



## Complete Heart Block in a Patient Taking *Trachyspermum ammi* and *Zingiber officinale*

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Received: 2016-11-20, Revised: 2016-11-24, Accept: 2016-11-26, Published: 2016-12-01

### ARTICLE INFO

Article type:  
Case Report

Keywords:  
Heart Block  
*Trachyspermum ammi*  
*Zingiber officinale*

### ABSTRACT

Herbal products are one of the most popular medications in the world. Nevertheless, herbal medications are not always safe and several cases of side effects have been reported. A 34 years old man was referred to Tehran heart center (THC) for implantation of permanent pacemaker (PPM). Recently, he had experienced several episodes of presyncope and according to the diagnosis of Complete Heart Block (CHB) with accelerated junctional rhythm, a temporary pacemaker (TPM) was implanted for him in another medical center. He had rheumatoid arthritis, type 2 diabetes mellitus and fatty liver in his past medical history. In his drug history, the patient took only herbal medications for the treatment of his ailments among them daily use of *Trachyspermum ammi* and *Zingiber officinale* (ginger) products were the main causes of this adverse effect.

J Pharm Care 2016; 4(3-4): 91-92.

► Please cite this paper as:

Hosseinjani H, Sadeghian S, Hajhossein Talasaz A. Complete Heart Block in a Patient Taking *Trachyspermum ammi* and *Zingiber officinale*. J Pharm Care 2016; 4(3-4): 91-92.

### Introduction

*Trachyspermum ammi* which is known as a popular aromatic herb and spice, belongs to the family Umbelliferae (1). Its fruit with stimulant, antispasmodic and carminative properties has been used primarily for the treatment of indigestion and flatulence (1, 2). Some of other indications are colic, diarrhea, bowel disorders and treatment of asthma (1). Hypotensive and bradycardiac effects were observed in in vivo animal studies (3).

*Zingiber officinale* belongs to the family of Zingiberaceae and is widely used as a spice, food, and herbal medicine. Some of traditionally uses of this herbal product are treatment of rheumatism, nervous diseases, gingivitis, toothache, asthma, constipation, diabetes, and

arthritis (1). Case reports of cardiac arrhythmia including bradycardia and syncope have been documented with *Zingiber officinale* (4).

### Case report

A 34-year-old man was referred to Tehran heart center for implantation of permanent pacemaker. On admission to the hospital, the patient was normotensive (baseline blood pressure (BP) was 120/80mmHg), and resting 12-lead electrocardiogram showed normal sinus rhythm (85 beats/min) with first-degree atrioventricular (AV) block. The patient was on herbal medications and had no previous history of coronary artery disease. For the treatment of his ailments, he started taking *T. ammi* and *Z. officinale* dry powders bought from a grocery, 60 and 10 days prior to the episodes of presyncope, respectively. Findings in his past medical history were rheumatoid arthritis, type 2 diabetes mellitus and fatty liver. The patient used nearly one teaspoon of each herbal product

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every day. He was admitted first in another hospital with several episodes of presyncope and the diagnosis of CHB with accelerated junctional rhythm and after implantation of TPM, he was recommended to discontinue taking *T. ammi* and *Z. officinale* dry powders. The 24hrs ECG holter monitoring result in our medical center showed first degree AV block with frequent paroxysmal ventricular contraction (PVC) and non-sustained ventricular tachycardia (VT). Echocardiography was done for the patient and its report summary showed normal left ventricular (LV) size and systolic function, left ventricular ejection fraction (LVEF)=55%, no regional wall motion abnormality (RWMA), trivial mitral regurgitation (MR), trivial aortic insufficiency (AI), mild tricuspid regurgitation (TR), pulmonary artery pressure (PAP)=32 mmHg, mild pulmonary insufficiency (PI), normal right ventricular (RV) size and systolic function, inferior vena cava (IVC) not dilated with reduced collapse and no pericardial effusion (PE). Electrophysiology study (EPS) showed complete ventriculoatrial (VA) block. Regarding presence of non-sustained VT in holter monitoring, study continued for induction of VT with programmed and mechanical stimulation of both RV and LV but no significant arrhythmia had occurred. Other measurements were normal so their results did not persuade interventional cardiologists to implant the device. Finally his coronary angiography result demonstrated normal coronary vessels. All together according to insufficient findings to support implanting PPM or implantable cardioverter defibrillator (ICD), it was recommended by the cardiologists to discontinue herbal products and follow up for probable AV block occurrence.

## Discussion

This case report introduce a 34-year- old man who was admitted first with several episodes of presyncope and according to the diagnosis of CHB with accelerated junctional rhythm, TPM was implanted for him and he was referred to THC for further diagnostic evaluations and PPM implantation . The patient took only herbal medications for the treatment of his ailments and had no previous history of coronary artery disease. As a result of diagnostic and laboratory evaluation, the probable cause of these events was *T. ammi* and *Z. officinale* usage.

*T. ammi* is a native plant of Egypt and is cultivated in Iraq, Iran, Afghanistan, Pakistan, and India. The fruit with stimulant, antispasmodic and carminative properties is used traditionally for the treatment of flatulence, atonic dyspepsia, diarrhea, abdominal pains, piles, bronchial problems, lack of appetite, asthma and amenorrhea (2). In one study, bioassay-directed fractionation of *T. ammi* has resulted in the isolation of thymol. In anaesthetized rats, thymol (1-10 mg/kg) produced dose-dependent fall in systolic, diastolic, mean arterial blood pressure and heart rate. The results of this study suggest that *T. ammi* contains

a calcium channel blocker-like constituent (thymol) which may explain the hypotensive and bradycardiac effects observed in the in vivo studies (3).

*Z. officinale* (ginger) has been cultivated for medicinal and culinary purposes for at least two millennia. In one study done in hypertensive animals, the authors reported that ginger has a generally dose dependent hypotensive effect. Moreover, temporary AV dissociation due to ginger usage was documented shortly afterwards. In addition one animal study showed that ginger caused vasodilation in rats and rabbits, following induced vasoconstriction, and exhibited calcium channel-blocking activity similar to verapamil. Also in one human trial a synergistic effect between ginger and nifedipine was found (5).

In one case report, A 59-year-old woman who used a cup (150 mg) of ginger 3 times daily for 5 days for the relief of flu symptoms was admitted to the emergency department (ED) because of sudden loss of consciousness due to symptomatic bradycardia and syncope. On admission, the patient was hypotensive and resting 12-lead electrocardiogram revealed sinus bradycardia and first-degree AV block. Result of one study showed that ginger may lower BP through blockade of voltage dependent calcium channels. Also, authors of another animal study found that ginger can cause a triad such as rapid fall in BP, bradycardia, and apnea in rats. It was suggested that the possible mechanism of ginger induced hypotension and bradycardia was related to a negative inotropic and chronotropic effect and also vasodilator effect through increasing nitric oxide release or synthesis and blockade of the voltage dependent calcium channels (4).

Finally after performing necessary diagnostic and laboratory evaluation, the patient was discharged from THC with stable cardiac and hemodynamic status and no necessity for PPM.

In conclusion, this case demonstrated that herbal therapies can sometimes have harmful effects and clinicians especially Emergency physicians, cardiologists, clinical pharmacists and internal medicine practitioners should be aware of possible herbal cardio toxic side effects in cases with unexplained cardiovascular findings.

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