

Assuring the Safety of Severely Food Allergic Children in School

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Knowledge of life-threatening food allergies and preparation for allergic reactions will enable school personnel to effectively respond to a student having a severe allergic reaction. While the mortality rate for food allergy reactions is low and most students do not experience life-threatening reactions, there can be disastrous exceptions. Currently, it is estimated that 1-2% of the general population is at risk of experiencing anaphylactic reactions caused by food allergies and insect stings, with a smaller percentage having anaphylactic reactions due to latex and medication allergies. Children younger than 3 years are at higher risk with approximately 5% experiencing allergic reaction to foods.¹ In recent years, there has been an increased incidence of food allergies in children with approximately 2 million school-age children identified as having a food allergy.² Given these statistics, it is likely that school personnel will work with a child with the potential for a severe or life-threatening allergic reaction.

ANAPHYLAXIS SYMPTOMS AND PREVALENCE

Anaphylaxis, a severe, life-threatening allergic reaction, occurs when a reaction—usually induced by a food, medication, or insect sting—causes sufficient quantities of chemical mediators (such as histamine) to be released from mast cells scattered throughout the body. These mediators are released into the blood stream and produce leakage of fluid from blood vessels (causing reduced blood pressure and shock), itching, hives, swelling, bronchospasm (asthma), diarrhea, and at times cardiac rhythm disturbances and death. Death from anaphylaxis occurs most commonly from upper airway (laryngeal) swelling leading to asphyxia. Because symptoms can develop quickly, usually within 5-30 minutes after exposure, and can progress rapidly, it is imperative that school personnel be well trained to monitor and closely supervise children diagnosed with severe allergies.

In some individuals, foods can and do cause anaphylaxis. Fatal cases do occur, but they are probably underreported. Each year there are approximately 150-200 fatal food-induced allergic reactions in the United States.³ Many children with food allergies (particularly those with

peanut, tree nuts, and crustacean allergy) will remain allergic throughout their lives. The number of peanut allergy cases in children has steadily risen in recent years from 0.4% in 1997 to 0.8% in 2002³ and doubled in children under 5 years between 1999 and 2004.⁴

DIAGNOSIS, AVOIDANCE, AND TREATMENT

A food allergy diagnosis in a child should be confirmed by a trained allergy specialist, who will review the patient's history and perform a combination of skin and appropriate blood tests. The allergist should provide patient education and an emergency action plan (Figure 1) for the school nurse and staff to follow.¹ Actual treatment for a child with potential anaphylaxis begins with anticipation and preventive planning, coordinated with parent, teacher, and dietary personnel. Upon food allergy diagnosis, measures should be undertaken to avoid the specific food and all foods containing components of this food, such as avoiding casein and whey products in a milk allergic child.

Several factors may contribute to fatal allergic reactions to foods. Parents, children, and teachers often deny allergic symptoms. Even when an allergy problem is acknowledged, the potential severity of the reaction may be misunderstood. As a result, there is a tendency to deny or minimize symptoms or to rely solely on oral antihistamine for treatment of an evolving severe reaction.⁵ Antihistamines alone may not reverse generalized reactions that include hives, swelling, flushing, and difficulty swallowing or breathing.¹ In 1998, the American Academy of Allergy, Asthma, and Immunology (AAAAI) issued a position statement stressing the significance of using epinephrine as the first line drug in the treatment of anaphylaxis and the need for allergists to devise treatment protocols for schools to implement.^{1,2,6,7}

The most critical factor linked to food anaphylaxis deaths has been failure to administer epinephrine promptly.^{1,2,6,7} Deaths have occurred because of delays in initiating therapy, particularly in a school or restaurant environment where lack of knowledge and concerns for liability have delayed initiation of therapy until well into a reaction.⁸ In a 1992 study of fatal and nonfatal food reactions in children, 5 fatalities occurred in public places. Four incidents occurred at school. In each fatal case, epinephrine was administered only after severe symptoms developed. In 7 cases occurring in private homes, epinephrine was given prior to life-threatening symptoms, preventing a fatality in all 7 patients.⁷

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Figure 1 Food Allergy Resources

Organizations

1. The Food Allergy and Anaphylaxis Network provides comprehensive resources designed to educate and provide guidelines for addressing severe food allergies in school and in society.

<http://www.foodallergy.org>

Downloadable forms include School Guidelines and a Food Allergy Action Plan.

<http://www.foodallergy.org/school/SchoolGuidelines.pdf>

<http://www.foodallergy.org/actionplan.pdf>

2. American College of Allergy, Asthma, and Immunology—<http://www.acaai.org>

3. American Academy of Allergy, Asthma, and Immunology—<http://www.aaaai.org>

4. Asthma and Allergy Foundation of America—<http://www.aafa.org>

Related Web Sites:

1. Epi-Pen® demonstration—http://www.epipen.com/howtouse_high.aspx

2. Twinject™ demonstration—<http://www.twinject.com/patient/howuse.asp>

3. Field trip information—<http://www.foodallergy.org/school/fieldtrip.html>

4. School bus information and safety tips—<http://www.foodallergy.org/school/bus.html>

5. Child-friendly allergy web sites—<http://www.kidshealth.org> and <http://www.fankids.org>

6. Recipes for people with food allergies—<http://www.foodyoucaneat.com>

To order a MedicAlert necklace or bracelet:

MedicAlert® Foundation International—<http://www.medicalert.org>

A 2005 study in Massachusetts examined the availability and use of epinephrine, the training of school personnel, and the existence of emergency plans in 109 school districts between 2001 and 2003. Despite AAAAI's 1998 Position Statement, it was found that epinephrine was often not used or available, emergency plans were not always in place, and staff training had not consistently occurred. Several recommendations were made based on the findings. First, epinephrine should be on-site and used immediately when anaphylactic symptoms present. Second, comprehensive staff training is needed in schools. Third, all individuals treated with epinephrine should be transported to the hospital due to the possibility of biphasic reactions. Fourth, schools should create plans for when food allergic individuals are outside the school building.

