Prolonged $T_{peak-end}$ and $T_{peak-end}$/QT ratio as predictors of malignant ventricular arrhythmias in acute MI

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Abstract

Background: $T_{peak-end}$ prolongation(the interval from the peak of T wave and the end of it) and $T_{peak-end}$/QT ratio have been shown to be prdictors of malignant ventricular arrythmias in various cardiac conditions.

Objectives: The purpose of this study was to show the significance of using $T_{peak-end}$ and $T_{peak-end}$/QT ratio at admission in patients with acute ST-segment elevation MI to predict malignant ventricular arrythmia.

Methods: This is a controlled prospective observation cohort study. The study group included 60 patients presented with STEMI, in whom $T_{peak-end}$ and $T_{peak-end}$/QT ratio were measured at admission to our hospital, these patients were monitored for malignant arrythmia (VT and VF) with continous monitoring (ECG) in our intensive care unit for 5 days and 20 healthy individuals acted as controls.

Results: The $T_{peak-end}$ (94.3± 21.2 msec and Tpeak-end/QT ratio (26±6%)   in patients with STEMI. Ten patients with STEMI who sustained ventricular tachycardia within 24 hours of admission had prolonged Tpeak-end compared to 50 patient with STEMI without sustained VT(116.0±22.7msec versus 90.0±18.2 msec, P value < 0.001) and Tpeak-end/QT ratio (0.32±0.05 versus 0.25± 0,05, P value < 0.001). Four patients with STEMI who sustained ventriculal fibrilation within 24 hours of admission had prolonged Tpeak-end compared to 56 patient with STEMI without sustained VF (120.0 ±28.28 msec versus 92.5±19.65 msec, P value 0.011) and Tpeak-end/QT ratio (0.33±0.08 versus 0.26±0.05, P value 0.011) . ROC showed Tpeak of 110 msec to predict occurrence of VT had AUC 81.5%, sensitivity 80.0% and specificity 90.0% and to predict VF had AUC 80.1%, sensitivity 50.0% and specificity 70%. ROC showed Tpeak/QT of 0.3 to predict occurrence of VT had AUC 83.9%, sensitivity 80.0% and specificity 76.0% and to predict VF had AUC 78.8%, sensitivity 75.0% and specificity 70%.

Conclusion: Tpeak-end and Tpeak-end/QT ratio may be prolonged in patients with STEMI. And Tpeak-end >110 msec and Tpeak-end/QT ratio > 0.3 can predict malignant ventricular arrythmias within 24 hours of STEMI.

Key Wards: *Tpeak-end , Tpeak-end/QT ratio, ventricular arrythmia in STEMI.*