

Environmental and occupational disorders

Allergy to iguana

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Background: Furry animals produce allergens that can cause allergic rhinitis and asthma. In contrast, scaly animals, such as lizards, are assumed not to be allergenic. **Objective:** We sought to evaluate a 32-year-old man who complained of allergic rhinitis and asthma symptoms that occurred exclusively in his own home. He had dogs and cats at home but denied any increase in symptoms specifically associated with these pets. Skin prick testing initially performed to 42 common aeroallergens, including cat, dog, and house dust mite, elicited negative results. He later reported that the symptoms were worse on exposure to his pet iguanas. **Methods:** Skin prick tests were subsequently performed to an extract made from scales from his pet iguana. Extracts were also prepared from several zoo reptiles. Immunoassays for IgE antibody, as well as IgE immunoblots, were performed by using these extracts and the patient's serum. **Results:** The skin prick test result with the pet iguana scale extract was positive. The patient's serum contained IgE antibody to his own pet iguana and to a zoo iguana. **Conclusion:** Our patient's history, skin test results, and in vitro studies clearly demonstrate that he is allergic to iguana. Physicians should be aware that such allergy to scaly pets may occur and should not restrict history taking to questions about furry pets. (*J Allergy Clin Immunol* 2000;106:369-72.)

Key words: Allergy, allergic rhinitis, allergic asthma, aeroallergens, iguana, lizard, reptile, pets

Furry animals, such as pet cats and dogs and laboratory rats and mice, produce allergens that can cause allergic rhinitis and asthma.^{1,2} Allergens found in the dander,

hair, saliva, and/or urine of these animals become airborne, leading to sensitization and symptoms in predisposed individuals.³⁻⁵ In contrast, scaly animals, such as lizards, are assumed not to be allergenic. We report a patient allergic to his pet iguanas.

CASE REPORT

A 32-year-old man reported that he had nasal congestion, rhinorrhea, itchy eyes, cough, wheeze, and shortness of breath, which occurred exclusively in his own home. A review of his allergy questionnaire revealed a positive response to the question "Do you have any dogs, cats, or other furry pets?" He said he had two dogs and two cats but denied any increase in symptoms specifically associated with these pets. Skin prick testing elicited negative results to 42 common aeroallergens, including cat, dog, and house dust mite, with a positive histamine control. He was diagnosed as having nonallergic rhinitis and asthma. He returned 6 months later to report that he had now noted that the nose, eye, and chest symptoms were acutely worse on exposure to his two pet iguanas.

METHODS

Unweighed scales collected by the patient from his pet iguanas were pulverized with a mortar and pestle in 5 mL of normal saline for skin prick testing. Subsequently, scales were also collected from another iguana and several additional reptiles from the San Diego Zoo (courtesy of Mr John Kinkaid, Table I). The amount of material available from each animal varied widely from 3 to 450 mg. Scales were weighed, chopped with a spatula, and extracted 1:1 (wt/vol) or 1:10 (wt/vol) in PBS (pH 7.4) overnight at 4°C. Insoluble material was separated by using centrifugation. The protein contents of the reptile scale extracts were measured by using a modified ninhydrin assay with BSA as a standard.⁶

Solid-phase allergens were prepared by coupling the various reptile scale extracts to cyanogen bromide-activated paper discs, after which the discs were washed thrice with assay wash and stored in buffer containing human serum albumin to block any remaining binding sites. Allergen-coupled discs were reacted sequentially with serum from the patient or a healthy control individual and radiolabeled anti-human IgE, after which radioactivity bound to the discs was counted in an automatic gamma spectrometer.⁷ Radioactive binding greater than twice that produced by serum from the healthy control subject was considered elevated.

