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American Academy of Allergy, Asthma, and Immunology: Position Statement

Anaphylaxis in schools and other child-care settings

AAAAI BOARD OF DIRECTORS

The statement below is not to be construed as dictating an exclusive course of action nor is it intended to replace the medical judgment of healthcare professionals. The unique circumstances of individual patients and environments are to be taken into account in any diagnosis and treatment plan. The above statement reflects clinical and scientific advances as of the date of publication and is subject to change.

The public's awareness regarding the potential consequences of anaphylaxis has been heightened by increasing reports of deaths in the US, Canada, and Europe that are associated with this event. Anaphylaxis refers to a collection of symptoms (Appendix 1) affecting multiple systems in the body. The most dangerous symptoms include breathing difficulties and a drop in blood pressure or shock, which are potentially fatal. Common examples of potentially life-threatening allergies are those to foods and stinging insects. Life-threatening allergic reactions may also occur to medications or latex rubber and in association with exercise.

It is estimated that 1% to 2% of the general population is at risk for anaphylaxis from food allergies and insect stings, with a lower reported prevalence for drugs and latex. Asthmatic subjects are at particular risk.¹ Approximately 50 anaphylactic deaths caused by insect stings and 100 food-related anaphylactic deaths are recognized each year in the US.^{2,3}

The most important aspect of the management of patients with life-threatening allergies is avoidance. In the event of contact with the offending allergen, epinephrine (adrenaline), administered by means of subcutaneous or intramuscular injection, is the treatment of choice for anaphylaxis.^{3,4} Other medications, such as antihistamines, inhaled asthma medications, or steroids, that subsequently may be given by physicians in treating anaphylaxis should not be regarded as first-line medications. It is imperative that epinephrine be recognized as the drug of choice and that all efforts be directed toward its immediate use.^{5,6} Data clearly show that fatalities more often occur away from home and are associated with either not using epinephrine or a delay in the use of epinephrine treatment.^{1,5,6}

Anaphylaxis is an unusual but preventable and treatable event. The American Academy of Allergy, Asthma and Immunology endorses this modified consensus statement, which was originally drafted by the Canadian Society for Allergy and Clinical Immunology together with its provincial affiliates and allergy organizations. This consensus statement has been developed to help simplify the management of anaphylaxis for the public. This is a working document that may be modified as future research dictates.

Identifying the Problem

The diagnosis of allergy with a risk of anaphylactic reactions is made on the basis of the patient's history and confirmed with appropriate skin and/or blood tests done by appropriately trained allergy specialists. Treatment protocols should be physician prescribed for use in the school setting.

School personnel should develop a system of identifying children with life-threatening allergies to prevent anaphylactic reactions, and they should also be prepared to deal with those that occur despite precautions.

All school personnel should be aware of those students who have been prescribed epinephrine. Aids could include identification sheets with the child's name, photograph, specific allergy (eg, peanut or bee sting), warning signs of reactions, and emergency treatment. This information should be readily available and reviewed by all personnel. However, for confidentiality reasons, it should not be accessible to other students or parents. Furthermore, school personnel should work in partnership with the parents to develop strategies for avoiding a reaction while allowing the student to participate fully in all activities.

Staff members involved with the child's care should be instructed about the potentially severe nature and proper

treatment of the allergic problem. This information should be reviewed with the student's parents before each school year or special activities (eg, school trips). Any questions and possible treatment strategies should then be discussed with the parent, the child's physician, or both.

If prescribed, every student should have the epinephrine auto-injector device clearly labeled with his or her name and classroom number. School personnel should be instructed about the location of the medication. Expiration dates should be checked regularly. In addition, it is often useful if children allergic to foods wear some form of identification (eg, Medic-Alert bracelet or necklace or badges in nursery school).

Avoidance Strategies

Avoidance of a specific allergen is the cornerstone of management in preventing anaphylaxis.

Food avoidance

The foods that commonly produce allergic problems are peanuts and tree nuts, shellfish and fish, milk, egg, soy, and wheat. Reactions to peanuts, nuts, fish, and shellfish tend to continue to be a life-long problem and are usually more severe than allergic responses to the other foods. Most individuals with allergic reactions to milk, soy, egg, and wheat will have lost their sensitivity by the time they are in the elementary and high school systems.⁷ However, there are still some who will continue to run the risk of having an anaphylactic reaction to these foods.

It is difficult to achieve complete avoidance of all allergenic foods because there can be hidden or accidentally introduced sources. However, it is definitely possible to reduce children's exposure to allergenic foods within the school setting.

First, all school staff who may be giving allergic students any food or supervising activities involving food should know the technical and scientific words for common foods. Ingredient statements should be carefully read before giving the child any food. Second, strict "no food or eating-utensil trading" rules should be implemented throughout the school to avoid peer pressure. Third, surfaces (eg, tables and toys) should be washed clean of contaminating foods. Fourth, the food used in lesson plans for math or science, crafts, and cooking classes may need to be substituted depending on the allergies of the students. Finally, handwashing after food handling should be encouraged in day care and preschool settings, as well as in lower schools.

The potential risk of life-threatening allergic reactions to food particles that become airborne during cooking is much lower than with food ingestion, but airborne food allergens and clinical reactions to these allergen have been documented. Thus preparing or cooking the food in the presence of the allergic student are potential causes of allergic reactions (generally with respiratory symptoms) and should be avoided.

If a student is going to eat from the cafeteria menu, the child's parents should inform the cafeteria staff in writing about foods to be avoided and suggest "safe" substitutions. In accordance with the policy set by the USDA Child Nutrition Section in charge of school lunches, school food service staff are required, if parents request, to prepare special meals of equivalent quality for children who cannot eat the regular meal. These substitutions should be made available at no extra cost to the family.

