50% males, BP 158 ± 20/95 ± 15 mmHg), in 20 untreated essential hypertensives (EHT, 49 ± 4 years, 60% males, BP 155 ± 16/95 ± 10 mmHg) and in 20 normotensives (NT, 42 ± 4 years, 40% males, BP 120 ± 11/79 ± 7 mmHg). Ultrasonic myocardial backscatter signal (IBS) was analysed with an “acoustic densitometry” method and IBS end-diastolic amplitude and absolute systo-diastolic variation of backscatter (CV) at interventricular septum (IVS) and posterior wall (PW) were considered.

LV mass index was higher in patients with PA and RVH as compared to NT and EHT (ANOVA p < 0.001). End-diastolic IBS amplitude (dB) at IVS and PW did not differ among the four groups; IVS CV was significantly lower in patients with PA and RVH as compared with NT and EHT (ANOVA p < 0.001).

In patients with secondary hypertension due to activation of the RAAS or to increased levels of aldosterone, indexes of ultrasound tissue characterization, possibly related to collagen content, are observed.

Key Words: Tissue characterization, renin-angiotensin-aldosterone system, LV hypertrophy

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LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN SIGNIFICANTLY CORRELATED WITH UNFAVORABLE ALTERATIONS IN LARGE ARTERY ELASTICITY IN UNCOMPPLICATED ESSENTIAL HYPERTENSION

Department of Cardiology, University of Athens, Hippokration Hospital, Athens, Greece.

Previous studies have reported that both left ventricular (LV) diastolic dysfunction and increased large arterial stiffness are predictors of unfavorable outcome in hypertensive subjects. For this purpose, we studied by echocardiography 122 untreated, newly diagnosed patients with stage I to II essential hypertension (aged =55 years and office blood pressure =155/97 mmHg). LV diastolic function was evaluated by the ratio between early and late flow velocity peaks (E/A). The physical properties of large arteries were evaluated by calculating aortic distensibility (AoD) and the augmentation index (AIx). AoD was calculated as a function of changes in aortic diameter (determined by echocardiography) and pulse pressure (determined sphygmomanometrically at the brachial artery) by the use of the formula: Distensibility = 2x(pulse systolic changes in diameter)/((diastolic diameter) x (pulse pressure)). Moreover AIx was estimated by carotid applanation tonometry. In the entire study population LV mass index was 93gr/m², relative wall thickness was 0.48, AIx was 0.11, AoD was 1.16dynes(-1) cm¹⁰(–6) , and the ratio E/A was 0.94. The E/A ratio was negatively correlated with age (r=-0.63, p<0.005), office systolic blood pressure (r=-0.27, p<0.05), office pulse pressure (r=-0.24, p<0.005), LV mass index (r=-0.45, p<0.001), relative wall thickness (r=-0.34, p<0.005) and AIx (r=0.7, p<0.05) and positively correlated with AoD (r=0.43, p<0.001). The results suggest that the impairment of large artery distensibility is associated with concomitant LV diastolic dysfunction, in essential hypertensive subjects. Furthermore the coexistent unfavorable LV systolic function may contribute to the worse cardiovascular outcome of the abovementioned patients.

Key Words: Left ventricular diastolic dysfunction

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SENSIBILITY AND SPECIFICITY OF TILT TABLE TEST POTENTIATED WITH NITROGLYCERIN IN HYERTENSIVES ARE LOWER THAN IN NORMOTENSIVES

Andrea Ugner, Tommaso Cellai, Malin Novella, Mussi Chiara, Del Rosso Attilio. Unit of Gerontology and Geriatric Medicine, University of Florence. A.O. Careggi, Florence, Italy; Dept. of Gerontology and Geriatric Medicine, University of Modena, Modena, Italy; Unit of Cardiology, Hospital of Fucecchio, Fucecchio, Florence, Italy.

The sensibility and specificity of Tilt Table Test are never evaluated in patients with essential hypertension.

Aim of the study was to evaluate the sensibility and specificity of tilt table test potentiated with nitroglycerin in hypertensive patients and evaluate their age-related differences.

509 patients were enrolled, 389 with syncope (73 hypertensives and 316 normotensives) and 120 controls (58 hypertensives and 62 normotensives). All patients underwent head up tilt testing with sublingual nitroglycerin stimulation (10 minutes in the supine position, 20 minutes in the upright position at 60° and, if syncope did not occurred, patients received 400 mg of sublingual spray nitroglycerin and continued to be tilted for a further 20 minutes). All patients had a syncope of unknown origin after a first level evaluation consisting of a history, physical examination, standard electrocardiogram and carotid sinus massage. The response was classified as positive, negative and exaggerated during the pharmacological phase. The exaggerated response was defined as a gradual development of symptoms with a progressive, slow (>5 minutes) and isolated hypertension without or with a slight concomitant reduction in heart rate (<30%). Tilt table test was executed with pharmacological therapy (In hypertensive patients the vasoactive therapy previously assumed was continued in the day of the test).

In the hypertensive control group the positive responses were higher than in normotensives (17% vs 7%, p<0.001). The exaggerated responses, considered as negative ones, were significantly higher in the hypertensives (29% vs 17%, p <0.001), so the specificity was 83% in hypertensives and 97% in normotensives.

