

Management of food allergy in the school setting

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ABSTRACT

Food allergy is a growing health and safety concern that affects up to 8% of school-age children. Because children spend a significant part of their day in school, and the overall number of school-age children with food allergy has been increasing, management of food allergies relies on the collaboration of allergists, families, and schools to treat and prevent acute allergic reactions. For schools, this involves policies centered on food allergen avoidance, preparedness with epinephrine autoinjectors, adequate school personnel training, and accommodations for an equal opportunity learning environment. Partnerships with allergists, primary care providers, students, families, school nurses, and school staff are vital for creating individualized and effective care plans that will allow all children, including those with food allergies, a safe and nurturing learning environment.

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Anaphylaxis is a sudden onset, potentially life-threatening, systemic allergic reaction that occurs after contact with an allergen. Results of recent studies show that, in the United States, up to 8% of children ages <18 years are estimated to have food allergy, with a 50% increase in prevalence over the previous decade.^{1,2} Among school-age children in the United States, the most prevalent food allergies include peanut, cow's milk, hen's egg, shellfish, tree nuts, wheat, finfish, soy, and sesame.¹ Milk has been reported to be the most common cause of an allergic reaction in preschool-age children, and peanut as the leading cause in children in kindergarten through high school.¹

The current approach to management remains for students to avoid the food of concern and to treat reactions that occur. Despite best efforts of allergen avoidance, children with food allergies still have exposures in the preschool and school setting. In studies of children with food allergies, up to 16 to 18% have experienced a reaction in school.³ Schools must also be prepared to handle management of reactions in

students with no previous diagnosis of food allergy. In a survey of school epinephrine administration, ~25% of recipients had no previous diagnosis of food allergy.⁴ Schools face the responsibilities of creating a safe environment in which students can avoid culprit foods, of training personnel to recognize and treat anaphylaxis, and of having stock epinephrine in states where legally mandated or allowable by law.

MINIMIZING RISK AT SCHOOL

The primary route of exposure that causes a severe reaction is through ingestion. A majority of reactions in school occur in the classroom.⁵ In addition to preventing reactions, schools should minimize food exposure in the classroom, whether it is for art projects, snacks, or celebration, to reduce anxiety and promote the classroom as a safe space. Furthermore, school cafeteria personnel should be trained to read food labels and ensure that cross-contamination of allergens does not occur.

Skin and inhalational exposures are unlikely to trigger anaphylactic reactions.⁶ In an Australian study, application of 1 g of peanut butter under an occlusive patch did not lead to severe systemic reactions among children sensitized to peanut and children with peanut allergy.⁷ In another study, airborne peanut protein was undetectable when participants consumed peanut butter, walked on peanut shells, shelled peanuts, and/or unshelled peanuts.⁸ In contrast, cooking foods, such as boiling milk, or steaming or frying fish can produce aerosolized particles that may trigger respiratory symptoms.⁹

The paucity of systematic research on food allergy management in schools has led to policies based on limited evidence. Some schools have adopted “bans” on peanuts and tree nuts.¹⁰ However, public schools

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in Massachusetts self-labeled as “peanut-free” had significantly higher rates of epinephrine use than schools without a ban on peanut.¹¹ It is possible that these approaches may provide a false sense of security that leads to less surveillance by way of students, families, and school staff for preventing exposures. Allergen-free tables may be more warranted for younger children or in situations in which there is limited adult supervision. These recommendations also should be individualized for each student based on clinical history, age, maturity, and developmental abilities.

When cleaning surfaces that come into contact with allergens, schools should clean surfaces with soap and water or commercial cleaner.⁸ Cleaning hands with water alone or with antibacterial hand sanitizer does not sufficiently remove all peanut protein.⁸ Staff members or students who come into contact with allergens should use soap and water or commercial wipes to clean food-contaminated hands.

TREATMENT OF REACTIONS

Action Plan Availability

All children with a food allergy should be given a food allergy action plan on diagnosis of a food allergy. In a survey of school nurses, only 44% had a food allergy action plan for all of their patients with food allergy, which suggests that families are either not receiving these plans or are not sending them to schools.¹² The action plan details what steps should be taken if a student ingests or is suspected to have ingested a food to which he or she is allergic and/or has symptoms of an allergic reaction. Food allergy action plan templates can be found through the web sites of Food Allergy, Research and Education (FARE) and the American Academy of Pediatrics (AAP). The food allergy action plan should include student identifying information (*e.g.*, name, date of birth), names of allergenic foods, emergency contact information, instructions for administering and dosing medications, and asthma status. The family should discuss this plan with school personnel (nurse, teacher, and principal) before the start of the school year. Plans should be reviewed with a physician and updated yearly as needed.

