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# **Disparity in Physician Recognition of QT interval duration and associated Mortality**

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## **Background**

QT interval prolongation is associated with all-cause mortality (1,2). American Heart Association/American College of Cardiology (AHA/ACC) recommends considering QTc interval above 99<sup>th</sup> percentile as abnormally prolonged, to prevent torsade de pointes (TdP).

## **Methods**

Retrospective chart review of 291 EKG's (162 unique), from patients visiting our facility from Jan 2016 to Mar 2020. All EKG's were read, the measured QT interval was corrected for heart rate using Bazett formula. Simple descriptive statistics were created with all variables considered: patient age, gender, interpreting physician, report of long QT, presence of U-wave falsely prolonging QT and death. Correlation analysis was done, with linear mixed models to assess prolongation to account for repeated measures on some patients.

## **Results**

The average age of patients was 65.7 years (SD=17.2, range:18-98) and 70.3% was male gender. EKG's were reviewed by a cardiologist or ER doctor 59.99%, 40.06% respectively. 4 EKG's (1.3%) were not reviewed by any physician. The 90<sup>th</sup> and 99<sup>th</sup> percentile QTc (ms) was 517 and 588.12 respectively. U-wave was included in the measurement of QT interval 1.7% times, contributed to false reporting of QTc above 99<sup>th</sup> percentile once. Using the 90<sup>th</sup> percentile cutoff, cardiologist documented prolonged QT (57.1%, 12/21) more often than an ER doctor (45.45%, 5/11) [p-value= .529]. Of the reported deaths (12/162), arrhythmia- related deaths (80%) are more likely associated with QTc above 50<sup>th</sup> percentile i.e., 475 ms than non-arrhythmia related death (14.7%) [p-value= .022]. QT prolongation was not documented in any death summary.

The Contingency tables below depict the (expected total) and the [chi-square statistic].

### **Long QT Reporting for QTc above 90<sup>th</sup> percentile**

	Reported long QT	No report of long QT
Cardiologist	12 (11.16) [0.06]	9 (9.84) [0.07]
ER doctor	5 (5.84) [0.12]	6 (5.16) [0.14]

The chi-square statistic is 0.396. The  $p$ -value is .529148. *Not* significant at  $p < .05$ .

### **Deaths associated with QTc above 50<sup>th</sup> percentile**

	Arrhythmia-related death	Non-Arrhythmia related death
QTc above 475 ms	4 (2.08) [1.76]	1 (2.92) [1.26]
QTc below 475 ms	1 (2.92) [1.26]	6 (4.08) [0.9]

The chi-square statistic is 5.182. The  $p$ -value is .022822. Significant at  $p < .05$ .

## **Conclusion**

The observed trend is for cardiologists less likely to make an error than ER doctors, though not statistically significant. Based on the results of the study, this problem is likely not acted upon and maybe associated with increased mortality (more likely arrhythmia-related death). Long QT duration is a common problem and these results suggest further studies needed.

## **References**

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