

Maternal Antenatal Peanut Consumption and Peanut and Rye Sensitization in the Offspring at Adolescence

Kemp AS, Ponsonby AL, Dwyer T, Cochrane JA, Pezic A, Jones G. *Clin Exp Allergy*. 2011;41(2):224–231

PURPOSE OF THE STUDY. To examine the influence of antenatal peanut ingestion on peanut and rye sensitization.

STUDY POPULATION. The 373 participants were drawn from a cohort of 1437 children born in Tasmania in 1988 and 1989, selected from all births for being at elevated risk of sudden infant death syndrome. Those who were not lost to follow-up and who subsequently agreed to participate at age 8 in studies on bone density, blood pressure, high-density lipoprotein cholesterol, and vitamin D and at age 16 in a study of bone health and allergy were included.

METHODS. The mothers completed a hospital interview shortly after delivery that included a food-frequency questionnaire of diet in the third trimester and family history of asthma. Those mothers who ingested peanut at least once per month were regarded as eating peanut. Peanut and rye sensitization at age 16 were determined by using the ImmunoCAP test (Phadia, Uppsala, Sweden). An allergen-specific immunoglobulin E (IgE) level of >0.35 kU of antibody (kU_A)/L was regarded as a positive result.

RESULTS. The peanut sensitization rate was 14%. In the entire cohort ($N = 310$), there was no association between antenatal peanut ingestion and peanut sensitization ($P = .17$). However, there was a strong association between antenatal peanut ingestion and decreased risk of rye sensitization and peanut sensitization in those ($n = 201$) without a family history of asthma (rye odds ratio [OR]: 0.30 [95% confidence interval (CI): 0.14–0.63], $P = .001$; peanut OR: 0.18 [95% CI: 0.04–0.78], $P = .02$). There was an increased risk of rye sensitization in those ($n = 108$) with a family history of asthma and antenatal peanut ingestion (rye OR: 2.69 [95% CI: 1.11–6.51], $P = .03$). It was considered that these sensitizations were likely to be related to the presence of IgE antibodies to cross-reacting carbohydrate epitopes common to rye and peanut allergens, which are not the epitopes thought to typically contribute to clinical disease.

CONCLUSIONS. Antenatal peanut ingestion might influence the development of IgE antibody to cross-reacting carbohydrate epitopes in later life, and avoidance might inadvertently increase sensitization in some people. Genetic factors might modify this association.

REVIEWER COMMENTS. This study is the first to obtain prospective data on antenatal peanut consumption in a population-based cohort rather than one with a family history of allergy. Selection bias is likely to have been limited, because the subjects were initially recruited for a study

of nonatopic conditions, but there was a substantial loss to follow-up that might have introduced unrecognized bias. The fact that the results were not significant overall, but were significant and meaningful when considered according to family history of asthma, adds to the evidence that the relationship between sensitization and disease, and antenatal and early life exposure to allergens, is complex and depends on multiple factors.

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Oral Food Challenges in Children With a Diagnosis of Food Allergy

Fleischer DM, Bock SA, Spears GC, et al. *J Pediatr*. 2011;158(4):578–583

PURPOSE OF THE STUDY. To assess the outcome of oral food challenges (OFCs) in a pediatric patient population placed on elimination diets often based solely on the results of food-specific immunoassays (specific immunoglobulin E [IgE] testing).

STUDY POPULATION. Included was a pediatric population of 125 children (median age: 4 years) with active atopic dermatitis (AD) and food avoidance evaluated at National Jewish Health (Denver, CO).

METHODS. This was a retrospective chart review of patients who underwent at least 1 OFC to evaluate for an IgE-mediated reaction. OFCs were conducted after reviewing clinical history, skin-prick-test (SPT) results, and serum allergen-specific IgE test results. If there was a history of a convincing reaction within the previous 6 to 12 months or if a reaction was life-threatening, then an OFC was not performed.

RESULTS. Ninety-six percent of the patients evaluated had AD, and OFCs were only undertaken once appropriate AD treatment had been started. Of the 364 OFCs performed on avoided foods, results were negative for 325 (89%). Of the 122 foods that were being avoided because of previous adverse reactions, 102 (84%) had a negative OFC result. Of the 111 foods being avoided because of immunoassay or skin-prick testing results, 103 (93%) had a negative OFC result. For foods without established decision points (ie, foods other than milk, egg, and peanut), there was a wide range of immunoassay results, and 93% had negative OFC results. Many foods were being avoided for reasons other than serum test results or a history linking the food to an observed reaction, and of those 131 OFCs, results were positive for only 11 of them.

