

Symptomatic first-degree atrioventricular block in a young woman after taking a fat burner supplement

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ABSTRACT

A 22-year-old woman collapsed at home and was brought to the accident and emergency department. History revealed that she was fit and taken T5 capsule the night before the collapse. There was no history of similar collapses or seizure. Examination revealed blood pressure (BP) of 104/69 mmHg and a heart rate (HR) of 70 bpm. Chest, cardiovascular, and neurology examination were unremarkable. However, on standing, her HR increased to 120 bpm, and her BP dropped to 62/40 mmHg. Blood Na, K, Ca, Mg, phosphate, creatinine, complete blood count, T4 cortisol, and thyroid-stimulating hormone (TSH) were normal. The electrocardiogram (ECG) on the ambulance revealed sinus rhythm with normal morphology but a significant first-degree atrioventricular block with a PR interval of 280-300 ms. The patient was treated for orthostatic hypotension with intravenous fluids. Her symptoms gradually improved. The repeat ECG taken 24 h after admission showed reduced PR interval to 230ms. The patient was followed up in the clinic after 1 week with normal ECG with a PR interval of 200 ms and a normal echocardiogram. The findings are discussed.

Keywords: First-degree atrioventricular block, fat burners, T5

Introduction

Fat burner dietary supplements are widely used to control body weight. They seem to promote body weight loss by suppressing appetite and increasing body fat burning processes. They are thought to enhance athletic performance through their thermogenic effects. T5 supplements are fat burners that contain a wide array of ingredients such as caffeine, ephedrine, aspirin, L-tyrosine, 5-hydroxytryptophan (5-HTP), and green tea extract. Some of these ingredients may cause adverse side effects including palpitations, bradycardia, and vasospasm.¹ We are reporting here a case of a 22-year-old female who collapsed and was brought to the hospital with first-degree atrioventricular (AV) block after taking a T5 supplement.

Case Report

A 22-year-old woman, who was fit and well, presented to our emergency department after suffering two episodes of collapse at home and a history revealed that the previous night she found herself at the bottom of the stairs with no recollection of falling. She believed that she lost consciousness for only a few seconds. On the day of admission, she felt light-headed and collapsed again. This was witnessed by a family member who reported that there were no seizures, no tongue biting, or incontinence. She informed us that she had taken T5 capsule the previous night before the first collapse. She never had similar symptoms previously or any significant past medical history.

On examination, her blood pressure (BP) was 104/69 mmHg, and heart rate (HR) was 70 bpm. Chest, cardiovascular, and neurology examination were unremarkable. However, on standing, her HR increased to 120 bpm, and her BP dropped by 20 mmHg (from 108/70 to 62/40 mmHg).

All her blood tests including Na, K, Ca, Mg, phosphate, creatinine, FBC, T4, cortisol, and TSH were normal.

The electrocardiogram (ECG) (Figure 1a) on the ambulance revealed sinus rhythm with normal morphology but significant first-degree AV block with a PR interval of 280-300 ms. The ECG (Figure 1b) on arrival in casualty showed slight improvement on first-degree AV block (PR interval 270 ms) otherwise unchanged.

The patient was treated for orthostatic hypotension with intravenous fluids. Her symptoms gradually improved. The repeat ECG (Figure 1c) 24 h after admission showed reduced PR interval to 230 ms. The patient was followed up in the clinic after 1 week with normal ECG showing a PR interval of 200 ms and a normal echocardiogram.

Discussion

The PR interval of ECGs represents the time needed for an electrical impulse to conduct through the atria, the AV node (AVN), and bundle of His. Its normal range is 120-200 ms.

