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THE PARADOXICAL PRO-ARRHYTHMIC EFFECT OF GINSENG: A CASE OF ATRIAL FIBRILLATION IN A HEALTHY ADULT

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ABSTRACT

Background: Ginseng is a popular herbal remedy widely consumed for fatigue and general well-being. While generally considered safe, it has been associated with cardiovascular side effects, including arrhythmias. However, none of the reports in the literature have described new-onset atrial fibrillation (AF) associated with ginseng in a young, healthy patient, as in our case.

Case description: A 29-year-old female presented to the emergency department complaining of palpitations for a few hours. She reported consuming red ginseng capsules, which was kept at home, at a dose of 500 mg orally twice daily for the past 2 months due to complaints of fatigue, muscle pain, weakness, and exhaustion as a traditional remedy. The patient had no past medical history. The patient's physical examination revealed no pathologic signs except for tachycardia and an irregular pulse rate. An electrocardiogram showed a ventricular rate of 123 beats/min, consistent with AF. Sinus rhythm was achieved rapidly after administration of 0.25 mg/kg intravenous diltiazem.

Conclusion: This is the first case report in the literature of new-onset AF after high-dose ginseng use in a young, healthy individual with no cardiac history, suggesting a possible association between AF and ginseng use. This case highlights the arrhythmogenic potential of ginseng and underscores the importance of evaluating the use of herbal supplements in patients presenting with AF.

KEYWORDS

Ginseng, atrial fibrillation, arrhythmia, herbal medicine

LEARNING POINTS

- Herbal supplements -especially ginseng- may trigger atrial fibrillation, even in young patients without structural heart disease.
- Ginseng consumption has paradoxical cardiovascular effects, ranging from proarrhythmic to antiarrhythmic.
- Always investigate the use of over-the counter and supplemental medications when evaluating palpitations or new-onset atrial fibrillation in the emergency department or internal medicine department.

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INTRODUCTION

Herbal remedies are widely consumed worldwide, and among them, ginseng is one of the most frequently used as a dietary supplement, alternative medicine, tonic, and panacea[1]. Although ginseng has demonstrated beneficial cardiovascular effects such as improvement of endothelial function and modulation of autonomic balance, several reports have described its potential to induce adverse cardiovascular outcomes, including hypertension, palpitations, QT prolongation, and ventricular tachycardia[2,3]. Awareness of these risks is particularly important because patients obtain ginseng without a prescription, often assume it is harmless or beneficial, and may fail to report their supplement use to physicians. This report presents a rare case of ginseng-induced atrial fibrillation (AF) in a young, healthy patient and highlights the paradoxical cardiovascular effects of ginseng together with the importance of obtaining a comprehensive clinical history.

CASE DESCRIPTION

A 29-year-old woman presented to the emergency department complaining of acute palpitations. She denied any prior medical conditions, including cardiac diseases, medication use, or family history of cardiac disease. She reported consuming red ginseng capsules, available at home, at a dose of 500 mg orally twice daily for the past 2 months due to complaints of fatigue, muscle pain, weakness, and exhaustion as a traditional remedy. On arrival, physical examination was conducted by the emergency physician and was then referred to cardiologist. No pathological findings were noted except for irregular heart rhythm and tachycardia. The electrocardiogram confirmed AF with a ventricular rate of 123 beats/min, without ST-T changes, Q-T prolongation, ventricular fibrillation, or torsades de pointes *(Fig. 1)*. Transthoracic echocardiography showed preserved left ventricular systolic function without valvular or wall-motion abnormalities. Laboratory investigations - including complete blood count, electrolytes, renal and hepatic function, arterial blood gases, and thyroid profile - were within normal limits. The patient was observed in the emergency department, and her heart rate was effectively controlled with 0.25 mg/kg intravenous diltiazem. She rapidly reverted to sinus rhythm *(Fig. 2)*. Follow-up creatine kinase-MB and troponin measured to evaluate acute coronary syndrome remained within reference ranges. She was discharged after 24 hours later with an uneventful course and was advised to discontinue ginseng. At the 6-month follow-up, she was well and in normal sinus rhythm.

