

Case Report

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Methadone-A Replacement for Deadly Heroin, Can Kill you too!!

Gurveen Malhotra^{1*} and Sivashankar Sivaraman²

¹Internal Medicine, Mt Sinai Hospital, Chicago, USA

²Pulmonary and Critical Care, Mt Sinai Hospital, Chicago, USA

Abstract

Methadone is widely used as a replacement for heroin addiction and an inexpensive treatment for chronic pain. We report the case of a 51 year old male on high dose methadone treatment for heroin addiction who presented with prolonged QT interval on electrocardiogram and later had a cardiac arrest with Torsades de Pointes (TdP), a rare complication.

Keywords: Methadone; Prolonged QT; Torsades de Pointes; Cardiac arrest

Case Presentation

A 51 year old male with history of hepatitis C, liver cirrhosis and on methadone treatment for heroin addiction presented to the emergency room with lethargy, weakness and acute confusion. He was taking 170 mg methadone daily and lorazepam only occasionally for anxiety. He however was still abusing heroin and had an alcohol problem as well. As per the significant other, patient was having brief lapses in consciousness for 2 days associated with sweating unrelated to postural changes. They were not associated with preceding chest pain, dizziness, palpitations or seizure like activity.

He was hemodynamically stable except for blood pressure elevated to 160/75 mm Hg with disorientation to time. Neurological exam did not reveal any focal neurological deficits or meningeal signs. Other pertinent findings were stigmata of liver cirrhosis with ascites but no asterixis or abdominal tenderness.

Electrocardiogram was remarkable for corrected QT interval prolonged to 605 msec and ventricular bigeminy (Figure 1) without

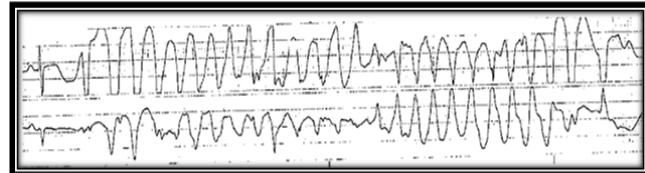


Figure 2: Rhythm strips.

any atrioventricular block. Blood work revealed hemoglobin of 10.5, platelet count 125, serum creatinine 2.02, potassium 4.2 and magnesium 1.3 (1.3-2.1 meq/L). Arterial blood gas did not show carbon dioxide retention and blood ammonia level was normal at 39 (16-53 µmol/L). A computerized tomography scan of the head did not reveal any acute intracranial abnormalities.

Magnesium sulfate infusion was given and on the night of presentation, he had a cardiac arrest with TdP (Figure 2) as the presenting rhythm. He was successfully resuscitated after a prolonged cardiac arrest of 17 minutes involving defibrillation. Magnesium was given intravenously and he was transferred to the intensive care unit. Patient was neurologically stable after the arrest and did not require hypothermia protocol. After the cardiac arrest, he developed sinus bradycardia to low 50 s requiring isoproterenol drip to prevent recurrence of TdP. The target heart rate was around 90-100 per minute. Echocardiogram showed stage II diastolic dysfunction with moderately dilated left atrium but no regional wall motion abnormalities. QT interval continued to be prolonged to as high as 700 msec and eventually started becoming shorter. Patient showed a good positive chronotropic response to isoproterenol and did not require overdrive pacing. Methadone was held all this time. The isoproterenol drip was slowly tapered off and the QT normalized to around 400 msec over the next few days. No further episodes of TdP were seen during the hospitalization.

Discussion

Methadone has a serious side effect of prolonging QT interval. It does so by inhibiting the rapid component of delayed rectifier

***Corresponding author:** Gurveen Malhotra, PGY-3, Department of Internal Medicine, Mt Sinai Hospital, Chicago, USA, Tel: 773-610-8973; E-mail: gurveen22@gmail.com

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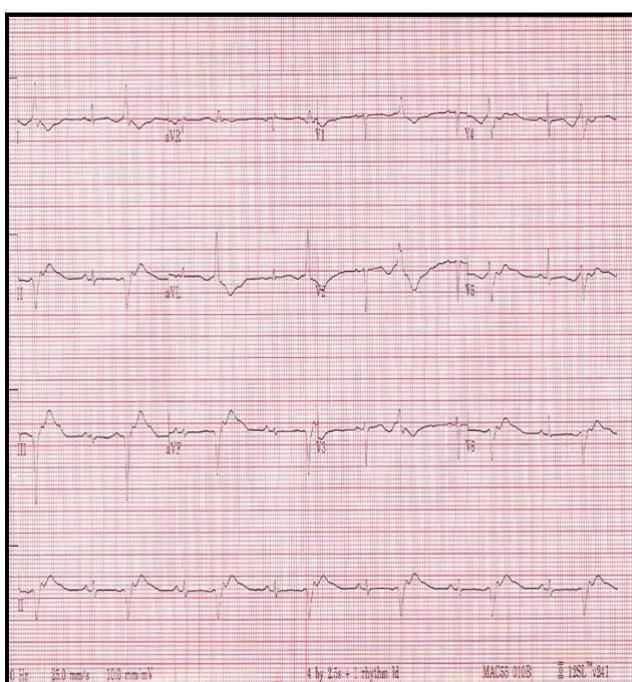


Figure 1: Electrocardiogram.

potassium ion current [1,2]. Prolongation of QT may lead to TdP which is a polymorphic ventricular tachycardia. Methadone-induced TdP is a rare complication and the true incidence is unknown. One study estimated the incidence to be less than 1% while others showed it to be around 3% [3-5].

We suspect hypomagnesemia in the setting of alcohol abuse, liver cirrhosis and high dose methadone use precipitated TdP in our patient. Further hepatitis C infection has also been seen to independently cause significant QT prolongation [6].

The acute management is intravenous magnesium administration [7] and holding the offending agent. Magnesium sulfate 2 grams can be infused intravenously irrespective of the serum magnesium level [8].

Bradycardia may predispose to TdP [9] and requires treatment with positive chronotropic agents like isoproterenol and overdrive pacing in patients with heart block, symptomatic bradycardia or recurrent pause dependent TdP [7].

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