Letter to the Editor

Anaphylaxis in America: A national physician survey

To the Editor:

Anaphylaxis is an acute, life-threatening reaction with various triggers, presentations, and severities.[1,2] Although prevalence estimates vary, our recent national survey estimated a lifetime prevalence of 1.6% to 5.1% in adults.[3] This is therefore a common entity that most physicians are likely to encounter. Several previous publications examining the care of patients with anaphylaxis have demonstrated potential deficiencies among primary care and emergency physicians, as well as allergy/immunology (A/I) specialists.[4-7] Consistent with this, we found in our recent survey that although most of those reporting anaphylaxis had experienced at least 2 previous episodes, most had not received an emergency action plan, only 32% intended to use their epinephrine autoinjector (EAI) for future reactions, 52% reported never receiving an EAI prescription, and 60% did not have an EAI available.[3] In this report, we summarize results from an additional survey in which we gathered data on experience, knowledge, and attitudes regarding anaphylaxis among A/I specialists, primary care physicians, and emergency physicians.

We conducted a telephone interview of physicians comprising A/I specialists (50% with pediatric and 50% with internal medicine training), emergency physicians, family practitioners, and pediatricians. Four thousand advance letters were sent to a sample derived randomly from the American Medical Association/American Osteopathic Association, from which 330 were screened and 318 interviewed. The final cohort included 114 A/I specialists (including 58 with pediatric and 56 with internal medicine training), 102 emergency physicians, 50 family practitioners, and 50 pediatricians. The interview consisted of 47 questions and lasted on average 19.1 minutes. Responses among the 5 physician groups were compared using ANOVA, with $P < .05$ considered statistically significant.

The survey revealed that most physicians reported being very familiar with the term *anaphylaxis* (range, 89% to 100%; see Table I for all results). Most had witnessed an anaphylactic reaction, ranging from 82% (family practitioners) to 99% (emergency physicians) ($P = .01$). Not surprisingly, A/I specialists and emergency physicians were more likely to see those patients at least once a month who reported a history of anaphylaxis (overall range, 17% family practitioners to 67% to 75% of A/I specialists; $P < .001$).

When asked which symptoms may be indicative of anaphylaxis, there were significant differences among the groups regarding cough (range, 30% to 55%; $P = .02$), skin reactions (26% to 54%; $P = .003$), and abdominal pain (6% to 46%; $P < .001$). Responses were similar regarding breathing problems (71% to 77%), dizziness/fainting (50% to 68%), and swelling (38% to 54%). Fewer than 20% of each group considered sudden behavioral change, anxiety, loss of bladder control, or hoarse voice to be indicative of anaphylaxis.

With regard to the foods that are most likely to cause severe allergic reactions, significant differences were found among the groups for each of the 9 foods queried. Peanut was recognized most consistently, although it was not recognized as a common trigger by 24% of emergency physicians and 30% of family practitioners. In addition, most non-A/I specialists did not identify tree nuts as a common cause of severe allergic reactions and shellfish was noted by less than half of family practitioners and pediatricians. With regard to medications as a cause of severe allergic reactions, there were significant differences among the groups for all medication classes except sulfa drugs. Possibly most surprising, nonsteroidal anti-inflammatory drugs were not recognized as a trigger by the vast majority of family practitioners and emergency physicians.

When queried regarding treatment of witnessed anaphylaxis, there were no significant differences among the groups, with 81% of family practitioners to 98% of A/I specialists reporting epinephrine as the first-line treatment. Significantly fewer emergency physicians (63%; $P < .001$) indicated that they prescribe an EAI for patients reporting a history of anaphylaxis, while they were also more likely to prescribe oral corticosteroids (21%; $P < .001$). Differences were also seen in those reporting subspecialty referral, ranging among non-A/I specialists from 5% of emergency physicians to 19% of pediatricians ($P < .001$).

