

Kounis syndrome: A rare case

Ashok Sunder¹, Bijaya Mohanty¹, Abha Singh¹

¹Department of Medicine, Tata Main Hospital, Jamshedpur, Jharkhand, India

ABSTRACT

Allergic angina and allergic myocardial infarction are ubiquitous diseases covering a wide spectrum of mast cell activation disorders, which are associated with acute coronary syndromes and are referred to as “Kounis Syndrome”. Here, we report a case admitted with dyspnea and mild chest heaviness secondary to bee sting, later diagnosed as Kounis syndrome.

Keywords: Allergic myocardial infarction, Kounis syndrome, vasospastic

Introduction

The acute coronary syndrome resulting from an allergic reaction is referred to as Kounis syndrome. Kounis and Zafras reported the first case in 1991.^[1] American Heart Journal in 1950 published the first case of allergic angina due to prolonged use of penicillin.^[2] The aim of presenting this case is to highlight this rare syndrome. Brown *et al.* reported that 9.5% of healthy volunteers developed chest pain after an insect sting challenge. All of them had electrocardiographic abnormalities consistent with acute myocardial ischemia.^[3] Here, we present a case of Kounis syndrome caused by bee sting injury.

Case Summary

A 59-year-old male was admitted with complaints of breathlessness and chest pain along with radiation to the left arm after bee sting injury. He is a diabetic and was on insulin therapy for the last 10 years. There was no past history of allergy or asthma and he had no kind of addictions. Approval obtained (15/01/2020).

Address for correspondence: Dr. Bijaya Mohanty,
Department of Medicine, Tata Main Hospital, Jamshedpur,
Jharkhand, India.
Postal Address: AC11 K, L, 11th Phase, Adarsh Nagar,
Sonari, Jamshedpur - 831 011, Jharkhand, India.
E-mail: bijayamohantymh@gmail.com

Received: 07-3-2020

Revised: 28-03-2020

Accepted: 15-04-2020

Published: 31-05-2020

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_355_20

On admission, the patient was dyspneic with a respiratory rate of 24/min, with tachycardia (pulse rate 100/min), raised jugular venous pulse (JVP) and blood pressure of 140/96 mm/Hg. Chest examination revealed the presence of bilateral basal crepitations with normal first and second heart sounds besides an S3 gallop. Other systemic examinations were non-contributory.

Blood investigations showed an increase in cardiac biomarkers CKMB -346.2, LDH -766.2, and CPK-2806.5 with slight increase in Trop-I level-0.03 ng/ml, serum cholesterol-250 mg/dl, low-density lipoprotein (LDL)-140 mg/dL, and high-density lipoprotein (HDL)-62 mg/dL. Echocardiogram (ECG) demonstrated ST elevation from V1–V5 suggestive of an anterior infarct [Figures 1 and 2] while the chest X-ray showed pulmonary edema [Figure 3]. The echocardiographic finding revealed an ejection fraction of 50%, grade 1 diastolic dysfunction along with regional wall motion abnormality (RWMA) in the mid anterior septum, distal interventricular septum (IVS), apex and distal anterior wall and an atherosclerotic aortic valve. Myocardial perfusion scan (single-photon emission computed tomography (SPECT)) revealed a reversible anterior and apical wall perfusion defect involving 23% of total myocardium with resting left ventricular (LV) ejection fraction within normal limits. Exercise had to be terminated as the patient developed chest pain during the procedure.

Treatment of Kounis syndrome consists of aborting the allergic reaction followed by the stabilization of coronary vasculature

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Sunder A, Mohanty B, Singh A. Kounis syndrome: A rare case. J Family Med Prim Care 2020;9:2514-6.

with medical/interventional techniques. Accordingly, our patient was treated with corticosteroids (Inj methyl prednisolone), low molecular weight heparin (Inj loparin), antiplatelets (ecosprin and clopidogrel), tab atorvastatin and was discharged home safely to be followed up at a higher center.

A coronary angiography done at the higher center revealed a triple vessel disease with 90% lesion in left anterior descending (LAD), 80-85% lesion in OM1, 90% in OM2, and 40% in right coronary (RCA) [Figure 4] following which an interventional technique (coronary artery bypass graft (CABG)) was performed.

