

Angina after anaphylaxis treatment

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Abstract

Anaphylaxis is a life-threatening emergency, and adrenaline is the mainstay treatment for this condition. However, there have been a few reported cases of patients experiencing cardiovascular complications, such as myocardial infarction and coronary vasospasm, after its use. We highlight such a case in a young, healthy patient and the important differentials to consider.

Introduction

Adrenaline is the crucial medication for anaphylaxis, which is an acute, life-threatening medical emergency that requires immediate treatment. However, adrenaline administration, although rarely, may cause complications such as an adrenaline-induced coronary vasospasm. We report a case in which a patient had severe chest pain after a therapeutic injection of intramuscular adrenaline for anaphylaxis treatment.

Case Report

A 23-year-old Malay man presented to a primary health clinic with feelings of throat tightness and having vomited twice in 2 hours after an insect sting in his backyard. He was known to be allergic (angioedema) to metoclopramide, tramadol, aspirin and CT contrast media. He had no significant cardiovascular risk factors. On examination, he was alert, conscious and not exhibiting signs of respiratory distress. His blood pressure was 118/73 mmHg, his pulse rate was 94 beats per minute (bpm) and oxygen saturation was 100% under room air. His lungs were clear with equal air entry. There was no facial, orbital, periorbital or lips swelling. However, he had an injected and swollen uvula. He was treated

with 0.5ml of intramuscular tetanus toxoid in his right deltoid, 200mg of intravenous hydrocortisone, and 10mg of intravenous chlorpheniramine. Within minutes, the patient had a sudden escalation of drowsiness and worsening throat tightness. His heart rate increased to 108 bpm; however, his oxygen saturation remained at 100% under room air, and his lungs were clear. He was diagnosed with anaphylactic shock, and 0.5mg (1:1000) of intramuscular adrenaline was administered to his left deltoid immediately. Within 3 minutes, patient complained of excruciating chest pain on his left side and fainted. Dextrostix stat was 6.5mmol/l. His blood pressure shot up to 181/87 mmHg, and his pulse rate was 82 bpm. The first electrocardiogram (ECG) showed sinus rhythm with no ischemic changes. He was given high flow oxygen at 15 liters per minute. Patient regained consciousness after a few minutes with no more chest pain, and the repeat blood pressure was 114/65 mmHg with a pulse rate of 76 beats per minute. ECGs done twice after the event had sinus rhythms with no ischemic or dynamic changes. The patient was then sent to the emergency department and was admitted to the medical ward for further observation. His vitals remained stable, and he was asymptomatic. Cardiac enzymes were later shown to be normal. He was discharged the following day.

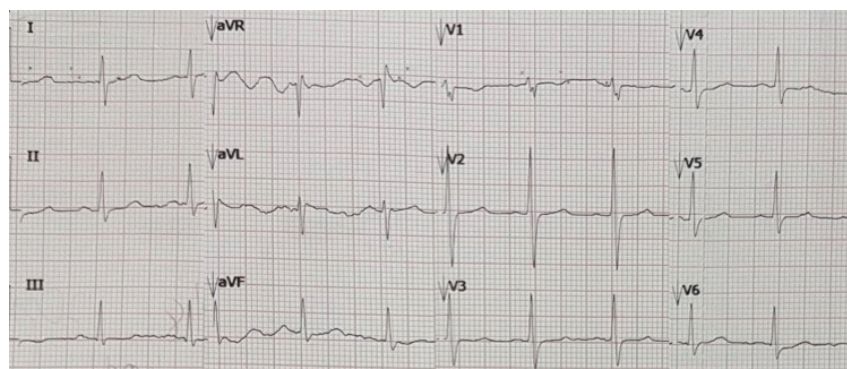


Figure 1: First ECG within 5 minutes after chest pain

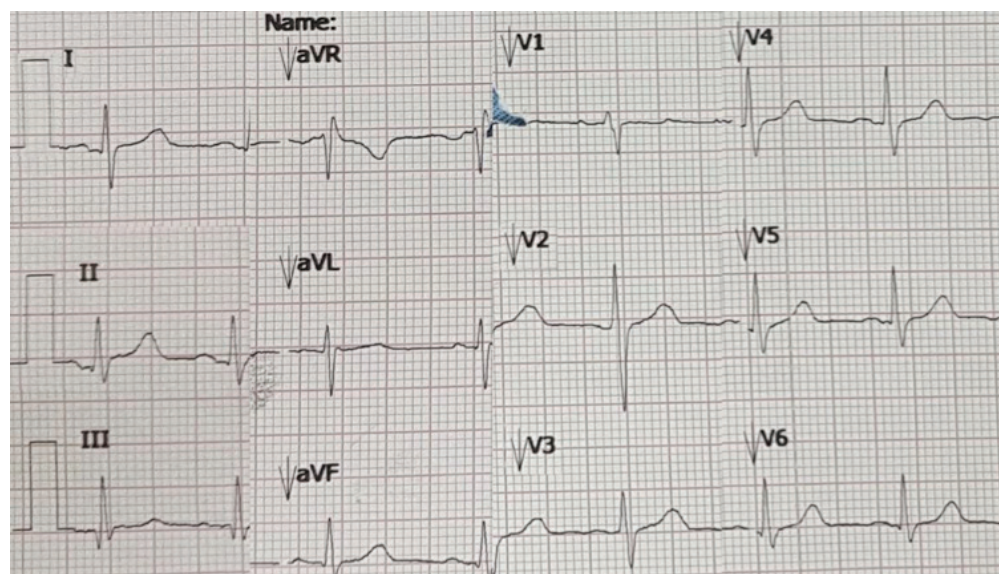


Figure 2: Second ECG 15 minutes later

Discussion

Anaphylaxis is an acute, life-threatening emergency that can be treated with adrenaline. The recommended treatment for anaphylaxis is an intramuscular injection of 0.5mg of 1:1000adrenaline for adults.¹ An injection is considered to be a relatively safer route of administration compared to intravenous administration (e.g., a lower risk of cardiovascular complications).²

In view of such possible complications, a definite diagnosis of anaphylaxis is of utmost importance before deciding on adrenaline for treatment. There are three diagnostic criteria for anaphylaxis³:

Criterion 1 (most frequently used) includes skin/mucosa symptoms and either respiratory symptoms or low BP.

Criterion 2 includes two out of the four symptoms made up of gastrointestinal symptoms and the three symptoms in criterion 1.

Criterion 3 only include low BP as a diagnostic criteria, provided the patient has been exposed to a known allergen.

*Hypotension for children is defined as⁴: Less than $65 + (2 \times \text{age in years})$ mmHg (5th centile)

In our case, the patient fulfilled criterion 2 with mucosal involvement (swollen uvula), respiratory symptoms (throat tightness), and gastrointestinal symptoms (vomiting) a few hours after the insect sting. We could not delay the treatment in the health clinic, as studies have shown that prompt treatment in pre-hospital care can reduce fatalities.¹

Chest pain or angina occurring in the context of anaphylaxis is rare. There are two common differential diagnoses, which are adrenaline-induced coronary vasospasm and Kounis syndrome. Both syndromes present with similar acute coronary symptoms, ECG and laboratory findings. This poses a diagnostic challenge for the treating physician.

It has been proposed that adrenaline-induced acute coronary syndrome is caused by the alpha-1-adrenergic effect inducing a coronary artery vasospasm or by the induction of platelet aggregation via adrenaline.⁵ There have been only six cases of reported myocardial infarction secondary to a therapeutic dose of adrenaline for anaphylaxis treatment among healthy patients with normal coronary arteries.⁶ Also, in these cases, there was a temporal relationship, with the onset of chest pain occurring within 5 to 15 minutes after the administration of adrenaline.⁷ Based on the above, our case was more likely to be an adrenaline-induced coronary vasospasm rather than Kounis syndrome. The suggested initial treatment of acute coronary syndrome (ACS) among young and healthy patients is nitrates and calcium channel blockers (CCB) when a vasospasm is considered to be the main culprit.⁸

Kounis syndrome (allergic angina or cardiac anaphylaxis) covers a clinical spectrum of ACS ranging from coronary vasospasm to acute myocardial infarction secondary to the inflammatory mediators released from mast cell activation during severe allergic reactions.

