After Administration of Intravenous Epinephrine for bee Sting-induced Anaphylaxis: Kounis Syndrome or Epinephrine Effect?

Nicholas G Kounis, George D Soufras, Dimitrios Lianas, Nicholas Patsouras

Department of Cardiology, University of Patras Medical School, Patras 26221, Achaia, Greece

To the Editor: In the very important report published in Chinese Medical Journal,[1] a 50-year-old male patient, stented with a bare metal stent followed by 3 overlapping drug-eluting stents, developed anaphylactic reaction following a bee sting that was treated with intravenous 0.1 mg epinephrine at a 1:100,000 together with intravenous methylprednisolone, chlorpheniramine maleate, and ranitidine. He developed, immediately after, an anterior wall myocardial infarction, and subsequent coronary arteriography revealed total occlusion in the proximal left anterior descending stent and 90% stenosis with tissue growth in the mid-stent. The authors concluded that the acute myocardial infarction occurred due to acute stent thrombosis caused by exogenous epinephrine administration. This report, however, raises important questions related to the cause and pathophysiology of these events.

First, could bee sting anaphylaxis be aggravated by concurrent anti-allergic therapy in atopic diathesis individuals? The described patient was given intravenously, apart from epinephrine, methylprednisolone, chlorpheniramine maleate, and ranitidine. These 4 drugs that are given to treat anaphylaxis have been incriminated, paradoxically, as inducing mild or severe allergic reactions! Indeed, most epinephrine preparations contain sulfite as a preservative and antioxidant, which itself may trigger anaphylaxis in atopic individuals.[2,3] We must always bring in mind that allergens have additive effects and the more allergens an atopic patient is exposed to, the easier and quicker anaphylactic shock and Kounis syndrome appear.[3]

Second, the administration of epinephrine was the cause of stent thrombosis or the anaphylactic reaction? The described patient was stented with a bare metal stent followed by 3 overlapping drug-eluting stents. Bare metal and drug-eluting stents have components namely stainless steel that is a combination of nickel, chromium, titanium, manganese, molybdenum, polymer coating, and eluted antiproliferative drugs such as paclitaxel, zotarolimus, and accompanying antiplatelet therapy that constitute an allergenic complex. This allergenic complex embedded in the coronary intima is applying continuous, persistent, and chronic hypersensitivity inflammation able to induce stent thrombosis manifesting as the Kounis hypersensitivity coronary syndrome.[4]

Access this article online	
Quick Response Code:	Website: www.cmj.org
	DOI: 10.4103/0366-6999.176081

Several reports have shown that stents attract, such as magnet eosinophils and mast cells that release inflammatory mediators locally and in the systemic circulation able to induce coronary spasm and stent thrombosis. For example, acute myocardial infarction, in the stented area, manifesting as Kounis syndrome has coincided with allergic reactions from contrast material, insect and larvae stings, nonsteroidal anti-inflammatory agents, and even with allergy to clopidogrel the drug that is given to prevent stent thrombosis![5,6]

Third, can we always give epinephrine intravenously? Epinephrine is the cornerstone of treatment for anaphylaxis but it can aggravate the ischemia, prolong QTc interval, promote platelet aggregation, and induce coronary vasospasm and arrhythmias. According to the current guidelines, there is no absolute contraindication to epinephrine use in anaphylaxis. However, the use of intravenous epinephrine is still controversial in severe allergic reactions. It should be considered in patients with severe hypotension or cardiac arrest who do not respond to aggressive fluid resuscitation. Intramuscular use of epinephrine is the safer and preferred route of administration unless the patient has severe anaphylaxis.[7]

All above support the view that the described patient's acute myocardial infarction due to stent thrombosis following the intravenous epinephrine for bee sting-induced anaphylaxis was due to Kounis syndrome rather than to intravenous epinephrine administration.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Address for correspondence: Prof. Nicholas G Kounis, Queen Olgas Square, 7 Aratou Street, Patras 26221, Achaia, Greece
E-Mail: ngkounis@otenet.gr

Received: 01-11-2015 **Edited by:** Yi Cui
How to cite this article: Kounis NG, Soufras GD, Lianas D, Patsouras N. After Administration of Intravenous Epinephrine for bee Sting-induced Anaphylaxis: Kounis Syndrome or Epinephrine Effect?. Chin Med J 2016;129:500-1.

References

1. Park JS, Min JH, Kang JH, In YN. Acute myocardial infarction due to stent thrombosis after administration of intravenous epinephrine for anaphylaxis. Chin Med J 2015;128:2692-3. doi: 10.4103/0366-6999.166020.
2. Kounis NG, Mazarakis A, Almpanis G, Gkouias K, Kounis GN, Tsigkas G. The more allergens an atopic patient is exposed to, the easier and quicker anaphylactic shock and Kounis syndrome appear: Clinical and therapeutic paradoxes. J Nat Sci Biol Med 2014;5:240-4. doi: 10.4103/0976-9668.136145.
3. Lee HS, Song WJ, Lee JW, Cho YY, Park HK, Kang MG, *et al.* Chlorpheniramine-induced anaphylaxis diagnosed by basophil activation test. Asia Pac Allergy 2015;5:177-80. doi: 10.5415/apallergy.2015.5.3.177.
4. Kounis NG, Soufras GD, Tsigkas G, Hahalis G. Are bioabsorbable and biodegradable polymer scaffolds still safe or Kounis syndrome is still watching for? Chin Med J 2014;127:4159. doi: 10.3760/cma.j.issn.0366-6999.20141992.
5. Greif M, Pohl T, Oversohl N, Reithmann C, Steinbeck G, Becker A. Acute stent thrombosis in a sirolimus eluting stent after wasp sting causing acute myocardial infarction: A case report. Cases J 2009;2:7800. doi: 10.4076/1757-1626-2-7800.
6. Kounis NG, Soufras GD. Coronary stent thrombosis: Beware of an allergic reaction and of Kounis syndrome. Indian Heart J 2014;66:153-5. doi: 10.1016/j.ihj.2013.12.013.
7. Cevik C, Nugent K, Shome GP, Kounis NG. Treatment of Kounis syndrome. Int J Cardiol 2010;143:223-6. doi: 10.1016/j.ijcard.2010.02.040.