STUDY POPULATION. Twelve public elementary schools from an urban metropolitan area in the northeastern United States were included. Children with asthma attending these schools were then recruited for participation in the study.

METHODS. Settled dust and airborne samples from 12 schools were analyzed for indoor allergens using multiplex array technology. School samples were linked to students with asthma enrolled in the School Inner-City Asthma Study, and settled dust samples from these students’ homes were analyzed similarly for indoor allergens.

RESULTS. Two hundred twenty-seven settled dust samples and 117 airborne dust samples were collected from schools. Settled dust samples (n = 118) were collected from homes. There were higher levels of dog, cat, and mouse allergens in settled dust samples from schools compared with homes (545% higher for mouse, P = .001; 198% higher for cat, P = .0033; 144% higher for dog, P = .0008). However, on average, for both schools and homes, the levels of dog and cat allergens were much lower than those found in households with pets (geometric means: Canis familiaris allergen 1 0.08 vs 0.03 μg/g; Felis domesticus allergen 1 0.19 vs 0.06 μg/g). Airborne and settled dust mouse allergen levels in classrooms were moderately correlated (r = 0.48, P < .0001). In general, dust mite levels were low in both home and school samples, but higher in the home samples (geometric means: Dermatophagoides farinata allergen 1 allergen 0.08 vs 0.04 μg/g; Dermatophagoides pteronyssinus 1 allergen 0.02 vs 0.01 μg/g). For cockroach allergen, there was no difference between school and home samples, and the levels were almost undetectable in both locations.

CONCLUSIONS. There were higher levels of mouse, cat, and dog settled dust allergen levels in schools versus homes of asthmatic students from an urban metropolitan area. Cockroach and dust mite allergens were present at undetectable to low levels across sites. Mouse allergen levels were highest overall, and aerosolization of mouse allergen in classrooms may be a significant exposure for students because levels of mouse allergen were correlated in settled dust and airborne samples from classrooms.

REVIEWER COMMENTS. This is the first study to compare indoor allergen levels in schools versus homes of children with asthma. Most studies of indoor allergen exposures focus on the home environment, particularly the bedroom because this is considered to be the main site of allergen exposure, especially during sleep. This study demonstrates that school may be another important site of exposure to indoor allergens, particularly mouse allergen. Mouse allergen has been implicated as a contributor to asthma morbidity in school-age children in other studies. Additional studies are needed to better understand the role of school allergen exposures on asthma morbidity among children with asthma.

Persistent Pollen Exposure During Infancy Is Associated With Increased Risk of Subsequent Childhood Asthma and Hayfever


PURPOSE OF THE STUDY. To determine if exposure to higher concentrations of pollen within the first 3 to 6 months of life increases the risk of eczema, sensitization to food or aeroallergens at 2 years old, and asthma or hayfever at 6 to 7 years old.

STUDY POPULATION. The study used the Melbourne Atopy Cohort Study, a longitudinal birth cohort study, comprising 620 participants who were enrolled before birth. Children were born between 1990 and 1994 and had a family history of allergic disease in at least 1 first-degree relative.

METHODS. Researchers identified those born “inside” or “outside” pollen season (defined as September to January in Melbourne) and used daily pollen counts to calculate cumulative pollen exposure in the first 6 months of each child’s life. Using logistical regression models, they examined the cohort at 2 years old for associations of pollen exposure with eczema or allergic sensitization (skin prick test >3 mm to at least 1 of the following: cow’s milk, egg white, peanut, house dust mite, rye grass, and cat dander) and again at 6 to 7 years for diagnoses of asthma or hayfever.

RESULTS. At age 2 years, birth during pollen season was not associated with eczema or with sensitization to food or aeroallergens; however, cumulative exposure to pollen at 6 months was associated with aeroallergen sensitization with the highest risk being at 3 months (adjusted odds ratio [aOR] = 1.34, 95% confidence interval [CI] 1.06–1.72, P < .05). Cumulative exposure at 6 months was associated with hayfever (aOR = 1.14, 95% CI 1.009–1.29, P < .05), and exposure at 4 to 6 months was associated with asthma only (aOR = 1.35, 95% CI 1.07–1.72, P < .05). Cumulative exposure at 6 months increased odds of hayfever, asthma, and both hayfever and asthma (P < .05).

CONCLUSIONS. Persistent exposure to pollen in infancy appears to increase risk of developing asthma and hayfever later in life.

