



## Licorice and Arrhythmia: A Case Report

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### Abstract

Licorice is a popular herb in herbal medicine specially to treat gastric ulcers. It is one of the most widely prescribed herbs in Persian medicine. Excessive consumption of licorice may lead to cardiac arrhythmia due to a hyper mineralocorticoid state and hypokalemia. In a 22-year-old man from Iran, with no prior history of cardiovascular disease, sinus arrhythmia occurred after using average dose of licorice for Irritable bowel syndrome without hypokalemia. According to Persian medicine, this case owned a hot temperament of heart so, licorice for this patient was not a good choice to treat his Irritable bowel syndrome because its temperament is hot and it could make the temperament of this patient's heart hotter and even result in faint. Neglecting from Individual features such as heart temperament, especially in addition to existence of sensitizer factors may lead patient to show cardiac arrhythmia without hypokalemia after using of licorice in average dose. This evidence belongs to only one case and actually, to receive a strong conclusion, more essential studies are required but it could be an evidence to think about evaluation the safety of licorice. It seems that our knowledge about herbal medicine is not so enough so we should use them with caution.

**Keywords:** Licorice, Arrhythmia, Persian medicine

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### Introduction

Licorice is a popular herb in herbal medicine. It is used to treat gastric ulcers when administered 20 to 30 minutes before meals either in combination with antacids or alone [1]. Licorice is one of the most widely prescribed herbs in Persian medicine (PM). It is used for cough and upper respiratory tract infections [2] Excessive consumption of licorice may lead to a hyper miner

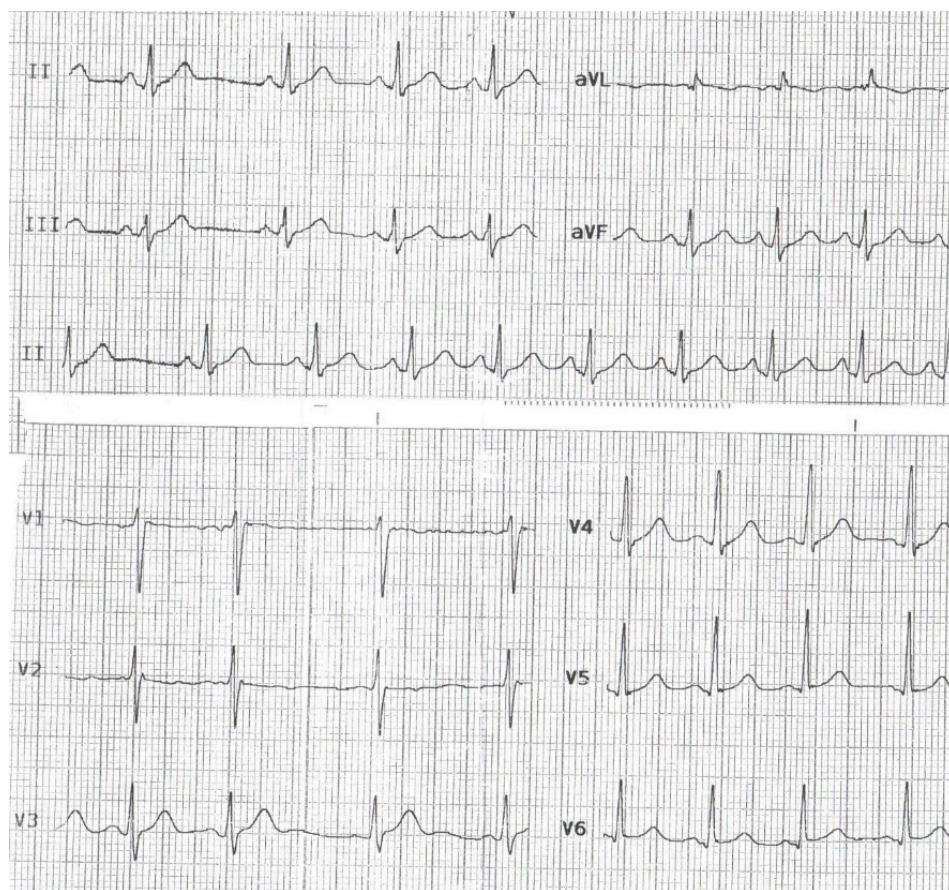
alocorticoid state and hypokalemia as a result of which cardiac arrhythmia may occur [3]. However ventricular arrhythmia has been described as the most common form of arrhythmia due to hypokalemic state [3]. There are some evidences that pose this question: "May licorice facilitates the occurrence of any type of arrhythmia without hypokalemia?" In this study, a case of sinus arrhythmia after using licorice is described.