Epinephrine at School. On diagnosis of a food allergy, parents should be given a prescription for two self-injectable epinephrine devices to be available at school and two for home to be carried at all times outside of school. Epinephrine autoinjectors come in three dosing options. The 0.1-mg dose is indicated for 7.5 kg–15 kg and is available only from Auvi-Q (Kaleo, Richmond, VA).¹³ More widely available are the 0.15-mg dose (10 kg–25 kg) and the 0.3-mg dose (>25 kg) from multiple companies.¹⁴ These devices should be kept in the

nurse’s office or with the teacher. Based on age and school policies, the second epinephrine autoinjector device can be carried by the child in a dedicated pack. Developmentally appropriate children can be expected to carry and self-administer epinephrine by ages 12–14 years, if permitted by school policy.¹⁵

Schools have started to stock epinephrine that is not prescribed to a particular child because many first-time food allergic reactions can occur at school. As previously noted, 25% of school epinephrine use involved recipients with no previous food allergy diagnosis.⁴ In 2013, the School Access to Emergency Epinephrine Act authorized the U.S. Department of Health and Human Services to give funding preferences to schools if they maintain an emergency supply of unassigned epinephrine. Currently, 12 states require schools to stock epinephrine, whereas most other states have regulations that encourage schools to stock epinephrine. Policies are also available on how to maintain and secure epinephrine and increase access in schools from organizations such as the AAP, U.S. Centers for Disease Control and Prevention, and FARE.¹⁶

Management of Anaphylaxis. School staff should be trained and prepared to respond in the case of an allergic reaction because severe reactions are possible, including fatalities.⁶ A factor associated with these unfortunate outcomes has been delayed use of epinephrine.¹⁷ Parents of children in the U.S. Peanut and Tree Nut Registry reported that school personnel did not recognize the symptoms of an allergic reaction in 32% of cases.⁵ School personnel may delay therapy with epinephrine in cases of anaphylaxis, preferring to use antihistamines or bronchodilators. Epinephrine is the primary treatment for anaphylaxis, and antihistamines and inhaled bronchodilators should be used for adjunctive therapy if needed.¹⁸ Current practice parameters for treatment of anaphylaxis recommends administering repeated doses of epinephrine every 5 to 15 minutes until symptoms are controlled.¹⁸ If students are given epinephrine, then the nurse or other school staff should monitor the child while contacting emergency medical services and the parents. A more-detailed review on the treatment of anaphylaxis can be found in the “Diagnosis and management of anaphylaxis”¹⁹ section of the Food Allergy Primer.

Performing Staff Training

In addition to children having a food allergy action plan and medication available, schools should have a plan to train school staff to appropriately recognize and respond to allergic reactions. In many schools, nurses lead school food allergy management and education of nonlicensed school staff. Standards for school training are available from the web sites of the National

Association of School Nurses and the U.S. Centers for Disease Control and Prevention. However, it is important to note, there is variability in access to nurses around the country, with fewer than half of schools in the United States having a full-time registered nurse and most states having no mandate on nurse-to-student ratios.²⁰ Many states have adopted online training sessions to be used for all school personnel. FARE offers online training and access to resources for educators managing food allergies in the school setting.²¹

SCHOOL GUIDELINES AND LEGAL ISSUES

The written emergency action plan, food allergy action plan, or emergency medical order completed by a provider should be submitted so that the school nurse can develop an individualized health plan (IHP). The IHP is a nursing document created by the school nurse with a collaborative effort of the family, physician, and other school personnel that contains a complete school management plan with preventative measures for day-to-day management and is written in terms understandable by nonlicensed staff members who may also have a supervisory role for the child at school. Although the IHP is not mandated by law, recommendations for content to be included in an IHP are included in various state guidelines. The IHP will often be additionally personalized based on available resources and student characteristics and is modified every 1–2 years, based on age and developmental stages.

Children with life-threatening food allergies are protected under federal civil rights laws, such as Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act. Children with a diagnosis of food allergy meet the definition of having a “disability.” Under these laws, schools cannot turn away a child based on a child’s diagnosis of food allergy. The facilities must be able to provide accommodations to allow the child to participate equally, including in classroom activities, field trips, and eating in the cafeteria. In some schools, if written emergency action plans and/or IHPs cannot ensure the student’s safety, then a 504 plan may be necessary.²²

FOOD ALLERGY IMPACT ON QUALITY OF LIFE

Results of studies show that children with food allergies have a lower quality of life when compared with their peers.²³ Children can develop anxiety related to accidental ingestion, isolation, or food-related bullying. Up to 35 to 45% of children with food allergies report experiencing bullying from peers and even from adult school personnel.²⁴ In a recent study, nearly 40% of allergists did not realize that children with food allergies dealt with more bullying than those without food allergies, and, in the same study, 78% of allergists did not feel comfortable advising families

on how to deal with this issue.²⁵ It is important for providers to recognize and provide guidance on management of teasing and/or bullying, as in one study, 48.9% of parents were not aware that their child was being bullied.²⁶ Asking open-ended questions about peer experiences during clinic visits may allow parental recognition and school notification about the problem, which has been associated with less distress and improved quality of life in children with food allergy who have been bullied.²⁶ In situations of significant psychosocial stress, the allergy care team can provide the family with school, community, and/or mental health resources for further assistance.

FUTURE CONSIDERATIONS

The overall prevalence of food allergies in school-age children is increasing, which results in greater potential for anaphylaxis in the school setting. In addition, the increasing use of food oral immunotherapy programs may contribute to higher numbers of food-allergic reactions that occur during school hours.

CLINICAL PEARLS

- Anaphylaxis results almost exclusively from ingestion of a food and not from inhalation or skin contact.
- Every student with a food allergy should have an emergency action plan available at school that is completed and reviewed annually by allergists or primary care providers, based on school resources and individual needs.
- School staff should be trained and prepared to quickly respond in case of an allergic reaction because a delay in the use of epinephrine is a risk factor in severe and fatal food anaphylaxis.
- Bullying is an issue for students with food allergies, and providers must recognize, ask about, and provide guidance on management of this issue.

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