

ous studies have found a positive relationship between pet ownership and allergic disease, leading to the widely accepted recommendation of refraining or removal of pets from the home. The current study, as well as others, found that pet ownership may have a protective effect against the development of allergic disease. Children who were exposed to pets at birth had a lower prevalence of allergic rhinitis, asthma, and infant eczema, although this study did not account for those families who did not own pets because of a family history of atopy. This would lead to selection bias because those families without a history of atopy would be more likely to own pets. Also, the number of participants with pet exposure was low (22%), and results may differ in a population with a higher prevalence of pet ownership.

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ASSOCIATION OF SPECIFIC ALLERGEN SENSITIZATION WITH SOCIOECONOMIC FACTORS AND ALLERGIC DISEASE IN A POPULATION OF BOSTON WOMEN

Lewis SA, Weiss ST, Platts-Mills TAE, Syrin BA, Gold DR. *J Allergy Clin Immunol.* 2001;107:615–622

Purpose of the Study. To establish the prevalence and socioeconomic pattern of allergic disease as well as the pattern of allergen sensitization to markers of socioeconomic status (SES).

Study Population. Participants were mothers ($n = 458$) of children in the Epidemiology of Home Allergen and Asthma Study (a longitudinal birth and family cohort study) with the following inclusion criteria: 1) delivered a child between September 1994 and June 1996 in Boston, Massachusetts, 2) ability to speak English or Spanish, and 3) mother or father had a doctor's diagnosis of asthma, hayfever, or allergen sensitivity.

Methods. Markers of race, SES, and diagnosis of asthma, hay fever, or allergy were elicited by questionnaire. Using 1990 US Census data, a marker of poverty in the zip code of residence was evaluated in terms of the proportion of the population living below the poverty level. Serum was collected for total immunoglobulin (IgE) and specific IgE to mites, cat, cockroach, dog, ryegrass, ragweed, *Alternaria*, and *Aspergillus* using the UNICAP system.

Results. The population was 18 to 46 years old, mostly white (79%), educated to a college level or above (78%), and lived with a household income $> \$50,000$ (70%). Only 5% smoked. Hayfever was reported in 43%, asthma in 31%, and eczema in 22%. When restricted to women with allergic disease and/or asthma, asthma was more common in areas of poverty while hayfever was more common in areas of affluence ($P = .007$). Eczema was not related to any markers of SES. Allergen sensitivity was found in 60%, with mite the commonest (36%) and *Aspergillus* the rarest (4%). Multiple sensitivities were typical, while only mite allergy occurred commonly as a sole sensitivity. Eleven percent had cockroach sensitivity with 94% also sensitive to 1 or more other allergens. Subjects living in areas of greatest poverty were at greatest risk for allergen sensitivities with cat, ragweed, and dog sensitivity common in high poverty areas. Sensitivity to cockroach allergen was much higher in relation to area poverty ($P < .001$). Sensitivities to mite and mold were equally common across all markers of SES. Ryegrass was the only allergen more common with markers of high SES. The mean total IgE levels

was higher across areas of poverty ($P < .001$). Allergen sensitivity was increased in women of household incomes $< \$50,000$. Asthma was significantly associated with cockroach, mite, and dander sensitivity, especially in those with higher specific IgE levels. Hayfever was associated with ragweed, ryegrass, and cat sensitivities. Eczema correlated with allergen sensitivity, but not to any specific allergen.

Conclusions. A socioeconomic gradient was demonstrated showing that the poorest had higher total and specific IgE levels, increased allergen sensitization, and asthma. Cockroach, cat, dog, and ragweed sensitivities were higher in the poorer areas, with additional risk the higher the specific IgE level. An increased risk for asthma was associated with cat, dog, and cockroach sensitivity. In contrast to asthma, hayfever was found to be more common in areas of affluence.

Reviewers' Comments. In the United States, asthma prevalence is highest in the inner cities while in Europe asthma and allergic disease has been associated with greater affluence. This study provides a possible mechanism for the association of asthma and lower SES in the United States. Increased exposures to allergens may explain the increased incidence of asthma in the inner-city.

