

Summaries of Articles

Relationship Between Rest Parameters of the Mitral Valve and Exercise Capacity

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Interventional therapy to the mitral valve aim to provide the patient with a better exercise capacity. It is therefore crucial to detect the exercise capacity before deciding on the time of intervention. In this study, we aimed to demonstrate whether resting parameters (especially valve resistance) of the mitral valve relate to the restricted exercise capacity.

Patients with moderate/severe mitral insufficiency, moderate/severe aortic stenosis or insufficiency, lung disease, left ventricular systolic or probable diastolic dysfunction, chronic illness, and those who were unable to exercise were excluded. Thus 46 (30 females) patients with mitral stenosis were enrolled. The exercise capacities of all patients were determined according to New York Heart Association (NYHA)'s classification and MET values obtained by exercise test. All patients underwent a symptom-limited treadmill exercise test according to standard Bruce protocol. The MET value obtained was calculated as "ob-METs = 1.11+ 0.016 (exercise time)". Furthermore, the exercise capacities in male patients were quantitatively calculated. For the calculation of the exercise capacity, the following formulae were used: "Predicted MET (pre-METs) = 16.6 - 0.16 (age)" and "exercise capacity (%) = (ob-METs/pre-METs)x100". The relations between parameters of the mitral valve or other patient's variables and the exercise capacity were evaluated with the simple linear regression analysis. The only predictor of the exercise capacity determined by discriminate multivariate analysis using the significant parameters in the linear regression analysis was diastolic filling period (DFP). There was a correlation between the quantitative exercise capacity of male patients and DFP ($r=0.64, p<0.001$).

In conclusion, the exercise capacity and timing for intervention are predicted by the rest parameters of mitral valve in patients with mitral stenosis. In this

respect, the left ventricular diastolic filling period may help.

Key words: Diastolic filling period, exercise capacity, mitral stenosis, rest parameters.

Relation of QT Dispersion with Left Ventricular Anatomy in Hemodialysis Patients

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Ischemic heart disease, ventricular arrhythmia and congestive heart failure are major causes of mortality in hemodialysis patients (HDp). The difference between QT intervals measured from surface ECG (QT dispersion) has been found to be associated with fatal arrhythmias in various cardiac diseases. In this case-control study, 35 HDp and 31 healthy controls were investigated for corrected-maximum (QTcmax) and minimum (QTcmin) QT durations, their difference; QT dispersion (QTcd) and their correlation with left ventricular dimensions. Mean time spent on dialysis was 32 (14 months. Corrected QT max (448 ± 40 vs 394 ± 22 msec, $p<0.0001$), QTc min (389 ± 36 vs 359 ± 25 msec, $p<0.0001$) and QTcd (59 ± 14 vs 34 ± 7 msec, $p<0.0001$) were significantly prolonged in HDp compared with controls. In HDp, QTcmax was correlated with interventricular septum thickness ($r=0.46, p=0.007$), LV posterior wall thickness ($r=0.45, p=0.009$) and LV mass index ($r=0.48, p=0.004$). QTcd was correlated with LV posterior wall thickness ($r=0.37, p=0.03$), interventricular septum thickness ($r=0.47, p=0.005$), and wall/cavity ratio ($r=0.43, p=0.01$), but not with LV mass index ($r=0.26, p=0.13$).

In conclusion, QTcmax, QTcmin and QTcd was found to be increased in HDp compared to controls. Increase in QTcd which is a marker of inhomogeneity in repolarisation, was related with wall thickness directly, and was more associated with the degree of uremic cardiomyopathy.

Key words: QT dispersion, uremic cardiomyopathy, left ventricular hypertrophy

Changes in Heart Rate Variability Measures During Exercise in Patients with Essential Hypertension

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The aim of this study was to assess the changes of heart rate variability parameters during exercise in patients with essential hypertension. Seventeen hypertensive patients treated with ACE inhibitors and 19 healthy subjects were evaluated by time domain and frequency domain parameters of heart rate variability. All subjects were studied with exercise treadmill test according to the Bruce protocol. The exercise tests were negative in all subjects. Time domain and frequency domain parameters of heart rate variability were measured for each the 5-minute segment before and after exercise and during the exercise period. There were no significant differences between the two groups with regard to age, gender, heart rate at rest and maximum, exercise time and METS value. Heart rate variability analysis showed that sympathetic activity was higher in hypertensive patients than in normal subjects at rest period. But, autonomic activity was not different between the two groups during exercise.

Key words: Hypertension, heart rate variability, exercise

Predicting Recurrence of Atrial Fibrillation in Patients Converted to Sinus Rhythm by Electrical Cardioversion Using Surface ECG: Analysis of Dispersion of P Wave Duration in Standard and Right Precordial ECG Leads

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We investigated the role of P-wave dispersion in predicting recurrence of atrial fibrillation (AF) in patients converted to sinus rhythm by electrical cardioversion. Twenty patients with AF, mean age of 49 ± 1 (SE) years (12 females), who were converted to sinus rhythm by cardioversion, but during their six months follow-up period recurrence of AF was observed were taken into group A. Twenty patients (13 females) with AF, with the mean age of 51 ± 2 (SE) years, who were converted to sinus rhythm by cardioversion and during their six

months follow-up period sinus rhythm was maintained were taken into group B.

