

Allergic Contact Dermatitis Due to Kojic Acid

To the Editor:

A 40-year-old woman developed an acute dermatitis on the face and neck after applying Kojicol PlusTM (SeSDerma Laboratories, Rafelbuñol, Spain) (a makeup product that she used for pigmented areas) for 3 days. Two years before, the patient had developed an eczematous eruption after the use of a product (she did not remember the name) for 2 months over hyperpigmented areas caused by sclerotherapy for varicose veins.

Patch testing was carried out according to the International Contact Dermatitis Research Group (ICDRG) recommendations.¹ The patient was tested to a European Standard series, to Kojicol PlusTM, and to individual components of this product (polyquaternium-10 0.1% aqueous [aq]; azelaic acid 1% petrolatum [pet]; kojic acid 0.5%, 1%, and 3% pet²; lactic acid 3% aq; salicylic acid 2% pet; polysorbate 80 1% pet; *Hamamelis virginiana* 1% aq; *Glycyrrhiza glabra* (licorice extract) 1% pet; and citric acid 1% aq).

Positive reactions were obtained to Kojicol PlusTM (+++); to kojic acid at 0.5% (++), 1% (+++), and 3% (+++); to lactic acid (++); and to polysorbate 80 (++) after 2 days and 4 days. Results of patch tests with the other ingredients of the product were negative. Ten control patients were tested, with negative results. After 3 weeks, the patient was tested again with lactic acid and polysorbate 80 to rule out an angry-back syndrome and to avoid false positives. Negative reactions were obtained to these ingredients.

In this patient, we performed the patch test again because we obtained a strong positive patch-test reaction with extension to the adjacent patches (lactic acid and

polysorbate 80); in this way, false positives and the angry-back or excited skin syndromes were avoided.

Kojic acid (5-hydroxy-2-(hydroxymethyl)-4-pyrone), a natural substance produced by fungi or bacteria (such as *Aspergillus*, *Penicillium*, or *Acetobacter* spp),³ is used as a dermatologic skin-lightening agent and is contained in traditional Japanese fermented foods (miso [soybean paste], shoyu [soy sauce], and sake).⁴ The mechanism of action of kojic acid in cosmetics is the suppressing of free tyrosinase in order to reduce the production of melanin. The tyrosinase catalyzes the hydroxylation of tyrosine to 3,4-dihydroxyphenylalanine (dopa) and the oxidation of dopa to dopaquinone (this is a well-known key enzyme responsible for the production of melanin).⁵

At present, the use of depigmenting agents such as kojic acid in the treatment of cutaneous hyperpigmentations has increased, so we will have to take care of these side effects in the future.

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