



Allergic contact dermatitis caused by neem oil: An underrated allergen?

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Neem oil is a vegetable oil obtained from cold pressure of the neem (*Azadirachta indica*), a fast-growing evergreen that is widely present in

Asia, and is much used in cosmetic products of Ayurvedic medicine.^{1,2} Its most important constituents include oleic acid, palmitic acid, stearic

acid, linoleic acid, behenic acid, arachidic acid, and palmitoleic acid. Despite the common notion that botanical or herbal substances are safe, these products may induce allergic contact dermatitis (ACD).^{3,4}

CASE REPORT

A 32-year-old atopic man presented with a 15-day history of eczema on the face and neck with intense oozing and itching. The lesions had appeared ~1 week after the use of a moisturizing product that he had been applying every day on his face to treat atopic dermatitis: its ingredients were neem oil and tocopheryl acetate. He also reported use of the same product during the previous month to treat eczematous lesions of his antecubital fossa. He denied any known allergy or exposure to irritants or other topical products. One month after the complete resolution of dermatitis, which was achieved with a once-daily topical application of mometasone furoate for 2 weeks, he was patch tested with the Italian Society of Allergological, Occupational and Environmental Dermatology (SIDAPA) baseline series (Euromedical, Calolziocorte, Italy) and with the moisturizing product "as is." Patch tests were applied on the back, and left under occlusion for 2 days with Al Test (Euromedical) on Scanpor tape (Norgesplaster, Vennessla, Norway). Readings were performed on day (D) 2 and D4, according to the Italian guidelines for patch testing, adapted from the ESCD,⁵ and showed a positive reaction only to the topical product "as is." Hence, we performed further patch tests with the ingredients of the topical product (neem oil 10% pet. and tocopheryl acetate 10% pet.), which yielded positive (++) reactions on D2 and D4 for neem oil 10% pet. Repeated open application tests (ROATs) with neem oil 10% pet. were performed on the volar aspect of the forearm (twice-daily 5 × 5-cm applications for a maximum of 7 days), and gave positive reactions after only three applications. Because of the similar substances (oleic acid, linoleic acid, stearic acid, and palmitic acid) contained in neem oil, argan oil, and olive oil,^{6,7} we performed patch test and a ROAT with olive oil and argan oil, without any reaction. Ten healthy volunteers were patch tested with neem oil 10% pet., with negative outcomes.

DISCUSSION

We report a case of ACD caused by neem oil, an ingredient that is currently widespread in cosmetics and Ayurvedic products. In the last years, few cases of ACD caused by neem oil have been reported⁶⁻⁸; however, considering that neem oil is widely used, the prevalence of allergic reactions might be underestimated. Recently, it was also described as a cause of airborne ACD in a 58-year-old man who used a spray containing it as an insect repellent in his garden, and who had previously applied neem oil to treat his psoriasis.⁹ Neem oil is widely used because of its antiseptic, anti-inflammatory, antibacterial and anti-fungal properties, which are attributable to its 100 pharmacologically

active constituents; among these, the best known are triterpenes.² Its oleic part is similar to the one present in olive oil and argan oil, which are already known as sensitizers, the latter in particular.^{6,10,11} In our case, patch tests showed positive reactions only to neem oil. We may speculate that the oleic part of neem oil (in common with that of argan oil and olive oil) does not contain the substance causing the ACD. Further studies are required to clarify the sensitizing potential of neem oil and to characterize the culprit allergen.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to report.

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