

George Tung, D.O., Pharm.D., Robert Murdock, D.O., Jason Chiang, D.O., Byron Beasley M.D.  
Mercy Medical Center North Iowa, Division of Cardiology, Critical Care and Internal Medicine

## Introduction

Amiodarone is a well-known class III antiarrhythmic agent that is frequently used to treat a variety of arrhythmias. Although associated with lengthening of the QTc interval and substantial bradycardia, the drug exhibits a remarkably low frequency of triggered arrhythmic events. So low in fact that the incidence of amiodarone induced torsade de pointes (TdP) is less than 1%<sup>1</sup>.

We present a case of an extremely rare but life threatening incidence of amiodarone induced TdP.

## Case Presentation

A 73-year-old female with hypertension, non-ischemic dilated cardiomyopathy with left ventricular ejection fraction of 40%, moderate to severe mitral regurgitation, and tobacco abuse was recently diagnosed with paroxysmal non-valvular atrial fibrillation and pulmonary embolism. Her atrial fibrillation was rate controlled and she was started on warfarin, which she tolerated well and was subsequently discharged to outpatient management. Three days later she re-presented to the emergency department with complaints of palpitations and progressive fatigue. She was found to be in atrial fibrillation with rapid ventricular response. She was found to be in acute congestive heart failure secondary to her uncontrolled atrial fibrillation. Multiple agents were attempted and was unsuccessful in controlling her heart rate. Due to her ongoing decompensated state, amiodarone was initiated to control the rhythm. This precipitated TdP with loss of consciousness and a code blue was called. She was successfully resuscitated and all QT prolonging agents were removed.

## Atrial fibrillation

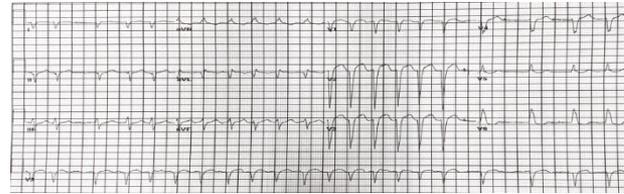


Fig. 1. EKG: Afib w/ RVR (prior to Amiodarone administration)

## Torsades de Pointe

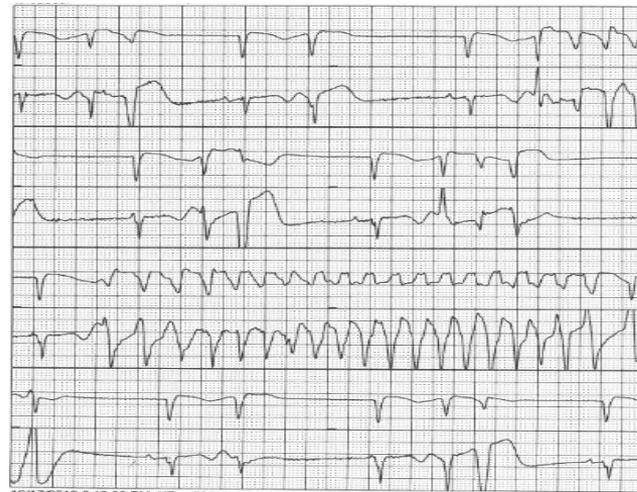


Fig. 2. EKG: Bradycardia, developing PVCs and progressing into TdP

## Discussion

In many countries, amiodarone is the most frequently used class III antiarrhythmic medication<sup>2</sup>. Although pro-arrhythmic incidence is rare, when it does occur it can be potentially fatal.

Our case is important because it adds to the literature and depicts a unique instance of amiodarone induced TdP. The pro-arrhythmic effects of amiodarone are often ignored and can be easily overlooked. Our example supports the case that when starting any medication with the potential to cause malignant arrhythmias, it is necessary to screen for and treat any reversible factors that contribute to increased risk. These factors include but are not limited to electrolyte abnormalities, thyroid abnormalities, and non-essential QT prolonging medications.

During our research, additional risk factors (female sex, left ventricular dysfunction, electrolyte abnormalities, baseline prolonged QTc, concomitant beta-blocker, and digoxin therapy)<sup>3</sup> were identified that increase the risk of TdP with Amiodarone administration. These risk factors should be considered prior amiodarone initiation.

## Conclusion

When starting any therapy, it is necessary to carefully consider potential risks versus benefits so that a patient centered care discussion can be held.

Amiodarone is a commonly used drug for treatment of arrhythmia.

*Although rare, other cases have been reported previously<sup>4</sup>. Amiodarone induced TdP risk factors is an area of further interest to investigate.*

It has been hypothesized that ventricular arrhythmias may arise in the setting of QTc prolongation due to early after depolarization dependent triggered activity<sup>5</sup>.

When starting antiarrhythmic therapy, proper patient screening is necessary to reduce the risk of adverse outcomes.

## References

- <sup>1</sup> Hohnloser SH, Klingeneben T, Singh BN. Amiodarone-associated proarrhythmic effects. A review with special reference to torsade de pointes tachycardia, Ann Intern Med, 1994, vol. 121 (pg. 529-35)
- <sup>2</sup> Weiss, James N et al. "Early afterdepolarizations and cardiac arrhythmias" Heart rhythm vol. 7,12 (2010): 1891-9.
- <sup>3</sup> Paul Foley a, Paul Kalra b, Neil Andrews b. Amiodarone—Avoid the danger of Torsade de Pointes, Resuscitation, 2008, Vol. 76, Iss. 1 (pg. 137-141)
- <sup>4</sup> Shenthathar J, Rachaiah JM, Pillai V, Chakali SS, Balasubramanian V, Chollenhalli Nanjappa M. Incidence of drug-induced torsades de pointes with intravenous amiodarone. Indian Heart J. 2017 Nov - Dec;69(6):707-713. doi: 10.1016/j.ihj.2017.05.024. Epub 2017 Jun 3
- <sup>5</sup> Weiss, James N et al. "Early afterdepolarizations and cardiac arrhythmias" Heart rhythm vol. 7,12 (2010): 1891-9.