

 Arrhythmias and Clinical EP**DYNAMIC QRS-WIDENING AND APPEARANCE OF EARLY REPOLARIZATION PATTERN PREDICT IMPENDING VENTRICULAR FIBRILLATION IN EXPERIMENTAL MYOCARDIAL INFARCTION**

Poster Contributions

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**Background:** Previously considered to be benign, early repolarization (ER) phenomenon has recently been reported to be associated with ventricular fibrillation (VF), particularly in the setting of acute myocardial infarction (MI). However, automatic assessment of ER is complex and J-wave may be included in the QRS width by automatic ECG processing. Our aim was to analyse whether QRS widening and appearance of ER-pattern in the settings of experimental MI is predictive for VF.

**Methods:** In 32 pigs MI was induced by 40-min inflation of an angioplasty balloon in the left descending artery (LAD) and ECG continuously recorded. Six animals had VF immediately after occlusion and 10 more -  $20.9 \pm 4.0$  min after occlusion. We aimed at prediction of the late VF episodes. Multilead QRS boundaries were computed and QRS duration was calculated on a beat-to-beat basis during the occlusion period for each pig. Association between QRS-widening and subsequent VF was studied using ROC-curve analysis. ECGs at maximum QRS-duration were reviewed for the presence of ER as QRS slurring or notching in anterior, inferior or lateral leads.

**Results:** Two peaks of QRS widening were found in all animals: the first peak immediately on LAD occlusion and the second one  $19.1 \pm 4.0$  min later. The magnitude of changes in the QRS width over time had significant interindividual differences. Using ROC-curve analysis, QRS-widening  $\geq 28$  ms during 3 min time window was observed in 14 animals and appeared to be predictive of impending VF (Se=80%, Sp=73%, PPV=57%, NPV=89%,  $p=0.008$ ). In 10 of the 14 pigs with QRS widening, ER criteria were fulfilled at maximal QRS duration. Appearance of ER-pattern predicted VF with Se=80%. Sp=68%, PPV=53%, NPV=88%  $p=0.02$ .

**Conclusions:** Detection of ER pattern during QRS widening suggests that not only conduction aberrancy, but also repolarization abnormalities may be related to the QRS-widening during acute ischemia. Transient QRS widening, commonly associated with ER pattern, appears to predict impending VF in the settings of acute ischemia and motivates further clinical studies for monitoring the immediate risk of VF in MI.