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Occupational asthma to ivy (*Hedera helix*)

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Key words: decorative flowers; green plants; *Hedera helix*; ivy; occupational asthma.

Occupational asthma (OA) associated with decorative plants is not rare (1, 2), and occupational (3) and nonoccupational (4) sensitization to green plants has also been reported. Common ivy, *Hedera helix* (family Araliaceae) is a climbing plant with beautiful evergreen leaves but humble flowers. It is a popular decorative green plant grown both outdoors and indoors. Unfortunately, ivy is known to cause contact dermatitis, with first reports dating from 1899 (5). There are also suggestions of an association between ivy and rhinitis symptoms (6). As far as we know, ivy-induced OA has not been reported

previously. In the present paper, such a case is presented.

The patient was a 40-year-old female who had worked in her own flower shop for the past 11 years. She was an ex-smoker having stopped smoking 3 years earlier and had no history of atopy. Symptoms of cough had started 4 years prior to the current examinations, appearing especially when she handled ivy. One year later she began to experience dyspnoea, and she was treated with inhaled steroids for a short time. She also had work-related skin symptoms, which were later diagnosed as nonimmunologic contact urticaria for narcissus and rose.

At the Finnish Institute of Occupational Health, respiratory and allergologic investigations were performed, as reported previously (1, 2), and the diagnosis of OA was made according to the European guidelines (7). The total serum IgE was 105 kU/l; radioallergosorbent test for ivy was not available. The skin prick tests (SPT) were performed to 18 common allergens as well as to storage mites. Sensitization to the following plants was studied with the prick-prick method (4): *Ficus benjamina* (leaf), *Dracaena fragrans* (leaf), *Asplenium nidus* (leaf), *Yucca aloifolia* (leaf), *Spathiphyllum wallisi* (leaf), *Euphorbia trigona* (stalk), rose (leaf), *Euphorbia pulcherrima* (green and red leaf), *Rumohra adiantiformis* (leaf), *Lilium orientalis* (pollen),

Hedera helix (leaf), *Hyacinthus orientalis* (leave, petal and bulb) and *Narcissus pseudonarcissus* (petal, leaf and stalk). All SPTs were negative. Spirometry showed normal ventilatory function, but in the histamine challenge test, strong bronchial hyperresponsiveness (BHR) was noted (PD₁₅ 0.08 mg). Peak expiratory flow (PEF) varied between 340 and 510 l/min during working days, with the lowest values occurring when handling green plants, especially ivy; during holidays PEF varied between 410 and 510 l/min. Bronchial asthma was diagnosed, and inhaled budesonide dipropionate started, after which BHR was mild (PD₁₅ 0.43 mg).

Specific bronchial challenge tests were performed in a 6 m³ challenge chamber, in which the patient cut and tore the flowers, stalks and leaves of the plants for 30 min. The forced expiratory volume in 1 s (FEV₁) and PEF values during the challenge test procedure were measured by a portable, pocket-size spirometer (One Flow; STI MEDICAL, Saint-Romans, France). The referent inhalation challenge test to lettuce leaves was negative. In the specific test, the handling of ivy caused an immediate asthmatic reaction, with 21% reduction in FEV₁ (Fig. 1) and with 20–30% reductions in PEF (not shown), with simultaneous subjective symptoms of dyspnoea. The PEF and FEV₁ values returned to normal after Atrodoal® (Boehringer Ingelheim

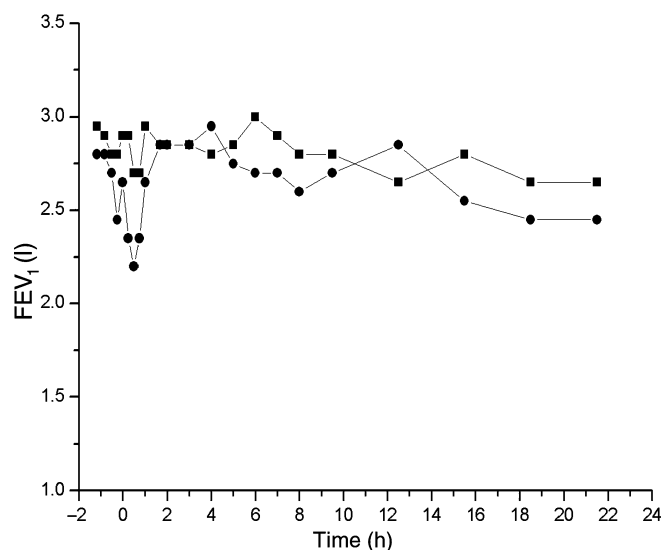


Figure 1. Forced expiratory volume in 1 s (FEV₁) follow-up during challenge tests: ■, placebo (lettuce); ●, ivy. Challenge ended at 0 h.

