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Cocaine Induced QT Prolongation

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Cocaine Inducing QT Prolongation

Introduction

The Q-T interval represents ventricular repolarization of the heart. Prolongation of this interval is called Long QT syndrome (LQTS) and can lead to deadly arrhythmias such as Torsades de Pointes. (1) According to the AHA, a Q-T interval is prolonged when it is >450ms in males and >460ms in females. LQTS has different etiologies (not limited to, but including): idiopathic, congenital, electrolyte abnormalities, and drug-induced. (2) However, recreational drugs such as cocaine may often be overlooked by some. A study by Magnano et al. found that cocaine can increase a QTc interval by 23 points (+/- 25) ($P < 0.001$) in habitual users. (3) There have also been numerous case reports detailing this exact same phenomenon. (4,5,6) Here we present a case of this exact same phenomenon.

Case:

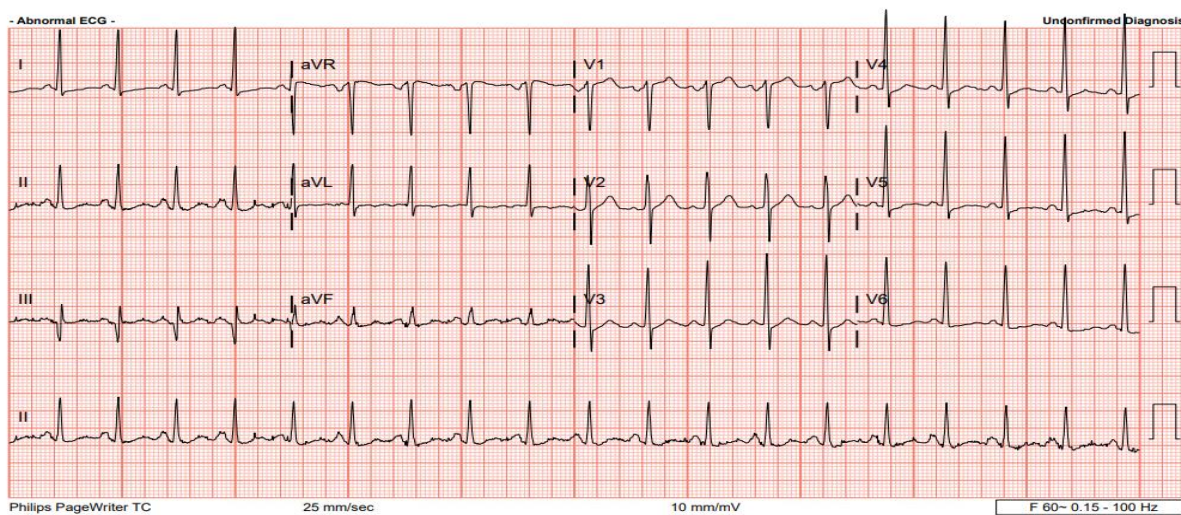
42-year-old gentleman with a known history of hypertension not on medications and polysubstance abuse who presented to the ED with complaints of fever, hypertension, sore throat, nausea, bilateral upper and lower extremity joint pains and stiffness and was admitted for sepsis due to influenza. Patient was taking ibuprofen and acetaminophen since the symptoms started. UDS was positive for cocaine, cannabinoids and opioids. EKG on admission was remarkable for sinus tachycardia with qtc of 472. While on the hospital his blood pressure remained persistently elevated with systolic blood pressure in the 200s after nifedipine and hydralazine were administered at the ED. Enalapril injection 1.25 mg q6h PRN was commenced but patient's blood pressure remained elevated with systolic blood pressure in the 200s. Patient blood pressure continued to be elevated regarding treatment; therefore, patient was transferred to the ICU for the management of hypertensive urgency with Cardizem drip. EKG on the second day showed sinus tachycardia with qtc 452. No medication that affects the qtc were given or taken by the patient that are known to cause qtc prolongation except for cocaine.

Conclusion:

Cocaine use has been associated with QTc prolongation, which can increase the risk of serious cardiac arrhythmias. Cocaine can interfere with the normal functioning of ion channels in the heart, leading to disruptions in the electrical signals. This disturbance can prolong the QTc interval, potentially causing torsades de pointes or other arrhythmias. Prolongation of the QTc interval can lead to an increased risk of this abnormal heart rhythm, which may result in fainting, seizures, or even sudden cardiac death. Healthcare providers need this information to make informed decisions about prescribing medications, avoiding potentially harmful drug interactions, and ensuring patient safety. It's crucial for healthcare professionals to be aware of these risks when treating individuals who use or have a history of cocaine use, as it can impact decisions regarding medication and overall patient care.

