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Early myocardial deformation index modification in hypertensive patients without hypertensive cardiomyopathy: the role of speckle tracking echocardiography

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Topic(s):
Tissue Doppler, Speckle Tracking and Strain Imaging

Citation:

BACKGROUND: The structural heart modifications especially for left chambers, in chronic hypertensive status are well known but recently, an increased interest in a global assessment of cardiac dysfunction in arterial hypertension is developing especially concerning the preclinical cardiac damage. The two-dimensional speckle tracking echocardiography (2D STE) is a promising technique to detect the preclinical myocardial dysfunction in different circumstances included hypertension.

PURPOSE: Our aim was to detect and investigate the early changes in myocardial deformation index in hypertensive patients without evident signs of organ damage, using speckle tracking echocardiography.

METHOD: We enrolled 92 subjects referred to our outpatient clinic for suspected hypertension without history of previous cardiovascular disease.

The blood pressure measurements were always gotten with the patients seated after 5 minutes of rest. Among the selected patients 49 were finally diagnosed with essential hypertension (average office blood pressure (BP) = 140/90 mmHg for at least 3 times or valid 24 hours ambulatory blood pressure measurement (ABPM) with an average BP = 135/85 mmHg) while 43 subjects were not and their data were used as controls. A 2D conventional echocardiography was performed prior to other analysis for an internal protocol to exclude all the subjects with structural pathologic findings and all the patients underwent the echocardiography before the starting of any kind of therapy active on BP. Patients with chronic diseases and pregnant women were considered not eligible. We perform STE analysis of LA, LV, RV free wall, and a multilayer STE analysis for LV and RV (epicardial, mid-wall myocardial, endocardial) using specifics offline software.

RESULTS: All the patients had always conventional echocardiographic parameters in range of normality without particularly difference between the groups except for IVS thickness and E/E’ ratio (P<0,05). Patients with hypertension were usually overweight.

The STE analysis show worsening in myocardial deformation index both for LV GLS (P<0,001), LA STE (P=0,03) and RV STE (P=0,01). In multivariate analysis the LV GLS was the best predictive index of preclinical organ damage (P=0,0004) however adding to same models the values of multilayer analysis result in best predictive value for the mid-wall RV index (P=0,015). This index was also well correlated with all the global STE and the E/E’ ratio (P<0,05)

CONCLUSION: Our study suggest that 2D STE can be considered a useful method to identify early alterations of myocardial dysfunction in hypertensive patients without a clinical organ damage.

All ventricular myocardial layers are involved in arterial hypertension likewise the LA walls.

A layer specific pattern of alteration looks to be present in the early phases of arterial hypertension however its predictive value needs more investigation first to become of clinical use.
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CONCLUSION: Our study suggest that 2D STE can be considered a useful method to identify early alterations of myocardial dysfunction in hypertensive patients without a clinical organ damage. All ventricular myocardial layers are involved in arterial hypertension likewise the LA walls. A layer specific pattern of alteration looks to be present in the early phases of arterial hypertension however its predictive value needs more investigation first to become of clinical use.