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QT interval prolongation is a novel predictor of one year mortality in patients with coronavirus disease-19 infection

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Background: QT interval prolongation is common in critically ill patients and is associated with increased mortality. However, the predictive value of a prolonged corrected QT interval (QTc) for myocardial injury and long-term mortality among patients hospitalized with COVID-19 infection is not well known.

Purpose: To evaluate the association of prolonged QTc with myocardial injury and with 1-year mortality among patients hospitalized with COVID-19 infection.

Methods: A total of 335 consecutive patients hospitalized with COVID-19 infection were prospectively studied. All patients underwent a comprehensive echocardiographic evaluation within 48 hours from admission. Using the Bazett formula, the QTc interval was calculated from the first ECG tracing recorded at the ER. QTc ≥ 440 msec in males and ≥ 450 msec in females was considered prolonged. Patients with elevated cardiac biomarkers and/or echocardiographic signs of myocardial dysfunction were considered to have myocardial injury. The predictive value of QTc prolongation for myocardial injury was calculated using a multivariate binary regression model. One-year mortality rate of patients with and without QTc prolongation was compared using the log-rank test, and a multivariate Cox regression model adjusting for multiple covariates was performed to evaluate the 1-year mortality risk.

Results: One-hundred and nine (32.5%) patients had a prolonged QTc. Compared to patients without QTc prolongation, patients with prolonged QTc were older (70 ± 14.4 vs 62.7 ± 16.6 , $p < 0.001$), had more comorbidities, and presented with a more severe disease. Prolonged QTc was an independent predictor for myocardial injury (adjusted HR 2.07, 95% CI 1.22-3.5; $p = 0.007$). One-year mortality of patients with prolonged QTc was higher than those with no QTc prolongation (40.7% vs 16.9; $p < 0.001$, adjusted HR 1.85[1.2-2.84]; $p = 0.005$). Compared to patient without QTc prolongation and no myocardial injury, the adjusted 1-year mortality risk was highest in patients with prolonged QTc and myocardial injury (HR 6.63, 95% CI 2.28-19.3; $p = 0.001$), followed by patients with QTc prolongation without myocardial injury (HR 6.12 95% CI 1.83-20.49; $p = 0.003$), and patients with myocardial injury without QTc prolongation (HR 4.95 95% CI 1.83-20.49.; $p = 0.003$).

Conclusion: Prolonged QTc is an independent risk factor for both myocardial injury and 1-year mortality among patients hospitalized with COVID-19 infection.

