

A survey of Epi-PEN use in patients with a history of anaphylaxis

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A recent report on the incorrect use of metered-dose inhalers by asthmatic patients¹ and a survey that showed the deficiency of physicians in providing after-care instructions to patients with Hymenoptera sting-induced anaphylaxis^{2,3} prompted us to observe closely how patients and their parents are instructed to use Epi-PEN or Epi-PEN Jr (Dey Laboratories, Napa, Calif), life-saving epinephrine injectors. Epi-PEN Jr is indicated for children whose body weight is less than 30 kg (66 lb). The device is designed for the emergency treatment of systemic allergic reactions (anaphylaxis) caused by allergens, such as insect venom, foods, drugs, and latex products. It is also prescribed for idiopathic or exercise-induced anaphylactic reactions or for patients who are at high risk for systemic reactions to immunotherapy injections.

METHODS

Patients who had been prescribed Epi-PEN and were referred to our allergy clinic were the subjects of the study, which included questioning of patients and their parents (regardless of the patient's age) on their knowledge of Epi-PEN. Patients and parents were also asked to demonstrate its use.

RESULTS

A total of 98 consecutive patients participated in this study. Ninety-three of them were less than 18 years of age, with ages ranging from 18 months to 18 years, and 15 were adults over the age of 18 years. We assumed that the primary trainees for patients under the age of 12 should be the parents, and for those over the age of 12, they should be the patients and the parents. Because of the smaller size of the adult population, we did not attempt to compare the 2 groups in relation to age. Responses to questions and the results of their demonstration of Epi-PEN use are summarized as follows.

Questions

1. What was the clinical condition for which Epi-PEN was prescribed? Insect sting or bite: 56 (57.2%); food

allergy: 21 (21.4%); latex allergy: 12 (12.2%); drug allergy: 3 (3.1%); exercise-induced or idiopathic anaphylaxis: 6 (6.1%).

2. Who prescribed Epi-PEN for you? Allergist: 20 (20.4%); other physicians: 78 (79.6 %).

3. Did your physician or his/her staff demonstrate the use of Epi-PEN for you after they gave you the prescription? Allergist: Yes 5 (25%), No 15 (75%); other physicians: Yes 6 (7.7%) No 72 (92.3%).

4. Do you know the circumstances for which the use of Epi-Pen is indicated? Correct answer: 82 (83.7 %); incorrect answer: 16 (16.3%).

5. Do you have at least two Epi-PENs so that one can be kept at school and one can be carried by you or your parents when you are outside of the house? Yes: 82 (83.7%); No: 16 (16.3%).

Demonstration

1. Knows to remove the cap before the injection. Yes: 88 (89.8%); No: 10 (11.2%).

2. Knows to press the Epi-PEN on the lateral thigh. Yes: 76 (77.6%); No: 22 (22.4%).

3. Knows to press Epi-PEN until a clicking sound is heard. Yes: 36 (36.7%); No: 62 (63.3%).

4. Knows to hold Epi-PEN in place for at least 10 seconds. Yes: 40 (40.8%); No: 58 (59.2%)

5. Knows that Epi-PEN can be used without removing clothes. Yes: 52 (53.1%); No: 46 (46.9 %).

6. Knows that there is an expiration date on Epi-PEN. Yes: 95 (96.9 %); No: 3 (3.1%).

Case reports on erroneous use of Epi-PEN

1. A 6-year-old boy had sudden onset of generalized urticaria after he had eaten a piece of shrimp, to which he was known to be sensitive. His mother gave Epi-PEN but his symptoms rapidly escalated to respiratory distress with wheezing. He was rescued in a nearby emergency department. The error was that the mother did not hear the clicking sound when the Epi-PEN was pressed, and therefore it was never activated.

2. A 4-year-old girl was known to have fire ant allergy and received an ant bite on her ankle. She immediately experienced flushing, began heavily perspiring, and became cyanotic, with severe wheezing. Her mother gave Epi-PEN. She looked better for a while but gradually lost consciousness. She was revived in the emergency department. The error was that the mother did not wait for 10 seconds while she gave Epi-PEN.

3. A 4-year-old boy was known to be very sensitive to peanuts. He accidentally ate a piece of cookie with peanut and immediately experienced flushing and

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wheezing. His mother gave Epi-Pen, but it fell when the child moved and was no longer usable. He was rushed to the emergency department where he was appropriately treated. The error was that the mother gave Epi-PEN to the front part of the thigh too close to his knee joint. The sharp pain followed by a sudden jerky movement caused the Epi-PEN to drop on the floor.

DISCUSSION

Our survey illustrated alarmingly that many patients are not properly instructed in the use of Epi-PEN when the prescription is given. The 3 cases reported above further illustrate that a grave outcome may result when parents or patients erroneously feel that they are capable of managing an emergency or life-threatening event with Epi-PEN. I urge any physician who prescribes Epi-PEN to (1) give proper instructions to the patients or their parents (this should include the use of a demonstrator of Epi-PEN); (2) give parents or patients the opportunity to

practice with an Epi-PEN demonstrator on each follow-up visit to their physician's office; (3) tell parents and patients that even the application of Epi-PEN may not always rescue the patient from a severe anaphylaxis and that they should remain vigilant and be ready to get medical attention; and (4) include the demonstration of the use of Epi-PEN in a CME course. Finally, the results of the study also support the need for the Epi-PEN distributor to make better teaching and demonstration materials, such as videos and illustrated pamphlets, available to allergists and pharmacists.

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