

Summaries of Articles

Effect of the Valsalva Maneuver on Diastolic Indices in Patients with Essential Hypertension

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Diastolic dysfunction is one of the earliest signs of hypertensive heart disease. However, in some of the hypertensive patients echocardiographic examination cannot reveal any pathologic findings. The aim of our study was to investigate the effect of the Valsalva maneuver on diastolic indices in hypertensive patients with normal mitral flow pattern and to compare the results with a healthy control group and with hypertensive patients with diastolic dysfunction.

Sixty-eight hypertensive patients without evidence of coronary artery disease (28 female, 40 male, age 50 ± 7) were divided in two groups according to their E/A ratio as those with diastolic dysfunction (n=36) and no diastolic dysfunction (n=32) (DD-). DD-patients and the control group (n=20) performed Valsalva maneuver and their pulsed-Doppler measurements were repeated at the straining phase. In 72% of DD- patients E velocity decreased during Valsalva maneuver, but E/A ratio fell below 1.0 because A velocity did not change or increased in some of the patients. However, in the control group E and A velocity showed a similar decrease and no difference could be observed in E/A ratio. In 47% of the patients with a positive response to Valsalva maneuver myocardial perfusion scintigraphy revealed reversible defects whereas none of the patients whose E/A ratio remained over 1.0 had perfusion defects.

It is concluded that, a substantial proportion of hypertensive individuals have left ventricular diastolic abnormalities; in patients with normal E/A ratio the Valsalva maneuver should be performed in order to unmask a probable falsely normal finding and diastolic dysfunction develops together with a decrease in coronary reserve.

Key words: Hypertension, pulsed-Doppler echocardiography, Valsalva maneuver

Frequency of Left Atrial Thrombus in Nonanticoagulated Chronic Nonvalvular Atrial Fibrillation with and without Left Ventricular Systolic Dysfunction

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This study was designed to determine the transesophageal echocardiography (TEE)-detected incidence of left atrial (LA) thrombus and spontaneous echo contrast (SEC) in 100 patients with and without left ventricular systolic dysfunction with chronic nonvalvular atrial fibrillation (AF) not receiving anticoagulation. In addition, we investigated left atrial appendage (LAA) function. Group I consisted of 53 patients with normal left ventricular systolic function (left ventricular ejection fraction= $62\pm 6\%$), group II of 47 patients with left ventricular systolic dysfunction (left ventricular ejection fraction= $40\pm 5\%$). LA thrombus was present in 6 of 53 (11%) patients in group I and in 17 of 47 (36%) patients in group II. There was significant difference in the occurrence of LA thrombus between the groups ($p<0.01$). LA SEC were observed in 20 (38%) patients in group I and in 27 (57%) patients in group II. There was significant difference in the occurrence of LA SEC between the groups I and II ($p<0.05$). The LAA emptying velocities were significantly reduced in groups II compared with group I (20 ± 4 cm/sec versus 23 ± 6 cm/sec; $p<0.01$). The maximal LAA areas were significantly larger in group II than in group I (8.9 ± 2 cm² versus 7 ± 2.5 cm², $p<0.01$). We concluded that patients with chronic nonvalvular AF with left ventricular systolic dysfunction had a higher incidence of LA thrombus and a worse LAA function than patients with chronic nonvalvular AF with normal left ventricular systolic function. Therefore, anticoagulant treatment should be given especially to patients with left ventricular systolic dysfunction in AF.

Key words: Nonvalvular atrial fibrillation, left atrial thrombus, left atrial appendage function, left ventricular systolic function

Glucose-Insulin-Potassium Therapy and its Effects on Signal-averaged Electrocardiography in Acute Myocardial Infarction

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Low amplitude signals (LP) at the end of the QRS in patients with acute myocardial infarction (AMI) are related to fragmentation of the electrical impulse in ventricular myocardium and detected on signal-averaged electrocardiography. In this study, we investigated the use of glucose-insulin-potassium (GIK) solution and its effects on the SAECG in AMI. Methods: Seventy-two consecutive patients diagnosed with first Q-wave AMI were prospectively studied. Thrombolytic therapy was given to all patients unless contraindicated. The patients were randomly given glucose-insulin-potassium (GIK, n=34) solutions which consisted of 300 g of glucose, 50 units of insulin and 80 mEq of KCl in 1000 cc water placebo (saline, n.38). Ambulatory electrocardiographic examinations were performed in all patients between 24-48th hours. Sub-maximal exercise testing (if not contraindicated), signal-averaged electrocardiogram (SAECG) and echocardiographic records were obtained before discharge (6-9, mean 7 days). In postdischarge early period (in 30-40 days after index infarction) SAECG and echocardiography recordings were repeated. Results: There were no differences found between both groups in view of ages, number of risk factors, localization of infarction. In pre-discharge evaluations total filtered QRS duration (FQRS₁: 103±7 msec vs 108±11 msec p<0.05), low-amplitude terminal signal duration (HFLA₁: 25±8 msec vs 32±11 msec, p<0.01) and frequency of VLP₁ (%20 vs %45 p<0.05) were found to be lower while root mean square voltage of the terminal 40 msec of the QRS (RMS-40₁: 45±18µV vs 36±20µV p<0.05), left ventricle ejection fraction (EF: 54±9 vs 48±8, p<0.05) to be higher in GIK when compared with the placebo group.