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## Case presentation

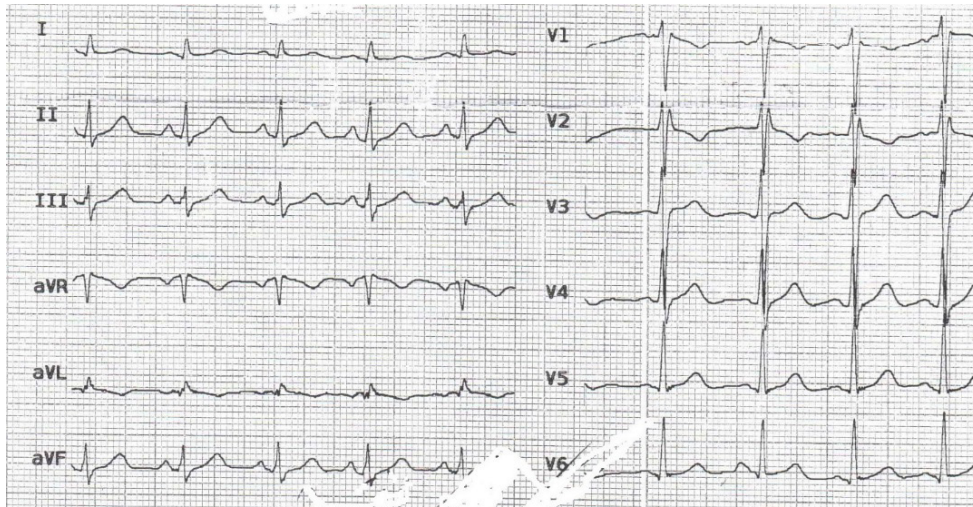
A 22-year man from Iran, with no prior history of cardiovascular disease was admitted to the emergency room with feeling palpitation and faint for a few seconds. He offered from flashing and headache after 4 weeks ingestion of licorice as an herbal combination for Irritable Bowel Syndrome (IBS). He was not on any other medication and reminded anorexia and IBS and sometimes anxiety and flashing in his past medical history. As a hobbit, he liked driving at high speed and was a little hasty. He denied any vomiting and diarrhea during 4 weeks ago. On presentation, blood pressure was 90/60 with

monitor showing supraventricular tachycardia and pulse rate, 100,  $SpO_2$  was 96%. His laboratory examinations including serum glucose, sodium levels and thyroid function test were within normal limits and potassium was 2.9 mmol/L (N= 3.5-5). His electrocardiography (ECG) showed a sinus arrhythmia (Fig 1). Serum therapy and Diazepam 5 mg IM, were done and patient was discharged with a good general condition. Ten days later, as a cardiovascular checkup, his echocardiogram showed normal view with a mild MVP and an ejection fraction of 55% (Fig. 2) and his ECG showed sinus arrhythmia (Fig 3). Inderal 10 mg oral per day was administrated by cardiologist.