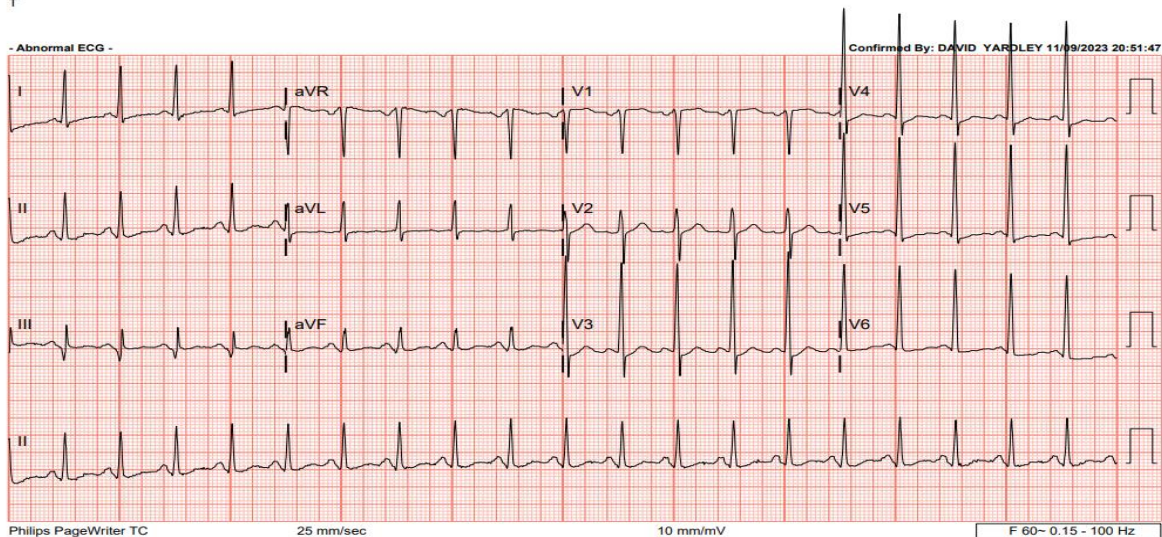
EKG on admission

Pat ID 105781952	11/06/2023 17:17:03	VASQUEZ, DAMIAN	Knapp Medical Center ED
RX	02/08/1981 42 yrs	Caucasian Male	Dept KMC ED
DX SOB		Account # 7700091340304	Room KMC MI04
			Tech
Rate 114	Sinus tachycardia	Req Provider: NESTOR ASTORGA	
PR 141	Probable left atrial enlargement	E	
QRSd 91	LvH with secondary repolarization abnormality		
QT 342			
QTc 472			
--Axis--		Reason:	
P 66			
QRS 20			
T 91			



EKG on the second day

Pat ID 105781952	11/07/2023 16:37:45	VASQUEZ, DAMIAN	Knapp Medical Center
RX	02/08/1981 42 yrs	Caucasian Male	Dept KMC MICU
DX CP		Account # 7700091340304	Room KMC MI04
			Tech
Rate 119	Sinus tachycardia	Req Provider: IVANA MANGIONE LEON	
PR 129	Probable left atrial enlargement	I	
QRSd 94	LvH with secondary repolarization abnormality		
QT 321	Electronically Signed On 11-9-2023 20:51:47 CST by DAVID YARDLEY		
QTc 452			
--Axis--		Reason:	
P 67			
QRS 33			
T			



(1) Rod Passman, Alan Kadish, POLYMORPHIC VENTRICULAR TACHYCARDIA, LONG Q-T SYNDROME, AND TORSADES DE POINTES, Medical Clinics of North America, Volume

85, Issue 2, 2001, Pages 321-341, SSN 0025-7125, [https://doi.org/10.1016/S0025-7125\(05\)70318-7](https://doi.org/10.1016/S0025-7125(05)70318-7). (<https://www.sciencedirect.com/science/article/pii/S0025712505703187>)

(2) El-Sherif N, Turitto G. Torsade de pointes. *Current Opinion in Cardiology*. 2003; 18 (1): 6-13.

(3) Magnano AR, Talathoti NB, Hallur R, et al. Effect of acute cocaine administration on the QTc interval of habitual users. *Am J Cardiol*. 2006;97(8):1244-1246.
doi:10.1016/j.amjcard.2005.11.046

(4) Taylor D, Parish D, Thompson L, et al. Cocaine induced prolongation of the QT interval. *Emergency Medicine Journal* 2004;21:252-253.

(5) Schrem SS, Belsky P, Schwartzman D, et al. Cocaine-induced torsades de pointes in a patient with the idiopathic long QT syndrome. *Am Heart J* 1990;120:980-4

(6) Singh N, Singh HK, Singh PP, et al. Cocaine-induced torsade de pointes in idiopathic long QT syndrome. *Am J Ther* 2001;8:299-302.