Pediatric Nutrition
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AN OVERVIEW OF FOOD ALLERGIES IN CHILDREN

RECENT COURSE UPDATES

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How and why does geographic variation influence types and frequency of food sensitization and food allergy?

The most common causes of food allergy in the United States are cow's milk, egg, peanut, tree nuts, fish, shellfish, wheat, and soy. However, food allergy types and trends differ by geographic region, which reflects unique environmental exposures.[1] In European countries, allergies to certain fruits, vegetables, and tree nuts are more common due to cross-reactions with inhaled allergen sensitizers (eg, sensitization to birch tree pollen leads to cross-reaction with hazelnut, apple, peach, kiwi, carrot, and celery).[2] Cultural influences on dietary patterns also impact food sensitization. In the Mediterranean and Thailand, where shellfish is one of the most common food allergens, while chickpea allergen is common in India.[2-4] Intriguingly, changing cultural dietary pattens are also reflected in food allergen trends. For example, peanuts rarely caused food allergies in Asian countries about 2 decades ago, but more recent analyses show that peanut is now the most common food allergen in these countries, which likely reflects Western dietary influences.[1]

The dietary practices of certain regions can also promote food allergen tolerance. One of the most well-known examples of this is the discovery that the rates of peanut allergy were substantially lower in Israeli children than in children of similar ancestry living in the United Kingdom.[5] This difference correlated with earlier introduction of peanuts in Israeli children, who are frequently weaned on Bamba, a peanut butter–flavored puff snack containing 50% peanut protein.[5,6] As such, Bamba was the snack used in the Learning Early About Peanut Allergy (LEAP) study that demonstrated early introduction of peanuts could decrease peanut allergy and changed infant food introduction recommendations.

Within the US, what disparities in food allergy incidence, diagnosis, and management have been reported?

Healthcare disparities are an important and timely topic across all disease states, and food allergy is no exception. There is evidence that infants and children of racial minority groups, and from low socioeconomic backgrounds, have higher rates of food allergy than White infants and those from high socioeconomic backgrounds. However, despite higher rates of reported food allergies among these groups, the rates of clinician-diagnosed allergy are similar or lower among children of color, even among those with prior severe allergy symptoms, suggesting disparities in accessing and obtaining clinician diagnoses. Food allergy management may also be suboptimal among disadvantaged children, with lower rates of emergency preparedness (eg, access to epinephrine and anaphylaxis training) in schools and daycares in low-income, rural, and high minority representation settings.[7]

In an effort to reduce disparities in the prevention, diagnosis, and management of food allergies, the American Academy of Allergy, Asthma, and Immunology (AAAAI) has developed several key recommendations, including partnerships between allergy specialists and primary care providers and advocacy organizations in high-risk communities that emphasize education, development of action plans, and access to epinephrine for all patients with food allergy.[7] Other key factors to address include screening for food insecurity, which is more prevalent among low socioeconomic groups and can be compounded by suspected or diagnosed food allergy. Furthermore, addressing food security is an important component of food allergy prevention, as a diverse healthy complementary feeding diet is associated with a lower risk of allergen sensitization.[7,8] Finally, all of these strategies should be undertaken within the context of culturally sensitive care, which may require cross-cultural clinician training.[7]

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How can population-level approaches decrease the risk of food allergy development?

Coordinated engagement of governmental organizations, nonprofits, healthcare providers, and the general public, has the potential to substantially reduce the incidence of food allergy. Many of the recommendations for preventing food allergy in infants are inexpensive and simple to implement, suggesting that a key barrier to food allergy prevention is simply a lack of awareness.[9,10] Evidence to support this notion recently came out of Finland, where a 10-year nationwide program to prevent and improve management of allergies and asthma was implemented. As a part of an informational campaign, targeting both the general public and healthcare providers, the following strategies were applied: support for breastfeeding, support for introduction of solid foods between 4 and 6 months, discouragement of environmental allergen (eg, pets) with avoidance except when necessary, encouragement of contact with the natural environment through regular physical activity, reduction of use of unnecessary antibiotics, parental smoking cessation, and promotion of oral immunotherapy (OIT) for food allergy. During the 10-year program period, allergy and asthma prevalence plateaued, and requirements for food allergy diets in daycares decreased by 50%.[10] These data suggest that the Finnish approach to public health education regarding allergy prevention could substantially reduce allergy burden.

