, and benzophenone-10. We designate this as an anaphylactoid reaction because symptoms occurred 2 hours after application and there were severe associated urticarial and systemic symptoms. Although immediate reactions to, and systemic symptoms caused by, these chemicals are rare, it is imperative that patch testers are aware of the risk of them.

CONFLICTS OF INTEREST

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