In post discharge evaluations, FQRS₂ (105±8 vs 110±10, p=0.05), HFLA₂ (26±7 vs 34±10, p<0.01) and frequency of VLP₂, (%25 vs %38, p>0.05) were found to be lower while RMS-40₂ (47±21 vs 33±19 p<0.05) and EF₂ (59±10 vs 52±11, p<0.05) were higher in the GIK compared with the placebo group.

The incidence of post-MI angina pectoris was significantly lower in the GIK-administered group (p<0.005) than in the placebo groups. The incidence of premature ventricular contraction was insignificantly lower in the GIK-administrated group (p>0.05).

We concluded that using GIK solutions at the early stages of AMI may be beneficial on the SAECG, angina incidence, and left ventricular systolic performance in the pre-and postdischarge early period of AMI.

Echocardiographic Evaluation of Cardiac Functions and Left Ventricular Mass in Children with Protein Energy Malnutrition

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We studied 30 children (15 males, 15 females), aged 2 months-2 years (mean 8.5 ± 5.5 months) with protein energy malnutrition (4 kwashiorkor, 7 marasmus-kwashiorkor, 19 marasmus, of which 21 were classified as third-degree malnutrition), and compared their left ventricular mass and systolic and diastolic functions to those of 17 healthy, age-matched children (mean 7.0 ± 5.1 months).

The mean left ventricular mass in the patients was lower than that in the controls (14.5 ± 0.9 vs 19.8 ± 1.1, p<0.05). However, left ventricular mass / body surface area was not different in patients with PEM and in the control group (52±1.6 vs 53.9±1.9, p>0.05), indicating that left ventricular mass was reduced in proportion to decrease in body size in malnutrition. Left ventricular septal and posterior wall thickness in PEM was also lower than that in controls, and the most significant reduction in left ventricular mass, septal and posterior wall thickness was found in the kwashiorkor group.

Cardiac output was reduced in proportion to decrease in body size in the patient group (1.6 ± 0.09 vs 2.1 ± 0.18, p<0.05), so that cardiac index was not significantly different in patients and in the controls (5.9 ± 0.2 vs 5.7 ± 0.3, p>0.05). The systolic function indices like ejection fraction, fractional shortening, left ventricular end-diastolic and end-systolic volumes were not different in patients and the control group. However, ejection fraction was

decreased in patients with third-degree malnutrition compared to controls (0.63 ± 0.02 vs 0.69 ± 0.01 , $p < 0.05$). Diastolic function indices like peak E velocity of mitral inflow, peak A velocity, E/A ratio, EVTI/AVTI ratio, isovolumic relaxation time, the deceleration time of peak E velocity were not significantly different in patients from the controls, except decreased acceleration time of mitral inflow to peak E in the patient group (47.2 ± 1.4 vs 54.4 ± 1.4 msec, $p < 0.05$).

In conclusion, we demonstrated that left ventricular mass and cardiac output are reduced in proportion to decrease in the body size in patients with PEM, and left ventricular systolic and diastolic functions are preserved in the atrophic hearts, except in third-degree malnutrition.

Key words: Protein energy malnutrition, cardiac functions, left ventricular mass

QT Dispersion in Isolated Myocardial Bridges of Left Anterior Descending Coronary Artery

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The aim of this study was to investigate the relation between the QT dispersion and localization and degree of systolic diameter narrowing in the left anterior descending artery caused by myocardial bridge (MB). Forty-nine patients with MB in the left anterior descending artery were enrolled in this study in whom coronary angiography had been performed with suspect of coronary artery disease in the period between 1994-1998 at Turkey's Yüksek İhtisas Hospital. Patients were classified according to the degree of systolic diameter narrowing caused by the segment with MB (Group 1: control group, Group 2: patient with MB <50%, Group 3: patients with MB 50-69%, Group 4: patients with MB $\geq 70\%$) and also according to the localization of MB, whether before or after the second diagonal branch (D2) (Group A: MB before D2, Group B: MB after D2, Group C: control group). The QT parameters were measured from the resting 12-lead electrocardiograms and the values were compared with each other.

QT dispersion (QTd) and corrected QT dispersion

(QTcd) of the group in which the systolic narrowing was equal to and/or greater than 70% (Group 4) were significantly higher than QTd and QTcd values of other three groups ($p < 0.01$). In regard to the lesion localization, there was no significant difference in the QTd and QTcd values in patients with MB before D2 (Group A) and after D2 (Group B) ($p > 0.05$), but a difference was found between Group A and the Control group (Group C) in QTd and QTcd values ($p < 0.05$). Moreover, a positive correlation existed between the degree of systolic narrowing and QTd and QTcd values (QTd $r = 0.37$ $p < 0.01$, QTcd $r = 0.36$ $p < 0.01$).

