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Title: Postinfarction Risk Stratification Using the Angle of Ventricular Gradient

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Present experience with prospective identification of patients who might benefit from prophylactic antiarrhythmic intervention, such as with implantable cardioverter-defibrillator, is restricted to risk stratification of patients using left ventricular ejection fraction (LVEF). The precision of LVEF-based identification of high risk patients is neither highly sensitive nor highly specific. Additional risk stratifiers are therefore still needed.

METHODS. This study investigated risk stratification of 466 survivors of acute myocardial infarction (86 women, aged 57.5 ± 8.5 yrs) for whom a 5-year follow-up was available. During the follow-up 67 pts died and 24 of these events were sudden arrhythmic deaths. In addition to LVEF, pts were stratified by mean heart rate, heart rate variability and the slope of heart rate turbulence, all derived from 24-hr Holter recording obtained before hospital discharge, and by the angle of ventricular gradient (total cosine R-to-T, TCRT) obtained from digital resting ECG before hospital discharge. To avoid the problem of using differently suitable dichotomies with different risk factors, individual characteristics and their combinations were evaluated by calculating the areas under the receiver operator characteristics (AROC). The bootstrap technology was used to investigate these statistically.

RESULTS. For the stratification of both all cause mortality and sudden arrhythmic death, TCRT was the strongest risk stratifier (AROC of 0.6857 ± 0.0367 , and 0.7275 ± 0.0544 , respectively) that compared very favourably to LVEF (AROC of 0.6610 ± 0.0362 and 0.6346 ± 0.0595 , for all cause and arrhythmic death prediction, both $p < 10^{-10}$ for the comparison with TCRT). TCRT was also stronger in combination with other stratifiers, e.g. TCRT+LVEF (AROC of 0.7631 ± 0.0325 and 0.8057 ± 0.0473 , for all cause and arrhythmic death prediction) was stronger than mean heart rate+LVEF (AROC of 0.7396 ± 0.0298 and 0.7673 ± 0.0445 , respectively, both $p < 10^{-10}$ for comparison with TCRT+LVEF).

CONCLUSION. The angle of ventricular gradient is a very powerful risk stratifier especially suited for the prediction of sudden arrhythmic death. It should be prospectively investigated in future trials of prophylactic antiarrhythmic interventions.

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