EFFECIIS OF CORONARY REPERFUSION ON THE PREVALENCE OF MYOCARDIAL INFARCTION: EFFECTS ON SIGNAL AVERAGED ELECTROCARDIOGRAMS 5-7 DAYS AFTER MYOCARDIAL INFARCTION

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Coronary reperfusion has been reported to reduce the prevalence of silent ischemia (SI) detected early (within 48 h) after myocardial infarction. The purpose of this study is to determine if successful coronary reperfusion reduces the prevalence of SI detected beyond 3 days after myocardial infarction when LPs have been shown to have significant ST-segment elevation. Signal averaged electrocardiograms (SAECGs) were recorded using a RA-8600 and a CR-4800 (45-250 Hz, resample 0.5V, sine wave filter) in 100 patients (mean age 64 years) 5-7 days after myocardial infarction. The 30 events occurred: 4 cardiac deaths, 3 myocardial infarctions, 14 coronary artery bypass grafts, 0 PTCA and 1 recovery for unstable angina.

We conclude that successful coronary reperfusion achieved at a mean of 3.8 hours after onset of myocardial infarction does not reduce the prevalence of SI after SAECG recorded 5 to 15 days after myocardial infarction.

LACK OF REPRODUCIBILITY OF FREQUENCY VS TIME DOMAIN SIGNAL-AVERAGED ECG ANALYSIS, AND EFFECTS OF LEAD POLARITY

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Time domain (TD) signal averaged (SA) ECG parameters have been found to be consistent over the short term. Similar data has not been verified for the frequency domain (FD). Also the effects of lead polarity changes on TD or FD parameters are not known. SAECGs were done on 19 patients using the ART 1600 EPK with orthogonal X, Y, and Z leads. TD variables included filtered QRS, root-mean-square voltage (RMS) of the last 40 ms of the QRS, and duration of signal less than 40 uV (LAS). Two TD area ratios were analyzed: 140 ms window including last 40 ms of QRS+100 ms of ST and 140 ms window beginning at QR onset (both 20-60/0-20 Hz). Values were compared for each lead as well as a vector composite and the arithmetic mean of the 3 leads. Each patient had 3 studies performed 5 min apart. The polarity of the lead was reversed between the 1st and 2nd studies and then returned to standing for study 3. RESULTS: TD variables correlated closely between studies irrespective of lead polarity with r values of .996 to 1.000 (all p<.0001). FD parameter correlation was much poorer with r values as low as .278. FD correlation between leads 1 vs 2 (mean r=.765) and 2 vs 3 (mean r=.840) was poorer than 1 vs 3 (mean r=.895) implying an effect of lead polarity change.

CONCLUSION: 1) TD variables are consistently measured and not affected by lead polarity 2) FD parameters are altered by lead polarity change and 3) are inconsistently measured even over the short term.