DISCUSSION

Ginseng has been demonstrated to have many protective functions, including immune-response regulation, antioxidant, anti-cancer, anti-neurodegenerative, wound-healing effects, and cardiovascular protection[4]. However, ginseng has been reported to exhibit both antiarrhythmic and proarrhythmic effects. Experimental studies indicate that ginsenosides can inhibit L-type calcium currents and modulate potassium channels, thereby reducing susceptibility to certain arrhythmias[5,6]. It has also been shown that ginseng extracts may lessen ventricular arrhythmias following ischaemia–reperfusion injury[7]. In contrast, ginseng has been associated with ventricular proarrhythmia. Torbey et al. described marked QT prolongation and torsades de pointes in a patient consuming large amounts of ginseng[8]. Additional cases of non-sustained ventricular tachycardia associated with ginseng abuse have been reported[3]. These observations suggest that ginseng may affect cardiac repolarisation, possibly through its

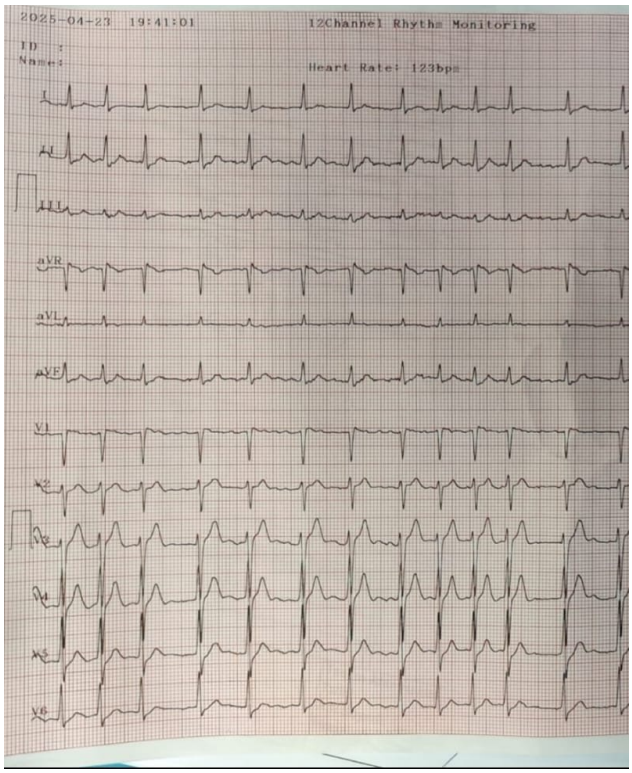


Figure 1. Electrocardiogram at presentation demonstrating atrial fibrillation with a rapid ventricular response.

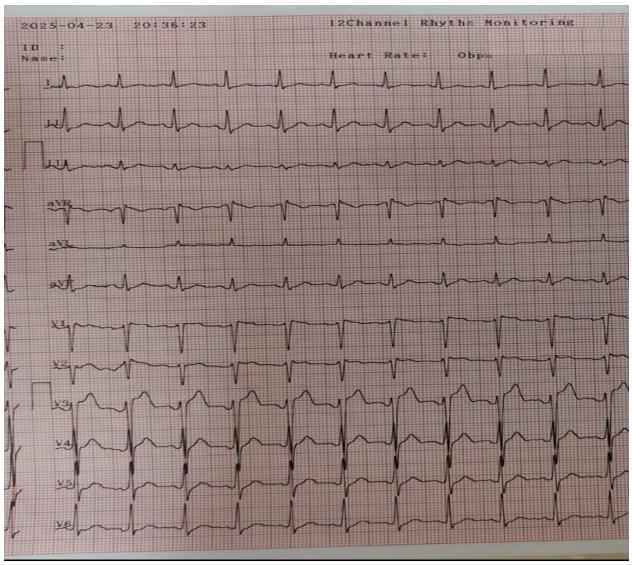


Figure 2. Electrocardiogram showing restoration of normal sinus rhythm after intravenous amiodarone administration.

effects on the hERG (IKr) potassium channel[5]. In addition, sympathomimetic activity and possible interaction with ion channels may increase atrial automaticity and trigger AF in susceptible individuals[9]. Previous literature includes a case of AF after 1 week of Asian ginseng use in an elderly patient with chronic kidney disease[10]. We provide further evidence that AF can occur even in healthy individuals. The paradoxical electrophysiological effects of ginseng, ranging from antiarrhythmic to proarrhythmic, require further investigation.