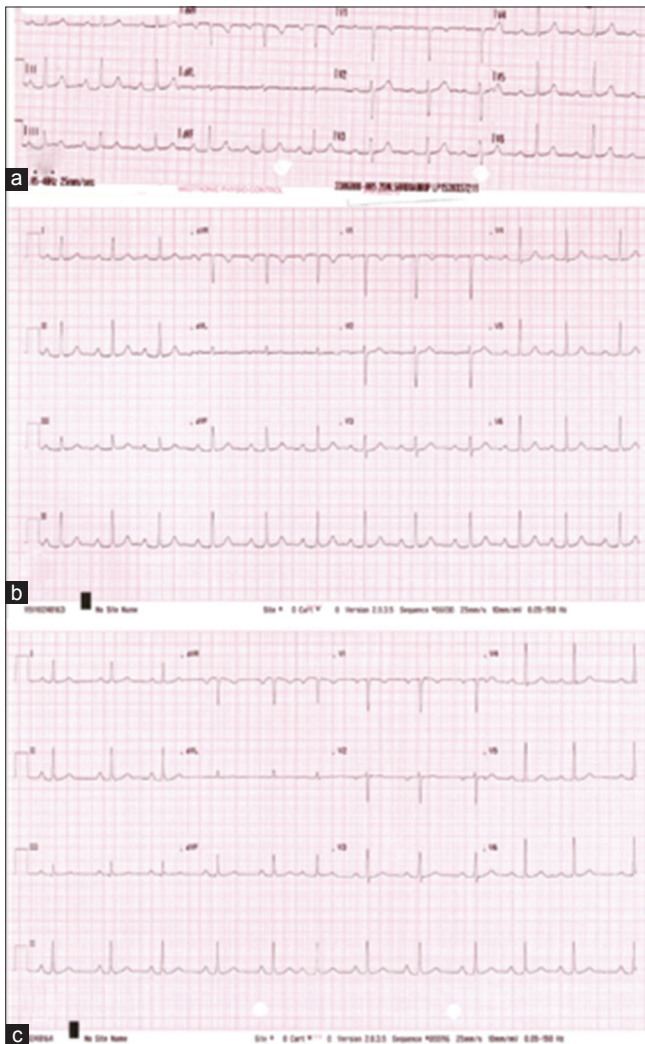


Figure 1: (a) Electrocardiogram (ECG) performed on the ambulance showing sinus rhythm with normal morphology but significant first-degree atrioventricular block (PR interval 280-300 ms). (b) ECG performed on arrival at the casualty still showing first-degree AV block (PR interval 270 ms). (c) ECG performed 24 h after admission showing PR interval reduced to 230 ms

Our patient had a PR interval of more than 280 ms and was considered as having first-degree AV block which is defined as a PR interval >200 ms. PR interval prolongation is attributed to conduction delays within the right atrium, the AVN, the bundle of His or the Purkinje fibers. In first-

degree AV block, the conduction is slowed, but all atrial impulses are transmitted to the ventricles, resulting in a regular ventricular rate. Previously, first-degree AV block was considered benign; currently, there is growing evidence that it poses a risk factor for atrial fibrillation and left ventricular dysfunction.² In first-degree AV block, dysfunction of the AVN is much more common than dysfunction at the His-Purkinje system. Occasionally, the conduction delay can be the result of an intra-atrial conduction defect.³ AVN contains different cells types including connexin-43 +ve cells, and connexin-43 negative myocytes. It is highly innervated with by both sympathetic and parasympathetic nerves that modulate its function.⁴ One possibility in this case, we are reporting here is that one of the ingredients of the dietary supplement taken by the patient adversely affected one or more of the components of the conducting system of the heart. Risk factors for acquired AV block include heart failure, coronary artery disease, cardiomyopathy, sarcoidosis, Lev's disease, and toxic substances.

It is not apparent which of supplement's ingredients was involved in the PR prolongation. Fat burner ingredients include caffeine, ephedrine, aspirin, L-tyrosine, and 5-HTP. Ephedrine has adverse cardiovascular effects including palpitations, vasospasm, and transient ventricular dysfunction.⁵ Caffeine and aspirin augment the effects of ephedrine. 5-HTP causes a serious condition called eosinophilia–myalgia syndrome.

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