

55th WEEKLY NEWSLETTER

USF INTERNAL MEDICINE & PEDIATRIC DIVISIONS OF ALLERGY AND IMMUNOLOGY

Next in the line of key historical articles of scientific impact in the medical literature is the paper on “Ferret Allergy” by Rosa Codina, PhD, Affiliate Associate Professor of Medicine, Division of Allergy and Immunology, Department of Internal Medicine.

From Rosa Codina, PhD:

This week’s scientific article entitled “Ferret Allergy”, published in the *Journal of Allergy and Clinical Immunology* in 2001, is a case report that describes for the first time allergy to an uncommon household pet. Rosa Codina, PhD, a faculty member, conducted the laboratory investigations with the assistance of Cristina Jaen, a visitor student at that time and now a PhD scientist; Daniel Reichmuth, MD, a fellow, and now a board-certified allergist; and Richard F. Lockey, MD, Director, Division of Allergy and Immunology, Department of Internal Medicine. The patient was evaluated and all in vivo tests were performed. This study created a precedent and clinicians are now aware that their patients can house uncommon pets and become sensitized to them. Case reports of allergy to uncommon pets have become prevalent during the past years.

With warm regards,

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Ferret allergy

To the Editor:

This is the first case report of a pet ferret (*Mustela putorius furo*) owner who experienced near fatal asthma after washing his ferret.

A 41-year-old man with a 2-year history of asthma had a pet male ferret in his home for 4 years. He had noted pruritus and erythema of the skin where the ferret touched him. On the day of presentation, the subject had performed some lawn work, and 10 minutes afterwards, he washed his ferret for the second time in 2 weeks. He developed severe asthma, which was thought to be caused by ferret exposure, requiring intubation and assisted ventilation for 2 hours. He had had a less severe asthma exacerbation 1 week prior, 5 minutes after washing his ferret for the first time.

Ferret hair was homogenized and extracted. Male and female ferret urine was dialyzed, and all ferret extracts (FEs) were sterilized by filtration. The protein content of the FEs was measured by a BCA protein assay (Pierce, Rockford, Ill).

Six nonatopic and 6 atopic control subjects were used. Specific IgE and IgG and skin tests with the 3 FEs and with common allergens were performed in the study subjects and control subjects with use of standard methods. Specific IgE was performed by RIA and specific IgG by ELISA. SDS-PAGE and Western blot for specific IgE binding were performed according to standard protocols.^{1,2}

The serum-specific IgE level to the 3 FEs was low, and the specific IgG level was comparatively high. Therefore IgG was adsorbed with a protein A column, and specific IgE and IgG levels and SDS-PAGE/Western blot were measured again.

The subject's skin test results were positive (wheal \geq 3 mm) to tree, grass, weed, mite, dog, and cat vaccines; results to ferret hair and male and female urine were +2 (erythema \geq 21 mm, wheal $<$ 3 mm), +3 (wheal $>$ 3 mm), and +2, respectively. The 6 atopic control subjects had positive test results to mites, with variable sensitivity to other allergens, and the 6 nonatopic control subjects had negative test results. All 12 controls had negative skin test results to FEs. The highest specific IgE in the subject's serum was to male urine, and specific IgE to the 3 FEs was higher in the IgG-depleted than in the whole serum (Table I).

TABLE I. Specific IgE and IgG to ferret hair and urine

Serum	Hair		Male urine		Female urine	
	IgE (%TCB)	IgG (OD)	IgE (%TCB)	IgG (OD)	IgE (%TCB)	IgG (OD)
Patient (whole)	1.45	1.471	5.8	1.458	1.5	1.692
Patient (IgG depleted)	7.1	0	13.6	0	7.6	0
Nonatopic controls (mean \pm SD)	0.2 \pm 0	0.06 \pm 0.048	0.18 \pm 0.02	0.059 \pm 0.047	0.3 \pm 0.19	0.192 \pm 0.256
Atopic controls (mean \pm SD)	0.23 \pm 0.05	0.067 \pm 0.059	0.23 \pm 0.05	0.05 \pm 0.052	0.3 \pm 0.1	0.132 \pm 0.06

%TCB, Percentage of total counts bound; OD, optical density.

The subject's IgE bound to 4 protein bands (molecular weights [MWs] of 103, 81, 28.8, and 14.8 kg/mol) in the male and female urine and to no bands in the hair Western blots. The IgG-depleted serum bound to 2 additional bands (MWs of 213 and 41.2 kg/mol) in the urine and to 2 bands (MWs of 81 and 10.1 kg/mol) in the hair Western blots.

This subject's acute asthma began minutes after he washed his ferret, the time frame expected for an immediate IgE reaction. However, an additive effect of outdoor allergens triggering life-threatening asthma exacerbation cannot be excluded.

In a separate case report, a subject allergic to mink, a mammal from the same family as ferret (Mustelidae), had positive skin tests and negative IgE results to the suspected allergens.³ In this study the specific IgG to ferret interfered with the specific IgE measurement. Therefore it is hypothesized that the mink-allergic subject's serum contained similar competing antibodies.

This study demonstrates high-MW allergens in ferret urine and hair. High-MW allergens have also been described in other mammals.^{4,5} Ferret allergens may sensitize and cause severe asthma in subjects in contact with them.

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