In conclusion, QT dispersion is increased in patients with proximally located MB causing 70% and more systolic narrowing, and a positive correlation exists between QT dispersion and degree of systolic narrowing.

Key words: Myocardial bridge, QT dispersion

New Mathematical Models to Estimate Aortic Valve Area by Echocardiography

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Aim: Different parameters were proposed for non-invasive estimation of aortic stenosis by means of echocardiography. The purpose of this prospective study was, using the Doppler velocity index (DVI), the fractional shortening velocity ratio (FSVR), and the left ventricular ejection time difference (LVETD), to predict the aortic valve area (AVA) values obtained during cardiac catheterization (CC) using the Gorlin formula.

Methods and results: Patients in whom these parameters could not be calculated, or aortic valve could not be passed through during CC were excluded from this study. Forty-three patients (8 women; mean age 63 ± 13 years), hospitalized for aortic stenosis suspicion, were included. All the parameters were calculated in all the patients by the same physician without knowledge of cardiac catheterization results. Linear (simple or multiple linear) regression analyses were done for each these parameters:

AVA = $1.81[\text{DVI}] + 0.06$ ($p_{\text{DVI}} < 0.00001$);
AVA = $0.45[\text{FSVR}] + 0.19$ ($p_{\text{FSVR}} < 0.00001$);

0.81[LVETD] + 0.46 (pLVETD = 0.02); 0.84[DVI] + 0.30[FSVR] + 0.098 (pDVI = 0.08; pFSVR = 0.009); 1.67[DVI] - 0.33[LVETD] + 0.10 (pDVI = 0.001; pLVETD = 0.28); 0.42[FSVR] - 0.47[LVETD] + 0.23 (pFSVR < 0.00001; pLVETD = 0.08); 0.65[DVI] + 0.31[FSVR] - 0.37[LVETD] + 0.15 (pDVI = 0.19; pFSVR = 0.007; pLVETD = 0.19).

Conclusion: This prospective study concludes that the Doppler velocity index (DVI) and/or the fractional shortening velocity ratio (FSVR) alone, or combined to left ventricular ejection time (LVETD) are strongly correlated with the aortic valve area calculated during cardiac catheterization using the Gorlin formula.

Key words: Aortic stenosis, Doppler velocity index, fractional shortening velocity ratio, left ventricular ejection time difference, echocardiography

Reviews

Treatment of Neurocardiogenic Syncope with Permanent Pacemaker Implantation

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Neurocardiogenic syncope episodes are characteristically associated with sudden fall in arterial blood pressure and decrease in heart rate. The presence of bradycardia suggests that pacemaker implantation may prevent the syncopal episodes. Single-chamber VVI pacemaker does not prevent syncope and may increase the severity of the neurocardiogenic syncope because of the disruption of AV synchrony. Studies with dual-chamber pacemakers showed different results and studies with rate drop response pacemakers did not reveal that treatment of neurocardiogenic syncope with this pacemaker algorithm effectively prevent the episodes. The most important predictor of the failure of vasovagal syncope therapy with pacemaker implantation is the decrease in blood pressure prior to decrease in heart rate. In addition, the type of the syncope attacks that occurred spontaneously or were induced with head-upright tilt table test may not be in the same pathophysiologic pattern (cardioinhibitor, vasodepressor, mixed). Although pacemaker implantation for neurocardiogenic

syncope does not prevent the presyncope attacks, it has been shown that these patients have better response to drugs and better quality of life. The beneficial effect of permanent pacemaker in neurocardiogenic syncope primarily occurs by providing persistence of consciousness, and by providing a valuable time to the patient during the initiation of attacks.

Key words: Dual-chamber permanent pacemaker, neurocardiogenic syncope

High-Density Lipoprotein Family

G. Hergenç

HDL family consists of a group of heterogenous class of lipoproteins most of which contain apo AI and exhibit alpha electrophoretic mobility. Epidemiological studies show that coronary heart disease is inversely proportional to the concentration of high density lipoprotein cholesterol. HDL-cholesterol is found to be a significant predictor of overall survival following coronary artery bypass graft and event free survival. Protective role of HDL is generally explained by its reverse cholesterol transport ability. However, extensive researches have started to reveal other functions of HDL particles, new subclasses of HDL and mechanisms of action.

Key words: HDL-cholesterol, Apo A, reverse cholesterol transport

Case Report

A Rare Syndrome with Congenital Cardiac Defect: Chondroectodermal Dysplasia (Ellis-van Creveld Syndrome)

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Case histories of two children were presented with the diagnosis of a rarely seen congenital disease: chondroectodermal dysplasia (Ellis-van Creveld syndrome). Both cases had short stature, skeletal abnormalities, polydactyly, dysplastic nails and aberrant oral frenulum besides a cardiac defect.

Key words: chondroectodermal dysplasia, Ellis-van Creveld syndrome