Discussion

Clinical, laboratory, and electrocardiographic findings of classic angina pectoris can be caused by various inflammatory mediators, e.g. histamines, neutral proteases, arachidonic acid products, platelet-activating factor and a variety of cytokines and chemokines released during the allergic insult.^[4,5] The underlying pathophysiology in Kounis syndrome is due to coronary vasospasm and atheromatous plaque rupture. Braunwald noted that allergic reactions can lead to vasospastic angina. The mediators like histamine and leukotrienes are the

main culprits causing vasospasm of coronary vascular smooth muscle.^[6] Even the mediators like tryptase are also documented in the pathogenetic mechanism of allergic angina and infarction. This activates interstitial collagenase, gelatinase, and stromelysin, which erode the atheromatous plaques resulting in rupture of plaque and thrombus formation.^[7]

Kounis syndrome is divided into three subtypes:

Type I patients don't have any predisposing factors for coronary artery disease. The allergic event leads to coronary artery spasm resulting in chest pain and ECG changes. Cardiac enzymes level may be normal.^[8,9] These cases have a normal myocardial perfusion scan, normal coronary angiogram, and positive ergonovine test.^[8] The explanation for this type would be endothelial dysfunction or microvascular angina.^[10]

In Type II, there is angiographic evidence of coronary artery disease during an acute allergic reaction.^[8,9] This type includes patients with pre-existing atheromatous disease and an acute allergic episode induces plaque erosion or rupture manifesting as an acute myocardial infarction.^[8,10,11]

In Type III patients with coronary thrombosis (including stent thrombosis), the presence of eosinophils and mast cells have

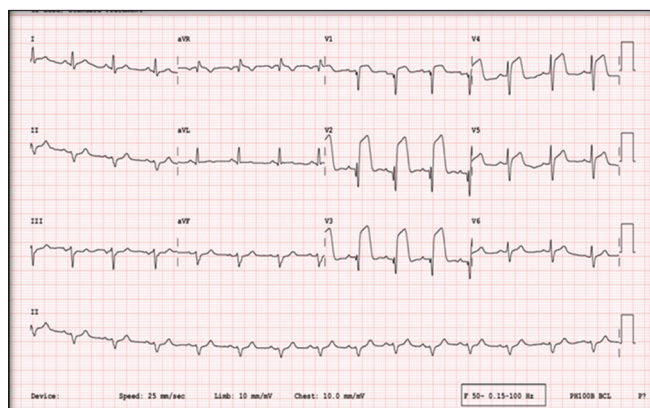


Figure 1: ECG showing ST elevation in V1-V5 suggestive of anterior infarct

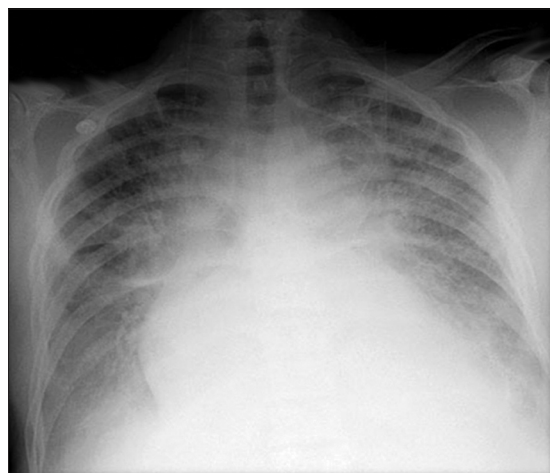


Figure 3: X-ray suggestive of pulmonary edema

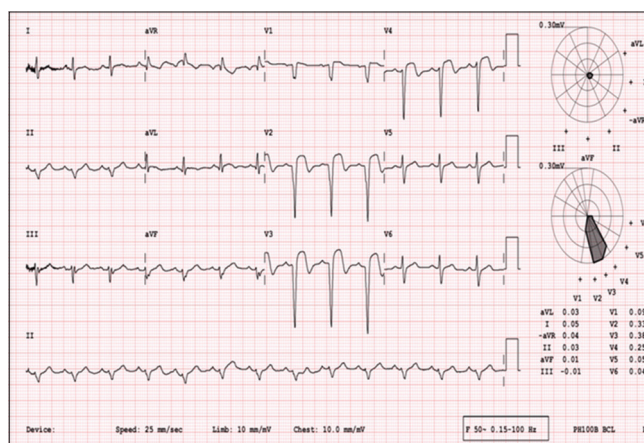


Figure 2: ECG showing anterior wall myocardial infarction (AWMI)



Figure 4: Coronary angiography revealed LAD: 90% lesion in proximal third, another 70% lesion, in the middle third, diffusely diseased distally)

been demonstrated.^[12] Our case fits into KS type II, diagnosis based on history and clinical evaluation. The patient was referred to a higher cardiac center after discharge where an angiography performed showed multiple vessels coronary artery disease with normal LV systolic function and the patient was advised to go in for CABG, which ultimately restored him to normal.

