THE COMBINATION OF T-WAVE ALTERNANS AND NT-PROBNP IN PREDICTING SUDDEN CARDIAC DEATH

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Introduction: Studies in recent decades have shown that T-Wave Alternans (TWA) was associated with ventricular arrhythmias due to stimulation and idiopathic ventricular arrhythmias. The clinical evidence proved TWA, N-terminal pro-B-type Natriuretic Peptide (NT-ProBNP) to be very reliable markers for the risk of sudden cardiac death (SCD). The combination of the two above predictive markers will promote the predictive value. Therefore, we carry out this study with three objectives: 1. Evaluate TWA in predicting sudden cardiac death 2. Evaluate NT-ProBNP in predicting sudden cardiac death; 3. Evaluate the combination of NT-ProBNP and TWA in predicting sudden cardiac death in myocardial infarction patients.

Methods: This was a longitudinal study. Our subjects included 121 people divided into two groups. Disease group: 71 myocardial infarction patients admitted to the Cardiology department of Hue University of Medicine and Pharmacy Hospital, Vietnam from May 2017 to May 2019. Control group: 50 healthy people of the same range of age. Time of following: 24 months. TWA was analyzed continuously with the time-domain modified moving average method. NT-ProBNP was measured with ELISA (Enzyme-linked Immunosorbent assay) method.

Result: The study was carried out in 71 myocardial infarction patients (32 males, 39 females), aged from 25 – 75. TWA of the control group was 31.38±12.14 μV and the disease group was 97.54±31.73 μV (p<0.0001). The NT-ProBNP of the control group was 52.69±25.46 pg/ml and the disease group was 2595.41±952.15 pg/ml (p<0.0001). 1. The best cut-off point of TWA in predicting sudden cardiac death was 107 µV; AUC = 0.81 (95% CI: 0.69 – 0.87); the sensitivity: 83.7 % (95% CI: 64.5- 94.8); the specificity: 66.9 % (95% CI: 54.1- 78.6). 2. The best cut-off point of NT-ProBNP in predicting sudden cardiac death was 3168 pg/ml; AUC = 0.86 (95% CI: 0.72 – 0.91); the sensitivity: 84.6 % (95% CI: 64.5-93.6); the specificity: 70.3 % (95% CI: 59.3- 81.6). 3. TWA could predict sudden cardiac death with OR= 8.45 (p<0.01); NT-ProBNP could predict sudden cardiac death with OR= 7.26 (p<0.01); the combination of NT-ProBNP and TWA in predicting ventricular arrhythmia in myocardial infarction patients: OR= 17.91 (p<0.001).

Conclusion: The combination of NT-ProBNP and TWA provided a better value of predicting the sudden cardiac death in myocardial infarction patients, compared with NT-ProBNP or TWA alone.