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Occupational rhinitis caused by beech wood dust

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Key words: beech; occupational rhinitis; rhinomanometry; wood dust.

• DIFFERENT kinds of wood have been implicated in causing respiratory symptoms in workers who inhale their dust. It has been suggested that an allergic mechanism may be implicated in their pathogenesis, but an IgE-mediated sensitization has been described in a few studies only (1–5).

Beech (*Fagus sylvatica*) wood is frequently used in carpentry cabinet-making, and the paper industry. However, occupational diseases related to this wood have not been reported. This study describes a case of occupational rhinitis caused by IgE-mediated sensitization to beech wood dust. To our knowledge, no previous cases have been reported.

The 57-year-old patient had been working for 20 years as a carpenter. At work, he was

exposed to beech and iroko wood dust daily. Three years later, he started to present symptoms of rhinitis when he was working with beech wood. Such symptoms increased during the working week and improved during weekends, and they were not related to the inhalation of iroko wood dust. The patient had no history of atopy and had never smoked.

Beech and iroko dust wood extracts were prepared at a 1:40 w/p in 0.125 M ammonium bicarbonate by magnetic stirring for 15 h at 2–8°C and after centrifugation (10 000 rpm) for 30 min at 10°C. Then the preparation was dialyzed against distilled water with a dialysis membrane which retained molecules larger than 3.5 kDa, filtered through a 0.22-µm pore size membrane, and lyophilized. These extracts were supplied by C.B.F.

Leti (Barcelona, Spain).

Skin prick test (SPT) was performed with common commercial extracts and beech and iroko wood extracts at 2 mg/ml of dry weight. Histamine chlorhydrate (10 mg/ml) was used as a positive control and PBS as a negative control. A positive reaction was defined as a skin reaction showing a mean wheal diameter of at least 3 mm.

Specific IgE antibodies to beech and iroko wood were detected by ELISA (Leti, Barcelona, Spain) (6). In a CAP-System assay (Kabi-Pharmacia, Sweden), we determined IgE antibodies against the same battery tested in SPT. A positive result was defined as a value of CAP of ≥ class 2 or optical density (OD) of >0.100 in ELISA.

ELISA IgE inhibitions were done against beech wood and beech pollen (*F. sylvatica*).

Nasal provocation tests were performed with the extracts of iroko and beech wood measured by computerized active anterior rhinomanometry with a Rhinotest MP-500 rhinomanometer, according to the criteria of the Committee Report on Standardization of

Rhinomanometry (7). After spraying 0.2 ml of diluent, increasing concentrations of allergen were sprayed into both nostrils every 15 min. We considered the test positive when there was a decrease of more than 40% in nasal airflow from diluent values according to the criteria of Bachmann (8). To detect possible late response, nasal flow was measured 4 and 6 h after the last administration of allergen.

All tests were performed in five asymptomatic, exposed workers and three atopic, unexposed subjects.

The prick test with beech extract at 2 mg/ml gave an immediate positive reaction, with a wheal of 6×5 mm. No late response was observed. SPT was negative for common inhalant allergens as well as for an extract of iroko dust. The test was negative in all control subjects.

Total serum IgE was 140 IU/ml (Pharmacia Immuno-Cap System, Uppsala, Sweden). Specific IgE was positive for beech extract with the patient's serum (OD 0.108) and negative with a battery of common allergens and iroko wood. The control group had negative ELISA (OD 0.020–0.052) to beech wood dust. ELISA 50% IgE-binding inhibition values were 16.4 mg/ml dry weight for beech-wood extracts and 19.5 mg/ml for *F. sylvatica* pollen extract.

The nasal provocation with beech-wood extract was positive. We obtained an immediate response (46% decrease in nasal airflow) after administration of a 1/10 dilution of the original extract (2 mg/ml). No significant response was elicited in the nasal provocation test with iroko wood extract. Nasal challenge was negative in all control subjects.