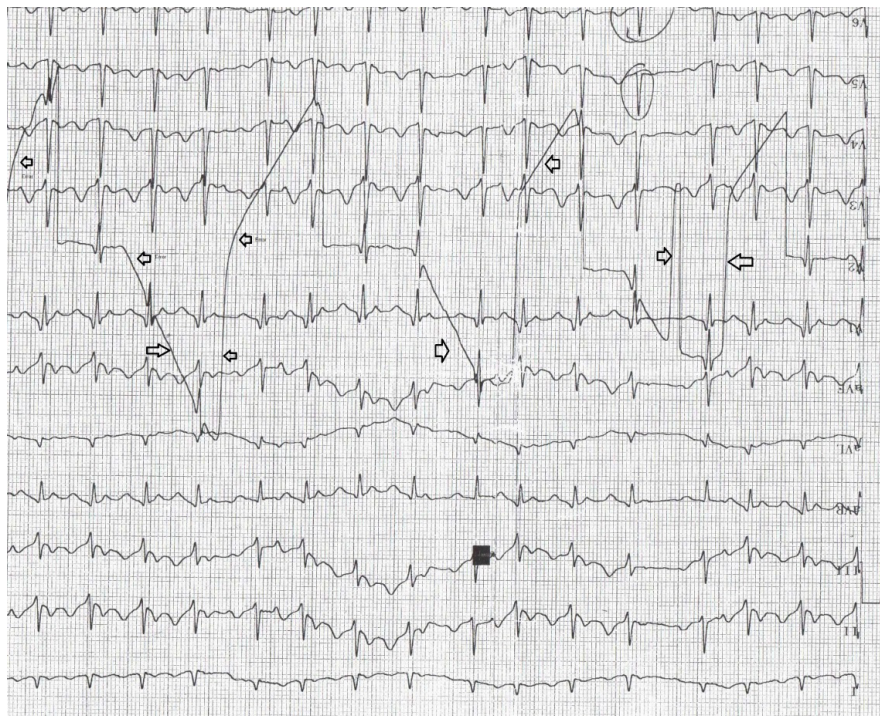


A)





B)



C)

**Figure 1.** A The first ECG which shows sinus arrhythmia; B The second ECG after 1 hour which shows sinus arrhythmia; C The third ECG after 1 hour later which shows some PAC (➡ Shows some technical Errors)

