Use of Multiple Doses of Epinephrine in Food-Induced Anaphylaxis in Children


PURPOSE OF THE STUDY. Data from mixed or adult populations indicate that 16% to 35% of anaphylactic reactions from various causes require >1 dose of epinephrine. This study sought to determine the prevalence and risk factors for administration of repeated doses of epinephrine in food-induced anaphylaxis in children.

STUDY POPULATION. Questionnaires (N = 542) were distributed to parents or caregivers of consecutive patients up to 18 years of age presenting for initial or follow-up evaluation for food allergy. The study was conducted at a hospital-based, pediatric, allergy clinic and a private practice-based, pediatric, food-allergy, referral clinic at Mount Sinai Hospital (New York, NY).

METHODS. An anonymous 2-page questionnaire regarding details of as many as 2 anaphylactic reactions was administered. Data collected from the past 2 reactions requiring epinephrine included suspect food, onset of symptoms, and timing of treatment with single or multiple doses of epinephrine. The Mann-Whitney rank-sum test was used to compare medians and the t test to compare means.

RESULTS. Overall, 413 questionnaires were included in the analysis. A total of 78 children reported 95 reactions for which epinephrine was administered. Of the 95 reactions, 77 (81%) required a single dose, 12 (13%) required 2 doses, and 6 (6%) required 3 doses of epinephrine. Peanut, tree nut, and cow’s milk were responsible for >75% of the reactions requiring epinephrine. Children receiving >1 dose of epinephrine more often had asthma (P = .27), compared with those receiving 1 dose. The amount of food allergen ingested and the delay in administering the initial epinephrine dose were not risk factors for receiving multiple doses of epinephrine. Of the second doses of epinephrine, 94% were administered by a health care professional.

CONCLUSIONS. Nineteen percent of food-induced anaphylactic reactions in this referral population required >1 dose of epinephrine. Additional studies are required to identify risk factors for severe anaphylaxis and to aid in establishing guidelines for prescribing multiple doses of epinephrine autoinjectors for children with food allergies.

REVIEWERS COMMENTS. The retrospective design and selected referral-based population with multiple food allergies are limitations to this study. These results, however, contribute to a body of evidence that suggests 2 doses of epinephrine may be required for our at-risk food-allergic patients. It is hoped that with additional studies we will improve our ability to identify those food-allergic patients most at risk for severe anaphylaxis.

Epinephrine Auto-Injectors: First-Aid Treatment Still Out of Reach for Many at Risk of Anaphylaxis in the Community


PURPOSE OF THE STUDY. Epinephrine is a life-saving medication for the treatment of anaphylaxis, and epinephrine auto-Injectors (EpiPen [Dey, Napa, CA] or Twinject [Sceile Pharma, Inc., Atlanta, GA]) are universally recommended as essential first-aid treatment for anaphylaxis. A survey conducted in 2003 at the World Allergy Organization (WAO) raised concerns regarding lack of universal availability and affordability of epinephrine auto-Injectors in many countries. This study was conducted at the WAO meeting as a follow-up study to determine whether availability and affordability of epinephrine auto-Injectors had improved worldwide between 2003 and 2007.
STUDY POPULATION. Participants included allergy and immunology specialists in the 2007 WAO House of Delegates.

METHODS. The same survey that was designed for use in 2003, with 2 additional questions, was self-administered at the 2007 WAO meeting. Responses were tabulated by country.

RESULTS. Completed surveys were received from ≥1 representative of all 44 countries with voting delegates (100% response rate). Auto-injectors containing 0.3 mg of epinephrine were available in 59.1% of countries, up from 56.4% in 2003, and auto-injectors containing 0.15 mg of epinephrine were available in 59.1% of countries, up from 43.6% in 2003. In no country were doses appropriate for infants available, in either 2003 or 2007. The unsubsidized median cost of 1 auto-injector was US $97.87 (range: $65.50–$168.66), up from $30 to $110 in 2003.

CONCLUSIONS. Since 2003, the global availability of auto-injectors containing 0.3 mg of epinephrine has improved slightly and the availability of those containing 0.15 mg of epinephrine has improved even more. Auto-injector costs have increased since 2003. The lack of availability and affordability of epinephrine auto-injectors remains a concern in many countries. Availability is especially limited in Asia, Africa, the Middle East, and Latin America.

REVIEWERS COMMENTS. It would be nice to follow this survey with other assessments of epinephrine availability (eg, polling more physicians and polling pharmacies), because the WAO physician population is not likely representative of the population at large. Although the accuracy of survey responses regarding availability or lack of availability was verified by contacting manufacturers, verification regarding accuracy of cost was not done. It is important to point out that the cost figures do not reflect what patients ultimately pay, because these figures do not factor in government subsidies or reductions from private health insurance. Importantly, this study finds that in no country was an appropriate infant dose available; this is obviously a problem for infants at risk for anaphylaxis. The authors also point out that, in more than one half of the countries in which epinephrine is available, it is not standard practice to recommend that people at risk for anaphylaxis carry 2 doses of epinephrine at all times. This is a potential concern, because up to 35% of anaphylaxis episodes occurring in the community are treated with ≥2 doses. Furthermore, because this study points out that global availability is relatively limited, physicians should encourage at-risk patients to travel with auto-injectors.

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ATOPIC DERMATITIS AND ALLERGIC SKIN DISEASE

Association of Staphylococcal Superantigen-Specific Immunoglobulin E With Mild and Moderate Atopic Dermatitis

PURPOSE OF THE STUDY. To examine the frequency of allergic sensitization to staphylococcal superantigens in young children with mild-to-moderate atopic dermatitis (AD).

METHODS. AD severity was assessed with objective scoring of AD. Levels of serum immunoglobulin E to staphylococcal enterotoxin A (SEA), SEB, SEC, SED, and toxic shock syndrome toxin 1 were measured with ImmunoCAP tests (ImmunoCAP, Phadia AB, Uppsala, Sweden). Comparisons between mild AD and moderate AD were performed by using logistic regression.

RESULTS. The prevalence of allergic sensitization to staphylococcal superantigens in patients with mild and moderate AD was 38% and 63%, respectively. Allergic sensitization to staphylococcal superantigens, particularly SEA and SED, was found to be associated with moderate AD, compared with mild AD.

CONCLUSIONS. These results suggest that allergenic sensitization to staphylococcal superantigens is common even in young children with mild-to-moderate AD, and such sensitization may contribute to the disease severity of these patients.

REVIEWER COMMENTS. Approximately 90% of patients with AD are colonized with Staphylococcus aureus, which may contribute to the worsening of skin inflammation in these patients. S aureus worsens AD by secreting superantigens (eg, SEA, SEB, SEC, and toxic shock syndrome toxin 1) and structural molecules within the cell wall that induce skin inflammation. An association between allergic sensitization to specific staphylococcal superantigens and AD has been recognized for some time now. Furthermore, superantigens have been demonstrated to induce corticosteroid resistance of T cells in vitro. This could contribute to difficulty in the management of AD, because topical corticosteroids are the most common medications used for treatment of AD. Recognition of this association in patients with AD, even those with mild-to-moderate disease, may lead to better overall control of skin symptoms following the use of a combination of antiinflammatory drug treatment and appropriate antibiotic therapy.

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