



Letter

Prevalence and characteristics of food allergy in urban minority adults

Recent estimates suggest the prevalence of food allergies to be 3% to 4%; however, little is known about prevalence of food allergy in adults.^{1–4} In adults, food allergy may reflect persistence of pediatric food allergy or *de novo* sensitization to food allergens encountered after childhood. Because many knowledge gaps exist for food allergy in adults,⁵ we sought to determine the prevalence and characteristics of food allergy in a general internal medicine clinic that serves an urban, low-income minority population.

A retrospective review of electronic medical records from the general internal medicine hospital-based clinic at Mount Sinai Hospital between July 1, 2008, and July 1, 2010, was performed. Medical records with the diagnosis codes 693.1 (food allergy), v15.01 (personal history of allergy to peanut), v15.02 (personal history of allergy to milk products), v15.03 (personal history of allergy to eggs), v14.04 (personal history of allergy to seafood), v15.05 (personal history of allergy to other foods), and/or 995 (anaphylaxis) and/or epinephrine autoinjector prescription were examined because these indicated a visit associated with a food allergy diagnosis or treatment plan. Medical records were reviewed for demographics, food allergy history, other allergic history, and food allergy management. Medical records were excluded from analysis if there was no clear documentation of a food allergy–associated visit or epinephrine was prescribed for a non–food allergy reason. Anaphylaxis was defined according to national guidelines.⁶ This study was approved by the Icahn School of Medicine at Mount Sinai Institutional Review Board with a waiver of consent.

Statistical analysis was performed with GraphPad software (GraphPad Software, La Jolla, California). The χ^2 and Fisher exact tests were used as appropriate. Odds ratio and 95% confidence intervals were calculated using MedCalc software (MedCalc Software, Ostend, Belgium).

During the study period, 20,747 patients were seen in this predominantly minority clinic, which primarily accepts Medicaid managed care. Most were female (64%) and African American (32%) or Hispanic (18%); 32% of patients were of unknown or other race. The medical records of 363 individuals met search criteria. A total of 212 medical records were excluded; 19 medical records were excluded because food allergy was ruled out by an allergy specialist, 176 were prescribed an epinephrine autoinjector for non–food allergy reasons (eg, angioedema, drug reaction, immunotherapy, asthma, or venom allergy), and 17 lacked any documentation of food allergy. Included in the final analysis were 151 adults with physician-documented food allergy (Table 1).

Disclosures: Authors have nothing to disclose.

Funding: Dr Wang is funded in part by grant K23 AI083883 from the National Institutes of Health, National Institute of Allergy and Infectious Diseases. The study was conducted under “Prevalence and Characteristics of Food Allergy in Inner-City Adults” GCO 12-0574, funded by the Icahn School of Medicine at Mount Sinai.

The prevalence of physician-documented food allergy in this population was 0.73%, and 26% had multiple food allergies. The median age was 44 years (range, 23–81 years). Most were female (83%), 44% were black, and 33% were Hispanic. Comorbid allergic disease was common: 56% had asthma, 68% had allergic rhinitis, 43% had a drug allergy, and 12% had atopic dermatitis.

Overall, shellfish allergy was most prevalent (52%), followed by allergies to peanut (23%), fruit (21%), tree nuts (20%), and fish (7%). A history of food-induced anaphylaxis was documented in 17.2%. A trend for a lower rate of food-induced anaphylaxis was seen for blacks compared with nonblacks (10.4% vs 28.6%, $P = .054$). Shellfish was the trigger for 61%, and peanut was implicated for 26%.

Respiratory reactions (cough, shortness of breath, wheezing, or nasal congestion) were the most frequent food allergic reaction, with shellfish accounting for 51% of these. Respiratory symptoms were also commonly reported for peanut and tree nuts. Cutaneous symptoms (urticaria, atopic dermatitis, or rash) were the second most common symptom for any food, and gastrointestinal reactions (nausea, vomiting, diarrhea, or oral pruritus) were uncommon (2% of reactions).

A total of 59.6% had documentation of a referral to an allergy specialist, and 86.7% of these (51.7% overall) completed visits with an allergy specialist. Most had documentation of an epinephrine autoinjector prescription (80.1%). Of these, 62.5% were prescribed by the primary care physician, 32.5% by the allergy specialist, and the remaining by other specialist physicians. Only 3% had written emergency action plans documented in the medical record.

This study explores prevalence and characteristics of adult food allergy using medical record documentation of food allergy, which we recognize has limitations. These limits include the retrospective nature of this study, the referring physician’s knowledge base of food allergy, lack of documented clinical reactivity for foods in some patients, and the possibility of errors inherent to documentation in electronic medical record systems, such as miscoding or incomplete physician documentation. Patient lack of awareness of food allergy is another possibility, although this seems unlikely given that most overreport food allergies (up to 35% of the general population self-report having a food allergy).⁷ Furthermore, young adults may not be visiting a physician regularly, possibly underestimating the prevalence. This hospital is a known referral center for food allergy; thus, greater awareness of food allergy likely exists at this medical center, leading to higher food allergy diagnosis rates than at other institutions, affecting the generalizability of our data. A major limitation in assessing food allergies by race was that 32% of patients in the clinic had race documented as “other/unknown,” which is often due to a multiracial status.

