

QUANTIFICATION OF QTc PROLONGATION DUE TO ANTIMICROBIAL EXPOSURE. J Dukes (PharmD candidate), MN Jeffres (PharmD), University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, Aurora, CO.

Background: Torsade de Pointes (TdP) is a life-threatening arrhythmia associated with a long QT corrected (QTc) interval. QTc interval >500 milliseconds (ms) increases risk of TdP. Medications commonly cause QT prolongation, but clinical resources describe QTc qualitatively, not quantitatively. The imprecision hampers clinical decision making.

Objective: To quantify QTc prolongation for fourteen common antimicrobials in macrolide, fluoroquinolone, or azole antifungal classes.

Methods: A literature review of PubMed and EMBASE databases was performed in June 2020 using MeSH terms for the antimicrobials and QTc prolongation and/or Torsade de Pointes. Data was extracted for each antimicrobial and categorized by sample population. Quantification of QTc prolongation was done by calculating weighted means.

Results: There were greater changes in QTc prolongation in patient populations than in healthy volunteers. Of macrolides, erythromycin had the greatest QTc prolongation in (32.3 ± 13.6 ms) then clarithromycin (12.5 ± 3.8 ms) and azithromycin (4.9 ± 6.4 ms). Of fluoroquinolones, moxifloxacin had the greatest QTc prolongation (16.4 ± 12.0 ms, healthy volunteers) then ciprofloxacin (10 ± 20 ms), levofloxacin (6.0 ± 5.6 ms), delafloxacin (3.9 ms) and gemifloxacin (2.6 ± 24.5 ms). Of azole antifungals, voriconazole had the greatest QTc prolongation (25.7 ± 9.3 ms) then posaconazole (9.0 ± 6.3 ms), ketoconazole (7.3 ± 0.95 ms, healthy volunteers) and isavuconazole (-13.6 ± 4.9 ms).

Conclusion: This analysis demonstrates significant variability in duration of QTc prolongation. How much a medication increases the QT interval is critical information for patients at risk for QTc prolongation and TdP. Quantification of QTc interval can help clinicians assess patient risk for QTc prolongation.