To date, about 20 cases have been reported in the literature.⁹ There are three types of Kounis syndrome – a vasospasm in normal coronary artery, known or asymptomatic pre-existing coronary artery disease, and stent thrombosis.¹⁰ Based on the reported cases, the onset of Kounis syndrome can be as early as minutes to as late as 48 hours after the exposure to allergen.¹¹ The mainstay treatment for Kounis syndrome is to treat the underlying anaphylaxis to suppress the allergic reaction. At the same time, ACS protocol with the primary aim of vasodilating the coronary artery with nitrates and CCB should be the first line therapy. Opioids should be used cautiously at this stage, as they may further aggravate mast cell degranulation. Fentanyl and its derivatives should be the alternative in such a situation.^{8, 12}

Conclusion

Although rare complications such as angina and ACS may arise, as illustrated in this case, early administration of adrenaline is still the crucial lifesaving measure in managing anaphylaxis. Thus, we suggest cardiac monitoring in patients with anaphylaxis, especially during adrenaline administration. This case is highlighted to raise awareness among primary care doctors regarding the potential side effects of adrenaline treatment. Moreover, it also points out the possible diagnostic dilemma faced when a patient has angina after adrenaline treatment for anaphylaxis. Regardless of the final diagnosis, the ACS management remains the same.

References

1. Simons FER, Arduzzo LRF, Bilò MB, et al. World Allergy Organization guidelines for the assessment and management of anaphylaxis. *World Allergy Organization Journal*. 2011 Feb; 4(2):13-37.
2. Campbell RL, Belloio MF, Knutson BD, et al. Epinephrine in anaphylaxis: higher risk of cardiovascular complications and overdose after administration of intravenous bolus epinephrine compared with intramuscular epinephrine. *J Allergy Clin Immunol Pract*. 2015 Jan; 3(1):76-80.
3. Sampson HA, Munoz-Furlong A, Campbell RL, et al. Second symposium on the definition and management of anaphylaxis: summary report: Second National Institute of Allergy and Infectious Disease/Food Allergy and Anaphylaxis Network Symposium. *J Allergy Clin Immunol*. 2006; 117: 391-397.
4. Ismail HIHM, Ng HP, Thomas T. Paediatric protocols for Malaysian hospitals, 3rd edition. KKM; 2012.
5. Cruz MC, Carvalho RS, Daniel PM, et al. A rash decision. The hazards of the wrongful use of adrenaline. *Romanian Journal of Anaesthesia and Intensive Care*. 2017;24(2):163-166.
6. Jayamali WD, Herath HMMTB, Kulathunga A. Myocardial infarction during anaphylaxis in a young healthy male with normal coronary arteries- is epinephrine the culprit?. *BMC Cardiovascular Disorders*. 2017; 17:237.
7. Kroll K, Jesus J, Tibbles C, et al. Intramuscular epinephrine and acute myocardial infarction. *The Journal of Emergency Medicine*. 2012; 43(6):1070-1074.
8. Izgi C, Cevik C, Kenneth Nugent K. Severe myocardial ischemia after concentrated epinephrine use for the treatment of anaphylaxis: Kounis syndrome or epinephrine effect? *Heart & Lung: The journal of Acute and Critical Care*. 2009 Aug; 39(2):160-163.
9. Kasim S, AbuBakar R, McFadden E. Anaphylaxis from wasp stings inducing coronary thrombus. *Case Reports in Cardiology*. 2012; 2012:701753
10. Kounis NG. Coronary hypersensitivity disorder: the Kounis syndrome. *Therapeutics*, 2013, 35(5):563-71.
11. Kundumadam S, Reddy V, Reddy SM, et al. An unusual case of recurrent hypersensitivity reaction associated with Kounis-like Acute Coronary Syndrome. *Case Reports in Cardiology*. 2017; 2017:6421208.
12. Yesin M, Kalçık M, Gürsoy MO, et al. Acute myocardial infarction in a patient suffering from penicillin-induced laryngeal edema, Kounis syndrome aggravated by adrenaline. *Wien Klin Wochenschr*. 2017; 129(13-14):509-511.
13. Lieberman P, Estelle F, Simons R. Anaphylaxis and cardiovascular disease: therapeutic dilemmas. *Clin Exp Allergy*. 2015 Aug; 45(8):1288-95.