

Detecting photoallergic contact dermatitis with patch testing and daylight

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Photoallergic contact dermatitis (PACD) is a delayed-type hypersensitivity reaction that occurs when the skin is exposed to ultraviolet (UV) or visible light after application of a topical photoallergen. The most common photoallergens are organic UV absorbers in sunscreens and topical non-steroidal anti-inflammatory drugs (1). The availability of photopatch testing tends to be limited to specialist photobiology or contact allergy units, thereby potentially delaying diagnosis.

Case Report

We report a 63-year-old retired nurse who was referred for patch testing for further investigation of her chronic hand dermatitis. On collation of further history, she also described an itchy rash that would develop on sun-exposed sites in the early spring and would settle spontaneously over the course of the summer. She regularly wore a sunscreen.

She was patch tested with the British Society for Cutaneous Allergy baseline series, a cosmetic series, a medicament series, and extended fragrances, with Chemotechnique Ultra IQ™ chambers and allergens from Trolab (Reinbek, Germany) and Chemotechnique (Vellinge, Sweden).

As the dermatology department did not have access to photo-patch testing, a sunscreen series was applied in duplicate, with one positioned on the upper arm and the second on the back with the other patches. On removal of the patches on day (D) 2, the patient was advised to keep the site of the sunscreen series on her arm exposed to daylight over the following 2 days. She was instructed

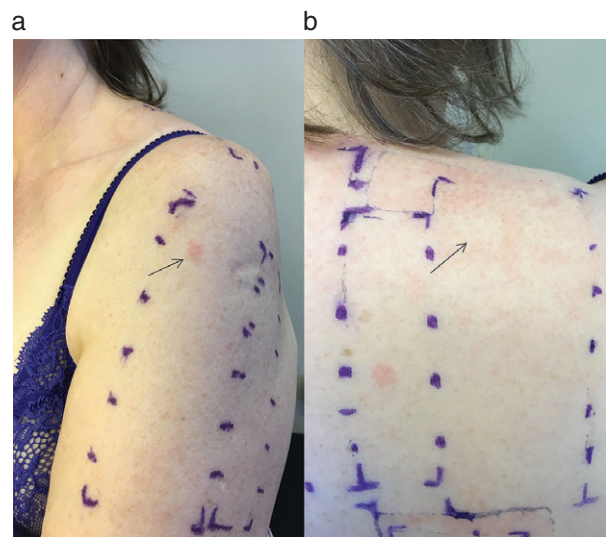


Fig. 1. Day 4 reading of the sunscreen series, showing a positive reaction (arrow) on the sun-exposed area on the upper arm (a) and no reaction (arrow) on the same series on the back (b).

to go about her normal day-to-day activities and not to sit out in the sun for prolonged periods. It was emphasized to her that she must not burn. When she returned for her D4 reading, she had a ++ reaction to butyl methoxydibenzoylmethane (10% pet.) on the sun-exposed sunscreen series, whereas the area on the back that was protected from sun exposure did not show any reaction (Fig. 1). This confirmed PACD caused by butyl methoxydibenzoylmethane in sunscreen.

Discussion

It is important to consider PACD when patients present with an exposed-site dermatitis occurring during the summer months. One European multicentre study found ~16% of patients to have at least one positive photo-patch test reaction when reporting this history (2).

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The standard method for photo-patch testing is to apply duplicate sets of patches, and, on their removal on D2, to cover one set with material that is impermeable to UV. UVA (315–400 nm) at a dose of 5 J/m² is then applied to the exposed unit, and the site is read again on D4. Dermatology departments do not always have access to photo-patch testing, so utilizing daylight is a simple alternative approach. It also has the advantage of being able to detect those cases of PACD in which the photoallergen is activated by UVB alone. However, these are thought to be rare, and, in addition, the dose for UVB-induced PACD is usually higher than the minimum erythema dose (3). Another factor to take into consideration is that

the amount of UV received from daylight cannot be standardized, so a negative photo-patch test result may not always be a true negative. However, in the age of portable electronic devices, consistency could be maintained through the use of mobile phone applications that provide real-time UV readings.

In conclusion, we have illustrated the use of daylight to successfully diagnose PACD. This may be a method that smaller patch test centres could easily introduce in order to improve their detection of PACD. Even though it would need to be used with caution, given the risk of false-negative results, we believe it is a potentially valuable diagnostic tool.

References

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