The major strength of this study is the large number of participants, with more than 20,000 adults attending this internal medicine clinic during a 2-year period. Furthermore, use of physician documentation is a more accurate measure of food allergy than

Table 1
Demographics and characteristics of the study patients

Characteristic	Patients, % ^a
All Patients (N = 20,747)	
Sex, % female	64
Race/ethnicity	
African American	32.1
Hispanic/Latino	17.7
White	15.6
Asian	2.8
Native American	0.28
Pacific Islander	0.09
Unknown/other	31.5
Electronic medical records fulfilling search criteria	1.75 (n = 363)
Patients with food allergy diagnosis after medical record review	0.73 (n = 151)
Patients With Food Allergy (n = 151)	
Age, median (range), y	43.7 (23.0–81.4)
Patients reporting >1 food allergy	26.5
Prevalence by food	
Shellfish	52.0
Peanut	22.5
Fruit	21.2
Tree nut	20.0
Fish	7.3
Egg	4.0
Nonspecific nut	3.3
Vegetable	3.3
Not documented	3.3
Other	3.3
Soy	2.7
Seed	2.0
Milk	1.3
Seafood	0.7
Wheat	0
History of food-induced anaphylaxis	17.2
Documentation of epinephrine autoinjector	80.1
Referred to an allergist	59.6
Seen by an allergist	51.7
Asthma	56.3
Asthma in patients with shellfish allergy	51.8
Asthma in patients with peanut allergy	29.4
Allergic rhinitis	67.5
Drug allergy	43.0

^aData are presented as percentage of patients unless otherwise indicated.

the use of food specific IgE or self-reported allergy alone. Allergies to all foods were included in the analysis, and the medical records provided additional information regarding severity of reactions, food allergy management, and other atopic disorders.

In conclusion, data have been lacking on food allergies in urban minority adults, and this is the largest study, to our knowledge, to examine physician-documented food allergies in this population. The prevalence appears lower than expected based on recent reports.⁸ Our results also indicate a need for improvements in food allergy management. Although nearly 80% of adults with physician-documented food allergy had epinephrine autoinjector prescriptions in the medical record, few had a written emergency action plan for food allergy documented. Educational interventions

should be aimed at raising internal medicine physicians' awareness of the National Institute of Allergy and Infectious Diseases food allergy guidelines⁶ and online resources where food allergy action plans and educational materials can be accessed quickly. Patients and physicians should be aware of the importance of an accurate diagnosis of food allergy because unnecessary avoidance of foods may have nutritional, economic, and social effects.^{9–11} Furthermore, food allergy education is essential to ensure appropriate allergen avoidance and emergency management for allergic reactions. Additional studies are needed to further examine the racial and ethnic differences in food allergy prevalence and triggers, identify possible risk factors in these groups, and improve food allergy management.

Shradha Agarwal, MD*

Julie Wang, MD†

*Division of Allergy and Clinical Immunology
Department of Medicine
Icahn School of Medicine at Mount Sinai
New York, New York

†The Elliot and Roslyn Jaffe Food Allergy Institute
Division of Allergy and Immunology
Department of Pediatrics
Icahn School of Medicine at Mount Sinai
New York, New York
shradha.agarwal@mssm.edu

References

- [1] McGowan EC, Keet CA. Prevalence of self-reported food allergy in the National Health and Nutrition Examination Survey (NHANES) 2007–2010. *J Allergy Clin Immunol*. 2013;132:1216–1219.e5.
- [2] Sampson HA. Update on food allergy. *J Allergy Clin Immunol*. 2004;113:805–819.
- [3] Soller L, Ben-Shoshan M, Harrington DW, et al. Overall prevalence of self-reported food allergy in Canada. *J Allergy Clin Immunol*. 2012;130:986–988.
- [4] Sicherer SH. Epidemiology of food allergy. *J Allergy Clin Immunol*. 2011;127:594–602.
- [5] Bock SA, Munoz-Furlong A, Sampson HA. Further fatalities caused by anaphylactic reactions to food, 2001–2006. *J Allergy Clin Immunol*. 2007;119:1016–1018.
- [6] Boyce JA, Assa'ad A, Burks AW, et al. Guidelines for the diagnosis and management of food allergy in the United States: report of the NIAID-sponsored expert panel. *J Allergy Clin Immunol*. 2010;126(6 suppl):S1–S58.
- [7] Rona RJ, Keil T, Summers C, et al. The prevalence of food allergy: a meta-analysis. *J Allergy Clin Immunol*. 2007;120:638–646.
- [8] Liu AH, Jaramillo R, Sicherer SH, et al. National prevalence and risk factors for food allergy and relationship to asthma: results from the National Health and Nutrition Examination Survey 2005–2006. *J Allergy Clin Immunol*. 2010;126:798–806.e13.
- [9] Infante D, Tormo R. Risk of inadequate bone mineralization in diseases involving long-term suppression of dairy products. *J Pediatr Gastroenterol Nutr*. 2000;30:310–313.
- [10] Patel DA, Holdford DA, Edwards E, Carroll NV. Estimating the economic burden of food-induced allergic reactions and anaphylaxis in the United States. *J Allergy Clin Immunol*. 2011;128:110–115.e5.
- [11] Jansson SA, Heibert-Arnlin M, Middelvel R, et al. Health-related quality of life, assessed with a disease-specific questionnaire, in Swedish adults suffering from well-diagnosed food allergy to staple foods. *Clin Transl Allergy*. 2013;3:21.