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FOOD ALLERGY

THE NATURAL HISTORY OF PEANUT ALLERGY

Skolnick H, Conover-Walker MK, Koerner C, Sampson H, Burks W, Wood RA. *J Allergy Clin Immunol.* 2001;107:367–374

Purpose of the Study. It has traditionally been thought that peanut allergy, once established, almost always lasts lifelong. These investigators sought to determine the frequency with which peanut allergy is actually outgrown and identify any characteristics in these children that might predict this tendency.

Study Population. A total of 223 patients with a diagnosis of peanut allergy were identified by chart review in two tertiary care allergy clinics and one private practice. Patients were determined to be peanut allergic if they had a positive history and positive results to a skin test, radioallergosorbent test (RAST) or challenge; or in some cases positive tests in the absence of any known exposure.

Methods. A questionnaire was administered to all study patients that detailed the nature of the reaction, age of onset, any other food sensitivities and their resolution or lack thereof, and history of other atopic diseases. Most patients were skin tested for peanut, and CAP RASTs were obtained. Patients with histories of strictly cutaneous symptoms after peanut ingestion and RASTs < 20 kU/L were asked to participate in peanut challenges. Those with histories of more severe reactions were asked to participate in challenges only if RASTs were < 10 kU/L. Both double-blind, placebo-controlled and open food challenges were used. All negative challenges were confirmed by open challenge.

Results. Seventy-five percent of the patients had a history of acute reaction to peanut, while 5% had positive peanut skin tests or RASTs and a history of marked improvement in atopic dermatitis with a peanut-restricted diet. Approximately 25% had positive test(s) but were not known to have ever ingested peanut. Of the 223 patients (ages 4–20 years) evaluated, 126 were eligible for challenges, and 85 subsequently underwent such challenges.

Forty-eight (21.5%) had negative results, and 37 reacted. Peanut RASTs of those who underwent challenges were different for those who passed (median 0.69 kU/L) versus those who failed (median 2.06 kU/L) at time of challenge but not a time of diagnosis. Patients who had negative challenges were significantly more likely to have had an initial reaction with involvement of the skin alone than those with ongoing peanut allergy. Yet, 17% of those with cutaneous only reactions had RASTs >20 kU/L and therefore were ineligible for challenge. One child with a reaction involving cutaneous, respiratory, and gastrointestinal systems outgrew his allergy. Six patients with negative RASTs had positive challenges that ranged from simple cutaneous to multisystem involvement.

Conclusions. Peanut allergy is outgrown in approximately 22% of children, especially in those with histories of cutaneous only reactions and with currently low peanut RASTs. Although children with initial RASTs >10 kU/L are unlikely to lose their sensitivity, younger patients should have RASTs monitored annually until at least age 4 years. Challenges in controlled settings should be offered to appropriate patients, because the benefit provided to those who are no longer allergic clearly outweighs the risk of a carefully performed challenge.

Reviewer's Comments. This reviewer recently peanut challenged a 4-year-old asthmatic girl with a history of persistent cow milk allergy, distant history of positive peanut puncture skin test, no known lifetime exposure to peanut, and currently negative peanut RAST, with resultant biphasic anaphylaxis. Earlier studies have shown that asthma is a major risk factor for life-threatening allergic reactions to peanut, yet any asthmatic children lost their peanut sensitivity in this study. These various observations do not suggest less aggressive avoidance measures or less diligence with adrenaline contingency plans; but closer monitoring of peanut immunoglobulin E with an eye toward ultimate challenge in qualifying children. Does avoidance of peanut at a critical time in life in sensitized children truly alter the natural history of this allergy in some? Also, it would be interesting to know if the natural history of peanut allergy is different in that smaller group of persons who begin with such sensitivity in adulthood.

