Children with food allergies should carry two doses of emergency medicine

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In a large six-year review of emergency department (ED) data, researchers at Children's Hospital Boston, in collaboration with Massachusetts General Hospital, found that many children with severe food-related allergic reactions need a second dose of epinephrine, suggesting that patients carrying EpiPens should carry two doses instead of one.

Since 1997, the number of school-aged children with food allergies has increased nearly 20 percent, according to the Centers for Disease Control and Prevention. The study, publishing in the April issue of *Pediatrics*, is the largest to date to investigate emergency treatment of food-related anaphylaxis in children, according to the authors.

"Food allergies are an increasingly important topic in pediatrics," says Susan Rudders, MD, of Children's Division of Allergy and Immunology and first author of the paper. "There's not a lot of data about the epidemiology of food allergies because it's a hard thing to study." Difficulties imposed on previous studies included insensitive clinical tests for food allergies - such as through a skin test or blood test - and lack of a universally accepted definition of anaphylaxis.

In reviewing the charts of children under 18 seen in two Boston EDs from 2001 to 2006, the researchers identified 1,255 children who made visits for food-related allergic reactions. Of these, more than half had anaphylaxis, the most severe allergic reaction involving at least two organ systems or low blood pressure (as defined by the National Institute

of Allergy and Infectious Disease and the Food Allergy and Anaphylaxis Network in 2006). Common symptoms included trouble breathing, skin rashes, swelling and gastrointestinal problems.

Of those children with anaphylaxis who were treated with epinephrine, 12 percent needed more than one dose because of a resurgence of symptoms, either before or after being taken to the ED. This finding is consistent with those of smaller previous studies.

"Until we're able to clearly define the risk factors for the most severe reactions, the safest thing may be to have all children at risk for food-related anaphylaxis carry two doses of epinephrine," Rudders says. To offset the added cost, Rudders suggests that school nurse offices carry un-assigned extra doses of injectable epinephrine for the children who need them.

The study also characterized the state of anaphylaxis treatment in the two EDs. The study, spanning 2001-2006, suggests that EDs may not always follow current practice guidelines, which have not changed much since 1998. Current practice guidelines recommend a protocol for food-related anaphylaxis: doctors use epinephrine as the first line of treatment, refer patients to allergists, instruct patients to avoid suspected foods and prescribe self-injectable epinephrine.

However, consistent with trends seen nationwide, emergency physicians were more likely to treat children in the emergency department with corticosteroids and antihistamines. Upon discharge from the ED, less than half of patients were prescribed epinephrine, and even fewer were referred to an allergist or received instructions on avoiding suspected foods. These last recommendations are important in light of the fact that 44 percent of the children studied had a known history of food allergies, but still ate these foods accidentally.

These findings may be due to lack of a universal understanding of anaphylaxis in the ED before 2006, Rudders says. That gap in knowledge has been closing since, and Rudders hopes her study will move things forward.

"As food allergies are becoming more prominent in the media, some of these [shortcomings] will catch up," Rudders says. "Recognizing anaphylaxis, promptly treating with epinephrine and sending children home with self-injectable epinephrine are going to become increasingly important."

Provided by Children's Hospital Boston