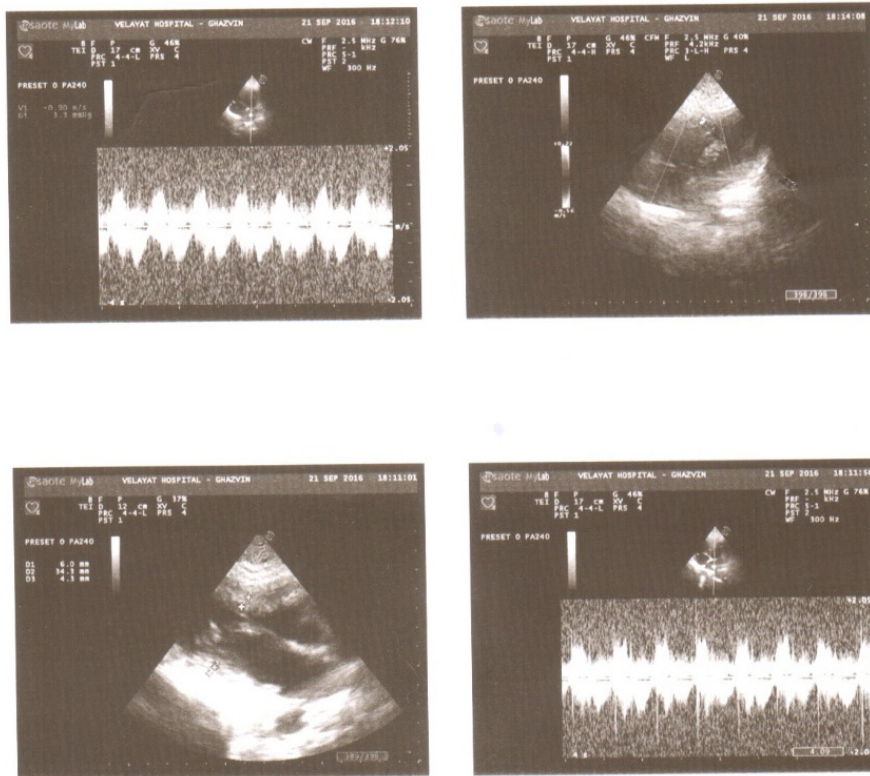


Figure 2. Echocardiography 10 days later

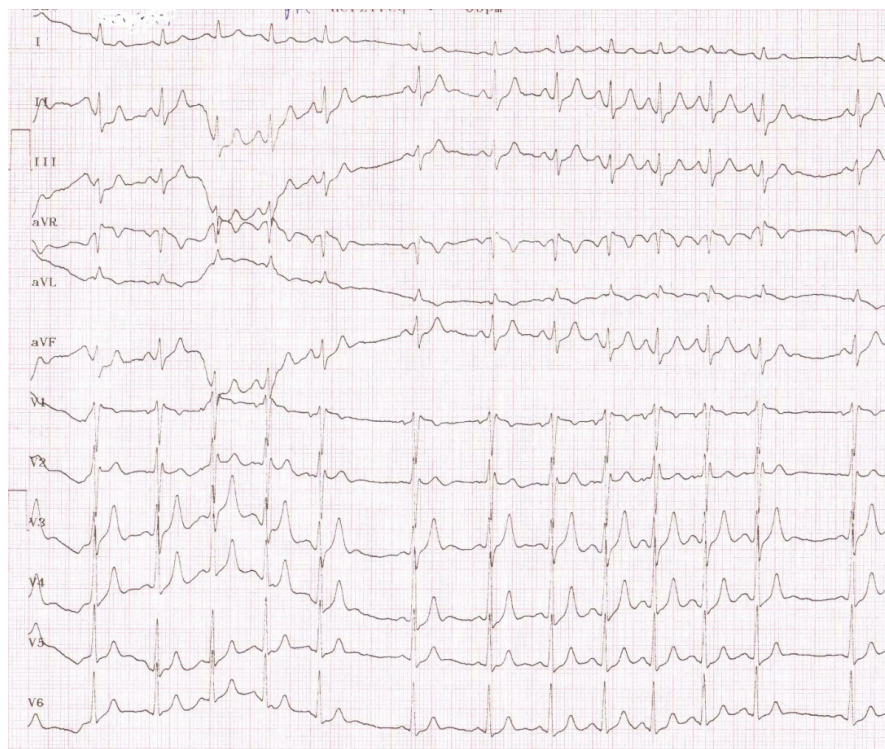


Figure 3. ECG 10 days later in which a sinus arrhythmia is showed



## Discussion

Sinus arrhythmia is considered as an arrhythmia which occurs as a result of many factors such as emotional stress and everybody may experience it [3]. In many studies prolonged Q-T is the arrhythmia due to hypokalemic state following excessive consumption of licorice [4, 5]. In this case, there was no hypokalemia and there was a sinus arrhythmia and PAC after using an average dose of licorice. At first glance, it seems to be only a concurrency between 2 things: using Licorice and a low risk arrhythmia without any causal relationship. There are some evidences that lead us to review and recheck our knowledge. Omar et al named some risk factors as a result of them individuals will be sensitive to licorice to show side effects among lower dose of drug such as “Prolonged gastrointestinal transit time” and “Anorexia nervosa” [1]. This case suffered from IBS and anorexia. On the other hand Emre et al reported atrial fibrillation (AF) after using licorice [6]. So, the most important question is that “May licorice facilitates occurring cardiac arrhythmia without hypokalemia in sensitive individuals?” Of course, this evidence belongs to only one case and actually, to receive a strong conclusion, more essential studies are required but it could be evidence to thinking about evaluation of the safety of licorice.

According to foundation of PM for treatment, physicians have a duty to treat the patient, not the disease and they should treat the same disease in each patient for himself; so, there are various treatments for the same disease considering the patient’s individual features. Also, every individual may show different reaction to uniform medication in appropriate with his/her temperament [2]. According to PM, This case owned a hot temperament of heart (driving at high speed, hasty, anxiety, flashing) so, licorice for this patient was not a good choice to treat his IBS because its temperament is hot [3]. Thus,

it could make the temperament of this patient’s heart hotter and even result in faint. So, neglecting individual features such as heart temperament, especially in addition to existence of sensitizer factors such as anorexia and IBS, led this patient to show cardiac arrhythmia without hypokalemia after using of licorice in average dose. However, anxiety has been known as a cause of arrhythmia, we are not allowed to say that anxiety is the only reason for arrhythmia in this case as exactly as we cannot say that this arrhythmia occurred due to using licorice, decisively. It seems that our knowledge about herbal medicine is not so enough so we should use them with caution.

## Conflict of interests

None

## References

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