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Allergic Contact Dermatitis due to Benzoyl Peroxide from an Unlikely Source

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Introduction

- A 67-year-old man presented with an eight month history of a pruritic dermatitis involving the hands.
- The patient had a past medical history of atopic dermatitis, which had previously been well controlled.
- Previous treatments: triamcinolone 0.1% ointment and fluocinonide 0.05% ointment without any relief.
- The patient is a baker and has frequent contact with flour.
- The onset of pruritus was associated with switching from unbleached flour to bleached flour.
- Given the clinical presentation and lack of improvement, the patient underwent patch testing with the North American 80 Comprehensive Series (NAC-80).

Physical Exam

- A hyperpigmented eczematous patch was present on the right dorsal hand.

Patch Testing Results



Figure 1: 48 hour patch test results. A) 1+ reaction to benzoyl peroxide B) 1+ reaction to balsam of peru.

Patch Testing Results Continued



Figure 2: 7 day patch test results. A) 2+ reaction to benzoyl peroxide B) No reaction to balsam of peru.

Course and Treatment

- The patient switched from bleached to unbleached flour to avoid benzoyl peroxide, which was the most likely causative agent. Avoidance of his other allergen, balsam of peru, was also recommended.
- At his post-patch test visit, the majority of lesions had resolved with avoidance of allergens and fluocinonide 0.05% ointment.

Allergens in Baking

- Untreated wheat flour contains carotenoids, which give it a yellow tint.¹ Benzoyl peroxide oxidizes the conjugated double bonds in carotenoids, making the flour colorless.¹
- During the baking process, most of the benzoyl peroxide is converted into benzoic acid.
- The Joint FAO/WHO Committee on Food Additives (JECFA) has concluded that 40 mg of benzoyl peroxide per kg of flour is acceptable.²
- Balsam of Peru can be found in many types of food flavoring as well as in tomatoes, citrus fruits, vanilla, cinnamon, and other spices.

Discussion

- Although commonly thought of as an acne treatment, benzoyl peroxide is found in many other products, such as hair bleaching treatments, teeth whitening agents³, and food, including edible oils and flour.
- Balsam of Peru is extracted from trees grown in Central America. It is used as a fragrance in perfumes and toiletries, in medicine for its healing properties, and as a flavoring in foods.⁴ It is also found in several other items used in food preparation.
- A thorough history is needed when evaluating patients for possible allergic contact dermatitis to account for less well known sources of allergens.
- It is important to consider all possible occupational causes of dermatitis, including benzoyl peroxide and balsam of peru in food handlers and bakers.

References

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