

ELISA; a histamine-release test was performed as well.

Immediate positive responses, a 6 by 5 mm wheal and a 12 by 10 mm wheal, respectively, were obtained for the prick and intradermal skin tests with methotrexate. The cyclophosphamide skin tests were negative. The same tests in control subjects were negative for both drugs. *In vitro* specific IgE by ELISA was not detected, and the histamine-release test was negative as well. A cyclophosphamide challenge test was negative, and the patient received a new chemotherapy cycle with no adverse reaction.

Although methotrexate has been commonly used for many years, only a few cases of anaphylactic reactions to this drug have been reported, almost all after high doses. *In vitro* immunologic studies were unable to detect specific IgE in patient sera; this failure may be explained by technical difficulties, as *in vitro* specific IgE has never been demonstrated against methotrexate.

Positive skin tests to methotrexate have been reported only in two previous papers – Cohn et al. (5) and Vega et al. (7) – with description of positive intradermal and prick tests, respectively. Our patient had an anaphylactic reaction due to methotrexate in which both the clinical data and the positive skin tests suggested an IgE-mediated hypersensitivity mechanism.

Key words: anaphylaxis; antineoplastic agents; cutaneous tests; methotrexate.

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Occupational allergy to rye flour in carpenters

DUST from many types of wood provokes rhinitis and asthma after occupational exposure (1). In patients with specific IgE and positive bronchial challenge tests to a particular wood dust, type I allergic mechanisms are likely to cause the asthmatic reactions. However, we found atopic carpenters who had negative results in skin tests, challenge, and *in vitro* tests using several wood dust extracts.

Rye flour, which is often added to the glues used to manufacture certain boards, may be an important allergen in wood dust.

Rye flour is frequently used in the wood industry to increase the viscosity of the glue employed to manufacture boards. Occupational exposure to cereal flour may cause baker's asthma, a common disease among bakers, pastry factory workers, and farmers. However, no case of cereal allergy has been reported as the cause of occupational asthma among carpenters, cabinetmakers, sawmill workers, or other subjects exposed to wood dust until now.

We report here nine atopic patients exposed to wood dust and suffering occupational allergy (Table 1) that seemed to be caused by the rye flour used in the manufacture of agglomerate boards.

Skin prick tests were performed by standard methods with the following samples:

- 1) 16 commercial wood dust extracts (Bayer Laboratories): western red cedar (*Thuja plicata*), California redwood (*Sequoia sempervirens*), cedar of Lebanon (*Cedrus libani*), iroko (*Chlorophora excelsa*), oak (*Quercus robur*), mahogany (*Shorea* sp.), African maple (*Triplachiton scleroxylon*), birch (*Betula* spp.), makore (*Mimusops beckeii*), Eichenspaene (*Quercus* spp.), teak (*Tectona grandis*), beech (*Fagus sylvatica*), obeche (*Tripl. Sclerosylon*), hemlock (*Tsuga heterophylla*), Paraná pine (*Araucaria brasili-cina*), and ramín (*Gonystylus* spp.)

Table 1. Clinical data and results of *in vivo* tests

Patients	Age (years)	Job ¹	Years of exposure	Disorder	Skin prick tests					RAST to rye (class)	CT ⁵	MT ⁶	BT ⁷
					Wood	Rye	Sec c 1	RAI-1	RAI-3				
BCS	29	C	5	RC	—	+	+	+	—	2	+	—	—
AAS	53	C	15	RC-A	—	+	+	—	—	2	+	+	+
EPM	46	C	20	RC-A	+ ³	+	+	+	—	3	+	+	+
JGL	36	C	10	RC	—	+	+	—	+	2	+	+	—
AMG	25	CB	6	RC	—	+	+	+	—	3	+	—	—
JRP	31	S	8	RC	—	+	+	—	—	2	+	—	+
SGM	42	C	16	A	—	+	—	—	+	2	+	+	+
JMT	38	CB	12	RC	—	+	+	+	—	2	+	—	—
LMA	51	C	30	RC-A	+ ⁴	+	+	—	—	3	+	+	+

¹ C: carpentry; CB: cabinetmaking; S: sawmill.

² RC: rhinoconjunctivitis; A: asthma.

³ Western red cedar and ramín.

⁴ Western red cedar and iroko.

⁵ CT: conjunctival test (rye flour extract).

⁶ MT: methacholine test.

⁷ BT: bronchial test (rye flour extract).

2) a commercial rye (*Secale cereale*) flour extract (Abelló ALK Laboratories)

3) three purified major allergens of rye flour, designated Sec c 1, RDAI-1, and RAI-3 (2).

Histamine (0.1%) and saline buffer 0.9% were used as positive and negative controls, respectively. Five nonatopic carpenters were subjected to the same tests with the rye extracts, showing negative results.

Airway responsiveness to methacholine was measured according to Chatman et al. (3). The bronchial challenge test with a commercial rye flour extract (initial dose equivalent to that producing a 3-mm-diameter wheal in skin prick tests) was performed as previously reported (4). Conjunctival tests were also carried out with the same commercial extract by standard methods. Specific IgE was determined by FAST (Ingelheim Diagnostics).

The results obtained are summarized in Table 1. No reaction was found in most patients (7/9) in skin prick tests when different wood dust extracts were assayed. By contrast, all subjects showed positive reactions with the commercial rye flour extract, both in the skin prick and in the conjunctival test, and five of them also in bronchial challenge tests.

Three purified rye allergens, which belong to the cereal α -amylase inhibitor family, were also reactive, particularly Sec c 1 (5) (8/9 patients). These inhibitors, as well as their wheat and barley homologs, have been identified as prominent allergens associated with baker's asthma (5).

Baker's asthma is a common disease among workers with occupational exposure to cereal flour. Around 15–30% of exposed workers are affected, and the disorder is a significant problem among bakers, pastry factory workers, and farmers, but, as far as we know, no case of cereal allergy has been

reported to cause occupational asthma among carpenters. On the other hand, a 3.4% prevalence of cases of sensitization to wood dust has been reported among carpenters (1).

We concluded that in cases of occupational allergy induced by inhalation of wood dusts, cereal flour antigens may play an important role, and, consequently, should be investigated.

Key words: baker's asthma; occupational allergy; rye flour; wood dust.

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