Reptile scale extracts were fractionated by electrophoresis in 12.5% acrylamide gels containing 1% SDS-PAGE. Gels were stained with Coomassie blue to visualize proteins. Duplicate unstained gels were blotted onto polyvinylidene fluoride membranes (Immobilon-P; Millipore Corp, Bedford, Mass) and probed with serum from the patient.⁸

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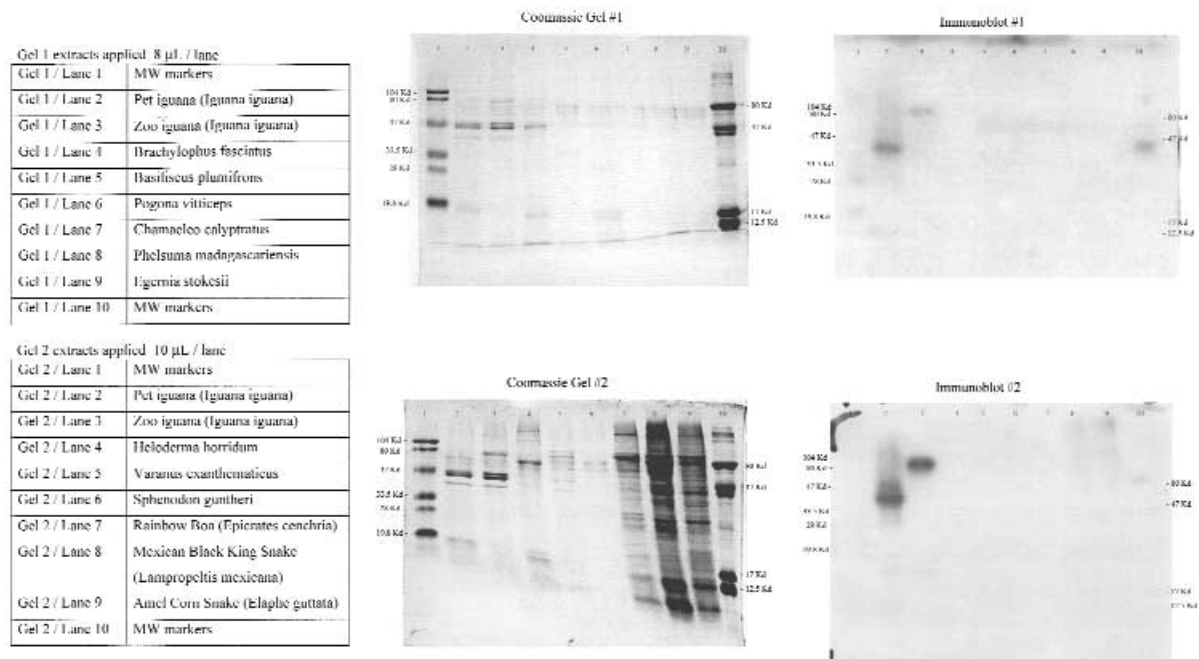


FIG 1. Gels for protein stains (Coomassie) and IgE immunoblots. MW, Molecular weight.

TABLE I. Taxonomy of reptiles tested

Order	Squamata (scaly reptiles)				
Suborder	Sauria (lizards)				
Infraorder	Iguania	Iguania	Iguania	Iguania	Iguania
Family	Iguanidae	Iguanidae	Iguanidae	Agamidae	Chamaeleonidae
Genus	<i>Iguana</i>	<i>Brachylophus</i>	<i>Basiliscus</i>	<i>Pogona</i>	<i>Chamaeleo</i>
Species	<i>Iguana iguana</i>	<i>Brachylophus fasciatus</i>	<i>Basiliscus plumifrons</i>	<i>Pogona vitticeps</i>	<i>Chamaeleo calytratus</i>
Common name	Green iguana	Fiji Island iguana	Green basilisk	Bearded dragon	Veiled chameleon
Order	Squamata (scaly reptiles)				
Suborder	Sauria (lizards)				
Infraorder	Gekkota	Scincomorpha	Platynota	Platynota	
Family	Gekkonidae	Scincidae	Helodermatidae	Varanidae	
Genus	<i>Phelsuma</i>	<i>Egernia</i>	<i>Heloderma</i>	<i>Varanus</i>	
Species	<i>Phelsuma madagascariensis</i>	<i>Egernia stokesii</i>	<i>Heloderma horridum</i>	<i>Varanus exanthematicus</i>	
Common name	Madagascar giant day gecko	Stokes' skink	Beaded lizard	Savannah monitor	
Order	Squamata (Scaly reptiles)				
Suborder	Serpentes (snakes)				
Superfamily	Henophidia	Xenophidia	Xenophidia		
Family	Boidae	Colubridae	Colubridae		
Genus	<i>Epicrates</i>	<i>Lampropeltis</i>	<i>Elaphe</i>		
Species	<i>Epicrates cenchria</i>	<i>Lampropeltis mexicana</i>	<i>Elaphe guttata</i>		
Common name	Rainbow boa	Mexican black king snake	Amel corn snake		
Order	Rhynchocephalia (tuataras)				
Suborder	Sphenodontida				
Family	Sphenodontidae				
Genus	<i>Sphenodon</i>				
Species	<i>Sphenodon guntheri</i>				
Common name	Gunther's tuatara				

