

Acrylates tooth and nail: coexistent allergic contact dermatitis caused by acrylates present in desensitizing dental swabs and artificial fingernails

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Allergic contact dermatitis caused by acrylates is well documented in users of artificial fingernails, and among dental health professionals and their patients. 2-Hydroxyethyl methacrylate (2-HEMA) is frequently implicated as the causative allergen. We present the first reported case of allergic contact dermatitis caused by 2-HEMA present in desensitizing dental swabs used by a wearer of artificial fingernails.

Case Report

A 55-year-old woman presented after undertaking a series of home dental bleaching treatments. Tooth sensitivity led to the use of AcquaSeal™ desensitizing dental swabs. Marked symmetrical lip and gingival oedema and erythema were noted within days of the start of treatment, and a short course of oral prednisolone and antihistamines was prescribed by the local accident and emergency department. The patient had mild fingertip and neck dermatitis at the time of treatment, and was noted to be a wearer of artificial fingernails. Two days after she re-commenced use of the products, her lips flared again and treatment was discontinued. She reported no problems following previous dental procedures, and there was no associated history of atopy.

Before assessment in our clinic, the patient had performed her own open application tests on the left forearm with the fluoride toothpaste, tooth whitening gel and AcquaSeal™ desensitizing dental swab solution (2-HEMA) that she had been using. The patient's photographs confirmed a vesicular, eczematous reaction to all three products, with the desensitizing dental swab solution producing the most pronounced reaction.

Patch testing was performed with the British Society of Cutaneous Allergy baseline series and modified cosmetic, medicament, acrylate and dental series, in addition to the three dental products (allergens supplied by Chemotechnique Diagnostics, Vellinge, Sweden, and Tro-lab, Reinbek, Germany), using Finn Chambers®. Patches were removed after 2 days, and final readings were taken on day 4. Results were graded according to the criteria of the International Contact Dermatitis Research Group.

The following reactions were recorded at both day 2 and day 4: + reaction to 2-hydroxyethyl acrylate (0.1% pet.), 2+ reaction to 2-HEMA (2.0% pet.), 2+ reaction to 2-hydroxypropyl methacrylate (2.0% pet.), 2+ reaction to ethyleneglycol dimethacrylate (2.0% pet.), and 3+ reaction to AcquaSeal™ desensitizing dental swab solution ('as is' and 10.0% aq.). No reaction was detected to either the toothpaste or tooth-whitening gel, suggesting that the patient's earlier positive results were attributable to cross-contamination from the desensitizing dental swab solution.

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Discussion

Allergic contact dermatitis caused by acrylates is well documented in users of artificial fingernails and among beauticians and manicurists (1). Exposure occurs through contact with acrylates in the nail substance itself, as well as in nail adhesives and nail varnishes. 2-HEMA is recognized as one of the most frequently encountered allergens in this group, alongside 2-hydroxypropyl methacrylate, ethyleneglycol dimethacrylate, and triethyleneglycol dimethacrylate (1, 2).

Acrylate contact allergy is also recognized in dental health professionals and their patients, through acrylate exposure in restorative materials, cement, adhesive lacquers, and, in this case, desensitizing dental swabs. 2-HEMA is also the most important allergen in this setting, followed by ethyleneglycol dimethacrylate and triethyleneglycol dimethacrylate (3, 4).

We report the first case of allergic contact dermatitis caused by 2-HEMA present in desensitizing

dental swabs. AcquaSeal™ is available to dental professionals as a solution or one-dose desensitizing swabs for use as required. It is marketed to diminish tooth sensitivity when patients undergo teeth-whitening procedures, as well as during oral hygiene or restorative treatments.

It is highly likely that, in our patient, sensitization to 2-HEMA had occurred through prior use of acrylic artificial fingernails. Several other reports of acrylate allergy affecting dental health professionals and their patients have implicated prior sensitization in this way (1, 5, 6). Our case highlights the increased risk of dental acrylate allergy in users of artificial nails, which may need to be taken into account by dental health professionals when planning treatment. As cross-reactivity between different acrylic monomers frequently occurs, it is recommended that all subsequent acrylate exposure is avoided to limit the risk of recurrence (7).

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