Food service personnel should also be instructed about measures necessary to prevent cross contact during the handling, preparation, and serving of food per USDA Child Nutrition Section guidance entitled, "Accommodating Children with Special Dietary Needs in the School Nutrition Programs: Guidance for School Food Service Staff." It should be stressed that minute amounts of certain foods, such as peanuts, can be life-threatening when ingested.^{1,6,8} Several children have had skin rashes and stomach upsets from simply coming in contact with residual peanut butter or milk on tables wiped clean of visible material.⁸

Foods brought in for special events should be purchased in stores and contain complete ingredient declarations.

Education and supervision are paramount in managing food allergies. Guidelines for children should include the following: (1) no trading or sharing of foods, food utensils, and food containers, and (2) hand washing should be encouraged before and after eating.

Insect avoidance

Avoidance is more difficult to achieve for this type of allergy, but the following precautions by the schools may be helpful: (1) insect nests should be removed from on or near school property, (2) garbage should be properly stored in well-covered containers, and (3) eating areas should be restricted to inside school buildings for students and staff at risk.

Other allergies

Anaphylaxis caused by drug and latex allergies or associated with exercise is rare in the school setting. These should be dealt with on an individual basis.

Treatment Strategies

Accidental food ingestion can occur despite avoidance measures. Treatment should be immediately available for these emergency situations.

Treatment protocols need to be prescribed by a physician. The school staff should have written instructions from the child's physician and signed by the parents, providing easy to follow steps for recognizing a reaction and administering medication. Several federal laws protect the rights of disabled children, which include those with life-threatening food allergies. Parents should be advised never to sign a liability waiver absolving the school of responsibility for administering epinephrine.

Epinephrine is the first drug that should be used in the emergency management of a child having a potentially life-threatening allergic reaction. Epinephrine injection is available in a number of self-administration delivery devices (Appendix 2). There are no contraindications to the use of epinephrine for a life-threatening allergic reaction.

In patients who have had anaphylactic reactions, it is recommended that epinephrine be given at the start of any reaction occurring in conjunction with exposure to a known or suspected allergen. In situations where there has been a history of a severe cardiovascular collapse to an allergen, the physician may advocate that epinephrine be administered immediately after an insect sting or ingestion of the offending food and before any reaction has begun. Reports have shown that adequate warning signs are not always present before serious reactions develop.⁹

All individuals receiving emergency epinephrine should immediately be transported to a hospital even if symptoms appear to have resolved. In the majority of cases, epinephrine will be effective after 1 injection. However, further treatments may be required, and therefore observation in a hospital setting is necessary for at least 4 hours after initial symptoms subside because delayed and prolonged reactions may occur even after proper initial treatment.^{1,10}

Additional epinephrine should be available during transport and may be administered every 15 to 20 minutes as required, preferably following medical advice.⁸ This should only be given in situations where the allergic response is not under adequate control (ie, the patient's breathing becomes more labored or the patient has a decreasing level of consciousness). The need for multiple injections indicates the need for other emergency drugs. Therefore it is important when planning trips or camping outdoors that everyone consider how they would manage a medical emergency.

Epinephrine should be kept in locations that are easily accessible and not in locked cupboards or drawers. All staff members should know these locations. Children old enough to self-administer epinephrine should carry their own kits. For younger children, the epinephrine device should be kept in the classroom and passed from teacher to teacher as the child moves through the school (eg, from classroom to music to PE to lunch).

All students, regardless of whether they are capable of epinephrine self-administration, will still require the help of others because the severity of the reaction may hamper their attempts to inject themselves. Adult supervision is mandatory.

All individuals entrusted with the care of children need to have familiarity with basic first-aid and resuscitative techniques. This should include additional formal training on how to use epinephrine devices. Training programs may be through health departments or physicians' groups to ensure that all individuals in schools and other areas of child care (eg, school bus drivers, coaches, camp counselors, and lifeguards) are qualified in these techniques. A school-wide food allergy awareness program for the staff, including an allergy emergency drill, should be developed to ensure that everyone will know what to do if a reaction occurs.

Educational material is available from The Food Allergy Network in Fairfax, Va entitled The School Food Allergy Program and includes an emergency health care form to be signed by the physician, parents, and school staff (Appendix 3). The Anaphylaxis Network in Canada also has educational material available for schools.

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APPENDIX I

Common symptoms and signs of allergic reactions may be a combination of any of the following:

- Hives
- Itching (of any part of the body)
- Swelling (of any body parts)
- Red, watery eyes
- Runny nose
- Vomiting
- Diarrhea
- Stomach cramps
- Change of voice
- Coughing
- Wheezing
- Throat tightness or closing
- Difficulty swallowing
- Difficulty breathing
- Sense of doom
- Dizziness
- Fainting or loss of consciousness
- Change of color

APPENDIX II

Epinephrine kits are available by prescription only either as a spring-loaded self-injectable device (Epi-Pen, Epi-Pen Jr; Dey Laboratories, Napa Valley, Calif) or as a preloaded syringe (Ana-Kit; Bayer Laboratories, Spokane, Wash). The syringe has a locking notched plunger, which is rotated to enable each of the 2 doses (0.3 mg each) contained in the barrel for self-injection. The spring-loaded auto-injector device has 1 dose but may be preferred because of its simplicity of use.

Epi-Pen is available in 2 forms, Epi-Pen Jr and Epi-Pen. The Epi-Pen Jr is used for children weighing 10 to 20 kg (22 to 45 lb). The Epi-Pen is used for those weighing greater than 20 kg (45 lb). All those responsible for using epinephrine kits should be familiar with these kits and the instructions for their use. Training devices and brochures outlining most aspects of handling and administering epinephrine are available from the manufacturers.

APPENDIX III

Emergency health-care plan