Systemic contact dermatitis caused by inhaled cashew oil smoke

Dorota Kadlubowska[1], Howard Bargman[2] and Denis Sasseville[1]

[1] *Division of Dermatology, Montreal General Hospital, McGill University, Montreal, H3G 1A4, Canada and* [2] *Division of Dermatology, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, M4N 3M5, Canada*

doi:10.1111/cod.12612

Key words: Anacardiaceae; case report; cashew; case report; flexural dermatitis; systemic contact dermatitis.

The cashew nut tree, or *Anacardium occidentale*, belongs to the Anacardiaceae family of flowering and fruit-bearing plants. The Anacardiaceae also include poison ivy, poison oak, poison sumac, the mango tree, the Japanese lacquer tree, the Indian marking nut tree, and the Florida holly (1). The western poison ivy (*Toxicodendron rydbergii*) is well known for its ability to cause allergic contact dermatitis, owing to the urushiol compounds that it contains. Patients who have been previously sensitized to poison ivy can cross-react after exposure to other members of the Anacardiaceae. This is because of the similarity in chemical structure of the allergenic compounds.

We report the first case of systemic contact dermatitis, presenting as flexural dermatitis, caused by inhalation of cashew oil smoke. This patient also had a history suggestive of contact dermatitis caused by poison ivy, as well as contact dermatitis after exposure to mango, suggesting cross-reactivity to these related plants.

Correspondence: Dorota Kadlubowska. E-mail: dorota.kadlubowska@mail.mcgill.ca

Conflicts of interest: The authors declare no conflict of interests.

Case Report

A 26-year-old non-atopic woman presented to a dermatologist's office because of acute onset of facial oedema,

© 2016 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd



Fig. 1. Crusted eczematous and vesicular lesions involving the skin around the mouth, nose and eyes after exposure to cashew oil smoke.

erythema, pain, and itching sensations (Fig. 1). She also presented with multiple erythematous vesicle-studded plaques affecting the face, trunk, extremities, and perineum. There was accentuation of the lesions in the flexural and inguinal areas. She was treated with intravenous methylprednisolone and diphenhydramine, followed by medium-potency and high-potency corticosteroids topically. Her dermatitis took approximately 3–4 weeks to resolve.

The patient reported that, 2 days prior to her eruption, her mother had roasted a tray of raw cashews at home. At the time of roasting, the patient complained of a stinging sensation in her eyes caused by exposure to smoke. She denied direct contact with the raw or roasted cashews, but stated that there was thick smoke requiring subsequent extensive cleaning of the walls and cupboards. The patient had a history that was highly suggestive of poison ivy dermatitis as a child, consisting of a pruritic eruption on the legs that developed while she was at summer camp. In her teens, she developed several episodes of vesicular and itchy perioral contact dermatitis, beginning within a day after biting into fresh mango, and lasting for approximately 4–5 days before spontaneous resolution.

Discussion

This report shows that systemic contact dermatitis caused by cashew nut oil can develop after inhalation and subsequent systemic absorption. Even though the facial component of the patient's eruption could be attributable to airborne exposure, her eruption was not limited to exposed areas, as she also had extensive involvement of body areas covered by clothes.

Five patients developed systemic contact dermatitis after eating large amounts of raw cashews sold in an organic food store (2). All had a similar clinical presentation of erythematous and vesicular dermatitis involving the palms, axillae, medial aspect of the arms, bathing trunk area, and popliteal fossae. Another report described a patient who developed systemic contact dermatitis caused by cashew nut oil ingested in a pesto sauce (3). This patient developed bright red, coalescing plaques over the buttocks, medial thighs, and periaxillary areas, a pattern previously described by Andersen et al. as the 'baboon syndrome' (4). Systemic contact dermatitis occurs upon systemic exposure in an individual previously sensitized to an allergen. The routes of exposure may be transepidermal, transmucosal, oral, intravenous, subcutaneous, intramuscular, through implants, or by inhalation (5). The clinical manifestations are varied, and include vesicular hand eczema, flare-up of previous dermatitis or patch test reactions, maculopapular eruption, erythema multiforme, and vasculitis, but often, as in our patient, flexural dermatitis or the baboon syndrome (5).

Our report illustrates the likely cross-reaction between members of three different genera of the Anacardiaceae family. We speculate that this patient, previously living in Toronto, Canada, an area where poison ivy is endemic, and with a history of a severely pruritic eruption on the legs as a child while at summer camp, may have initially become sensitized to urushiol through exposure to western poison ivy (*T. rydbergii*). It is estimated that 50% of North Americans are sensitized to poison ivy (6). Later in life as a teenager, the patient developed contact dermatitis around the mouth after ingestion of fresh mango (from the *Mangifera indica* tree). Mango skin, leaves, stem and sap are known to contain potentially allergenic compounds, collectively termed 'mangol' (heptadecadienylresorcinol, heptadecenylresorcinol, and pentadecylresorcinol) (7). Finally, in her 20s, after her first exposure to cashew nut shell liquid (from the *A. occidentale* tree), which contains primarily anacardic acid, cardol, 2-methyl cardol, and cardanol (8), the patient developed systemic contact dermatitis. Urushiol in poison ivy contains catechol compounds that are structurally related to the resorcinol and phenol compounds in both mango and cashew nut shell oil.

Previous reports of systemic allergic contact dermatitis caused by cashew oil have not shown an inhalational mechanism of exposure, as in our patient. Our case highlights the possibility of systemic reactions resulting from inhalation, and it underlines the link between poison ivy, cashew, and mango, and their ability to cross-react.

© 2016 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd

References

1 Gladman A C. Toxicodendron dermatitis: poison ivy, oak, and sumac. *Wilderness Environ Med* 2006: **17**: 120–128.
2 Ratner J H, Spencer S K, Grainge J M. Cashew nut dermatitis: an example of internal–external contact-type hypersensitivity. *Arch Dermatol* 1974: **110**: 921–923.
3 Hamilton T K, Zug K A. Systemic contact dermatitis to raw cashew nuts in a pesto sauce. *Dermatitis* 1998: **9**: 51–54.
4 Andersen K E, Hjorth N, Menné T. The baboon syndrome: systemically induced allergic contact dermatitis. *Contact Dermatitis* 1984: **10**: 97–101.
5 Nijhawan R I, Molenda M, Zirwas M J, Jacob S E. Systemic contact dermatitis. *Dermatol Clin* 2009: **27**: 355–364.
6 Kligman A M. Poison ivy (Rhus) dermatitis: an experimental study. *AMA Arch Derm* 1958: **77**: 149–180.
7 Oka K, Saito F, Yasuhara T, Sugimoto A. A study of cross-reactions between mango contact allergens and urushiol. *Contact Dermatitis* 2004: **51**: 292–296.
8 Gómez-Caravaca A M, Verardo V, Caboni M F. Chromatographic techniques for the determination of alkyl-phenols, tocopherols and other minor polar compounds in raw and roasted cold pressed cashew nut oils. *J Chromatogr A* 2010: **1217**: 7411–7417.

© 2016 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd