

Research on Myocardial Ischemia Detection Based on the Electrocardiogram R-S-T

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Electrocardiogram (ECG) is an economic and convenient detecting tool in myocardial ischemia(MI), whose clinical appearance is mainly exhibited by ST-T complex change. However, it is highly sensitive to interferences(axis deviation, heart rate, electrode interference, postural changes, etc), which causes ST-T complex feature points difficult to detect accurately. In this paper, a new detection approach of myocardial ischemia was proposed based on ECG R-S-T, which just needed to locate three feature points R-wave peak, S-wave peak, and T-wave peak. Some vectors derived from the triangle RSTs were calculated, and they were RT(RT length), TS(ST length, the distance between S-wave peak and T-wave peak), RS(RS length), Area(the area of triangle RST), Rate1(the amplitude ratio of T-wave peak and R-wave peak), Rate2(the length ratio of RT and RS). The means, variances, and approximate entropys of these vectors were regarded as estimation parameters, as a result, significant differences ($P<0.05$) of five parameters $RTrv$, $TSrv$, $RSrv$, $AreaE$, and $Rate1rE$ were obtained after the long-term ST database(LTST) verification. The proposed method provided a simple and reliable basis for clinical diagnosis of myocardial ischemia.