Conclusion: Patients with arterial hypertension have subclinical subendocardial dysfunction both at rest and peak stress. This can be diagnosed easily by tissue Doppler, so it can be monitored during treatment to reduce cardiovascular complications of hypertension.

687 Filling pressure is increased in hypertensive patients with left ventricular concentric geometry: a Tissue Doppler evaluation

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Purpose: Hypertensive patients with concentric left ventricular (LV) geometry often present diastolic relaxation but little is known about magnitude of their LV filling pressure. Our aim was to evaluate LV filling pressure non invasively, by pulsed Tissue Doppler, in a population including both normotensive and hypertensive subjects, in relation with aging and abnormalities of LV geometry.

Methods: After exclusion of diabetes mellitus, heart failure, primitive/valvular cardiomyopathies and coronary disease (angina and/or ECG signs at rest/maximum treadmill exercise), 162 normotensive subjects and 71 firstly diagnosed, never treated hypertensive patients underwent Doppler echocardiography including Tissue Doppler of mitral annulus. The average of lateral and septal annular early diastolic velocity (Em) was determined and transmural E/Em ratio (E/Em ratio) calculated as an index of LV filling pressure. According to the values of relative wall thickness (RWT), the population was divided in 2 groups: 39 with concentric LV geometry (RWT≥0.43) and 194 with normal or eccentric geometry (RWT<0.43).

Results: The two groups were similar for sex and heart rate (HR) while age (p<0.001), body mass index (BMI) (p<0.003), systolic and diastolic blood pressure (BP) (both p<0.001) were higher in patients with RWT≥0.43. They also had higher LV mass (p<0.003), lower transmural E/Em ratio (1.1±0.3 vs 1.42±0.4, p<0.001) and longer deceleration time (p<0.02). E/Em ratio was 7.41±2.1 in presence of RWT≥0.43 and 6.54±1.6 with RWT<0.43 (p<0.01). In the overall population, after adjusting for BMI, systolic BP, HR and E/Em ratio by a multiple linear regression analysis, age (β coefficient =0.39, p=0.01) and RWT (β coefficient =0.43 and 6.54±1.6 with RWT<0.43 (p<0.01).

Conclusions: The increase of E/Em ratio is associated with LV concentric geometry in uncomplicated arterial hypertension. These findings show that the increase of LV filling pressure is independent of age and BP and occurs even in presence of transmural pattern of impaired relaxation when LV geometric abnormalities become overt.

688 Prevalence of sleep-disordered breathing and its impact on left ventricular remodeling in patients with essential hypertension

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Objective: To investigate the prevalence of sleep-disordered breathing (SDB) and evaluate its impact on left ventricular remodeling in adult patients with essential hypertension (EH).

Methods: Ambulatory sleep recording for 8 h was performed in 82 patients with EH, and the left ventricular ejection fraction (LVEF), internal end-diastolic diameter (LVIDd) and left ventricular mass weight (LVMWI) were measured using M-mode and two-dimensional echocardiography.

Results: The incidence of SDB defined as an apnea-hypopnea index (AHI, namely the number of apnea-hypopnea events per hour during sleep) no less than 10 was 63.2% in these EH patients (78.6% in male and 35.7% in female patients). Of the 82 patients 32.3% had mainly obstructive sleep apnea (OSA) and 18.4% had central sleep apnea (CSA). There was a moderate inverse correlation between LVEF and AHI (p=0.006, r=-0.355), LVMI in patients with EH and SDB was significantly greater than that in patients with isolated EH (45.56±8.31 vs 56.81±10.67 mm, p=0.01). The left ventricular myocardial weight was also greater in patients with EH and SDB than in patients with isolated EH (219.3±4.52 vs 230.07±23.4, p=0.001).

Conclusion: Our results suggest a higher prevalence of SDB in patients with EH in general population, and the prevalence is even higher in patients with severe EH in relation to left ventricular remodeling. SDB contributes to the progression of EH and further cardiac decline by a vicious cycle.

689 Prognostic value of doppler tissue imaging regional analysis in hypertension

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Spectral Doppler tissue imaging (DTI) has the capacity to analyse left ventricular (LV) longitudinal (FL) and transversal (TF) myocardial function in each wall segment, however its prognostic value in certain pathologies such as systemic arterial hypertension (H) is still unknown.

