

In conclusion, the association of a clinical process which resembles HAE with a decrease in C4 level is not always caused by a deficiency or dysfunction of the C1 inhibitor component.

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We report the case of a 46-year-old nonsmoker woman with a history of rhinitis and asthma due to grass pollen.

She had kept two hares as house pets for 2 years. Approximately 1 year after acquiring the hares, she presented with nasal and ocular itching, tearing, nasal stuffiness, and persistent asthma attacks. She was treated with inhaled budesonide (1600 µg/day) and formoterol (18 µg/day), but optimal control of asthma was not achieved. When she was examined in our clinic, physical examination, spirometry, and chest radiographs were all normal.

Skin prick tests (SPT) with a battery of common inhalant allergens were positive to grass and olive pollen. After being defatted, dialyzed, and lyophilized, an extract of hare epithelium was prepared in phosphate-buffered saline at 10 mg/ml (protein concentration 3 mg/ml). SPT to this hare extract and rabbit epithelium 5% w/v (C.B.F. Leti, Madrid, Spain) elicited positive skin responses (8- and 6-mm wheals, respectively). SPT to a battery of animal dander and/or urine extracts (C.B.F. Leti) from dog, cat, horse, cow, goat, guinea

pig, hamster, rat, and mouse were all negative. Total serum IgE (Pharmacia, Uppsala, Sweden) was 260 kU/l. Specific IgE antibodies determined by ELISA against hare (0.304 OD) and rabbit epithelia (0.478 OD) were positive, as compared to control sera from five atopic subjects allergic to mites (0.100 OD). Specific IgE (Pharmacia CAP System) measurements were positive against rabbit epithelium (9.42 kU/l) and negative against guinea pig, mouse, rat, and hamster. In the CAP-inhibition assays, IgE reactivity to rabbit epithelium (solid phase) was completely inhibited by hare extract, indicating cross-reactivity between these epithelia. Skin prick and serologic tests to hare epithelium were negative in five atopic and five nonatopic control subjects.

The methacholine inhalation test revealed bronchial hyperresponsiveness (PC₂₀ 0.125 mg/ml). Specific bronchial challenge to hare epithelium extract (0.04 mg/ml) was carried out by the tidal breathing method, and it elicited an isolated early asthmatic response (32% fall in FEV₁ 10 min after challenge). The patient showed a progressive improvement after removal of the hares from the house.

Allergic asthma to pet hares

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Key words: allergic asthma; animal allergens; hare.

• ALTHOUGH rabbits are popular domestic pets, there are few reports on asthma due to this animal (1, 2). The hare (*Lepus europaeus*) is another member of the Leporidae family and, to the best of our knowledge, allergy caused by this mammal has not been previously described.

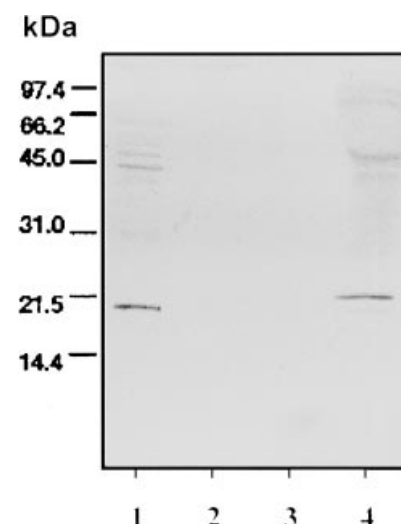


Figure 1. IgE immunoblots of hare (1), dog (2), cat (3), and rabbit (4) epithelium separated by SDS-PAGE under reducing conditions.

Immunoblotting with hare epithelium extract showed several IgE-binding bands between 14 and 70 kDa. Prominent allergens were observed in hare and rabbit epithelium at 18 and 19 kDa, respectively (Fig. 1). The strong allergen detected at 19 kDa probably corresponds to Ory c 1, a glycoprotein that is found in rabbit saliva and fur, but hardly in urine (3–5). This major rabbit allergen has been recently identified as a member of the lipocalin superfamily of proteins (5). The main allergen of hare epithelium has a molecular weight similar to that of Ory c 1, and may be responsible for the extensive cross-reactivity between rabbit and hare epithelium.

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