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THE NATURAL HISTORY OF PEANUT ALLERGY IN YOUNG CHILDREN AND ITS ASSOCIATION WITH SERUM PEANUT-SPECIFIC IgE

Vander Leek TK, Liu AH, Stefanski K, Balcker B, Bock SA. *J Pediatr.* 2000;137:749–755

Purpose of the Study. To characterize adverse reactions after accidental peanut exposure in young children with peanut allergy and to determine the usefulness of serum peanut-specific immunoglobulin E (IgE) levels during follow-up.

Study Population. One hundred two children were identified who had clinical peanut hypersensitivity before 4 years of age. Inclusion criteria included 1) a convincing history of clinical peanut hypersensitivity and/or a positive double-blind, placebo-controlled food challenge (DB-PCFC) response to peanuts and 2) a positive skin prick test response to peanuts.

Methods. Research subjects were contacted at least yearly to track adverse reactions caused by accidental exposure to peanuts. Nineteen participants discontinued their participation in the study or were lost to follow-up, leaving 83 for inclusion in the analysis. Peanut-specific

serum IgE levels were determined in 51 of 83 subjects using the Pharmacia CAP system (Uppsala, Sweden).

Results. Thirty-one of 53 (58%) of the subjects followed for 5 years experienced adverse reactions from accidental peanut exposure. Regardless of the nature of their initial reaction, the majority with subsequent reactions (31/60; 52%) experienced potentially life-threatening symptoms. The group with isolated skin symptoms (11/51; 22%) had lower serum peanut-specific IgE levels (median: 1.25 kUa/L vs 11.65 kUa/L; $P = .004$; Wilcoxon rank sum) than the group with respiratory and/or gastrointestinal symptoms (40/51; 78%). There was no threshold level below which only skin symptoms appeared to occur. Of note, 4 subjects had negative DBPCFC results to peanuts during the follow-up period.

Conclusions. The majority of children with peanut allergy followed for up to 5 years will have adverse reactions from accidental peanut exposure. Symptoms may not be consistent with symptoms reported during initial reactions. A minority of children with peanut allergy can lose their clinical hypersensitivity.

Reviewer's Comments. This report addresses 2 common questions asked by parents of children with peanut allergy: a) will the reactions become progressively worse? and b) will the reactions ever subside? Despite appropriate counseling on peanut avoidance, the majority of the children experienced an accidental peanut ingestion during follow-up. Moreover, initial clinical reactions involving only the skin can subsequently progress to involve the respiratory and/or gastrointestinal systems. A minority of subjects with low serum peanut-specific IgE levels developed oral tolerance to peanut. This investigation has expanded the growing body of evidence in this research area and has provided practical clinical information for addressing allergic reactions to peanuts. With the inevitability of accidental ingestions, the general trend for worsening of clinical reactions with subsequent exposures, and the inability to predict severity of future reactions, the take-home messages should be that all patients with peanut allergy need proper education about the potential seriousness of future accidental exposures and self-injectable epinephrine to manage future, severe allergic reactions.

A VOLUNTARY REGISTRY FOR PEANUT AND TREE NUT ALLERGY: CHARACTERISTICS OF THE FIRST 5149 REGISTRANTS

Sicherer SH, Furlong TJ, Munoz-Furlong A, Burks AW, Sampson HA. *J Allergy Clin Immunol.* 2001;108:128–132

Purpose of the Study. To define features of peanut (PN) and tree nut (TN) allergy among 5149 members of a voluntary registry.

Study Population. Food-allergic subjects ($n = 5149$) were enrolled from May 1977 to May 2000, with 75% voluntarily registered through membership in the Food Allergy and Anaphylaxis Network (FAAN) and 25% recruited by physicians. Eighty-nine percent of the registrants were children <18 years of age (median age = 5 years; 67% male). Only 16 individuals were ≥ 65 years of age (28% male).

Methods. A structured questionnaire was distributed to 7000 lay members and 1000 health professional members of the FAAN, as well as to 4000 members of the American Academy of Allergy, Asthma, and Immunology (AAAAI). Participants or parental surrogates provided demographic information and details about allergic reactions to PNs and TNs. Data were analyzed by χ^2 analysis.

The Natural History of Peanut Allergy

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