

CASE REPORT

Occupational rhinoconjunctivitis caused by the common indoor plant, *Hoya compacta*

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Background	Allergic reactions to the common house plant <i>Hoya compacta</i> (HC) have not previously been described.
Aims	To confirm HC as the cause of rhinoconjunctivitis in three horticultural workers.
Methods	Greenhouse working conditions were reproduced in our challenge chamber.
Results	All three cases developed rhinoconjunctivitis when working with HC plants. A control challenge was performed in two cases with iceberg lettuce causing no symptoms. Nasal volume measured by acoustic rhinometry (AR) fell after all three active challenges, but also after one of the control challenges.
Conclusions	Our study confirms that HC may cause occupational rhinoconjunctivitis and asthma through a Type I hypersensitivity reaction. Specific inhalation challenges, nasal nitric oxide measurement and AR may be useful additional tools in supporting such diagnoses for occupational physicians to consider.
Key words	Allergy; asthma; <i>Hoya compacta</i> ; rhinoconjunctivitis.

Introduction

Hoya compacta (HC) is a common indoor house plant. The different *Hoya* species are colloquially known as wax plants. Occupational allergic contact dermatitis caused by *Hoya carnosa* cultivar *variegata* has been reported by Rothe [1]. We studied three horticultural workers with work-related rhinoconjunctivitis in our challenge chamber located at the Odense University Hospital asthma outpatient department. To our knowledge, respiratory allergy to HC has not been previously demonstrated.

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In summary, all three workers complained of work-related rhinoconjunctivitis when handling HC. Case A also complained of work-related shortness of breath. Histamine release tests (Reflab, Copenhagen) with HC leaves and stems were positive in all three cases. Skin prick tests (SPT) using prick-prick method with HC leaves and stems were also positive in all three cases [2]. Five controls were tested with the same prick-prick method. All five had normal histamine reactions and no reactions to either HC stems or leaves were observed. The specific details of each case are discussed below.

Case A was a 30-year-old Romanian female greenhouse gardener apprentice based at a small nursery that specialized in HC. She developed rhinoconjunctivitis after working 4 months with HC. Her investigation results demonstrated normal blood eosinophil count, elevated total IgE and negative SPTs to latex and standard environmental aero-allergens. Her lung function parameters were forced expiratory volume in 1 s (FEV₁) 2.61 (86%), forced vital capacity (FVC) 3.07 (88%) and FEV₁/FVC ratio 85%. A mannitol test was positive at a cumulative dose of 35 mg with a 27% fall in FEV₁. She was treated with Desloratadine tablets (5 mg daily) and inhaled Salbutamol (0.2 mg) as needed.

Case B was a 36-year-old female based at a plant service company. She mainly worked with HC and *Ficus benjamina* (weeping fig). Work functions included replanting, removing dead leaves, watering, binding new growth and packing. She developed rhinoconjunctivitis after working 1 year with a plant service company. She had a history of food allergy when eating tomatoes and reported itchy eyes when baking bread or peeling potatoes. She was an ex-smoker. Investigations showed normal blood eosinophils, total IgE with negative SPTs and specific IgE results to standard inhalation allergens. Total IgE was not measured. She had positive SPTs; however,

Table 1. Specific nasal challenge with HC; control challenge with iceberg lettuce

Case		A	A	B	B	C	C
		AR	nNO	AR	nNO	AR	nNO
Active	Before	9.06	441	10.13	937	2.73	1396
	After	6.60	549	5.20	629	2.28	1492
	% change	-26	+20	-47	-33	-16	+7
Control	Before	5.76	504	11.54	559	ND	ND
	After	9.60	845	5.65	840	ND	ND
	% change	+67	+68	-51	+50	ND	ND

AR, acoustic rhinometry with the total volume of right and left nostrils (cm³); nNO, total nasal nitric oxide from sum of both nostrils (parts per billion); ND, not done.

for *Tritium aestivum* (Wheat) and *Triticum spelta* (Spelt), she was treated with Cetirizine (10 mg) as needed.

Case C was a 25-year-old Ukrainian male greenhouse gardener apprentice based at the same nursery as Case A. He developed rhinitis after working with HC for 2½ years. He was a non-smoker. His results showed normal blood eosinophil count, negative SPTs and specific IgE to standard inhalation allergens except for grass. He had a positive SPT for *Phleum pratense* (5 mm). Total IgE was not measured. He received no specific treatment.

Specific inhalation challenges were performed in our challenge chamber. Baseline data included rhinitis symptom scores from a validated questionnaire [3], nasal nitric oxide (nNO), acoustic rhinometry (AR) (Acoustic Rhinometer®, GM Instruments, Kilwinning) and spirometry (Microloop®, Care Fusion, UK). Peak nasal inspiratory flow (PNIF) was only performed for case C. AR measures the volume in each nostril using sound waves [4,5].

Numerous HC plants were placed on the work table. Only one challenge was performed on each day. The patient worked with the plants, removing leaves, binding plant growth, clipping leaves with scissors and mashing leaves with a mortar and pestle. Exposure periods ranged from 2 to 3 h. Baseline measurements were repeated immediately after exposure and then regularly for at least 4 h (data are shown in Table 1).

Case A developed severe rhinoconjunctivitis with symptom score going from 0 to 8. Nasal volume fell 22% and nNO rose 22%. She also developed shortness of breath. FEV₁ fell 13%, while peak flow fell 22%. She developed no symptoms when challenged with iceberg lettuce.

Case B developed severe conjunctivitis and rhinitis symptoms. Symptom score rose from 0 to 10. Nasal volume fell 47% and nNO was reduced by 33%. With the iceberg lettuce control challenge, she developed no symptoms, but nasal volume fell 51% and nNO rose 50%. Case C developed mild rhinoconjunctivitis with a rise in symptom score from 0 to 3. Nasal volume fell 16% and nNO rose 7%. PNIF fell 32%. A control challenge was not performed. However, PNIF variability during 4 days of daily monitoring was <15%.

Discussion

Type I IgE-mediated sensitization to HC was demonstrated in these three cases with positive SPT and histamine release test. An allergic response was also shown with specific challenges. Nasal volume fell by 26, 47 and 16%, respectively. In Case B, nasal volume fell 51% with the control challenge without any symptoms. Thus, nasal volume can be considerably reduced without nasal symptoms and should be interpreted carefully.

Although the only clear indication for nNO is screening for primary ciliary dyskinesia [6,7], it has been shown to increase in allergic rhinitis [8,9], and thus may be a useful additional tool in diagnosing work-related illness. In conclusion, the findings from these cases suggest that HC can elicit a Type I hypersensitivity reaction resulting in rhinitis, rhinoconjunctivitis and respiratory symptoms. Clinical responses are the most important factor in interpreting nasal challenges.

Key points

- The common house plant *Hoya compacta* can cause allergic rhinoconjunctivitis and asthma.
- The key parameter when interpreting nasal challenges is the clinical response.
- Nasal nitric oxide and acoustic rhinometry may be useful in confirming occupational illness in this setting.

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Conflicts of interest

None declared.

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