A series of questions also focused on awareness and attitudes regarding anaphylaxis. Although almost all A/I specialists were aware of professional anaphylaxis guidelines, this was true for only 60%, 46%, and 67% of emergency physicians, family practitioners, and pediatricians, respectively ($P < .001$). Most of the A/I specialists, family practitioners, and pediatricians believed that patients carry their EAI most/all of the time compared with only 39% of emergency physicians ($P = .007$). There were no differences regarding the opinion that patients will use their EAI appropriately (range, 42% to 65%). In addition, 16% to 38% believed that there are absolute contraindications to the use of epinephrine in treating anaphylaxis. Although most physicians recognized asthma as a risk factor for severe anaphylaxis, most emergency and family physicians did not recognize that teenagers are at an increased risk of fatal anaphylaxis.

In addition, 19% to 33% of the physicians mistakenly reported that restaurants are required to have EAIs available and 77% to 94% wrongly indicated that all ambulances are required to carry epinephrine. Finally, when asked about the impact of severe allergies on daily life, only 10% of the family practitioners responded "a lot" compared with 53% of pediatric A/I specialists.

Given that anaphylaxis is common and can have potentially deadly consequences, the findings from this survey raise concern about overall physician knowledge of this condition. Although it is reassuring that almost all physicians were very familiar with the term *anaphylaxis* and recognized that epinephrine is the recommended first-line treatment, it is concerning that many physicians did not identify breathing problems, fainting, swelling, and abdominal pain as symptoms that might indicate anaphylaxis. It is also of potential concern that very few physicians advise subspecialty referral for patients with anaphylaxis.

Fortunately, most physicians did state that they would provide an EAI prescription for patients reporting a history of anaphylaxis. Although emergency physicians were less likely to do so at 63%, this is not surprising given the fact that most patients in the emergency department are there for reasons unrelated to anaphylaxis. These results, however, are somewhat inconsistent with our previous public and patient surveys,[3] in which we found

TABLE I. Summary of survey results

Questionnaire item	A/I (pediatric) (n = 58)	A/I (internal medicine) (n = 56)	Emergency medicine (n = 102)	Family/general practice (n = 50)	Pediatrics (n = 52)	*P* value
Familiarity with "anaphylaxis"						.03
Very	100	98	95	90	89	
Somewhat	0	2	5	10	12	
Have witnessed anaphylaxis	95	89	99	82	85	.01
Frequency of witnessing anaphylaxis						
≥Once a month	40	28	21	10	25	<.001
Frequency of seeing patients reporting anaphylaxis						
≥Once a month	67	75	56	17	22	<.001
Symptoms of anaphylaxis						
Dizziness/fainting	57	68	55	50	52	.37
Breathing problems	72	77	71	74	77	.86
Coughing	31	55	37	30	44	.02
Swelling	38	41	41	44	54	.42
Skin reactions	53	54	41	26	56	.003
Sudden behavioral change	2	4	8	8	4	.41
Anxiety	9	9	7	4	8	.87
Loss of bladder control	5	4	0	0	4	.14
Throat itching	14	13	15	6	10	.59
Hoarse voice	7	4	5	2	6	.78
Cramps, abdominal pain	31	46	10	6	29	<.001
Foods most likely to cause a severe allergic reaction						
Strawberries	0	0	13	14	4	.001
Soy	14	16	0	0	10	<.001
Wheat	12	14	1	8	6	.01
Fish	28	30	10	8	19	.001
Milk	47	32	6	16	37	<.001
Eggs	57	32	9	20	37	<.001
Tree nuts	72	71	34	30	42	<.001
Shellfish	76	79	63	48	46	<.001
Peanuts	95	89	76	70	89	<.001
Medications most likely to cause a severe allergic reaction						
Blood pressure medications	9	9	18	16	2	.04
Aspirin, Advil, Motrin	33	41	9	6	40	<.001
Sulfa drugs	28	25	29	34	39	.57
Penicillin	76	63	35	44	62	<.001
Other antibiotics	40	59	60	58	40	.05
Treatment for anaphylaxis						
Administer epinephrine	93	98	91	81	89	.28
Administer something else	4	0	7	10	2	
Send patient to hospital	2	2	0	5	5	
Other	2	0	1	5	2	
Treatment for patients reporting previous anaphylaxis						
Nothing	0	0	18	2	2	<.001
Send patient to specialist	3	0	5	6	19	<.001
Discuss preventative measures	7	9	7	10	12	.83
Prescribe steroids	3	7	21	4	4	<.001
Prescribe antihistamines	12	25	17	16	12	.34
Prescribe EAI	100	93	63	88	85	<.001
Awareness of professional guidelines on anaphylaxis	97	96	60	46	67	<.001
Patients carry epinephrine as directed						
All	5	6	2	7	5	.007
Most	60	54	37	51	62	
Some	29	38	42	26	23	
Few	3	2	18	14	3	
None	0	0	0	2	0	
Patients use epinephrine as directed						
All	9	14	3	9	3	.24
Most	55	50	39	54	62	
Some	28	30	45	21	28	
Few	9	4	11	14	5	