The sensibility was much lower in hypertensives (55% vs 72%, p<0.03) and also in patients with syncope the exaggerated responses were higher in hypertensive patients.

There was no significantly difference among younger and older.

This study demonstrated for the first time that the shortened head up tilt testing potentiated with sublingual nitroglycerin in hypertensive patients has a lower positivity rate and a lower specificity than in the normotenive patients without age-related differences.

Key Words: syncope, tilt test

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LEFT ATRIAL ENLARGEMENT AND LEFT VENTRICULAR REMODELING IN PATIENTS WITH SECONDARY ARTERIAL HYPERTENSION


Left atrial (LA) dilatation is the early sign of the development of hypertensive heart disease in patients with arterial hypertension (AH). The aim of the study was to determine the relation between LA dimension and the different types of left ventricular (LV) remodeling.

This study population consisted of 63 untreated patients (BP>140 mm Hg.) with secondary arterial hypertension (SAH) of renal genesis (chronic pyelonephritis)- 38 males and 25 females, 42-64 years. All patients were examined by 2-D guided M-mode Echocardiography. LV mass index (LVMI), relative wall thickness (RWT), LA and aortic dimensions were determined. LVMI and RWT were calculated to determine LV
geometry patterns. LA size was evaluated by calculating LA dimension, LA index (LA dimension/ body surface area) and LA/aortic diastolic diameter (ADD) ratio.

In the patients with SAH LVMI was 137.4 ± 3.9 g/m², RWT was 0.45 ± 0.01, ADD was 2.91 ± 0.09 cm, LA dimension was 3.39 ± 1.0 cm and LA index was 1.82 ± 0.07 cm²/m² and LA/ADD ratio was 1.16 ± 0.06. Normal geometry had 24(38.1%) patients with SAH, 18(28.6%) had LV concentric remodeling, 11 (17.4%) patients with SAH had LV concentric hypertrophy and 10 (15.9%) patients with SAH had LV eccentric hypertrophy. LA dimension was significantly greater in secondary hypertensive patients with LV concentric and eccentric hypertrophy compared to those with LV normal geometry and concentric remodeling (3.68 ± 5.2 and 3.62 ± 5.1 vs 3.27 ± 3.4 vs ± 3.29 ± 3.5 cm, P <0.01, respectively). LA/ADD ratio was significantly greater in secondary hypertensive patients with LV concentric and eccentric hypertrophy (1.25 ±0.08 vs 1.26 ± 0.08 vs 1.05 ± 0.03 vs 1.13 ± 0.05, p <0.01, respectively).

**Conclusion:** The relation between LA dilatation and the type of LV remodeling was determined. In SAH LA enlargement was associated with LV concentric and eccentric hypertrophy.

Key Words: left ventricular remodeling, left atrial enlargement, hypertensive heart disease

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**VENTRICULAR DIASTOLIC FUNCTION DOPPLER PARAMETERS AS MARKERS OF CORONARY ARTERY DISEASE IN HYPERTENSIVE PATIENTS**

Ioannis Vlassea, Gregory Vyssoa, Ioannis Pylarinoa, Athanasion Kartula, Elias Gialafos, Akaterini Avgeloua, Pavlos Toutza, Ioannis Kalikza, State Cardiology Clinic, Hippokration Hospital, Athens, Greece; University Cardiology Clinic, Hippokration Hospital, Athens, Greece.

**Background:** Left ventricular (LV) diastolic dysfunction is an early finding in patients with arterial hypertension, while coronary artery disease (CAD) deteriorates left ventricular relaxation. The combination of these two common diseases may aggravate left ventricular diastolic function even more.

**Methods:** We examined 88 consecutive patients with uncomplicated essential hypertension (59 males and 29 females, mean age 61.9±9.8 years) who underwent diagnostic coronary angiography. All patients presented with typical anginal pain. Patients with diabetes mellitus or history of myocardial infarction or CAD invasive procedures were excluded from the study. All patients underwent a complete echocardiographic study (2D, Doppler echocardiography, color M-Mode and Doppler tissue imaging) within 24 hours of cardiac catheterization blindly. Significant obstructive CAD (stenosis >70% of lumen diameter) was demonstrated in 49 patients. All patients were either on ACE-I, β-blockers or calcium antagonists for hypertension treatment. There were no significant differences between the two groups concerning treatment.

**Results:** On echocardiography Doppler examination, significant differences appeared between the two groups in the below parameters. The deceleration time (DT) of E wave was found 260.0±51.7 vs 226.9±54.5 ms, p=0.07. The isovolumic relaxation time (IVRT): 129.2±17.5 vs 114.3±13.3 ms (p=0.00004). The flow velocity propagation (Vp): 46.0±17.3 vs 59.6±21.0 cm/s (p=0.003). If the value of 120 ms of IVRT is taken as cut off limit this index has 60% sensitivity and 69.7% specificity. In addition using the value of 240 ms for DT cut off limit, a sensitivity of 60.08% and specificity of 62.6% are produced. Using the 53 cm/s cut off value for Vp sensitivity for CAD detection is increased to 75.5% with a specificity of 61.5%.

**Conclusions:** Prolonged LV diastolic times as DT>240 ms and IVRT>120 ms are indicative of CAD coexistence in hypertensive patients. Decreased Vp<53 cm/s is another CAD marker in arterial hypertension.

Key Words: coronary artery disease, ventricular diastolic function