REVIEWER COMMENTS. This study is the first to show an association between early continuous pollen exposure and subsequent development of asthma and hayfever later in childhood. Interestingly, children without family history of asthma were also noted to have an increased risk of allergic disease if born inside pollen season. Given
ambient pollen exposure, the usefulness of avoidance recommendations to modify risk is unclear, however.


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ANAPHYLAXIS

Galactose-α-1,3-galactose and Delayed Anaphylaxis, Angioedema, and Urticaria in Children

PURPOSE OF THE STUDY. To determine whether immunoglobulin E (IgE) antibody to galactose-α-1,3-galactose (α-Gal) is present in the sera of pediatric patients who report idiopathic anaphylaxis or urticaria 3 to 6 hours after eating beef, pork, or lamb.

STUDY POPULATION. Children aged 4 to 17 years with a history suggestive of delayed anaphylaxis, urticaria, or angioedema (N = 51) were enrolled in an institutional review board–approved protocol at the University of Virginia and private practice offices in Lynchburg, Virginia.

METHODS. Sera were obtained and analyzed by using ImmunoCAP (Phadia, Inc, Uppsala, Sweden) for total IgE and specific IgE to α-Gal, beef, pork, cat epithelium and dander, Fel d 1, dog dander, and milk.

RESULTS. A total of 45 children were identified who had both clinical histories supporting delayed anaphylaxis or urticaria to mammalian meat and IgE antibodies specific for α-Gal. Most of these children also had a history within the last year of tick bites that itched and persisted.

CONCLUSIONS. A new form of anaphylaxis and urticaria that occurs 3 to 6 hours after eating mammalian meat is not uncommon among children in the Virginia area. The diagnosis should be suspected in children with a suggestive history living in the area in which the Lone Star tick is common, and the diagnosis should be confirmed by specific serologic testing.

REVIEWER COMMENTS. IgE response to α-Gal leading to delayed anaphylaxis or urticaria after eating meat is unlike any other known IgE-mediated food allergy, in which symptoms are typically immediate, often within seconds to minutes after ingestion. Most commonly, α-Gal responses occur after ingestion of beef, pork, or lamb but can occur even after milk ingestion. The authors point out that the history in a given patient is not always consistent, and they speculate that this finding is likely due to several factors, including amount of meat ingested, inconsistencies in the digestive process, and how the meat has been treated (eg, mechanical, thermal, freezing). Of interest, 90% of α-Gal patients with this syndrome report tick bites in the year before their first delayed meat reaction. Affected patients report marked pruritus at the site of bite(s) that often persists for weeks. This finding seems to suggest that tick bites may cause initial sensitization to α-Gal.

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Clinical Features of Children With Venom Allergy and Risk Factors for Severe Systemic Reactions

PURPOSE OF THE STUDY. The authors sought to analyze the clinical features and identify the risk factors associated with children who developed severe systemic reactions to insect sting venom.

STUDY POPULATION. A total of 76 Turkish children (57 boys, mean age 9.8 ± 3.4 years) with systemic reactions to Hymenoptera (honeybee or wasp) stings were recruited from a pediatric allergy outpatient center.

METHODS. Sting victims and their parents identified the insect through wasp and bee picture cards. The extent and severity of the allergic reaction, treatment intervention, and demographic data were documented. Immunoglobulin E (IgE)-mediated venom allergy was identified via allergy skin testing and/or specific IgE testing. Additional evaluation included atopic disease (asthma and/or allergic rhinitis) assessment, aeroallergen skin-prick testing, total IgE level, and eosinophil counts performed at least 2 weeks after the sting reaction.

RESULTS. Overall, 58 (76%) children reacted to Vespula (wasp) stings and 18 (24%) reacted to Apis mellifera (bee) stings. Severe systemic reactions occurred in 45 (59.2%) patients; 20 (26.3%) had aeroallergen sensitization and 25 (32.9%) had atopic disease (allergic rhinitis and/or asthma); 65.8% had experienced previous stings; 95% were admitted to the emergency department; and epinephrine was used in only 46%. The upper limb was the most frequent area stung (43.4%). Cutaneous reaction occurred in 98.9%, but respiratory (74.7%), gastrointestinal (41.3%), and cardiovascular (40.0%) symptoms also occurred. Specific IgE to wasp and bee venom was positive in 87% and 45% of children, respectively, and skin testing to wasp and bee venom was positive in 89% and 37%, respectively. No statistically significant correlations were found between severity of reaction and either testing method. Eosinophilia (>5% eosinophils), female gender, and associated atopic disorder were significant risk factors for severe systemic reactions.
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