High Frequency Spectral Analysis in signal Averaged ECG

楊騰芳

Yang TF;Lin CC;Chen CM;Yang IF

Abstract

Purpose: The aim is to develop high frequency (HF) spectral analysis technique in signal averaged electrocardiogram (SAECG) for the detection of ventricular arrhythmia. Materials and methods: There are 116 normal Taiwanese (N), 75 frequent ventricular premature contraction (VPC) and 22 ventricular tachycardia (VT) recruited. Time domain analysis using three parameters (fQRSD, RMS40 and LAS40) and three different HF analysis methods are performed. The root-mean-square amplitude (RMSA) of 60 to 120 Hz frequency band is defined to quantify the HF spectra at the terminal QRS. Results: It is shown that the higher the risk of ventricular arrhythmias, the lower the RMS40 (VT (22.1µV) < VPC (35.4µV) < N (43.4µV)) as well as the RMSA in lead Y (VT (25.1µV) < VPC (47.6µV) < N (62.6µV)). The receiver operating characteristic curve demonstrated that the best performance is RMSA in Y lead (area under curve (AUC) = 79.3%), then RMS40 (AUC = 77.7%), LAS40 (AUC = 69.8%) and fQRSD (AUC = 68.2%). Conclusions: The performance of the locally developed new method has been shown to be better than existing HF analysis approaches and at least as good as the time domain analysis.