A significant finding in the aforementioned study was that allergic reactions occurred in 24% of individuals who had no prior allergic reactions. This finding supports prior research where first-time reactions to peanuts occurred in 25% of students while at school. It was, therefore, recommended that schools have protocols signed by physicians to authorize the school nurse to administer epinephrine to

anyone experiencing anaphylactic symptoms. In addition, backup supplies of epinephrine should be on hand in schools. If the nurse is unavailable, protocols should indicate that school personnel be trained to recognize symptoms and call emergency personnel for treatment.²

SCHOOL EMERGENCY PLANNING AND RESPONSE

The American Academy of Pediatrics Committee on School Health recommends that schools be equipped to treat anaphylaxis in students.^{1,2,6} Public schools must comply with the physician's emergency treatment plan and with the Americans with Disabilities Act (ADA), which mandates accommodations for students with allergies.¹ ADA accommodations include participation of students with allergies in all activities, developing and efficiently implementing a food allergy plan, and making sure medications are always accessible.

In conjunction with the allergist, the parent of a child with a life-threatening food allergy should contact the teacher and school nurse to explain the condition, answer questions, and develop an emergency plan. At least 2

automatic epinephrine injection devices (Epi-Pen®, Epi-Pen® Jr, or Twinject™) should be supplied by the parents for all children with previous food reactions.^{1,2} These devices should accompany the child on class trips or any outings.^{1,2,8} An individual child's emergency plan should delegate who carries and administers the medication; who calls the emergency medical services, parents, and physician; and who will stay with the child having the reaction. A child experiencing an allergic reaction should not be left alone.

The school should develop a procedure for alerting the child's teachers and a prominent notation should be made on the child's health record. Teachers and other school personnel should be prepared to respond to food allergic reactions by being trained to administer cardiopulmonary resuscitation (CPR) and first aid. Phone numbers of the nearest medical facility and the estimated response time of a local emergency medical services (EMS) team should be determined.

When implementing the emergency plan, school personnel should begin with recognition of the symptoms and prompt administration of epinephrine. Additional measures including medication administration should be deferred to EMS personnel or to physicians in an emergency room. In a designated sequence, calls should be made to emergency medical services (911), parents, and the child's physician (if phone number is available). Under no circumstances should the child having the anaphylactic reaction be transported by school personnel to an emergency facility unless no emergency transport services are available in the community. Prompt therapy with epinephrine at the school site and intervention of emergency medical services at the site and during transport are mainstays of therapy to reverse a potentially life-threatening anaphylactic reaction.

AWARENESS AND INCLUSION OF STUDENTS

Occasions when allergenic foods will be present in the cafeteria, classroom, or on school outings can be stressful for students with food allergies, their families, and school personnel. Avoidance is the key to managing food allergies. Thorough precautions should be taken to ensure that children with allergies do not have reactions or do not feel isolated or stigmatized because of their allergy.¹

Some fundamental school-wide precautions for students with severe food allergies include the following. First, all school personnel should be aware of offending foods and know how to read food labels. Second, the cafeteria must provide safe substitutions at no extra cost to the families. Third, trading of food and utensils must be strictly prohibited. Fourth, since some allergic children react to physical contact with offending foods, including residue on uncleaned tables and on materials, the surface areas of tables and toys should be thoroughly cleaned with warm, soapy water followed by a wipe down with a fresh paper towel. Implementing milk-free and peanut-free tables in the cafeteria where allergic students can eat their lunches safely may be considered.^{1,9} Fifth, to prevent physical contact contamination, all students and personnel

should practice proper hand washing after handling food.¹ Finally, foods used in lessons or on class trips should be free of offending foods and ingredients and should be purchased with complete product labeling.³ When food substitutions are made in a lesson, use the same substitution for the entire class to avoid singling allergic students out as different.

To foster understanding and acceptance, teachers should conduct allergy awareness lessons to promote appropriate social interactions among students. Training kits, as well as educational awareness materials and literature for parents, children, and schools are available from The Food Allergy Network (www.foodallergy.org), a national food allergy support group. Lessons should be age appropriate and include accurate information regarding food allergies, effects of allergies, and emergency plans. It is important to emphasize how all people have similarities and differences and that everyone wants to be accepted. Through awareness and social skills instruction, understanding, empathy, and friendship can be promoted and misunderstanding and potentially dangerous ridicule or even "food sabotage" prevented.¹⁰

CONCLUSION

When contemplating the seriousness of potential life-threatening food allergic reactions in school children, attitudes of school personnel may be the single most important factor for ensuring fair and proper treatment of these children. School personnel must listen carefully to parents of children with severe food allergies and obtain the necessary confirmed medical documentation. If school personnel are open, knowledgeable, and understanding, they can successfully prevent and respond to emergency life-threatening food reactions. ■

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