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The Diagnosis and Management of Anaphylaxis

You are listening to ReachMD XM160, The Channel for Medical Professionals. Welcome to Hot Topics in Allergy presented by the American college of Allergy, Asthma, and Immunology. Your host is Dr. Ketan Sheth, medical director of the Lafayette Allergy and Asthma Clinic in Lafayette, Indiana.

What are the best ways to prepare for and prevent anaphylaxis? Are there new treatment options available? Joining us to discuss the diagnosis and management of anaphylaxis, an updated practice parameter is Dr. Richard Nicholas, clinical professor of medicine at George Washington University Medical Center. Dr. Nicholas is coauthor of the joint task forces Anaphylaxis Parameters.

DR. KETAN SHETH:

Welcome, Dr. Nicholas.

DR. RICHARD NICHOLAS:

Thank you.

DR. KETAN SHETH:

Let's start with what is the most common cause of anaphylaxis?

DR. RICHARD NICHOLAS:

Probably the most common cause of anaphylaxis are reaction to flu. Certainly there are many other causes for anaphylaxis. Medications, stinging insect venom, sometimes although somewhat rarely, airborne allergens, a number of different things with probably the most common of all of them are reactions to flu;.

DR. KETAN SHETH:

Well how does anaphylaxis present itself?

DR. RICHARD NICHOLAS:

That's a very good question when you ask many physicians about that in terms of trying to give the definition, they will say, I can't give you a definition, but I know what it is when I see it, and for that reason, a couple of years ago, an international panel of experts on this topic was convened at the NIH to try to define what anaphylaxis really is, they came up with 3 scenarios; I would like to present those, and then may be discuss something about how you can have other sorts of presentation. The 3 scenarios that they said were consistent with the diagnosis of anaphylaxis were first when you had an acute onset of a reaction, and I am sure most people are aware of the fact that anaphylaxis is a sudden, potentially life-threatening type of event and they said minutes to several hours, but that could be discussed further in terms of the length of time. It certainly is an acute onset with involvement of the skin or may be as a surrogate to that mucosal tissue and at least one of the following organ systems involved or either some sort of respiratory compromise, particularly upper airway obstruction due to laryngeal edema or reduced blood pressure or symptoms of end-organ dysfunction as a result of the decrease in blood pressure. Now that's one scenario that they said was consistent with anaphylaxis. The second scenario they said was when you had involvement of two or more organ systems which occurred rapidly after exposure to a likely allergen. For example, patient who is thought to have reacted to a certain type of shell fish when they have a history of reacting to other shell fish in the past and that would include any one of these 4 organ systems. Again, the skin or mucosal tissue, any sort of respiratory compromise, decrease in blood pressure or associated symptoms or persistent gastrointestinal symptoms. So if you had any of those two organ systems involved in that setting then that would be consistent with anaphylaxis, but then they went on to say, and I think knowing something about the amount of controversy on this topic, I could see why this was out, they said it was also consistent with anaphylaxis if you had a reduction in blood pressure, and they defined for children in adults the amount of blood pressure they thought was significant after exposure to a known allergen. For example, patient who knows that they have had an allergic reaction to penicillin and is given penicillin, again for example. So there it would be only one organ system involved, the cardiovascular system, but it would be in a setting where an anaphylactic reaction would not be unexpected. Now, those are the three scenarios that they established for a definition of anaphylaxis. What I would like to do is to point out that not infrequently you can see anaphylaxis occurring with involvement of only one organ system other than just when you have a fall in blood pressure. For example, I can remember when I was doing my fellowship that we were asked to consult on a patient in the hospital, a 40-year-old man who has been admitted for diagnostic evaluation prior to having a heart surgery and he was given penicillin prophylactically and 30 minutes later developed a ventricular arrhythmia. Fortunately, he was successfully resuscitated, but the resident noted that he had a few urticarial lesions on his legs, very minor, that most people would have overlooked. So we saw that patient, skin tested him for penicillin and he had a very strongly positive reaction to the major determinant for penicilloyl-polylysine. So this in retrospect was a gentleman who presented as an acute cardiac event, but actually had experienced anaphylaxis. One of the reasons for the potential for that to occur is that there are abundant mast cells in the human heart and mast cells and basophils in the circulation are the cells that are really involved with true anaphylactic reaction where allergen binds to or actually bridges IgE molecules attached to high affinity receptors on the surface of mast cells and basophils and initiate a series of intracellular reaction leading to the result of pharmacologically active mediator, the best known of which is histamine, but leukotriene, prostaglandins, kinins, and cytokines and other mediators. So there are abundant mast cells in the human heart and they are located in very strategic areas along the adventitia of large coronary arteries and in close contact with small intramural vessels as well. The stimulation of these mast cells can produce a negative inotropic effect in myocardia depression and there have been patients reported in the literature who during anaphylaxis have been shown to have constriction of the coronary arteries and also been shown to have changes in electrocardiograph that are identical to that which you would see in the acute myocardial infarction. So it's important to recognize that patients can present with that type of event which is due to anaphylaxis. I remember two things in patients in my office a number of years ago who had been skin tested and had some positive reactions, but she also mentioned that shortly after the skin testing was put on that she felt sort of a tightness or constriction in her throat and when we looked at her throat again, and we had done that before we did the skin testing, there was a tremendous increase in edema of the uvula. So this clearly this patient was having an anaphylactic reaction involving the upper respiratory tract without any other cutaneous manifestations or anything of that type, and that's important because if you look at the data in the literature, it will almost always say that it's hard to make a diagnosis of anaphylaxis unless you have cutaneous manifestations, and in fact, urticaria an angioedema occurs in 85 to 90% of patients with anaphylaxis, but clearly as that points out, not in all of them, and the next most likely symptom to see is upper airway obstruction or in some cases lower airway obstruction with bronchospasm, manifestations of hypotension or GI types of manifestations as well. So there are different types of presentation that you can have, and in fact, there was a retrospective case review study of 25 patients who experienced fatal anaphylaxis and they showed that only one of the patients of the 25 that had a fatal anaphylactic reaction had

dermatologic manifestation, so it's possible then to have just one organ system involved and it's possible to have the anaphylaxis occur without any dermatologic manifestation.

