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Research Article

**PREVENTION OF QTC PROLONGATION WHILE TREATING  
INFECTION IN PATIENT ON AMIODARONE, AND  
TRAZODONE.**<sup>1</sup>Mohammed Ali, <sup>2</sup>Nilima Chand, <sup>3</sup>Nathan Zaher, <sup>4</sup>Ahmed Karim, <sup>5</sup>Salam K.,Haider, H.

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**Abstract:**

*What would you prescribe for someone has a chest infection, allergic to Levaquin, penicillin and taking amiodarone and trazodone? Long QT increased risk of ventricular arrhythmias and sudden cardiac death. QTc prolongation results from dysfunction of cardiac ion channels; predominantly altered function of cardiac potassium (I<sub>kr</sub> and I<sub>ks</sub>) or cardiac sodium channels (I<sub>na</sub>) may elicit the phenotype of the long QT syndrome.<sup>2</sup> In the congenital form of long QT syndrome (cLQTS), the ion channels are dysfunctional due to inherited mutations. but the same ion channels can also be affected by numerous drugs and hypokalaemia. Polypharmacy leads to a high risk of adverse effects. Accordingly, it is crucial to recognize patients receiving medicines that can induce QT interval prolongation and accomplish serial electrocardiograms, due to the possible risk of ventricular arrhythmias. Especially this patient that was on trazodone and was just diagnosed with atrial fibrillation to be on additional qt prolonging drug-like amiodarone. In addition to everything else, she developed a chest infection and required more antibiotics. What makes it harder is that she is allergic to Levaquin and which stop us from giving the best medications for lung infection even the cephalosporins due to the cross-reactivity with penicillin. The only option was azithromycin but the latter also increase risk of long qt and causing arrhythmia and sudden death if put with the others. After extensive discussion with other health care providers, we started her on Doxycycline under very close observation.*

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**INTRODUCTION:**

What would you prescribe for someone has a chest infection, allergic to Levaquin, penicillin and taking amiodarone and trazodone? Long QT increased risk of ventricular arrhythmias and sudden cardiac death[1] QTc prolongation results from dysfunction of cardiac ion channels; predominantly altered function of cardiac potassium (I<sub>Kr</sub> and I<sub>Ks</sub>) or cardiac sodium channels (I<sub>Na</sub>) may elicit the phenotype of the long QT syndrome.<sup>2</sup> In the congenital form of long QT syndrome (cLQTS), the ion channels are dysfunctional due to inherited mutations[2] but the same ion channels can also be affected by numerous drugs and hypokalaemia[3]

Amiodarone used to treat atrial and/or ventricular arrhythmias [3] and verified to reduce mortality in sufferers with structural heart malfunctions [4]. Administration of intravenous amiodarone has been reported to cause TdP in some patients who have a reduced repolarization reserve, which is a risk factor for TdP [5] . Here, we report a patient with advanced nonsmall cell lung cancer (NSCLC), chronic obstructive pulmonary disease (COPD), and chronic heart failure (CHF), who developed TdP following the mistaken administration of intravenous amiodarone for premature ventricular contractions (PVCs).

**Case Presentation:**

60 y.o. female with a history of osteoarthritis, COPD, GERD, bipolar, history of lung cancer small cell in remission, allergic rhinitis, hypertension, type 2 diabetes, and fibromyalgia presents with coughing up yellow or green phlegm (thick mucus), breathlessness, wheezing, high temperature (fever), rapid heartbeat, and chest pain.

But she had multiple allergies to Chantix (Severe Dizziness/Lightheadedness), Acetaminophen, Codeine , Levofloxacin, and Penicillins. She was also just diagnosed with atrial fibrillation and was prescribed amiodarone and she is also taking trazodone for sleeping. The challenge was to prescribe azithromycin but that also increase QT interval which worsens her arrhythmia.

Her medication list is:

- Albuterol Sulfate (ProAir HFA) 108 (90 Base) MCG/ACT Inhalation Aerosol Solution
- Azithromycin 250 MG Oral Tablet
- Benzonatate (Tessalon Perles) 100 MG OralCapsule
- Budesonide-Formoterol Fumarate Dihydrate

(Symbicort) 160-4.5 MCG/ACT Inhalation Aerosol

- Celecoxib (CeleBREX) 200 MG Oral Capsule
- Cetirizine HCl 10 MG Oral Tablet
- Cyclobenzaprine HCl 5 MG Oral Tablet
- Doxycycline Hyclate 100 MG Oral Tablet
- Duloxetine HCl (Cymbalta) 60 MG Oral Capsule Delayed Release Particles
- HYDROcodone-Acetaminophen 5-325 MG OralTablet
- MetFORMIN HCl 500 MG Oral Tablet
- Methylprednisolone (Medrol) 4 MG Oral Tablet Therapy Pack
- Metoprolol Tartrate 25 MG Oral Tablet
- Nicotine 21 MG/24HR Transdermal Patch 24 Hour
- Omeprazole 40 MG Oral Capsule Delayed Release
- Pregabalin (Lyrica) 100 MG Oral Capsule
- Promethazine-DM 6.25-15 MG/5ML Oral Syrup
- Sennosides (Senna-Tabs) 8.6 MG Oral Tablet
- TraZODone HCl 100 MG Oral Tablet

The challenge was what medication to prescribe.

**DISCUSSION:**

As noted above, a number of medications have been withdrawn from the U.S. market due to the causation of prolonged QT interval and/or TdP. Medications that directly affect the electrophysiology of the heart can prolong the QT interval. Some medication classes, notably antiarrhythmics and fluoroquinolones, indirectly affect the heart via heterogeneity of transmural ventricular repolarization among the three principal cell types of the heart: endocardial, myocardial, and epicardial cells[6].

QTc prolongation may be acquired (secondary) or congenital (primary). Many distinct genetic mutations and polymorphisms lead to congenital long QT syndrome, which occurs in about 0.0005% of live births[7]. Acquired QTc prolongation is almost always caused by drugs.

TdP can be initiated by types of ventricular arrhythmias [7]. A so-called 'pause dependent' phenomenon is a typical mode of onset of TdP in patients with acquired or congenital LQTS [8, 9]. The sudden change in ventricular activation does not allow for the accurate adaptation of ventricular APD; it reduces the repolarization reserve of the ventricle and thus possibly leads to TdP [7, 10].

**CONCLUSION:**

Polypharmacy leads to a high risk of adverse effects. Accordingly, it is crucial to recognize patients receiving medicines that can induce QT interval prolongation and accomplish serial electrocardiograms, due to the possible risk of ventricular arrhythmias. Especially this patient that was on trazodone and was just diagnosed with atrial fibrillation to be on additional qt prolonging drug-like amiodarone. In addition to everything else, she developed a chest infection and required more antibiotics. What makes it harder is that she is allergic to Levaquin and which stop us from giving the best medications for lung infection even the cephalosporins due to the cross-reactivity with penicillin. The only option was azithromycin but the latter also increase risk of long qt and causing arrhythmia and sudden death if put with the others. After extensive discussion with other health care providers, we started her on Doxycycline under very close observation.

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