

Mad honey intoxication mimicking acute coronary syndrome

Ali Dur,¹ Ertan Sonmez,² Cemil Civelek,³ Kenan Ahmet Turkdogan,⁴ Mehmet Akif Vatankulu,⁵ Ozgur Sogut⁶

Abstract

Mad honey intoxication or grayanotoxin poisoning is caused by consumption of grayanotoxin-containing toxic honey produced from leaves and flowers of the Rhododendron family. Despite the rarity of intoxication cases, the correct diagnosis and treatment are required because of the significance of haemodynamic disturbance and confounding of symptoms for disease identification. We report herein a case of a patient with mad honey intoxication mimicking acute non-ST segment elevation myocardial infarction and review the pathophysiology and diagnostic considerations.

Keywords: Mad honey intoxication, Grayanotoxin-containing toxic honey, Myocardial infarction.

Introduction

The mad honey intoxication appears to be a clinical manifestation of use of grayanotoxin (GTX) isolated from the honey made by bees from the Rhododendron plant flowers, mainly Ericaceae and Sapindaceae families.¹ Despite the rarity of intoxication cases, the correct diagnosis and treatment are required because of the significance of haemodynamic disturbance and confounding of symptoms for disease identification. Symptoms develop over 24 hours and the patients return to normal within 6-8 hours, generally. Since the GTX affects cardiovascular and respiratory systems, it leads to dizziness, hypotensions and rhythm disorders. Electrocardiogram (ECG) changes similar to that in acute coronary syndrome are reported despite the fact that it is not expected in such food poisonings. Many patients are admitted to our emergency service with mad honey poisoning, but showing ECG changes not expected to mimic acute coronary syndrome. We present the case of a patient with the mad honey intoxication and review the pathophysiology and diagnostic considerations.

Case Report

A 65-year-old man was admitted to the Emergency Department (ED) of Bezmialem Vakif University with

^{1-4,6}Department of Emergency Medicine, ⁵Department of Cardiology, Bezmialem University School of Medicine, Istanbul, Turkey.

Correspondence: Ali Dur. Email: dralidur@hotmail.com

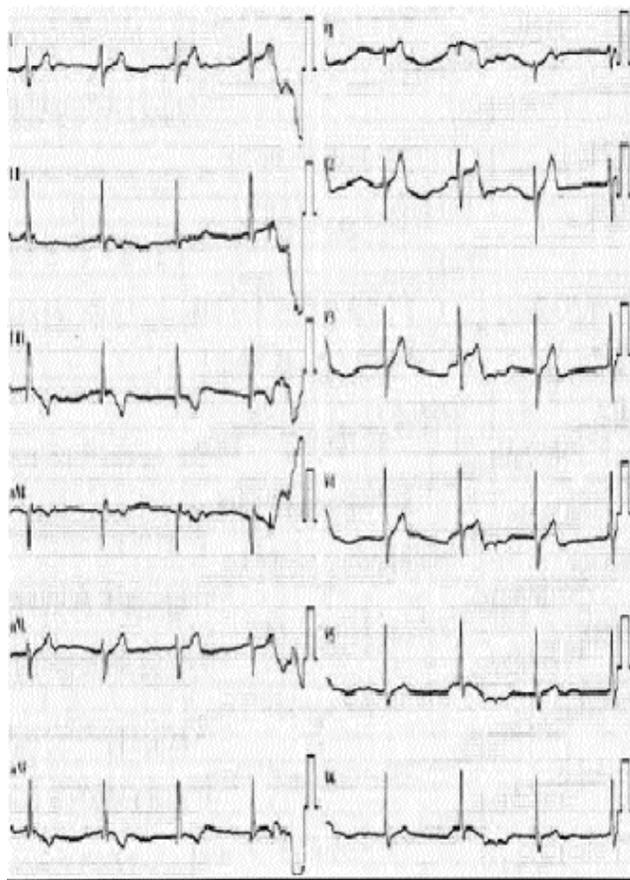


Figure-1: Electrocardiogram of the patient on admission showing ischaemic findings on DII, DIII, AVF.

