

Analyzing Drug Interactions with Risk of QT Prolongation and the Utility of the Tisdale Scoring System

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Purpose:

QT prolongation, which can be caused by various drug interactions, can increase the length of time a patient is hospitalized and causes increased all-cause mortality in patients. Electronic health record programs alert physicians and pharmacists about these drug interactions frequently, which contributes to alert fatigue. By analyzing the effectiveness of the Tisdale Scoring system for QT prolongation, alerts could be streamlined. The purpose of this study was to assess whether patients had echocardiograms (EKGs) performed when they received interacting medications, frequency of QTc prolongation, prediction utility of the Tisdale Score, and the most common drug interactions leading to QT prolongation.

Methods:

This was a single-center retrospective chart review study approved by the hospital's institutional review board. This study included patients 18 years and older who were hospitalized at Springfield Memorial Hospital through the period of January 1, 2020, to January 1, 2022, with patients receiving two or more of the following medications: amiodarone, ondansetron, tramadol, haloperidol, hydroxyzine, citalopram, or fluconazole. Exclusion criteria included patients with QT prolongation prior to receiving interacting medications, patients in hospice/end of life care, and patients hospitalized for less than 48 hours. The primary outcome of this study was to identify if an EKG was performed in patients who were initiated on interacting medications that result in an increased risk of QT prolongation. Secondary objectives included whether QT prolongation occurred, how each patient's Tisdale Score correlated with their QT prolongation status, and what drug interactions were associated with the most QT prolongation.

Results:

A total of 157 patients were analyzed. Of those patients, 34 (22%) did not receive an EKG during their hospital stay, even though patients were on medications known to cause QT prolongation. 56 (36%) patients only had one EKG during their hospitalization. Thirty-six (29%) patients experienced QT prolongation. Twenty (16%) had a low-risk Tisdale score and none of these patients had documented QT prolongation. Seventy-three (59%) patients had a moderate-risk Tisdale score and nineteen (26%) of these patients had documented QT prolongation. Finally, thirty (24%) patients had a high-risk Tisdale score and seventeen (57%) had documented QT prolongation. The most common drug-drug interaction that caused the system to fire an alert and led to QT prolongation was amiodarone-furosemide. 48 (31%) patients received this combination of medications and 25 (52%) of these patients had documented QT prolongation.

Conclusion:

Approximately twenty percent of our patient population is being under-monitored, which increases the risk of having unrecognized QT prolongation. Many patients only had one EKG during their hospitalization, which means their QT could have been prolonged after receiving interacting medications for an extended duration. The Tisdale score appropriately identified patients with a low risk of QT prolongation. If the Tisdale scoring system was integrated for order verification, this would be an effective strategy to decrease alerts that pharmacists see. Alerts are still appropriate for patients in the moderate and high-risk categories, leaving the decision to the practitioner's clinical judgment.