(Continued)

TABLE I. *(Continued)*

Questionnaire item	A/I (pediatric) (n = 58)	A/I (internal medicine) (n = 56)	Emergency medicine (n = 102)	Family/general practice (n = 50)	Pediatrics (n = 52)	*P* value
Believe there are absolute contraindications to prescribing EIA	16	32	38	38	21	.03
Agreement with statements about allergic reactions						
Restaurants are required to have epinephrine	22	30	18	26	33	<.053
All ambulances are required to carry epinephrine	85	77	84	94	87	.08
Teenagers are at a higher risk for fatal allergic reactions	91	73	35	36	62	<.001
Asthma is an important risk factor for severe allergic reaction (anaphylaxis)	98	96	79	90	85	.009
Think there are more life-threatening reactions today (compared with 10 y ago)	78	57	59	40	48	.03
Daily life impact of patients with severe allergies						
A lot	53	38	25	10	31	<.001
Moderate	33	34	30	34	39	
Some	14	20	28	26	15	
A little	0	9	16	30	12	
Not at all	0	0	1	0	4	

All values are in % except *P* values.

that although most respondents reported 2 or more previous anaphylactic episodes, and 19% reported 5 or more, 60% did not have EAI available. They are also inconsistent with published reports of emergency treatment of anaphylaxis, in which epinephrine is actually used in only a minority of patients, even in those with cardiovascular symptoms.[8,9] These discrepancies may be due at least in part to a limitation in the design of the questionnaire, which did not capture data about which specific symptoms would trigger administration of epinephrine, recognizing that respondents may have different interpretations of anaphylaxis and thresholds for the use of epinephrine. Finally, many doctors responded that there are absolute contraindications to epinephrine, although most experts agree that this is not the case for patients presenting with anaphylaxis. All these issues raise significant concern that physicians may be less likely to both prescribe and use epinephrine in actual practice than they reported in the survey.

In addition to survey responses about the recognition and treatment of anaphylaxis, a number of interesting findings emerged regarding other day-to-day issues. Physicians were overall misinformed about the availability of epinephrine in both restaurants and ambulances. When questioned regarding quality of life, only 10% of family practitioners and 31% of pediatricians believed that "severe allergies" have a major impact on quality of life. This differs markedly from results of previous studies about patients' perceptions regarding the effects of food allergy on quality of life.[10] More pediatric A/I specialists (78%) than others ($P = .03$) believed that life-threatening allergic reactions today are more common than 10 years ago, consistent with published data,[11] and most physicians in all groups recognized that asthma is a risk factor for severe reactions.

Similar to our surveys of patients and the general public, this study clearly demonstrates the need for ongoing education regarding anaphylaxis. As with previous studies, knowledge gaps are especially apparent for primary care and emergency physicians, who are most often the physicians on the front line in the treatment of this common and life-threatening condition.

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