The clinical presentation of Kounis syndrome includes a mixture of symptoms and signs of an allergic reaction and acute coronary syndrome with chest pain, faintness, dyspnea, nausea, vomiting, syncope, urticaria, pruritus, diaphoresis, palpitations, pallor, hypotension, bradycardia, etc.^[13] Multiple agents may result in this syndrome. Honeybee stings contain peptides, proteins, and vasoactive amines, including histamine, acetylcholine, norepinephrine, dopamine, and 5-hydroxytryptamine, which are responsible for angina which happened in our case.^[13]

Forman *et al.* describe a case of severe allergic vasospastic angina and sudden death, where the autopsy showed mast cell infiltration at the site of coronary artery spasm.^[14] Mast cells are abundant in the heart, myocardial fibers, around coronary arteries, within arterial intima and intramural vessels, and atherosclerotic plaques. During anaphylaxis, they are responsible for the acute coronary syndrome.^[15] Even recently one young woman presented with acute coronary syndrome secondary to allergic vasospasm.^[16]

Allergic reactions can occur secondary to various chemicals, food materials, and insect bites. Patients may present with various symptoms ranging from trivial to life-threatening situations like Kounis syndrome. Therefore, it is essential for family physicians to identify and treat these cases early.

Conclusions

Myocardial infarction is a rare complication of anaphylactic reactions due to bee sting. Thorough clinical examination and investigations including ECG and ECHO are recommended in all patients developing hypersensitivity reactions for prompt diagnosis and treatment. In case a previously normal patient develops acute coronary spasm, all possible causes of allergy should be looked for.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Kounis NG, Zavras GM. Histamine-induced coronary artery spasm: The concept of allergic angina. *Br J Clin Pract* 1991;45:121-8.
2. Pfister CW, Plice SG. Acute myocardial infarction during a prolonged allergic reaction to penicillin. *Am Heart J* 1950;40:945-7.
3. Brown SG, Blackman KE, Stenlake V, Heddle RJ. Insect sting anaphylaxis; prospective evaluation of treatment with intravenous adrenaline and volume resuscitation. *Emerg Med J* 2004;21:149-54.
4. Kounis NG, Zavras GM. Allergic angina and allergic myocardial infarction. *Circulation* 1996;94:1789.
5. Kounis NG, Grapsas GM, Goudevenos JA. Unstable angina, allergic angina and allergic myocardial infarction. *Circulation* 1999;100:e1 56.
6. Brawnvald E. Unstable angina. An etiologic approach to management. *Circulation* 1998;98:2219-22.
7. Kounis NG. Serum tryptase levels and Kounis syndrome. *Int J Cardiol* 2007;114:407-8.
8. Kounis NG. Kounis syndrome (allergic angina and allergic myocardial infarction): A natural paradigm? *Int J Cardiology* 2006;110:7-14.
9. Kounis GN, Soufras GD, Kouni SA, Kounis NG. Hypersensitivity myocarditis and hypersensitivity coronary syndrome (Kounis syndrome). *Am J Emerg Med* 2009;27:506-8.
10. Tavil Y, Turfan M, Türkoğlu S, Abaci A. Kounis syndrome secondary to amoxicillin/clavulanic acid use. *Int J Cardiol* 2008;124:e4-7.
11. Vivas D, Rubira JC, Ortiz AF, Macaya C. Coronary spasm and hypersensitivity to amoxicillin: Kounis or not Kounis syndrome? *Int J Cardiol* 2008;128:279-81.
12. González-de-Olano D, Alvarez-Twose I, Matito A, Sánchez-Muñoz L, Kounis NG, Escibano L. Mast cell activation disorders presenting with cerebral vasospasm-related symptoms: A "Kounis-like" syndrome? *Int J Cardiol* 2011;150:210-1.
13. Kogias JS, Sideris SK, Anifadis SK. Kounis syndrome associated with hypersensitivity to hymenoptera stings. *Int J Cardiol* 2007;114:252-5.
14. Forman MB, Oates JA, Robertson D, Robertson RM, Roberts LJ 2nd, Virmani R. Increased adventitial mast cells in a patient with coronary spasm. *N Engl J Med* 1985;313:1138-41.
15. Forlani D, Scarano G, D'Alleva A, Di Marco M, Paloscia L, Gatta A, *et al.* Kounis syndrome as first manifestation of allergic sensitization. *Case Reports in Medicine* 2019.
16. Rashedi N, Bennett C. Young woman presenting with acute coronary syndrome secondary to allergic coronary vasospasm (Kounis Syndrome). *J Am Coll Cardiol* 2020;75(Suppl 1):1-3.