The rhinitis suffered by our patient could be considered occupational rhinitis: after a sensitization period, symptoms occurred during each exposure to beech wood dust and improved during weekends. Type I hypersensitivity is strongly suggested by the positivity of SPT and by the demonstration of specific IgE antibodies (although at a low

A case of occupational rhinitis caused by IgE-mediated sensitization to beech wood dust.

level) to beech wood dust in the patient's serum. The positive nasal challenge test to beech wood dust, but not to iroko, supports the diagnosis. Neither an irritant nor a toxic effect was suspected, as no response was observed in control subjects. To the best of our knowledge, this is the first report of occupational rhinitis due to beech wood dust inhalation.

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Renal failure – a new risk group for latex allergy?

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Key words: chronic renal failure; fruit antigens; latex sensitivity; SPTs.

● IMMUNOGLOBULIN E (IgE)-mediated hypersensitivity to natural rubber latex (NRL) has been recognized as an international medical problem due to the widespread use of latex products. The prevalence of latex allergy appears to be higher in individuals with increased exposure or increased intrinsic predilection for atopy (1). Recently, cross-reactive allergenic proteins have been identified in banana, avocado, chestnut and kiwi (2, 3).

Patients with chronic renal failure (CRF) who are undergoing long-term dialysis are a suspected risk group due to high exposure to latex in the form of gloves, catheters, adhesive bandages, tourniquets, drains, and anesthetic

equipment. In the present study, we investigated latex sensitivity in this group of patients and examined the relationship between latex and certain fruit allergens as well.

Between November 1996 and June 1997, a total of 424 patients on regular dialysis were invited to participate in this study. However, 156 cases were withdrawn due to prior use of antihistamines, diagnosis of anergy, unwillingness to enroll, etc. Skin prick tests (SPTs) were performed with latex, kiwi, banana, and walnut extracts (Stallergènes SA-Pasteur, France). Serum samples were collected from each subject in order to determine total IgE level (Abbott Laboratories, IL, USA). Patients were compared to a group of 76 healthy controls. Data analysis was performed with SPSS for Windows. A *P* value of <0.05 was regarded as significant.

Eight subjects reported allergic symptoms related to rhinitis, while 58 had dermatitis and pruritis. None had experienced reactions to latex products. Of the 268 patients tested (159

male/109 female, mean age 43.1 years, with a range of 11-85), three (1.1%) had positive SPT results to latex antigen. One subject with latex sensitivity had positive SPT response to kiwi extract, while in the SPT-negative group, two patients had positive reactions to kiwi and one to banana antigens. All but one in the SPT-positive group were female. Atopy, defined as above-normal IgE, was not diagnosed in any of the subjects with positive SPT. Statistical analysis of the results identified the variables with no statistical significance (*P*>0.05) as age, duration of renal disease, frequency of dialysis, and IgE. None of the patients in the control group had latex sensitivity with SPT.

Certain groups are known to have an increased incidence of allergic reactions to latex products (1, 4). Our results showed that a significant number of patients with CRF have negative SPT response to latex despite frequent exposure. Host and environmental factors, including atopy and high levels of occupational and nonoccupational exposure, can predispose individuals to immunologic sensitization to latex (4-6). This is further supported by data from the present study, which indicate that none of the patients with latex-positive SPT reported manifestations of atopic disease, nor did they have elevated IgE levels.

According to our results, the prevalence of latex-positive SPT in CRF patients is lower than that of other reported risk groups. One of the key differences between the present report and previous ones is that our study group consisted of equal numbers of patients on the different dialysis programs. Exposure to latex products varies according to dialysis methods. Moreover, other studies may have involved a larger proportion of symptomatic subjects, whereas we tried to avoid this by attempting to assess virtually all dialysis patients. Another explanation of the difference in response rates could be the allergen content in the latex extract used, since allergenicity varies from one product to another.

The most striking finding in this study was the clear predominance of middle-aged women among latex- and fruit-positive SPT subjects. Female predominance in our data might be explained by greater exposure through the use of household latex products (1, 6). Moreover, considerable cross-reactivity between NRL

Nonatopic CRF patients are not at risk of latex allergy despite recurrent exposure.