

## Clinical Communications

### Allergists' opinions on anaphylaxis and epinephrine administration—a case-based survey

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#### Clinical Implications

- This survey suggests that, even amongst allergists, discrepancies exist regarding the use of epinephrine to treat anaphylaxis. This implies that additional educational efforts are needed to clarify the appropriate use of this drug in this setting.

#### TO THE EDITOR:

Although there are current international and national guidelines for the diagnosis of anaphylaxis, there is not a single accepted definition.<sup>1,2</sup> Rather, these guidelines suggest that anaphylaxis is likely in the presence of various clinical manifestations. This, along with the fact that there is no reliable diagnostic marker, can be perplexing to both patients and clinicians who are faced with treatment decisions, particularly regarding the prescription and administration of epinephrine. We were interested in learning about allergists' opinions regarding the diagnosis of anaphylaxis and whether epinephrine would be warranted in various clinical scenarios. We therefore surveyed practicing allergists to better assess their opinions.

We performed an anonymous online survey through the American Academy of Allergy, Asthma, and Immunology (AAAAI). We sent the survey to 1,070 practicing allergists randomly selected by the AAAAI survey administrators. We provided them with 10 clinical scenarios and asked them 2 short questions on each: (1) "Does this case represent anaphylaxis?" and (2) "Would you treat this patient with epinephrine during the reaction?" Respondents were told that this was not a test of knowledge and that there were no "right" or "wrong" answers (however, 9 of 10 cases, by design, met clinical criteria for likely anaphylaxis<sup>1</sup>). They were allowed to give explanations and comments if they desired. Data were collected from February-March 2017. Descriptive statistics were used to analyze the data. This study qualified as exempt human subjects research.

We received 133 responses (response rate 12.4%). Respondent characteristics are detailed in Table E1 (available in this article's Online Repository at [www.jaci-inpractice.org](http://www.jaci-inpractice.org)). Respondents ranged from current fellows-in-training to practitioners 59 years out of training. Background training of respondents included pediatrics (41.4%), internal medicine (39.1%), med-peds (8.3%), and other/nonresponding (11.3%). The majority worked in the United States (83.3%), and place of work was commonly a solo or small-group practice (56.4%) with others including being a fellow-in-training (12.8%), large-group/multispecialty group (9.0%), academic/university (4.5%), and other/nonresponse (17.3%).

For each case (Table I), at least 1 respondent selected treatment with epinephrine. Some selected epinephrine treatment in 2 of 10 cases and 1 respondent selected epinephrine treatment for every case, with a wide range in between (Figure 1).

Interestingly, in several cases, there was discordance between considering the reaction anaphylaxis and treatment with epinephrine. For example, 81.8% of respondents stated that they would diagnose case 1, a 12-month-old with mild eczema who develops hives and vomiting minutes after the first ingestion of egg, as anaphylaxis. However, only 67.2% would administer epinephrine in this case (and this discrepancy was seen in both pediatric and medicine-trained respondent). On the other hand, with cases involving peanut, respondents were more likely to give epinephrine, even if they did not consider the case anaphylaxis (cases 3 and 6, Table I).

Country of residence/practice, years since training, and type of practice (solo, large group, etc.) were not associated with whether respondents elected to give epinephrine or not (data not shown). However, there was an association of residency training (internal medicine vs pediatrics) and whether they would administer epinephrine. Those trained in pediatrics selected epinephrine for 56.0% of cases, whereas those trained in internal medicine selected epinephrine for 46.8% of cases ( $P = .006$ ). This discrepancy was most evident in case 6. Of respondents trained in pediatrics, 72.9% selected epinephrine, whereas 45.5% of those trained in internal medicine selected epinephrine for this case ( $P = .01$ ). More respondents trained in pediatrics identified this case as anaphylaxis, but it was not statistically significant.

