

The diagnostic value of coronary flow reserve by transthoracic Doppler echocardiography in non-diagnostic or inconclusive stress echocardiography tests

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Background: An inconclusive or non-diagnostic stress echocardiography test (SET) implies a need for additional tests, which often results in unnecessary invasive examinations and higher health costs.

Aim: The aim of our study was to investigate the value of non-invasive transthoracic Doppler echocardiography (TTDE) derived coronary flow reserve (CFVR) in patients with non-diagnostic and inconclusive SET.

Methods: The study group consisted of 122 patients (73 male, 49 females: mean age 63 ± 8 years) with non-diagnostic SET (target heart rate (HR) not reached, chest pain without electrocardiographic (ECG) and echocardiographic changes; and inconclusive SET (target HR reached, chest pain without ECG and echocardiographic changes). All patients were referred for TTDE assessment of CFVR in left anterior descending artery (LAD). CFVR was calculated as the ratio of maximal hyperemic and baseline coronary flow velocity. CFVR LAD ≤ 2 was considered abnormal. All patients were scheduled for invasive coronary angiography (CA).

Results: Mean CFVR LAD was 2.4 ± 0.44 . CFVR LAD was abnormal in 22 (18%) and preserved in 100 (82%) patients. Significant LAD stenosis was found in 15 (12.2%) out of 122 patients. Sensitivity of reduced CFVR LAD ≤ 2 was 88% for significant LAD stenosis, while preserved CFVR >2 had negative predictive value of 95%. Correlation analysis found significant correlation between invasive CA and CFVR LAD ($r = -0.356$; $p < 0.0001$).

Conclusions: Reduced CFVR LAD ≤ 2.0 has additive diagnostic value in detection of significant LAD stenosis in patients with non-diagnostic and inconclusive SET.

Key words: coronary flow reserve, non-diagnostic stress echocardiography test