

An Unexpected Cause of Cardiotoxicity: Kombucha Tea

INTRODUCTION

Ventricular tachyarrhythmias are life-threatening rhythm disturbances caused by abnormal electrical activity in the ventricles. Multiple etiological factors are known to cause ventricular tachyarrhythmias. Ventricular tachyarrhythmias increase the risk of sudden cardiac death. However, ventricular tachyarrhythmias occurring after consuming medicinal herbs constitute a small part of these causes.¹⁻³ This case report aims to explain ventricular tachyarrhythmias after Kombucha tea consumption and raise awareness against the cardiotoxic effects of agents like Kombucha tea, which are mainly used for their herbal antioxidant qualities.

CASE REPORT

A 35-year-old female patient without any history of chronic disease presented to the emergency department with complaints of nausea and vomiting after consuming homemade "Kombucha" tea. The patient was referred to the cardiology department with a preliminary diagnosis of ST-segment elevation myocardial infarction (STEMI) due to ST elevations observed in leads D1, aVL, and V1-3 in the electrocardiography (ECG) (corrected QTc calculated by Bazett's formula: 498 ms) (Figure 1). Coronary arteries were found as disease-free in selective coronary angiography (Figure 2). There were no findings indicating Takotsubo cardiomyopathy in ventriculography (Figure 3). Transthoracic echocardiography revealed an ejection fraction of 60%; no significant valve pathology or wall motion abnormality was observed. Electrocardiography was obtained in the coronary intensive care unit due to hemodynamic compromise which demonstrated sustained ventricular tachyarrhythmia with a rate of 127 beats per minute (Figure 4). The patient was reverted to sinus rhythm after multiple electrical cardioversions, however, despite the intravenous 300 mg bolus and subsequent continuous infusion of amiodarone, recurrent VT attacks were seen. The patient was deemed in VT storm, hence IV lidocaine at a 1.5 mg/kg dose was administered as a secondary antiarrhythmic agent. Despite electrical cardioversion and antiarrhythmic therapy, the patient developed cardiac arrest. Advanced cardiac life support was initiated including endotracheal intubation and cardiopulmonary resuscitation. Intravenous sodium

CASE REPORT

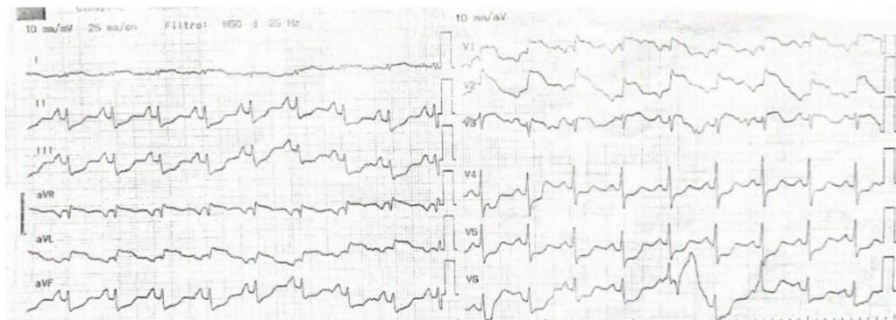







Figure 1. The electrocardiography at the admission

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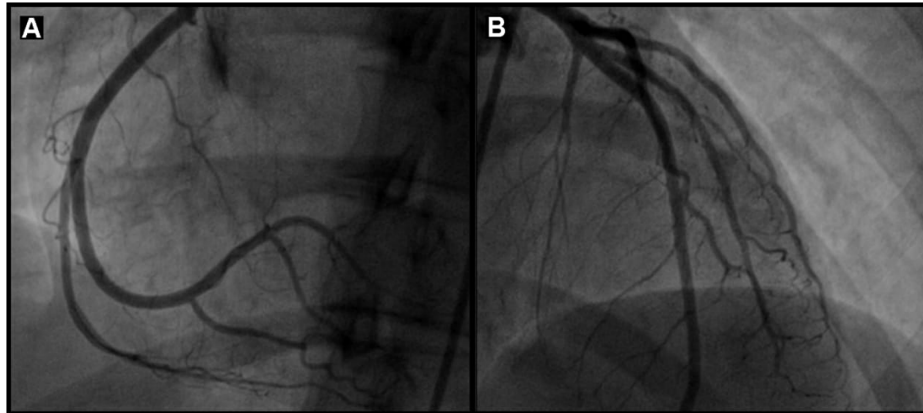


Figure 2. (A) Normal right coronary artery. (B) Normal left coronary system.