CONCLUSIONS. Using serum food-specific IgE testing alone to diagnose food allergy, especially for children with AD,

might result in an overly restrictive food-elimination diet.

REVIEWER COMMENTS. Although the retrospective design of the study did cause some limitations, the takeaway point for pediatricians and allergists alike should be that SPTs and immunoassays alone do not definitively diagnose food allergy, especially when evaluating nonanaphylactic symptoms of food allergy (eg, AD). Serum allergen-specific IgE testing, when necessary, should be directed toward relevant allergens only. OFCs performed in a board-certified allergist's office to confirm food-allergy status remain the most reliable test for food-allergy diagnosis. Further prospective studies that examine specific IgE levels and SPT results for suspected food allergy in patients with and without AD are needed.

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Performance of a Component-Based Allergen-Microarray in the Diagnosis of Cow's Milk and Hen's Egg Allergy

D'Urbano LE, Pellegrino K, Artesani MC, et al. *Clin Exp Allergy*. 2010;40(10):1561-1570

PURPOSE OF THE STUDY. Published clinical decision points (CDPs) have improved the accuracy of current allergen-specific immunoglobulin E (sIgE) testing, but the oral food challenge (OFC) remains the gold standard. These researchers sought to evaluate the performance of an in vitro microarray-based diagnostic test for the diagnosis of cow's milk (CM) and hen's egg (HE) IgE-mediated allergy.

STUDY POPULATION. Infants and children ($N = 104$; median age: 4.9 years [range: 0.7-15.1 years]) referred to the allergy clinic with a history of CM or HE consumption and a resultant severe and/or immediate reaction were included in the study.

METHODS. Using the ImmunoCAP system (Phadia, Uppsala, Sweden), sIgE testing was performed to milk, α -lactalbumin, β -lactoglobulin, casein, egg white, and egg yolk. Microarray testing was performed to multiple known CM and HE allergen components. OFCs were performed on all subjects using pasteurized CM and boiled egg. Negative OFCs to boiled egg were followed by an OFC to raw egg. OFCs were discontinued for anaphylactic shock or objective symptoms in 2 or more systems.

RESULTS. For CM allergy, sIgE testing to milk and casein and microarray testing to Bosd8 provided the highest accuracy for predicting OFC outcomes. For HE allergy, results of sIgE testing to egg white and microarray testing

to Gal d1 (ovomucoid) were most accurate. For CM allergy, the milk sIgE 95% CDP (≥ 16.6 kU/L) resulted in a positive predictive value (PPV) of 93% and a negative predictive value (NPV) of 57% compared with the Bosd8 microarray 95% CDP (>0.60 ISU [ISAC standardized units]), which resulted in a PPV of 96% and an NPV of 78%. For HE allergy, the egg white sIgE 95% CDP (≥ 25.3 kU/L) resulted in a PPV of 86% and an NPV of 59% compared with the Gal d1 microarray 95% CDP (>0.86 ISU), which resulted in a PPV of 94% and an NPV of 79%. Sequential use of sIgE and microarray testing for both CM and HE yielded minimally improved results.

CONCLUSIONS. Component-based allergen microarray provides improved PPV and NPV in the diagnosis of CM and HE allergy when compared with standard sIgE testing. The improved accuracy can reduce the number of OFCs that need to be performed and, more importantly, can reduce the number of positive challenge results, thereby decreasing the risk to patients.

REVIEWER COMMENTS. This well-designed, prospective study found strong performance of component-based microarray testing for food allergy. However, the modest additional accuracy of microarray testing, when balanced with its limited availability and its considerable cost, limits its practical benefit. As the authors suggested, it might presently be more suited to large tertiary care centers as a secondary screen after standard specific IgE testing has been performed.

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Serum Immunoglobulin E (IgE) Measurement and Detection of Food Allergy in Pediatric Patients With Eosinophilic Esophagitis

Erwin EA, James HR, Gutekunst HM, et al. *Ann Allergy Asthma Immunol*. 2010;104(6):496-502

PURPOSE OF THE STUDY. To determine the degree of allergic sensitization in patients with eosinophilic esophagitis by using serum immunoglobulin E (IgE) testing and comparing the results to those obtained by epicutaneous skin-prick tests (SPTs) and patch testing.

STUDY POPULATION. This was a cross-sectional study of pediatric patients ($N = 53$) referred for evaluation for biopsy-proven eosinophilic esophagitis at an allergy referral clinic at Nationwide Children's Hospital (Columbus, OH) over a 2½-year period (January 2007 to June 2009).

METHODS. Questionnaires about symptoms and treatment of eosinophilic esophagitis were completed. Serum-specific IgE antibodies to 8 common foods and

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