Purpose: The aim of our study was to assess the prognostic value of DTI indices among H pts in terms of major cardiovascular (CV) events during a long term follow-up. We studied a group of 66 H pts with LV hypertrophy, mean age 61±5 years, 63% male gender, with normal LV global systolic function. By conventional transthoracic Doppler echocardiography in each case we calculated the left atrial (LA-mm), LV end-systolic (ESD-mm) and end-diastolic (EDD-mm) diameters, LV end-systolic (ESD-mm) volumes, LV percent fractional shortening (LV% FS-%) and ejection fraction (LVEF %)-, interventricular septum (IVS-mm) and posterior wall (PW-mm) thickness, LV mass (LVM-g) and LVM index (LVM-g/m2).

Results: In presence of RWT≥0.43, the mean and maximal velocities (Vmax/cm-s) of the systolic contractions s’ wave, the early e’ and late a’ diastolic relaxation waves, and its Vmax e’/a’ ratio. Major CV events with prognostic importance were defined as CV mortality, CHF >III NYHA, AMI or unstable angina, and cerebrovascular disease, and the total population was divided in 2 groups based on the presence of these events, CV+ (31.8% 9 and CV- (68.2% 29). Clinical, echocardiographic and DTI variables were submitted to a Cox proportional model and multiregression analysis.

Results: LVM (p=0.02) and LVM (p=0.02) values were higher in the CV+ group. The mean values of the Vmax of the systolic contractions s’ (p=0.01), of the early e’ (p=0.01) and late a’ (p=0.02) diastolic relaxation waves were lower in the CV+ group. In the Cox regression model, the absence of CV events was related with the Vmax of the DTI s’ wave (HR: 0.75; 95% CI: 0.33-0.75), e’ (HR: 0.51; 95% CI: 0.32-0.86) and a’ waves (HR: 0.75; 95% CI: 0.66-0.83), when compared with all other parameters. In the multivariate analysis, the best predictor of major CV events was the Vmax of the DTI s’ wave.

Conclusions: The spectral DTI study of systolic and diastolic phases of regional LV myocardial function has the capacity to give useful prognostic information with important impact in the clinical management.

690 Proximal aortic stiffening is a major determinant of left ventricular hypertrophy and diastolic dysfunction in end stage renal disease

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Aim: Several epidemiological and clinical studies reported that damage of our larger arteries is a major contributory factor in the high cardiovascular morbidity and mortality in end-stage renal disease (ESRD) patients. We investigated the relationship between proximal aortic stiffening and cardiac alterations in patients with end stage renal disease (ESRD).

Patients and methods: Ninety-nine ESRD patients without any history of cardiovascular disease and preserved left ventricular ejection fraction (LVEF)≥50% and 83 age- and sex-matched control subjects were studied. All patients underwent a complete echocardiographic study. Aortic stiffness in the proximal aort (PWVcf) was assessed with pulse wave velocity (PWV) using tissue Doppler echocardiography: From the suprasternal view, the distance between ascending and descending AO was measured with 2D-ultrasound and the AO flow wave transit time (TT) was measured with pulsed-wave Doppler and PWV were calculated as distance IT (in m) / TT (in ms) and proximal aortic stiffness index (PWVcf) was estimated by the foot-to-foot echo method.

Results: ESRD patients had increased aortic b-index, PWV, PWVcf and LV mass index (LVMi) (all p<0.001) compared to controls. LV diastolic dysfunction was evident in the vast majority of ESRD patients. PWV had a close correlation with PWVcf (r=0.74, p<0.001) and b-index (r=0.42, p<0.001) in ESRD patients. Patients with advanced diastolic dysfunction (pseudonormal or restrictive filling pattern, 31 pts) had increased PWV (7.2±0.98 vs 6.2±0.86 m/s, p<0.001), PWVcf (12.6±1.6 vs 11.7±1.5 m/s, p<0.007) and b-index (p=0.003) compared to patients with lower grade of diastolic dysfunction (delayed relaxation pattern). Multivariate linear regression analysis revealed that PWVcf (included variables age, heartdiasymetry duration, PWVcf and b-index) was independently correlated to LVMi (b=1.17, p<0.002) and LV diastolic filling pattern (b=0.41, p<0.001) in ESRD patients.

Conclusions: Severe vascular alterations such as increased LVM, advanced LV diastolic dysfunction and generalized aortic stiffening were observed in ESRD patients compared to the healthy index. Proximal aortic stiffening is independently correlated to LVM and the LV diastolic filling pattern in ESRD patients. Multifactorial destiffening strategies targeting both the heart and the vessels could be an additional future therapeutic target in treating ESRD subjects.