What new guidelines and recommendations relevant to food allergy prevention in infancy have been published?

In 2021, a consensus approach to preventing food allergy through nutrition was developed by the AAAAI; American College of Allergy, Asthma, and Immunology (ACAAI); and the Canadian Society for Allergy and Clinical Immunology (CSACI). Two notable changes have been made in these guidelines, which diverge from the 2019 American Academy of Pediatrics guidelines. The first is that both peanut and cooked egg are recommended for early introduction at about 6 months of age and not before the age of 4 months. Additionally, this recommendation is made for all infants, and not just those at high risk for allergy development.[11] These recommendations are made based on the LEAP and Enquiring About Tolerance (EAT) studies. While LEAP was conducted in infants at high risk for allergy, EAT enrolled infants from the general population.[6,11,12] The 2021 European Academy of Allergy and Clinical Immunology (EAACI) guideline includes similar recommendations for the introduction of peanut and cooked egg in infants between 4 and 6 months of age.[13] Finally, recommendations for early introduction of allergenic foods have been added to the 2020–2025 US Dietary Guidelines, representing the first instance of the USDA discussing food allergies in their guidelines.[14]

What is the evidence for the early introduction of foods in preventing non-IgE–mediated food sensitivities?

The bulk of the data pertaining to the early introduction of allergenic foods is related to prevention of IgE-mediated food allergy. That said, a recent post hoc analysis of the EAT study was performed to determine whether early wheat introduction decreased the risk of developing celiac disease. The EAT trial enrolled 1303 exclusively breastfed, 3-month-old infants who were then randomized to early allergen introduction, including wheat, starting at 4 months, or allergen avoidance until at least 6 months. At age 3 years, no children in the early introduction group developed celiac disease compared with 1.4% of children in the standard introduction group ($P = .02$).[15]

But the relationship between early allergen introduction and the development of *non-IgE–mediated food sensitivity* is complex. A recent case series from a single institution showed an increase in peanut-induced food protein–induced enterocolitis syndrome (FPIES) cases among children with early peanut introduction. Therefore, more prospective, controlled trials are needed to determine the effects of early introduction on non-IgE–mediated sensitivities.[16]

How does pacifier sanitization impact the risk of food allergy?

There is evidence that the use of pacifier antiseptic may increase the risk of food allergies in infants. In a cohort study that enrolled pregnant individuals and followed 894 families with term infants through 1 year of age, at 6 months of age, the rate of food allergy was 3.6-fold in children who used pacifiers with antiseptic cleaning vs children who used pacifiers without antiseptic cleaning. In contrast, other methods of pacifier cleaning, including tap water, boiling water, and parental pacifier sucking, were not associated with increased allergy risk.[17] Although the reason for the association between antiseptic use and food allergy is currently unknown, researchers have hypothesized that antiseptic use may change the infant oral microbiome or expose infants to plasticizers leaching from the pacifier itself.[17,18] That said, other confounding factors include the potential for higher hygiene standards in the house or general increased use of household chemicals.[17] Additional research is needed to better characterize environmental causes of food allergy, such as the ongoing NIH-funded SUNBEAM trial, which is following at least 2500 families and infants from gestation to 3 years of age.[19]

For more context, watch Dr. Cohen's recorded CE/CME webcast, *An Overview of Food Allergies in Children.* It's part of our extensive collection of educational material, *Understanding Food Allergies in Infants and Children.*

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