dizziness, cold sweating and tickling in the throat that had developed three hours after the use of 2 spoons (60 ml) of honey in July 2011. There was no history of diseases of the cardiovascular and respiratory systems, but he had diabetes mellitus controlled by anti-hyperglycaemic drugs. The patient's physical examination revealed somnolence, normal pupils and no neurologic signs of lateralisation. He had tachypnoea (25/min), arterial blood pressure was 70/40 and heart rate, 52 beats/min. The ECG showed biphasic T wave in inferior leads (Figure-1). The approach to the patient was based on the treatment of acute coronary syndrome; 1000ml of parenteral fluid with 0.9% sodium chloride (NaCl) and 0.5mg atropine sulfate

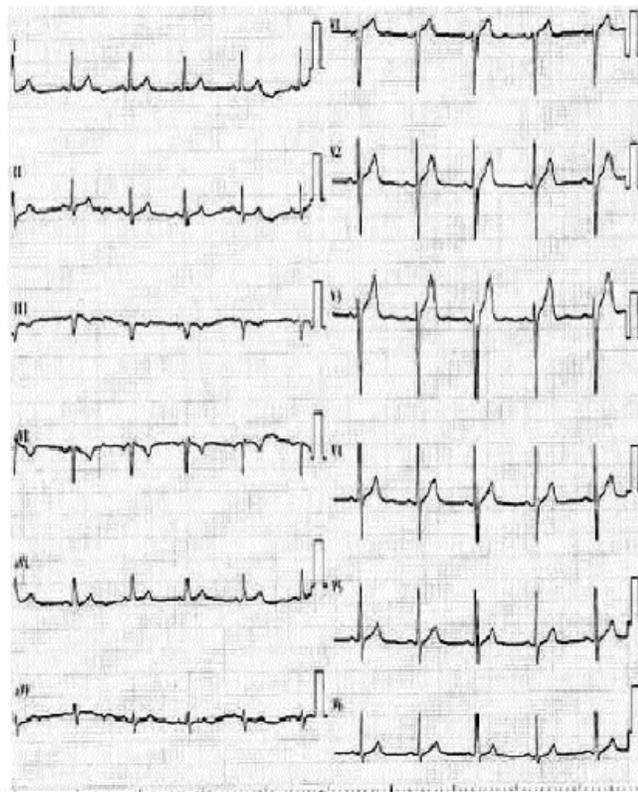


Figure-2: Electrocardiogram of the patient after one day.



Figure-3: Coronary angiograms showing normal coronary arteries.

was administered, all routine biochemical and cardiac tests Alanine Aminotransferase (ALT), aspartate aminotransferase (AST), Creatine Kinase, Muscle and Brain (CKMB), Troponin I were checked. Within further observation of arterial pressure there were no improvement there upon 2500ml of fluid with 0.9% NaCl was administered in next 5 hours. Taking into account a normal range of troponin I (0.008ng/mL), CKMB (12U/L) levels, other test results (AST: 20 U/L, ALT: 16U/L) and the recovering of consciousness, the patient was transferred to cardiology department to carry out coronary angiography. The patient stayed in the hospital for 4 days because of exercise testing and coronary angiography. He was discharged on the fourth day due to normal results (Figure-2, 3).

Discussion

Mad honey intoxication is a sort of food poisoning generally reported from Japan, Brazil, North America and some other countries in addition to Turkey.² Generally, it is manifested by weakness, profuse sweating, nausea, vomiting, impaired consciousness, but in serious cases it may develop into bradycardia, nodal rhythm, Wolff-Parkinson-White Syndrome and cardiac shock as a result of hypotension. The mad honey intoxication is a result of so-called GTXs which appear to be a diterpene derived from polyhydroxylated cyclic hydrocarbon with a 5/7/6/5 ring structure that does not include nitrogen. GTXs are divided into three groups; GTX I is called Andromedotoksin, while GTX II and GTX III are oil soluble. Although 18 forms of GTXs have been isolated from the leaves and flowers of the Rhododendron and some other plants, GTX I is responsible for honey poisoning. GTX increases the blockage of sodium channels by binding them and prevents re-polarisation.³ Thereby, it contributes to the weakness of sinoatrial node by increasing the intracellular flow of sodium and to the dysfunction of sinus node. In addition, the toxins can involve muscarinic receptors and, depending on dose, lead to hypotension, bradycardia and respiratory arrest.⁴ Although, the exact measure of toxic dose has not been known yet, the cardiovascular disorder and mental confusion have been seen more often in case of large quantity of toxin consumption. However, the consequences of toxin intake have a life-threatening potential, no cases of death have been reported yet and almost in all cases, positive results were achieved with the administration of atropine sulfate and parenteral fluid. To our knowledge, Pubmed and Google search results found five cases of mad honey intoxication with ECG changes similar to that in acute coronary syndrome, a serious arterial hypotension, as the common feature.^{5,6-9} Coronary artery graft (CAG) was normal in all cases except

