Characterization of short QTc interval in Emergency Department patients

Peta-Gay Nolan  
*Washington University School of Medicine in St. Louis*

Stacey House  
*Washington University School of Medicine in St. Louis*

S. Eliza Halcomb  
*Washington University School of Medicine in St. Louis*

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CHARACTERIZATION OF SHORT QTC INTERVAL IN EMERGENCY DEPARTMENT PATIENTS

Peta-Gay Nolan  MD  
Stacey House MD, PhD  
S. Eliza Halcomb MD  
Washington University in St. Louis School of Medicine
Contributors to Short QTc Interval

- **Congenital**
  - Short QTc Syndrome, <300ms
  - Channelopathy with gain of function genetic mutations

- **Prescriptions**
  - Thiazides
  - Lithium
  - Digoxin

- **Lab abnormalities**
  - Hypercalcaemia
  - Hypokalemia
Complications of Short QTc Interval

- Early repolarization
- Atrial fibrillation
- Atrial flutter
- Ventricular fibrillation
- Sudden death
- Inducible ventricular fibrillation
Treatment of Short QTc Syndrome

- Implantable cardioverter/defibrillator
- Hydroquinidine (prolongs QT)
Objective

- The study objective was to characterize the ED population with Short QTc Interval.
  - Electrolyte abnormalities
  - Temperature
  - Chief complaints
  - Presenting symptoms
  - Medications
Method

- Retrospective review of all ED patients who received an EKG from December 1, 2008 to November 30, 2009

- Inclusion Criteria
  - QTC \( \leq 390 \) ms

- Exclusion Criteria
  - Bradycardia (HR < 60 bpm)
  - Tachycardia (HR >100 bpm)
  - QRS >120 ms
  - Non-sinus rhythm
  - Left without being seen
Patient Enrollment

27,119 Patients

26,579 pts (98%)
QTc > 390 ms

540 pts (2%)
QTc ≤ 390 ms

265 pts (49%)
Excluded

275 pts (51%)
Eligible

211 pts (77%)
QTc 380-390 ms
0.8% of all pts

48 pts (17%)
QTc 370-379 ms
0.2% of all pts

16 pts (6%)
QTc ≤ 369 ms
0.1% of all pts

Excluded Patients
Bradycardia 184 pts
Tachycardia 28 pts
Non-sinus rhythm 62 pts
Paced rhythm 24 pts
QRS > 120 ms 8 pts
LWBS or AMA 13 pts
Results

- These pts were 40±19 years old
- Male - 73%, 95%CI 68-78%.
Comorbidities
Presenting Symptoms

- Chest Pain
- SOB
- Lightheaded/dizzy
- Syncope
- Ingestion
- Palpitations
- Fatigue/weakness
- Seizure

Proportion Present
Results

- 15% (95%CI 10-20%) had abnormal serum potassium.
- 13% (95%CI 9-18%) had abnormal serum calcium.
- 2% (95%CI 0.5-3.9%) were hyperthermic.
Results

- Only 3% (95%CI 1-5%) were on home medications which shortened QTc interval including <1% on Digoxin, the most commonly described cause of medication-induced short QTc.
- 67% (95%CI 62-73%) were discharged from the ED.
- There were no significant differences among the different length QTc groups with regards to comorbidities, symptoms, electrolyte abnormalities, QTc shortening medications, or disposition.
Discussion

- Shortened QTc interval occurs in 2% of ED patients
- <0.1% have QTc<369 ms
- Very small portion with short QTc interval also have hypercalcaemia, hyperthermia, and/or Digoxin therapy.
- As the majority of these patients are discharged to home, further studies are needed to determine the rates of cardiac events in patients with shortened QTc interval.
References

- Koboza et al. Identifying risk of cardiac events in short QT syndrome. Heart Rhythm, vol 9, No1, January 2012. Pages 76-77
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