Routine Left Atrium Strain in acute STEMI: to do or not to do

Introduction and purpose: Left atrium strain (LAS) is a very useful, modern method of establish left atrium (LA) function and rarely use in predicting adverse events (AE) in acute anterior ST-elevated myocardial infarction (STEMI). The purpose of our study was to compare LAS among other echocardiographic parameters of LA and left ventricle (LV) function, in patients that developed AE (heart failure, all cause mortality, reinfarction and rehospitalization) after acute anterior STEMI during one year follow up.

Methods: All 101 patients with a first acute anterior STEMI treated by primary PCI had early echocardiography in first 24 hours. After one year follow up, patients were divided in two groups: AE group (27 patients; 27%) and non-AE group (74 patients; 73%). We compared: LA size, LA maximal volume index, LAS, systolic and diastolic left ventricle parameters, between groups for the purpose of identifying early AE predictors.

Results: Among all left atrium parameters, LA strain was most prognostic for AE between groups (AE group vs. non-AE group): LA diameter (3.7cm vs. 3.5cm, p=0.03), LA maximal volume index (27 ml/m2 vs. 24.5 ml/m2, p=0.03), LAS (30% vs. 37%, p<0.0001).

Statistically significant differences in systolic and diastolic LV function between AE and non-AE groups were: ejection fraction (p<0.0001), stroke volume index (p<0.0001), fractional shortening (p<0.0001), cardiac index (p<0.0001), LV systolic work (p<0.0001), WMSI- wall motion score index (p<0.0001), average LV peak systolic longitudinal global strain- LGSav (p<0.001), mitral inflow peak early velocity/average mitral annular peak early velocity- E/e' av (p<0.001).

After adjustment for all echocardiographic parameters, LA strain (OR 0.91 95% CI, p=0.04), WMSI = 2 (OR 6.1 95% CI, p=0.001), average peak systolic left ventricle LGS (OR=15.1 95% CI, p<0.0001) and cardiac index (OR 2.6 95% CI, p=0.01) were independently associated with adverse outcomes.

Conclusion: Routine left atrium strain is very prognostic parameter of high-risk STEMI patients for adverse events and could possibly be considered as an important component of the new predictive score system for MACE and mortality of STEMI patients in the near future.