



Poison HOTLINE

Partnership between Iowa Health System and
University of Iowa Hospitals and Clinics

February 2012

Overdoses of Drugs That Block Potassium Channels and Prolong the QT Interval

The January, 2012, edition of *Poison Hotline* featured drugs which, in overdose, cause sodium channel blockade and widening of the QRS on EKG. This month we focus on overdoses of drugs that block potassium channels and lengthen the QT interval.

The flow of ions in and out of certain cardiac cells is necessary for the proper conduction of electrical signals in the heart. Sodium ions flow into these cells during systole, and potassium ions flow out of these cells during diastole.

Potassium channel blockers slow potassium flow through the potassium channels of these cardiac cells during phase 3 and phase 4 of the action potential. This blockade leads to prolongation of the QT interval on the electrocardiogram, and can increase the risk for *torsades de pointes*.

While there are many drugs that block potassium channels and prolong the QT interval in either regular dosing or in overdose, the more common exposures called to the ISPCC involving potassium channel blocking drugs include:

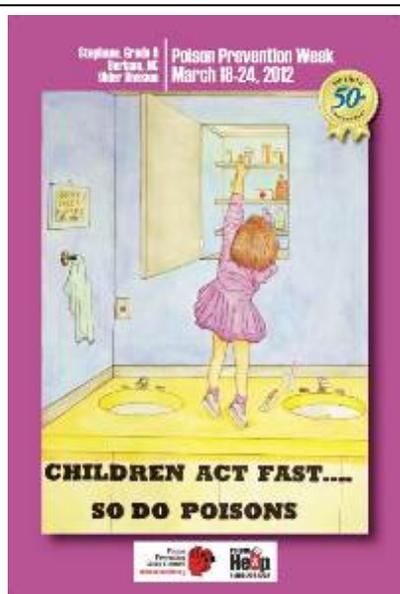
- Antibiotics: azithromycin, clarithromycin, erythromycin
- Antifungals: fluconazole, itraconazole, ketoconazole
- Antipsychotics: clozapine, droperidol, haloperidol, paliperidone, quetiapine, risperidone, thioridazine, ziprasidone
- Cyclic Antidepressants: amitriptyline, clomipramine, desipramine, doxepin, imipramine, nortriptyline
- Other Antidepressants: bupropion, citalopram, escitalopram, desvenlafaxine, fluoxetine, paroxetine, sertraline, trazodone, venlafaxine
- Others: diphenhydramine, felbamate, lithium, methadone, tizanidine

A longer list of drugs causing prolonged QT and torsades can be found at the Arizona Center for Education & Research on Therapeutics' website, www.qtdrugs.org.

The upper limits for a normal QT interval corrected for heart rate (QTc) are generally accepted to be 440 mSec for men and 460 mSec for women. Treatment for prolonged QTc includes stopping all offending drugs; correcting hypomagnesemia, hypokalemia and hypocalcemia; supplementing magnesium; and the standard treatments for *torsade de pointes*.

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Did you know

This year, March 18 – 24, 2012 marks the 50th Anniversary of National Poison Prevention Week (NPPW). If you would like to promote NPPW in your area, contact the ISPCC at 1-800-222-1222 to receive a NPPW packet with poison prevention brochures and phone stickers, or order materials on-line at www.iowapoisson.org.

POISON
Help
1-800-222-1222