

Allergic contact dermatitis to *Glycyrrhiza inflata* root extract in an anti-acne cosmetic product.

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KEY WORDS: Allergic contact dermatitis; case report; *Glycyrrhiza inflata* root extract; herbal extracts; licorice; patch tests; cosmetics; benzoyl peroxide; natural ingredients; facial dermatitis.

Plant-derived natural ingredients are frequently used in cosmetics. Their popularity is increasing with the population perceiving them as harmless. The cosmetics formulations are constantly changing, making it challenging to detect sensitization to emerging allergens with the available commercial hapten series.

CASE REPORT

A 31-years-old non atopic woman with acne consulted with a 2-year history of pruritic erythematous-scaly plaques involving her eyelid, periorbital and facial-cervical areas (Figure 1, A and B). Patch tests with the Spanish Contact Dermatitis Research Group (GEIDAC) baseline series (TRUE Test supplied by AllergEaze, SmartPractice, Calgary, Canada); supplementary allergens including ESCD candidate allergens; Fragrance Series; Cosmetic Series, Benzoyl peroxide 1% pet. (Chemotechnique Diagnostics, Vellinge, Sweden) as well as the patients' own products ("as is") occluded for 48 hours showed positive reactions with Eucerin Dermopure Oil Control (Beiersdorf, Hamburg, Germany) (+ on D4 and D7) and Epiduo (Galderma, Lausanne, Switzerland) (++) on D2; + on D4 and D7) "as is". Further patch tests with their individual ingredients kindly provided by the manufacturers were positive to *Glycyrrhiza inflata* root extract 1% alc. from Eucerin Dermopure Oil Control (++) on D4 and D7) and benzoyl peroxide 2.6% pet. from Epiduo (+ on D2, ++ on D4 and + D7) and (Figure 1, D-G). No positive patch test to *Glycyrrhiza inflata* root extract 1% alc. was detected in twenty controls.

DISCUSSION

The chemical profile of licorice, the root of the *Glycyrrhiza* species, including *Glycyrrhiza inflata*, depends on the source and the geographical area¹. Its derivatives (18 β -glycyrrhetic acid, glycyrrhizinate or enoxolone) are used in cosmetics as well as in the traditional Chinese medicine for their presumed anti-inflammatory, antioxidant, and skin-lightening properties¹.

Only rarely, allergic contact dermatitis to glycyrrhizic acid, oil-soluble licorice-extracts and enoxolone in cosmetics has been reported.² In two men, an aftershave cream with *Glycyrrhiza inflata* root extract applied onto damaged (shaved) skin caused allergic contact dermatitis of the face.²

Sensitization to benzoyl peroxide is uncommon, despite its wide use. However, it is known to be a strong irritant.³ Already the recommended patch test concentration of 1% pet is problematic and may cause irritant, false-positive reactions.

Although in our patient, an allergic reaction to Epiduo and benzoyl peroxide cannot be completely excluded (she used Epiduo for two years without initially presenting eczema; and the patch test reaction to the benzoyl peroxide 2.6% pet. preparation was edematous and *in crescendo*), it is more likely that an irritant reaction to benzoyl peroxide 2.6% was induced during patch testing and reaction to Epiduo was irritant (patch tests showed a *decrecendo* pattern with Epiduo “as is” and were negative to benzoyl peroxide 1% pet.).

Although licorice derivatives are poorly absorbed through intact skin², sensitization from them may be enhanced, by previous skin damage². We hypothesize that our patient initially developed contact dermatitis (irritant or allergic) to benzoyl peroxide and eventually developed sensitization and

subsequently allergy contact dermatitis to *Glycyrrhiza inflata* root extract because the product containing it was introduced after the eczematous lesions had started.

This case illustrates the importance of the cooperation of the manufacturers in the investigation of contact dermatitis from cosmetics in order to detect sensitization from emerging allergens. Additionally, it shows the usefulness of a legislation guaranteeing transparency regarding the composition. Building an analogous legislation, regulating other products such as medications and medical devices is desirable.

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FIGURES

FIGURE 1: Erythematous and scaly lesions involving the eyelids and periocular areas **(A)** as well as the neck **(B)**. Positive reaction to *Glycyrrhiza inflata* root extract 1% alc. on D4 **(D)** and D7 **(E)**. Positive reaction to benzoyl peroxide 2.6 % pet. on D4 **(F)** and D7 **(G)**

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