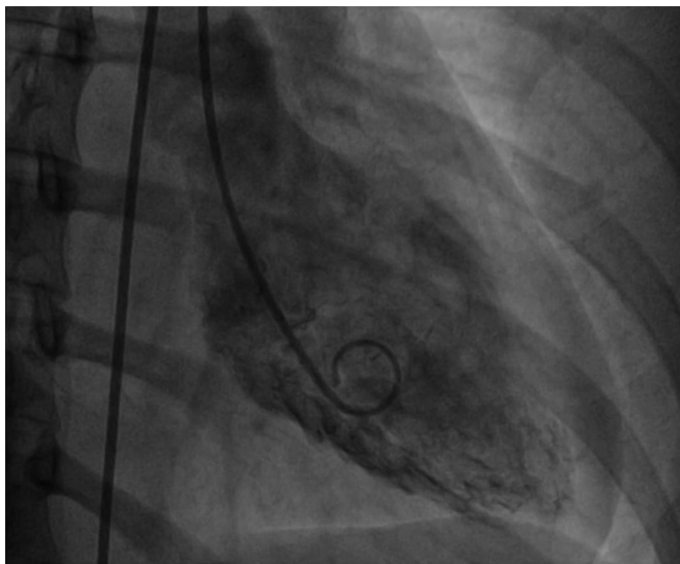


Figure 3. Normal ventriculography.

bicarbonate was administered due to lactic acidosis (pH: 7.16, lactate: 17 mmol/L) which was detected in arterial blood sample analyses. There was no abnormality in serum electrolyte levels but liver function tests (AST-ALT>x5 URL) were significantly elevated. Return of spontaneous circulation could not be achieved after 80 minutes of effective CPR and patient was declared dead.

DISCUSSION

Herbal agents have been used in the treatment of various diseases for centuries. These agents' side effects and cardiac effects, which are claimed to be beneficial, have not been demonstrated clearly. Although lactic acidosis, hepatotoxicity, respiratory failure, and DIC have been reported as side effects of Kombucha tea, its cardiac side effects are yet to be demonstrated.⁴ Patients may present to the emergency department with various ECG findings due to consuming herbal agents and drugs in toxic doses. As seen in our case, ECG may mimic ST elevation in patients with normal coronary angiography and ventriculography, depending on the use of these agents.⁵ Besides these effects, some of

