Injectable Epinephrine: An Epidemic of Misuse
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An Introduction to Epinephrine Misuse and Misinformation

It's time to face the fact that there is an epidemic of miscommunication about the use of epinephrine for allergic emergencies. This is a problem among both healthcare professionals and patients. As highlighted in December by Medscape Medical News, injectable epinephrine is often not used correctly by patients during allergic emergencies. Studies have even found that most parents were afraid to use the device in their children with peanut allergy.[1]

And doctors don't get it right, either. In my own experience, epinephrine is often omitted from the emergency care of the anaphylactic patient. R.S.H. Pumphrey reported,[2] in a study, that epinephrine was administered in just 62% of the fatal anaphylactic reactions that he reviewed, with only a small minority (14%) receiving the drug before cardiac arrest.

My partner in practice once had a patient in the emergency department for hours getting fluids for hypotension (blood pressure, 80/50 mm Hg), along with antihistamines and corticosteroids as anaphylaxis management. The patient was concerned and called my partner in the middle of the night. The treating emergency physician refused to give epinephrine and challenged my partner to come in if he wanted to manage the case—which he in fact did, and the patient promptly responded to a single intramuscular dose of 0.3 mg (1:1000) epinephrine.

Injectable Epinephrine: Safe and Effective When Used Correctly

What is this reluctance to use epinephrine, and from where does it arise? In my opinion, it is out of ignorance—not just of the guidelines for anaphylaxis, but also of the physiology of epinephrine.

At-rest plasma epinephrine levels are 0.035 ng/mL.[3] Levels over 10 times that amount have been measured in persons exercising,[4] and even higher than that in people under mental stress.[5]

Incredibly, it's not uncommon for doses of epinephrine to be administered intravenously during routine dental procedures, and this is usually tolerated.[6] We need to worry much less about the potential for epinephrine side effects.

It is epinephrine underuse that has consistently been shown to be the issue in anaphylactic emergencies,[2] and overdose is actually quite rare. The standard adult dose of self-injecting epinephrine (0.3 mg of 1:1000 epinephrine) raises the level of epinephrine in the body from an average of 0.035 ng/mL to about 10 times that amount.[7] It would require more about 20 such injections to reach a toxic level.

It's also important to note that a delay in use of epinephrine is linked to fatal food anaphylaxis.[8] The other risk factor for fatal food reactions is poorly controlled asthma, a point I always make to asthmatic patients with food allergy.

Finally, patients need to understand that allergic reactions are not all alike and that the severity may be influenced by many endogenous and exogenous factors. Factors that might accentuate an immediate hypersensitivity reaction include hormones, viral infections, nonsteroidal anti-inflammatory drugs, alcohol, and overheating/exercise.

To explain much of this to patients takes time. So I have developed a patient handout, which can be printed here, to help with your practice of medicine.

HANDOUT

Dear Patient:

You have been prescribed a self-injecting epinephrine device for allergic emergencies. You have probably
heard about this drug before, but I want to educate you more about it, because some of what you think you know may not be correct.

**Epinephrine is safe, and you already have epinephrine in your body**

Epinephrine is a naturally occurring hormone. It is the hormone that is part of our fight-or-flight response. When you are scared or excited, and also when you are exercising, your epinephrine levels surge, but even when you sleep, there is a little epinephrine circulating in your body. An injection from your epinephrine device will increase your level of epinephrine to the range seen under stressful circumstances. Since you have at some point in your life experienced stress, you have already been exposed to the effects of high levels of epinephrine.

If you were given the injection right now, all that would likely happen is that your heart rate and blood pressure would increase to a moderate degree and that you might feel slightly shaky. Epinephrine is metabolized very quickly, and you would not feel this effect for long.

**Why You Should Go to the Emergency Room (ER) After Using the Epinephrine**

You may have been told that you have to go to the ER after using your epinephrine device. That’s not because of the epinephrine; it’s because the allergic reaction probably requires further monitoring. Many patients also need more than one dose of epinephrine or other emergency treatments; that may be due to the severity of the allergic reaction or simply because the device was not used correctly (the most common mistake is not holding the device against your thigh for the time required for the full dose of medication to be delivered). So a trip to the ER is the safest thing to do after using epinephrine.

**Why You Should Not Wait to Use Your Epinephrine**

You might hope the allergic reaction won't be "that bad," and you might be right, but it's important to know that a delay in use of epinephrine is linked to fatal food anaphylaxis. The other risk factor for fatal food reactions is poorly controlled asthma, so if you do have asthma, that is another reason to keep your asthma under good control!

**Why You Should Not Be Afraid of the Epinephrine Device**

The device itself might look big, but the injection needle is not. It’s just like getting a flu shot. As mentioned above, the main side effect you might experience is feeling a bit shaky after using the device.

**References**


6. Lipp M, Dick W, Daubländer M, Fuder H, Stanton-Hicks M. Exogenous and endogenous plasma levels of

