The Journal of Emergency Medicine, Vol. 45, No. 3, pp. e55–e58, 2013

0736-4679/$ - see front matter

ELSEVIER

http://dx.doi.org/10.1016/j.jemermed.2013.04.020

Clinical Communications: Adults

SYMPTOMATIC SINUS BRADYCARDIA AFTER A TREATMENT COURSE OF HIGH-DOSE ORAL PREDNISONE

Mark R. Taylor, MD and Damjan Gaco, MD

Department of Emergency Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada
Reprint Address: Mark R. Taylor, MD, Department of Emergency Medicine, Royal University Hospital, 103 Hospital Drive, Saskatoon, Saskatchewan S7N0W8, Canada

☐ **Abstract—Background: High-dose corticosteroid therapy is used to treat several severe autoimmune diseases. Despite a common knowledge in the medical community of the adverse effects of chronic corticosteroid use, there is much less awareness of the affects that can occur after very high doses are administered in a relatively short period of time. Objective: Our objective was to report on the outpatient-based practice of administering high-dose corticosteroids for autoimmune disease and the possible bradycardic response that can occur as a result. Case Report: We present a case of a 45-year-old female with multiple sclerosis who presented to the emergency department with symptomatic sinus bradycardia secondary to a regimen of high-dose corticosteroid therapy. Conclusions: More patients with autoimmune diseases may be placed on outpatient-based treatment regimens of high-dose corticosteroids in the future. It is important for emergency physicians to be aware of bradycardia as a possible adverse effect, as many of these patients may present to the emergency department for evaluation.** © 2013 Elsevier Inc.

☐ **Keywords—corticosteroids; bradycardia**

INTRODUCTION

High-dose corticosteroid therapy has been used for several decades to treat a number of immune-related diseases, including rheumatoid arthritis, glomerulonephritis, and graft-vs.-host disease (1–3).Although there are several different treatment regimens in the literature, they all typically involve giving >1 g/day of i.v. corticosteroid for 3–5 doses (1–3). One of the more recent indications has been for optic neuritis, a condition that is closely associated with multiple sclerosis (4,5). The treatment is intended to give patients a faster recovery of visual disturbances (6). A meta-analysis by Brusaferri and Candelise on the topic provided evidence of better short-term visual recovery after a course of corticosteroid therapy with no evidence of benefit in long-term outcomes (7). Although several side effects are known to occur with chronic corticosteroid therapy, there are lesser-known effects that occur with very high-dose treatment administered over a short time period. We describe a patient who presented with symptomatic sinus bradycardia to the emergency department after the completion of a 5-day course of high-dose oral prednisone therapy for multiple sclerosis–related optic neuritis.

CASE REPORT

A 45-year-old woman with a medical history of recently diagnosed multiple sclerosis presented to the emergency department with a chief complaint of intermittent chest pain. The first episode occurred at rest the previous evening and was described as sharp and localizing across the chest, with no radiation to the neck, arms, or back. This lasted for 20 min before resolving on its own. An identical pain had returned the morning of the presentation and

RECEIVED: 17 February 2012; FINAL SUBMISSION RECEIVED: 27 July 2012;
ACCEPTED: 30 April 2013

lasted for several minutes. This time the patient noted that the chest pain was accompanied by mild dyspnea on exertion. These symptoms had resolved by the time the patient was seen in the emergency department. During the 3 days before presenting to the emergency department, the normally active patient had described increased general weakness, fatigue, and headache. The patient denied any medical history of angina-like symptoms, orthopnea, paroxysmal nocturnal dyspnea, leg swelling, presyncope, palpitations, or blood clots.

Several months before presenting to the emergency department, the patient had been diagnosed with optic neuritis and magnetic resonance imaging confirmed multiple sclerosis. She had continued to experience visual symptoms during the course of the next few months and was followed by a neurologist. In an attempt to improve her visual symptoms, the patient was started on high-dose corticosteroid therapy as an outpatient. She received 1,250 mg of oral prednisone per day for 5 days in total and finished her course 3 days before her emergency department presentation.

The initial vital signs were a blood pressure of 123/61 mm Hg, pulse rate of 43 beats/min, respiratory rate of 20 breaths/min, SpO_2 99% on room air, and a temperature of 36.8°C (98.2°F). She was in no acute distress. The patient had normal heart sounds with no murmurs, rubs, or elevation of her jugular venous pulsation. There was mild bilateral pedal edema present. The patient's lungs had equal air entry with no adventitious sounds. Abdominal and neurologic examinations were unremarkable.

The patient was placed in a bed with cardiac and respiratory monitors. Electrocardiogram showed sinus bradycardia with no acute abnormalities (Figure 1). Laboratory study results including complete blood count, electrolyte panel, and troponin T (drawn 8 h after the onset of pain) were unremarkable, except for a random blood glucose of 12.1 mmol/L (218 mg/dL). Chest x-ray study showed a normal-sized heart and clear lung fields.

After 4 h of cardiac monitoring in the emergency department, the patient was free of chest pain, able to ambulate without difficulty, and described feeling a little more energetic, despite still having a pulse rate in the low 50s. A decision was made to discharge the patient with subsequent outpatient follow-up and instructions to return to the emergency department if chest pain returned or if she developed a worsening of her symptoms. She was followed up by her family physician and a phone call 5 days later. Her pulse rate had normalized to her usual pretreatment heart rate of 70–80 beats/min and the patient had no further bouts of chest pain. In addition, her feelings of generalized weakness, fatigue, and headache had all resolved as well. For this reason, it was believed to be unnecessary by her family physician to send her for further testing, such as a Holter monitor or echocardiography.

DISCUSSION

Corticosteroids can be an effective means of controlling symptoms related to several autoimmune diseases. The adverse-reaction profile of chronic treatment is well known and includes several conditions, such as hypertension, hyperglycemia, mood disturbances, and Cushing's syndrome (8). There are, however, less well-known side effects that can occur after acute high-dose corticosteroid therapy. The most serious of these side effects is the potential for the precipitation of cardiac dysrhythmias (9). The mechanism by which this occurs is currently unknown. A recent study by Vasheghani-Farahani et al. looked at the rate of cardiac dysrhythmias in 52 admitted patients who received high-dose i.v. methylprednisolone therapy for multiple sclerosis (9). Atrial fibrillation, premature atrial contractions, premature ventricular

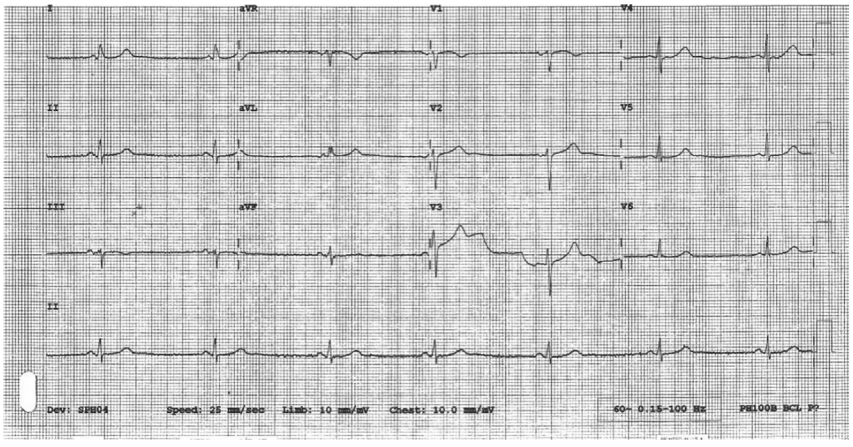

Figure 1. Twelve-lead electrocardiogram showing sinus bradycardia.