GmbH, Ingelheim, Germany) 2.5 ml mist inhalation.

Based on exposure and respiratory symptoms, peak flow surveillance, and specific inhalation challenge testing, OA caused by ivy was diagnosed. Regular inhaled budesonide dipropionate and, on demand, salbutamol were prescribed, and avoidance of exposure to ivy was recommended.

In our patient, the mode of asthmatic reaction was immediate in the specific bronchial challenge test. This mode generally, but not necessarily, points to hypersensitivity type I reaction. However, an IgE-mediated allergy to ivy could not be proven. Therefore, the mechanism by which ivy causes asthma is unclear and requires further study.

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IgE-mediated large local reaction from recombinant hepatitis B vaccine

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Key words: allergy; basophil; blot; hepatitis B vaccine; IgE.

A 58-year-old woman was referred because of an intense local pruritus with a rapidly progressive and impressive swelling within several hours at the injection site of a recombinant hepatitis B vaccine (rHBV, HBvaxPRO®; Sanofi-Pasteur MSD, Belgium). This reaction completely subsided within 72–96 h without leaving scars. History revealed no prior allergies. On two occasions, she had uneventful administration of the same vaccine, 1 and 2 months before the acute event.

Specific IgE for latex, *Saccharomyces cerevisiae* (bakers' yeast) and chlorhexi-

dine by ImmunoCAP technique (Phadia, Uppsala, Sweden) was negative (<0.35 kUa/l). Skin prick tests for latex (Stallergènes, Frèsnes, France), chlorhexidine digluconate 2% in 70% alcohol and undiluted rHBV (HBvaxPRO) could not be interpreted because of pronounced dermographism.

Flow cytometric analysis (FACSscan; BD, Immunocytometry Systems, San Jose, CA, USA) of activated basophils was performed using Alexa 448-coupled anti-IgE (Sigma-Aldrich, Chemic GmbH, Steinheim, Germany) and phycoerythrin-conjugated anti-CD63 antibodies (Pharmingen, BD Biosciences, Erembodegem, Belgium). The test included a negative control (stimulation buffer), a positive control (anti-IgE; Pharmingen) and stimulation with the HBV vaccine (HBvaxPRO®, dilution 10^{-3} up to $1 \mu\text{g/mL}$). The test was also performed in two healthy control individuals who had tolerated rHBV vaccination. Upon challenge with the vaccine, basophils of the patient showed a manifest dose-dependent up-regulation from 1% up to 81% for the highest stimulation concentration (Fig. 1). Expression of CD63 on basophils from the control individuals who tolerated rHBV remained unchanged (<2%).

Hepatitis B virus vaccine (HBvax-PRO®) was spotted on nitrocellulose (Whatman Ltd, Maidstone, UK) and incubated with serum of the patient and both control individuals. Bound specific IgE was detected with monoclonal anti-human IgE (Sigma) and anti-mouse IgG

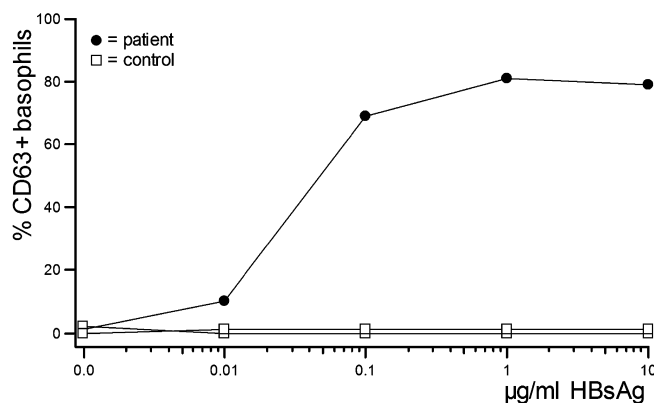


Figure 1. Percentage of CD63 positive basophils in the patient (closed circles) and in two control individuals (open squares) for stimulation with recombinant hepatitis B vaccine.