

Prognostic Value of Global Longitudinal Strain in Patients with Anterior Myocardial Infarction

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Background: Left ventricular ejection fraction (LVEF) is a potent prognostic parameter in acute myocardial infarction patients. However, global longitudinal systolic strain (GLS) from 2D speckle-tracking echocardiography is a potent novel method to estimate the left ventricular systolic function. This study was aimed to evaluate the value of GLS as a predictor for 1 year all-cause mortality in patients with anterior myocardial infarction (MI).

Methods: Among the 546 first-STEMI patients, who underwent primary percutaneous coronary intervention (PCI), From November 2007 to December 2011, 216 patients (mean age 60.5±12.4, 171 male) with anterior myocardial infarction were enrolled. **Results:** Mean LVEF of the patients was 46.1±10.1% and mean GLS was -12.0±3.9%. Receiver operating curve of GLS for 1-year mortality demonstrated that GLS showed excellent prediction for 1-year mortality in anterior MI patients (area under curve [AUC] 0.84, 95% confidence interval [95CI] 0.771 - 0.915). Cutoff value of GLS for mortality prediction was -11.7% (sensitivity 94%, specificity 58%). A Group with high GLS (n=100) showed significantly poor prognosis than low GLS (n=116) group in Kaplan-Meier survival analysis (mortality 16% vs. 0.9%, log rank $p < 0.001$). Compared with left ventricular ejection fraction, GLS showed better prediction for mortality, but not significant (AUC 0.84 vs. 0.79, $p = 0.31$). Univariate analysis showed that age, gender, Killip class, symptom-to-balloon time, systolic blood pressure, estimated GFR, post PCI TIMI flow and GLS were predictors for 1-year mortality. In multivariable analysis, GLS was an independent predictor for mortality in anterior MI patients (hazard ratio 1.205, 95CI 1.031-1.408, $p = 0.019$). Addition of GLS on established risk factors (including LVEF) had incremental predictive value in predicting 1-year mortality (global chi-square from 60.5 to 64.5, $p = 0.045$). **Conclusions:** GLS is an independent predictor of prognosis in patients with anterior myocardial infarction. Adding GLS on established prognostic factors can improve prediction of prognosis in patients with anterior myocardial infarction.

Feasibility of passive leg raising test for early stage HFpEF confirmed by invasive exercise test

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Background: Passive leg raising (PLR) increases preload and is known to increase pulmonary capillary wedge pressure (PCWP) in heart failure with preserved ejection fraction (HFpEF) patients. However correlation between PLR induced increase of PCWP and dynamic exercise induced increase of PCWP is not well established. **Methods:** Thirty nine patients with unexplained dyspnea and ejection fraction > 50% underwent invasive exercise test. After resting right cardiac cath, supine cycle ergometer exercise with 10 watt increments in 3 minute from 20 watt was performed to maximum tolerated levels. PCWP was measured at resting supine position, before exercise with PLR and after 3 minutes of 20 watt exercise. Patients with normal resting PCWP < 15 mmHg and exercise PCWP > 25 mmHg were classified as early-HFpEF. **Results:** Among total of 39 patients (mean age 67 years, 28 women), 13 patients showed elevated resting PCWP of 16±4 mmHg and 26 patients had normal PCWP of 12±2 mmHg at rest. Twenty six patients with normal PCWP at rest were classified into early HFpEF (n=16, 32±4 mmHg after exercise vs 13±2 mmHg at rest) or noncardiac dyspnea (NCD, n=10, 20±3 mmHg after exercise vs 12±2 mmHg at rest). PLR increased PCWP in both early-HFpEF and NCD group but this was more evident in early-HFpEF than in NCD group (19±3 mmHg vs 15±3 mmHg, $p = 0.005$). PLR induced PCWP was good correlation with exercise PCWP ($R^2 = 0.61$, $p < 0.001$). The optimal cutoff value for PLR-PCWP to detect early HFpEF was 17 mmHg (sensitivity, 0.69; specificity, 0.70), yielding an AUC of 0.81 (95% CI, 0.64 to 0.98). Positive predictive value of leg raising PCWP > 17 mmHg for diagnosis of early HFpEF was 79% and negative predictive value was 58%. **Conclusions:** PLR test could be used for detecting early HFpEF with good accuracy in substitution for cycle ergometer exercise test.