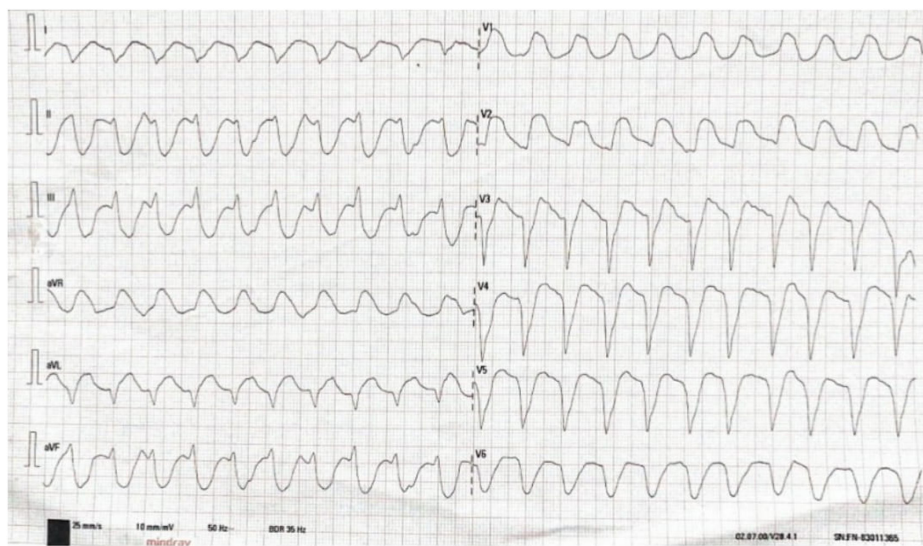


Figure 4. Last ECG showing ventricular tachycardia

these herbal agents might cause cardiac side effects by acting directly on cardiac channels. Such as in our case, where it is challenging to distinguish ventricular activity from atrial activity with wide QRS, the cardiac sodium channel blockage should be kept in mind for different ECG interpretations such as the slowing down of the intraventricular conduction, one-way block, development of a re-entry circuit, and resultant ventricular tachycardia. In addition, as in Kombucha tea toxicity, these agents can also lower the ventricular tachyarrhythmia threshold by triggering delayed after depolarizations in phase 4 action potentials due to acidosis, without affecting the cardiac channels directly.⁶⁻⁸ Although it is hard to ascertain whether the ventricular tachyarrhythmias are precipitated by acidosis or direct cardiotoxic effects, evaluating patients experiencing adverse effects after consuming herbal products such as Kombucha tea can assist researchers in better understanding the clinical effects of such agents and define adverse cardiovascular reactions.

CONCLUSION

Herbal medicines are gaining popularity over time and more patients are presenting to emergency services due to their side effects. Clinicians should be attentive to the toxic effects on cardiac function especially, and the use of herbal medicines should be questioned in every patient who has unexplainable toxic features. It is to be kept in mind that early investigation of these situations can earn valuable time, as well as provide a medical standpoint to

shape acute care and interventions necessary to save the patient.

Informed Consent: Written informed consent was obtained from the patient's guardian for sharing their relevant medical history and laboratory results.

REFERENCES

1. Weijters BJ, Verbunt R, Hoogsteen J, Visser RF, Aconito SM. Salade malade aconito intoxication. *Neth Hearth J*. 2008;16:96-99.
2. Tai YT, Lau CP, But PP, Fong PC, Li JP. Bidirectional tachycardia induced by herbal aconite poisoning. *Pacing Clin Electrophysiol*. 1992;15(5):831-839. [\[CrossRef\]](#)
3. Zakeri MA, Mohammadi V, Bazmandegan G, Zakeri M. Description of ventricular arrhythmia after taking herbal medicines in middle-aged couples. *Case Rep Cardiol*. 2020;2020:6061958. [\[CrossRef\]](#)
4. SungHee Kole AS, Jones HD, Christensen R, Gladstein J. A case of Kombucha tea toxicity. *J Intensive Care Med*. 2009;24(3):205-207. [\[CrossRef\]](#)
5. Ahn MS. Aconitine intoxication misdiagnosed as acute myocardial infarction. *Int J Arrhythm*. 2016;17(2):103-107. [\[CrossRef\]](#)
6. Gerst PH, Fleming WH, Malm JR. Increased susceptibility of the heart to ventricular fibrillation During metabolic acidosis. *Circ Res*. 1966;19(1):63-70. [\[CrossRef\]](#)
7. Bai J, Yin R, Wang K, Zhang H. Mechanisms underlying the emergence of post-acidosis arrhythmia at the tissue level: A theoretical study. *Front Physiol*. 2017;8:195. [\[CrossRef\]](#)
8. Carden DL, Martin GB, Nowak RM, Foreback CC, Tomlanovich MC. Lactic acidosis as a predictor of downtime during cardiopulmonary arrest in dogs. *Am J Emerg Med*. 1985;3(2):120-124. [\[CrossRef\]](#)