TABLE II. Skin prick test results at 15 minutes

	Patient	Control
Iguana	7/35	0
Histamine	7/40	4/30
Saline	0	0

Values are given in millimeters of wheal response/millimeters of erythema response.

TABLE III. Protein determinations on reptile extracts used for PAGE and immunoblotting experiments

Gel No.	Lane No.	Reptile	Protein (μg/mL)
1	2	Pet iguana (<i>Iguana iguana</i>)	1072
2	2		
1	3	Zoo iguana (<i>Iguana iguana</i>)	455
2	3		
1	4	<i>Brachylophus fasciatus</i>	280
1	5	<i>Basiliscus plumifrons</i>	161
1	6	<i>Pogona vitticeps</i>	1080
1	7	<i>Chamaeleo calytratus</i>	<70
1	8	<i>Phelsuma madagascariensis</i>	107
1	9	<i>Egernia stokesii</i>	178
2	4	<i>Heloderma horridum</i>	280
2	5	<i>Varanus exanthematicus</i>	1001
2	6	<i>Sphenodon guntheri</i>	<70
2	7	<i>Epicrates cenchria</i>	1411
2	8	<i>Lampropeltis mexicana</i>	6744
2	9	<i>Elaphe guttata</i>	5069

TABLE IV. Immunoassay for IgE antibody

Pet iguana	1104%
Zoo iguana	1188%
<i>Varanus exanthematicus</i>	417%
Seven other lizards, 1 tuatara, and 3 snakes	<200%

Results greater than 200% (compared with negative control serum) are considered positive.

RESULTS

The skin prick test result for iguana was positive for the patient, and there was no response for the control subject (Table II). Protein concentrations of the reptile extracts are shown in Table III. Immunoassay results for IgE antibody were strongly positive for extracts made from the patient's iguana and an iguana from the zoo and moderately positive to one additional lizard. Similar assay results were negative to 7 other lizards, 1 tuatara, and 3 snakes (Table IV). Immunoblots for IgE antibody revealed heavy bands at 40 kd to the patient's iguana and 80 kd to the zoo iguana (Fig 1). A very light band was also seen at 80 kd to the other lizard that had caused the moderately positive immunoassay.

DISCUSSION

We are aware of only one previous report (in German) of allergy to a scaly reptile.⁹ Our patient's history and results of skin tests and in vitro studies clearly demonstrate that he is allergic to iguanas.

A second patient subsequently reported allergic rhinitis symptoms and severe asthma symptoms around iguanas and stated that the symptoms were much worse around male compared with female iguanas. Male iguanas have much larger femoral pores, which secrete a substance to mark the animal's territory. Elevated IgE antibody to an extract made from iguana femoral pore secretions was demonstrated in the serum from this second patient (521% of negative control) and from the patient who is the main subject of this report (691% of negative control). This offers a potential explanation of the second patient's symptoms being worse around male iguanas.

Presumably, some material shed from the lizards (scales, femoral pore secretions, urine, and/or stool) contain allergens that become dried and airborne on particles of appropriate size to cause sensitization and symptoms. These allergens have not been further characterized. The first patient makes IgE antibodies that recognize an 80-kd protein in scale extract from the zoo iguana and a 40-kd protein in scale extract from his pet iguana. The 80-kd band may represent a dimer of the 40-kd band, or the 40-kd band may represent a cleavage product of the 80-kd band.

To conclude, physicians should be aware that allergy to scaly pets may occur. If allergy history taking is limited to questions about furry pets, such allergy may go undiagnosed.

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