If you are just tuning in, you are listening to Hot Topics in Allergy on ReachMD XM160, The Channel for Medical Professionals. I am your host, Dr. Ketan Sheth, and joining me to discuss the diagnosis and management of anaphylaxis, an updated practice parameter is Dr. Richard Nicholas, clinical professor of medicine at George Washington University Medical Center.

DR. KETAN SHETH:

Well, we have talked about some of the manifestations or how it's going to show up, but how should we be evaluating and managing the patient with a history of episodes of anaphylaxis?

DR. RICHARD NICHOLAS:

Well, I think the first thing you have to do is to be sure that you are dealing with anaphylaxis and that gets into the question about differential diagnosis and one of the types of conditions that you have to really think about in any patient who presents with any sort of scenario that we have just described in terms of the differential are patients who may have an abundance of mast cells. Certainly, mast cells are the main cells that are involved in anaphylactic reactions that we just described, but there are individuals who can have more mast cells than we would normally expect that is called mast cell disease. They can present with just dermatologic manifestations aside from when they have anaphylactic episode which are often salmon colored, light brown, often very nondescript lesions which are easy to miss, but which have a characteristic feature and that is what's called Darier sign where if you rub these lesions, they will urticate and form a small urticarial lesion, that's pathognomonic of urticaria pigmentosa which is the skin manifestations of systemic mast cell disease. In fact, there are other types of conditions which can cause endogenous production of histamines and other mediators, not only systemic mast cell disease, but also some types of basophilic leukemia and acute myelocytic leukemia. So that's one thing that one had to think about in the differential diagnosis. Now because such things as flushing, hypotension, those types of manifestations are seen frequently with anaphylaxis, you will also have to consider any other medical condition that could produce those types of symptoms. Probably the most common differential diagnosis we have to make though is between anaphylaxis and a vasovagal type reaction and we used to think that that was very easy to do because you can make the differentiation based on the fact there was vasovagal reactions, you really didn't have cutaneous manifestations like to do so commonly in anaphylaxis and even more importantly vasovagal reactions were associated with bradycardia and anaphylactic reactions were associated with tachycardia, but a study published several years ago pointed out that a very high percentage of patients in anaphylaxis can present with bradycardia, so that doesn't always give you the differential.

DR. KETAN SHETH:

So when those questions come up on the boards and we are always taught to answer it that way, we really clinically need to think that through a little bit more.

DR. RICHARD NICHOLAS:

Right, and I think that you have to think differently depending on what you would expect to be the correct answer on a board exam, for example, and what you might see in clinical practice, but it's certainly a fact, it's evidence based in the literature that patients with anaphylaxis can present with bradycardia so whether or not that would be the answer you would want to give on a board exam, I don't

know, but it is certainly something you would have to think about in terms of your management of patients.

DR. KETAN SHETH:

As we start to wrap up, what are the treatments that you would recommend, very briefly, for a patient who is having anaphylaxis we all need to consider?

DR. RICHARD NICHOLAS:

I think the most important thing that I can say in this whole interview is that epinephrine is the treatment of choice. There is no contraindication to epinephrine. I just saw a patient today in her 80s who has underlying cardiac disease, but I gave her epinephrine and we will talk about how that's given in a moment, but I gave that to her because if she has another reaction like she had last time and can't breathe, she needs the epinephrine to survive that attack, regardless of the underlying cardiac disease, but epinephrine unfortunately is not prescribed as it really should be. There are data that show from emergency rooms that only 27% of patients in one study who were seen in the emergency room for a true anaphylactic reaction received auto-injectable epinephrine when they left the emergency room and only 12% received epinephrine in the emergency room. I wouldn't go all through the data in regard to that because there is a lack of time, but there is a lot of data to indicate that epinephrine is still underutilized. Now, one of the things that's important to recognize is that there can be biphasic or protracted reactions. What it shows is that there are some patients. In fact in some studies up to about 35% of patients who may need more than one dose, but then that's we routinely now will give the patient two epi pens or may be even 2 Twin-Jects even though there are 2 doses of epinephrine in the Twin-Jects just so they have a second dose if the first dose doesn't completely control their symptoms and in fact there is a study of children with food allergy, 6% needed actually 3 doses of epinephrine before the reaction was controlled. Another issue that has come up is how you administer the epinephrine and you will see articles that have come out citing aspects of this that indicate very strongly that it should be given intramuscular injections or that it should be given by intramuscular injection in the thigh, and in fact there is really no data in patients who are experiencing anaphylaxis to indicate that IM administration is any more effective than subcutaneous administration.

DR. KETAN SHETH:

I would like to thank my guest from George Washington University Medical Center, Dr. Richard Nicholas. Dr. Nicholas, thank you for being our guest this week on Hot Topics in Allergy.

DR. RICHARD NICHOLAS:

It was my pleasure, thank you very much.

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