

Adherence to Guideline-Directed Management of Drug-Induced Long QT Syndrome

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Background:

QTc prolongation is a common but often overlooked phenomenon in hospitalized patients. Denoted as a QTc of greater than 470 milliseconds (ms) in males and greater than 480 ms in females, it is a consequence of many non-cardiac medications. Left untreated, severe QTc prolongation (>500 ms) has the potential to elicit fatal cardiac arrhythmias.

Torsades de Pointes (TdP) is the most commonly feared disastrous complication of QTc prolongation (1,2). It is treated with rapid administration of IV magnesium sulfate. Without treatment TdP can potentially progress into ventricular fibrillation leading to sudden cardiac death (2). According to the 2010 AHA statement on prevention of TdP in hospitalized settings and the 2017 AHA/ACC/HRS guidelines on management of ventricular arrhythmias and sudden cardiac death, in cases of severe QTc prolongation, QTc prolonging drugs should be promptly discontinued to avoid precipitating TdP (3,4).

Our project will be assessing if QTc prolongation is being recognized and monitored by clinicians at University Hospital in Newark, NJ. We will be examining if QTc prolongation is being appropriately documented in progress notes and properly managed through the discontinuation of the offending medication or prevention of starting new medications that can further lengthen the QTc.

Methods:

We searched through the electronic medical record (EMR) database under the various inpatient medicine teams to acquire a total of 50 patients at random who have electrocardiogram (ECG)-documented QTc prolongation. For each patient the age, sex, and QTc were recorded. Using the search function, documentation from their hospital stay was scrutinized for the phrases “QT prolongation” and/or “torsades” to observe if these topics were listed as active or recent problems. Current medications were assessed to see if the patient was actively on a QTc-prolonging medication at the time, which was determined via cross-referencing the official index of evidence-proven QTc-prolonging medications (5). If an active medication was identified, we noted whether it was “held”, “initiated” or “maintained” after QTc prolongation.

Results:

Among the 50 patients with identified QTc prolongation the mean QTc was 503 ms. On average, the QTc was prolonged 30 ms above the normal age-appropriate values. 42 of the 50 patients (84%) had prolonged QTc without in-chart documentation. 12 patients (24%) were on medications known to prolong the QTc, 4 of whom were appropriately documented, and 8 of whom were undocumented in the chart. Of the patients on medications, 11 (91.67%) did not

have their medications held after evidence of QTc prolongation. 10 patients (20%) were initiated on QTc prolonging medications after demonstrating a prolonged QTc.

Conclusions:

For most of our patients with recorded QTc prolongation on ECG, there was no official documentation of this as a problem in notes. In the majority of cases, patients were on QTc prolonging medications which were not held and there was a subset of patients who were actually started on medications that could further prolong the QTc. Overall, we need to improve our recognition and documentation of QTc prolongation in our notes to avoid a potentially catastrophic outcome.

In continuing with this study, we hope to examine and conduct a demographic and subgroup analysis of these patients. In particular we want to quantify QTc differences based on race, sex, age and also based on the different severities of QT prolongation (mild, moderate and severe). We would also like to expand our study to include more patients so that we can increase our sample size and overall power of the study.

Citations:

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