

Assessing the risk of QT prolongation in primary care

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Background and rationale

Drug induced prolongation of corrected QT (QTc) interval increases the risk for development of torsades de pointes (TdP), a rare but potentially fatal arrhythmia. In 2013, Tisdale et al. developed a risk score to assess the risk for QTc interval prolongation with pharmacotherapy which was validated in the cardiac critical care setting¹. A risk assessment tool in primary care can help weigh the rare but serious risk of TdP against potential benefit of pharmacotherapy.

Objectives

- To determine applicability of Tisdale risk stratification of drug induced QT prolongation in outpatient primary care setting.
- To understand prescribing patterns of QTc prolonging medications in primary care.

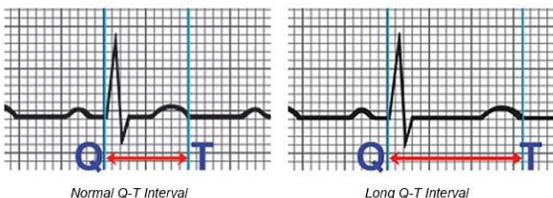
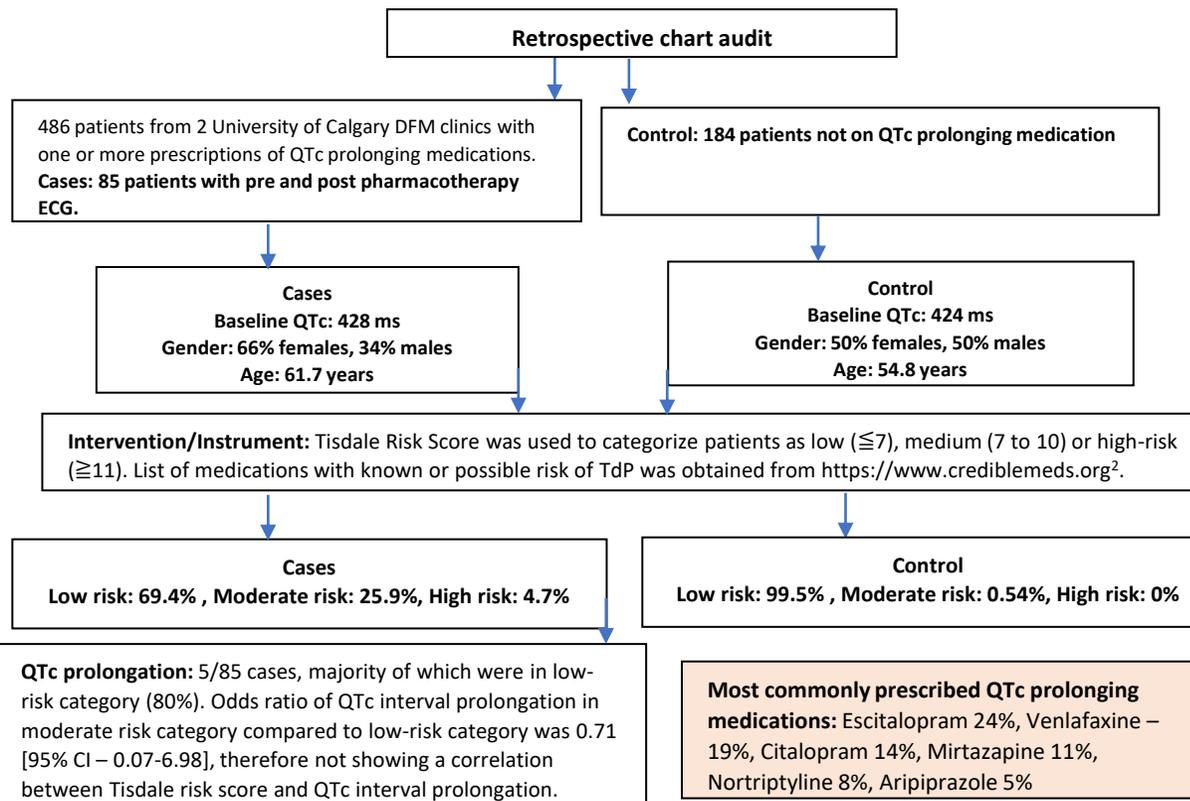


Figure 1: QTc prolongation refers to lengthening of the corrected QT interval as measured on an ECG. In this study, drug induced QTc prolongation was defined as post treatment QTc > 500 ms or an increase of 60 ms for pretreatment value. (Image Source: Cleveland Clinic. <https://my.clevelandclinic.org/health/diseases/17183-long-q-t-syndrome-lqts>)



Conclusions

Most patients in primary care are at low risk of QTc interval prolongation. This is expected as hospitalized patients or patients in critical care units are likely to have a greater number of risk factors. Most commonly prescribed long-term medications with known or probable risk of QTP are psychiatric medications. There was no correlation observed between QTc prolongation and Tisdale risk score with lower incidence of QTc interval prolongation in the study primary care population. One of the limitations was that only a small number of patients had pre- and post-pharmacotherapy ECG available in EMR. Another limitation is not being able to study the impact of short-term prescriptions of QTc prolonging medications like antibiotics due to lack of pre and post pharmacotherapy ECG. This study provides further information on drug induced QT prolongation which may help reduce unnecessary ECGs in outpatient primary care setting without risking patient safety and may help guide further prospective study to validate the Tisdale Risk Score in primary care.

Risk Factor	Points	
Age ≥ 68 years	1	Low Risk 0 – 6
Female gender	1	
Loop diuretic	1	
Serum potassium ≤ 3.5 mEq/L	2	Moderate Risk 7 – 10
Presenting QTc interval ≥ 450 msec	2	
Acute myocardial infarction	2	High Risk 11 – 21
Heart failure with reduced ejection fraction	3	
≥ 1 QTc interval-prolonging medication	3	
≥ 2 QTc interval-prolonging medications	3	
Sepsis	3	
Maximum Score	21	

Figure 2: Tisdale risk score for drug induced QTc prolongation¹

Clinical Pearls

- Most patients in primary care are likely to be low risk for QTc prolongation.
- When making treatment decision consider patient age, gender, electrolyte abnormalities, other medications, medical history and current medical status.
- Psychiatric medications are the most commonly prescribed long term QTc prolonging medications in primary care. Consider whether proposed treatment is associated with known or possible risk of TdP. <https://www.crediblemeds.org>
- Consider Tisdale Risk Score is estimating risk of TdP to help inform choice of pharmacotherapy. Check ECG if appropriate.

References

Tisdale JE. Drug-induced QT interval prolongation and torsades de pointes: role of the pharmacist in risk assessment, prevention and management. *Canadian Pharmacists Journal/Revue des Pharmaciens du Canada*. 2016 May;149(3):139-52.
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