This survey has several interesting findings. First, despite current guidelines, even amongst allergists, there is a discrepancy in individual decisions as to whether anaphylaxis is present and whether the case warrants epinephrine. There have been numerous studies examining barriers to epinephrine administration<sup>3,4</sup>; however, in spite of the fact that allergists are likely to be the physician prescribing and counseling patients on the use of epinephrine, few investigations have examined this issue related to variables that might affect allergist's practices and thoughts. Simons<sup>5</sup> examined the availability of treatment and what guidelines international allergists report using. However, a better understanding of the thought process amongst the physicians considered that experts in anaphylaxis would be valuable. For example, understanding why pediatric-trained allergists in this survey more often answered that they would give epinephrine, or why respondents felt that cases with peanut warranted epinephrine even without anaphylaxis, may help us to understand what prompts providers to use this medication.

Another interesting finding is that there is a gap in when allergists choose to administer epinephrine even if anaphylaxis is recognized (and vice versa). Of all responses, 5.5% of the time, the respondent considered the case anaphylaxis but would not give epinephrine (4.0% of the time the respondents would give epinephrine, but felt that the case did not represent anaphylaxis). Many allergists in this survey stated that they would watch the patient closely and give epinephrine only if the patient's status worsened. Although this may be safe to do when the patient is under observation, guidelines clearly state that epinephrine should be administered, and fatalities have been associated with a

TABLE I. Cases and responses

Case	Respondents reported that this case represents anaphylaxis	Respondents reported that they would treat with epinephrine during the reaction	Discordant: Yes anaphylaxis No epinephrine	Discordant: No anaphylaxis Yes epinephrine
1. A 12-mo-old with a history of mild eczema eats scrambled egg for the first time. Within minutes, he develops hives all over his body and vomits	81.8%	67.2%	16.8%	1.5%
2. An 8-year-old with no prior medical history is stung by an insect that she believes to be a wasp. Within minutes, she develops redness and swelling at the site of the sting and generalized itching. Approximately 30 min later, she develops a sense of dyspnea. No wheeze is noted on auscultation	61.5%	56.5%	6.2%	0.8%
3. A 14-year-old with peanut allergy who has a history of anaphylaxis to peanut develops hives minutes after tasting a cookie brought to school by a friend	43.9%	55.0%	9.2%	19.8%
4. A 14-year-old atopic asthmatic with allergy to grass and moderate persistent disease, currently controlled on medium-dose inhaled corticosteroid, develops generalized itching and wheezing when playing touch football on his lawn during the summer while the neighbor was mowing his grass	20.6%	13.5%	7.1%	0%
5. A 30-year-old with a known history of large local reactions to insect stings is stung near a wasps nest. Within minutes, she develops generalized urticaria, vomiting, and dyspnea	100%	100%	0%	0%
6. A 24-year-old patient with known peanut allergy and past reactions including hives and dyspnea eats a dessert. After finishing, he discovers that the dessert contained a small amount of peanut. He then starts to develop tingling in his lip and immediately starts to feel an impending sense of doom	60.8%	66.13%	3.2%	8.1%
7. A 44-year-old man with no past history of allergy awakens in the middle of the night with hives all over his body, intense pruritus, severe abdominal pain, and wheezing. He was fine when he went to bed that night	79.5%	77.4%	4.1%	1.6%
8. A 54-year-old woman is prescribed hydrocodone-acetaminophen after a dental procedure. Within 20 min of taking the first dose at home, she develops generalized itching and dizziness	23.0%	20.7%	2.5%	1.7%
9. A 25-year-old with moderate persistent asthma, controlled on inhaled corticosteroid, develops a large local reaction, dyspnea, and tachypnea 20 min after receiving 0.3 mL of his 1:1 allergy immunotherapy containing tree and grass pollens. He has no wheeze on examination and his peak flow is equal to his preshot peak flow. He is visibly uncomfortable	64.2%	67.5%	1.6%	4.9%
10. A 17-year-old girl with intermittent asthma is walking through a department store. When she gets close to the cosmetics/perfume section, she develops dyspnea, "wheezing," and generalized erythema	13.0%	10.6%	3.5%	0.8%

delay in epinephrine administration.<sup>6</sup> For example, case 9 involved a patient who developed a large local reaction, dyspnea, and tachypnea 20 minutes after receiving an allergy

immunotherapy injection. Although the patient did not have wheeze on examination and did not have drop in his peak flow, this case would, by guidelines, warrant epinephrine.<sup>7,8</sup> In reviews

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