IV amiodarone vs IV sotalol use in postoperative junctional ectopic tachycardia (JET): A randomized study

Tanner Isaacson

Follow this and additional works at: https://scholarlyexchange.childrensmercy.org/researchdays

Part of the Chemical and Pharmacologic Phenomena Commons, and the Pediatrics Commons
Research Abstract Title: IV amiodarone vs IV sotalol use in postoperative junctional ectopic tachycardia (JET): A randomized study

Submitting/Presenting Author (must be a trainee): Tanner Isaacson, MD
Primary Email Address: tisaacson1@cmh.edu

☐ Medical Student
XX - Resident/Psychology Intern (≤ 1 month of dedicated research time)
☐ Resident/Ph.D/post graduate (> 1 month of dedicated research time)
☐ Fellow

Primary Mentor (one name only): Lindsey Malloy-Walton, DO

Other authors/contributors involved in project: Bethany Runkel MD, Kelly Tieves DO, Erica Molitor-Kirsch MD, Jennifer Nelson CCRC, Christopher Follansbee MD, Svjetlana Tisma-Dupanovic MD, Andrea Miles MSN, CPNP-AC, Sher Foy DNP, CPNP-AC, Jim St. Louis MD, John Papagiannis MD, Lindsey Malloy Walton DO

IRB Number: STUDY00000846

Describe role of Submitting/Presenting Trainee in this project (limit 150 words):
• Completed appropriate research training to be credentialed as a co-investigator
• Involved in creation and submission of IRB protocol – received approval September 2019
• Submitted to MARS Ops
• Created patient consent
• Worked collaboratively with the heart center research team, cardiac ICU, pharmacy, nursing staff and IRB board
• Worked closely with families to provide information about the study and obtain consent
• Created Redcap database to analyze data
• Oral presentation at CMH Resident Research Days 2020 – 2nd place oral presentation
• Poster presentation at Midwest Pediatric Cardiology Society 2020
• Submitting for the Heart Rhythm Society's annual meeting, July 2021

Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words

Background
Junctional ectopic tachycardia (JET) is one of the most common post-operative arrhythmias encountered following congenital heart surgery. For many, amiodarone is the pharmacologic treatment of choice. While effective, amiodarone has been associated with dose-related adverse effects. Sotalol has been approved for intravenous use in pediatric patients in the United States to treat both supraventricular and ventricular arrhythmias, although pediatric data remains limited. Sotalol has class III antiarrhythmic properties with some mild β-adrenergic blocking effects, similar to amiodarone. Data shows a lower rate of cardiovascular collapse and adverse events with sotalol in patients with congenital heart disease. At present, it is unclear whether IV sotalol is as safe and as effective as amiodarone in the treatment of JET.
**Objectives/Goals:**
The purpose of this pilot study is to evaluate the safety and efficacy of IV sotalol in comparison to IV amiodarone in postoperative patients with confirmed junctional ectopic tachycardia.

**Methods**
IRB approval was obtained for this pilot randomized prospective study. The most at-risk patients were preoperatively consented and randomized at the onset of JET. Patients were monitored for clinical changes and severe side effects. Efficacy was determined by successful termination of the rhythm, adequate rate control, effective use of AAI/DDD pacing, time to rate control/termination, and recurrence of JET.

**Results**
Since September 2019, 120 patients were eligible for enrollment and 72 patients consented. During the study period, 8 patients developed postoperative JET, 5 of which consented for the trial. Of these 5 patients (age 6-152 days, average weight 4.23kg), 3 were randomized to sotalol and 2 to amiodarone. Normal cardiac function (EF>55%) by echocardiography was seen prior to drug administration in all patients. All 5 patients in the study achieved adequate rate/rhythm control. Those that received sotalol required ≤ 2 boluses (1mg/kg over an hour) for control. Of the two patients that received amiodarone, the first required 2 boluses (5mg/kg) and nearly 72 hours of an infusion (5-10 mg/kg/day) to maintain control. The second was very difficult to control, receiving 10 boluses (3-5 mg/kg) and an infusion (5-10 mg/kg/day) for 7 days to maintain control. One patient in the sotalol arm had QTc prolongation > 465msec (from 447msec to 496msec) but this did not require early termination of the medication. No significant adverse effects occurred in either group that were attributed to the antiarrhythmic medication.

**Conclusions**
We have a very low incidence of postoperative JET at our institution. Thus far, both medications have achieved rate/rhythm control with no significant adverse events. Our data shows that the patients who have been randomized to amiodarone have required much longer treatment courses, directly prolonging length of ICU stay, however our study is insufficiently powered to make a definitive conclusion. More data is needed to determine if IV sotalol is as safe and as effective as IV amiodarone in achieving rate and/or rhythm control in patients with postoperative JET.