Increased Use of Adrenaline in the Management of Childhood Anaphylaxis Over the Last Decade

Rueter K, Ta B, Bear N, Lucas M, Borland ML, Prescott SL. *J Allergy Clin Immunol Pract*. 2018;6(5):1545–1552

PURPOSE OF THE STUDY: To determine if the management of anaphylaxis in children had improved over a 10-year period after the introduction of intensified training programs and new anaphylaxis guidelines, relating in particular to the use of adrenaline (epinephrine).

STUDY POPULATION: The population included 136 children <17 years of age who presented to the main tertiary pediatric emergency department in Perth, Australia, with anaphylaxis from January 1, 2003, to December 31, 2004, and 177 children from January 1, 2012, to December 31, 2012, after intensified training programs and new anaphylaxis guidelines were developed.

METHODS: The investigators used a retrospective chart review, using the criteria from the 2006 Second National Institute of Allergy and Infectious Diseases Food Allergy and Anaphylaxis Network symposium. All cases coded as anaphylaxis were independently reviewed to verify the diagnosis. The intensified training program was mandatory for all trainees rotating through the pediatric emergency department and was taught by a pediatric allergist and pediatric emergency physician.

RESULTS: There were significant increases in the appropriate treatment of anaphylaxis with adrenaline before and after arrival in the pediatric emergency department, reduced use of adjunctive medications, a greater proportion of children discharged with an adrenaline autoinjector, and a greater proportion of children referred to allergy services between the 2 time periods.

CONCLUSIONS: An intensified training program for medical staff and improved cooperation between pediatric emergency specialists and allergists has improved the management of pediatric anaphylaxis over this 10-year period.

REVIEWER COMMENTS: Use of epinephrine and compliance with anaphylaxis guidelines have been dismal in the United States and Europe, with significant underuse of epinephrine, low rates of discharge prescriptions for epinephrine autoinjectors, and low rates of referral to allergists. In this article, investigators demonstrated that an intense training program for both allergists and pediatric emergency department physicians can improve the compliance with anaphylaxis guidelines and should be of particular interest to training program directors of pediatric programs. Even with this intensified training program, however, mismanagement still occurred in 24.5% of patients.

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Risk Factors for Multiple Epinephrine Doses in Food-Triggered Anaphylaxis in Children

Tsuang A, Menon NR, Bahri N, Geyman LS, Nowak-Węgrzyn A. *Ann Allergy Asthma Immunol*. 2018;121(4):469–473

PURPOSE OF THE STUDY: To examine risk factors of multiple-dose epinephrine treatment in pediatric food-induced anaphylaxis.

STUDY POPULATION: In a total of 642 surveys, participants reported allergic reactions. The median age of the child was 2.5 years, 59% were boys, and 77% were white. Allergy to peanut and tree nut were the most common in this population. Prospective follow-up data were collected from the same respondents at median age 7.5 years.

METHODS: Between 2009 and 2011, families of children with food allergy at the Jaffe Food Allergy Institute were randomly selected to complete a questionnaire evaluating demographics, atopic history, and number of reactions requiring epinephrine. Follow-up data on reaction details were prospectively collected.

RESULTS: History of asthma or report of respiratory symptoms during a reaction increased the odds of requiring any epinephrine. Eleven percent of reactions required multiple doses of epinephrine. Milk-triggered reactions were 3 times more likely to require multiple doses of epinephrine than reactions caused by other foods. In reactions that required multiple doses of epinephrine, the initial dose was more likely to be given by emergency medical services, not a child's immediate caregiver. Reactions managed with oxygen were also more likely to require more than 1 dose of epinephrine.

CONCLUSIONS: This is the first study evaluating the need for multiple doses of epinephrine in young pediatric patients. A significant number of food-induced anaphylaxis cases required multiple doses of epinephrine, especially those triggered by milk or treated with oxygen, and 11% of the children required multiple doses of epinephrine. This emphasizes the importance of carrying 2 autoinjectors.

REVIEWER COMMENTS: Although nut allergy was the most common reported allergy, reactions to milk were the most likely to require multiple doses of epinephrine in this young cohort. Families often separate the autoinjectors in a kit and must be counseled on the importance of having 2 autoinjectors available at all times. Caregivers must be empowered to administer epinephrine immediately in cases of anaphylaxis. Prompt epinephrine administration, occasionally multiple doses, is paramount and lifesaving.

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