We applied the Naranjo Adverse Drug Reaction Probability Scale to evaluate the likelihood of a causal relationship between ginseng intake and AF in this patient. The total score was 8, indicating a probable adverse reaction. Although the Naranjo algorithm was originally developed for conventional pharmacologic agents, it can also be applied to herbal products to support causality assessment[11]. Both extracardiac (e.g., thyrotoxicosis) and intracardiac (e.g., accessory pathways) causes of AF were carefully considered and excluded. The patient's thyroid function tests were within reference ranges, ruling out thyrotoxicosis as a potential trigger. Electrocardiographic evaluation revealed no evidence of pre-excitation, delta waves, or a short PR interval, thereby excluding Wolff–Parkinson–White and Lown–Ganong–Levine patterns. No findings suggestive of concealed accessory pathways or dual atrioventricular nodal physiology were identified. Moreover, there were no ischemic ST–T changes, QT prolongation, or polymorphic ventricular arrhythmias such as torsades de pointes, further excluding alternative proarrhythmic or ischemic mechanisms. In this context, the strong temporal relationship between ginseng use and arrhythmia onset, rapid resolution after discontinuation, and the absence of alternative explanations collectively indicate that ginseng intake was the most plausible precipitating factor rather than a coincidental finding.

To our knowledge, this is the first case report in the literature of new-onset AF after high-dose ginseng use in a young, healthy individual with no cardiac history, suggesting a possible association between ginseng use and AF. The absence of other triggers and recovery after discontinuation of ginseng use support causality. The potential for complications such as AF related to ginseng use should be considered in clinical history-taking and patient management, even in young individuals, to ensure early diagnosis and appropriate treatment.

REFERENCES

1. Potenza MA, Montagnani M, Santacroce L, Charitos IA, Bottalico L. Ancient herbal therapy: A brief history of Panax ginseng. *J Ginseng Res* 2023;**47**:359-365. doi: 10.1016/j.jgr.2022.03.004
2. Jafari A, Kordkatuli K, Mardani H, Mehdipoor F, Bakhtiari Jami P, et al. Ginseng supplementation and cardiovascular disease risk factors: a protocol for GRADE-assessed systematic review and dose-response meta-analysis. *BMJ Open* 2024;**14**:e080926. doi: 10.1136/bmjopen-2023-080926
3. Zhou J, Zhang J, Jing P, Lan Y, Cao X, Feng H, et al. Ginseng in white and red processed forms: Ginsenosides and cardiac side effects. *Food Sci Nutr* 2023;**12**:1857-1868. doi: 10.1002/fsn3.3879
4. Zhang ZB, Yu CY, Wang HY, Jia XB, Wu W, Pang ST, et al. The history, beneficial ingredients, mechanism, processing, and products of Panax ginseng for medicinal and edible value. *Food & Medicine Homology* 2025;**2**:9420059. doi: 10.26599/FMH.2025.9420059
5. Sun Y, Liu Y, Chen K. Roles and mechanisms of ginsenoside in cardiovascular diseases: progress and perspectives. *Science China Life Sci* 2016;**59**:292-298. doi: 10.1007/s11427-016-5007-8
6. Wang T, Zhao H, Chen Y, Guo S, Zhou C, Cao H, et al. Ginsenoside Rg1 exerts anti-arrhythmic effect by inhibiting ICaL through cAMP-PKA and PI3K-AKT signaling pathways in rat ventricular myocytes after myocardial ischemia-reperfusion injury. *Science Progress* 2025;**108**:p00368504251341113. doi: 10.1177/00368504251341113
7. Liu L, Hu J, Mao Q, Liu C, He H, Hui X, et al. Functional compounds of ginseng and ginseng-containing medicine for treating cardiovascular diseases. *Front Pharmacol* 2022;**13**:1034870. doi: 10.3389/fphar.2022.1034870
8. Torbey E, Abi Rafeh N, Khoueiry G, Kowalski M, Bekheit S. Ginseng: a potential cause of long QT. *J Electrocardiol* 2011;**44**:357-358. doi: 10.1016/j.jelectrocard.2010.08.007
9. Paik DJ, Lee CH. Review of cases of patient risk associated with ginseng abuse and misuse. *J Ginseng Res* 2015;**39**:89-93. doi: 10.1016/j.jgr.2014.11.005
10. Liao WI, Lin YY, Chu SJ, Hsu CW, Tsai SH. Bradyarrhythmia caused by ginseng in a patient with chronic kidney disease. *Am J Emerg Med* 2010;**28**:538.e5-6. doi: 10.1016/j.ajem.2009.08.006
11. Naranjo CA, Busto U, Sellers EM, Sandor P, Ruiz I, Roberts EA, et al. A method for estimating the probability of adverse drug reactions. *Clin Pharmacol Ther* 1981;**30**:239-245. doi: 10.1038/clpt.1981.154