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Reduction in left atrial reservoir strain is an independent predictor of atrial fibrillation in patients with arterial hypertension and preclinical diastolic disfunction

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Left atrial (LA) dimensions, wall composition and function strongly depend on left ventricular (LV) diastolic function and impaired in patients with preclinical diastolic disfunction (PDD), which increases the likelihood of atrial fibrillation (AF) occurrence. LA longitudinal strain (LALS) is a sensitive parameter of subclinical myocardial changes and its reduction might be predictive for AF.

Methods: 168 patients (90 female) 68±9 years with arterial hypertension in sinus rhythm with preserved systolic function (LVEF>50%) and PDD and without renal or valvular disease and 45 age and sex matched healthy controls were followed up for 2 years. PDD was diagnosed at stress echocardiography (SE) if E/e' ≥13, transmittal E wave deceleration time reduction >50ms, systolic pulmonary artery pressure (sPAP) >30 mmHg, and patients remained asymptomatic. LALS was measured by speckle tracking echocardiography as average value of two basal segments in 4 chamber view along with LA end-systolic volume index (LAVi), LA EF, LV mass index (LVMi), and LVLS. 72 hours Holter monitoring was performed every 6 months.

Results: Patients with PDD had larger LAVi, less LALS, higher LVLS and bigger LVMi compared with controls (LAVi 30.5±4.9 ml/m^2 vs 23.1±4.8 ml/m^2, $p<0.001$; LALS 34.7±6.9% vs 45±4.3%, $p<0.001$; LVLS –17.4±2.4% vs –20.8±2.1%, $p<0.002$; LVMi 81.8±12.3 g/m^2 vs 68±9.2 g/m^2, $p<0.001$). AF was registered in 42 (25%) patients with PDD. LAVi, LVLS and LVMi did not significantly differ in PDD patients with or without incidents of AF however LALS was significantly less in patients with AF (26.8±7.5% vs 37.2±8.1%, $p<0.01$). Multivariate analysis defined LALS as an independent predictor of AF development (OR=2.4; 95% CI=2.41–5.96; $p<0.01$) with the cut-off value of 28.9%.

Conclusion: LA peak reservoir LS is an independent predictor of AF development in patients with PDD.

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