one.⁹ The myocardial infarction with normal results of coronary angiography may occur in cases of hypercoagulable states, coronary embolism, imbalance between oxygen demand and supply, intense sympathetic stimulation, coronary trauma, coronary vasospasm, coronary thrombosis and endothelial dysfunction.¹⁰ Three of the five above-mentioned cases revealed ST changes in inferior lead and in anterior lead in two of them. Taking into account all cases and our case with the presence of ST changes in inferior leads, it is considered that mad honey intoxication may cause the circumflex and right coronary arterial involvement. In one case report, hypotension and bradycardia occurred in acute myocardial infarction with ST elevation and with normal CAG.⁷ It was argued that prolonged vagal tonus may contribute to such clinical manifestation. In our case with hypotension and bradycardia, we approved the influence of prolonged vagal tonus.

Mad honey intoxication observed in our case and in all reported up to date four cases revealed no abnormalities in CAG study. But one patient had stenosis lesion in the mid portion of left anterior descending coronary artery.

Conclusion

Generally, mad honey intoxication has a temperate clinical course, but in some cases it leads to serious haemodynamic disturbances which mimic acute coronary

syndrome. In patients suspected of the acute coronary syndrome with normal or moderate troponin I and CKMB levels, clinicians should be vigilant in case of normal CAG, and question patients regarding mad honey intoxication.

References

1. Qiang Y, Zhou B, Gao K. Review Chemical constituents of plants from the genus *Rhododendron*. *Chem Biodivers* 2011; 8: 792-815.
2. Sutlupinar N, Mat A, Satganoglu Y. Poisoning by toxic honey in Turkey. *Arch Toxicol* 1993; 67: 148-50.
3. Aliyev F, Turkoglu C, Celiker C, Firatli ? Alici G, Uzunhasan I. Chronic mad honey intoxication syndrome: a new form of an old disease? *Europace* 2009; 11: 954-6.
4. Yilmaz O, Eser M, Sahiner A, Altintop L, Yesildag O. Hypotension, bradycardia and syncope caused by honey poisoning. *Resuscitation* 2006; 68: 405-8.
5. Akinci S, Arslan U, Karakurt K, Cengel A. An unusual presentation of mad honey poisoning: acute myocardial infarction. *Int J Cardiol*. 2008; 129: e56-8.
6. Sayin MR, Karaba? T, Dogan SM, Akpinar I, Aydin M. Transient ST segment elevation and left bundle branch block caused by mad honey poisoning. *Wien Klin Wochenschr* 2012; 124: 278-81.
7. Yarlioglu M, Akpek M, Ardic I, Elcik D, Sahin O, Kaya MG. Mad-honey sexual activity and acute inferior myocardial infarctions in a married couple. *Tex Heart Inst J* 2011; 38: 577-80.
8. Yildirim N, Aydin M, Cam F, Celik O. Clinical presentation of non-ST-segment elevation myocardial infarction in the course of intoxication with mad honey. *Am J Emerg Med* 2008; 26: 108.e1-2.
9. Sumerkan MC, Agirbasli M, Altundag E, Bulur S. Mad-honey intoxication confirmed by pollen analysis. *Clin Toxicol (Phila)*. 2011; 49: 872-3.
10. Tun A, Khan IA. Myocardial infarction with normal coronary arteries: the pathologic and clinical perspectives. *Angiology* 2001; 52: 299-304.