P-wave durations were measured in each ECG recorded after cardioversion with the rate of 50 mm/sec for all patients. Maximum P-wave durations (P_{maks}) and minimum P-wave durations (P_{min}) were detected for every ECG recording. The P-wave dispersion in standard 12 lead ECG, Pd, was described as $Pd = P_{maks} - P_{min}$, the P-wave dispersion in additional right precordial leads ($V_{3R} - V_{6R}$) (rPd) was described as $rPd = rP_{maks} - rP_{min}$ for each patients. The maximum P-wave duration in all detected leads was described as $P_{makstotal}$, and the minimum P-wave duration in all detected leads was described as $P_{mintotal}$ for every patient. The difference between $P_{makstotal}$ and $P_{mintotal}$ was defined as largest P-wave dispersion (Δp).

$P_{makstotal}$ and rP_{max} values were higher in group A than group B ($125,3 \pm 0,7$ (SE) msec versus $121,8 \pm 0,6$ msec, and $123,8 \pm 0,7$ msec versus $121,0 \pm 0,6$ msec $p < 0,01$, $p < 0,01$, respectively). P_{min} values were higher in group B ($109,1 \pm 1,0$ msec versus $111,6 \pm 0,5$ msec, respectively, $p < 0,05$). Pd and r-Pd values were higher in group A ($14,0 \pm 1,3$ msec versus $9,7 \pm 0,9$ msec, and $13,3 \pm 0,9$ msec versus $10,0 \pm 0,9$ msec $p < 0,05$, $p < 0,05$, respectively). The main difference between two group was in Δp values ($17,1 \pm 1,0$ msec in group A, $12,0 \pm 0,8$ msec in group B, $p < 0,001$).

In conclusion, P-wave analysis and P-wave dispersion can be used in predicting of recurrence of AF in patients converted to sinus rhythm by cardioversion, and adding right precordial leads ($V_{3R} - V_{6R}$) can be more helpful. In patients with large Δp values, the risk of recurrence of AF is higher.

Key words: atrial fibrillation, electrical cardioversion, dispersion of P wave duration

Relation Between Some Ambulatory Blood Pressure Parameters and Left Ventricular Mass Index in Normotensive Subjects and Untreated Hypertensive Patients

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It is known that the relation between blood pressure (BP) measured in the office and left ventricular mass index is weak. However, it is suggested that ambulatory blood pressure monitoring (ABPM) can be more valuable than BP measured in the office. In this study, we aimed to compare some ABPM parameters to left ventricular mass index (LVMI) in normotensive subjects and untreated hypertensive patients.

The study was carried on 48 normotensive subjects (35 females, 13 males; mean age: 44.3 ± 11.4 years) and 33 hypertensive patients (23 females, 10 males; mean age: 54.6 ± 13.1 years). ABPM was applied for 48 hours to each subject. Actigraph (an accelerometer) was applied to a subgroup of subjects to determine actual sleep-wake cycle. M-mode and two-dimensional echocardiography were performed in all subjects. We calculated 24 hour, day and night mean and load (proportion of elevated BP over a certain limit for a period) values for systolic and diastolic BPs, and LVMI. Correlation analysis was done to compare ABPM parameters to LVMI.

The correlation with LVMI for all systolic BP parameters was higher than for diastolic BP parameters. Night mean and load of systolic BP showed a better correlation with LVMI than the other parameters (night mean systolic BP: $r=0.59$ and $p<0.001$; night Load systolic BP: $r=0.60$ and $p<0.001$). In normotensive subjects, no statistically significant correlation between ABPM parameters and LVMI were found.

In assessment of the optimal effects of antihypertensive treatment, systolic BP parameters, night mean and night load values as detected with ABPM seems to be useful and valuable.

Key words: Ambulatory blood pressure monitoring, left ventricular mass index, load

Aortic Root Replacement with Homograft

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Aortic homografts can be used for aortic valve replacement in congenital, rheumatic, degenerative and

infective conditions, as well as failed prosthetic valves. This study was conducted to determine the mid-term results of aortic valve replacement with aortic homografts.

Aortic valve replacement with homografts was performed in 20 patients from February 1997 until February 2000. The valve was preferentially used in younger patients with a mean age 39.7 ± 1.2 years (range, 18 to 63 years). Two operative techniques were used: total aortic root replacement in 15 patients and freehand aortic valve replacement in 5 patients. We used one cryopreserved aortic allograft, and the rest were fresh allograft (17 aortic and 2 pulmonary), which were kept in a solution including an antibiotic combination with five different antibiotics. Valve function was assessed by echocardiography during the operation and in the follow-up period.

There was no early mortality and one late death (5%). Cumulative survival was $94.7 \pm 5.1\%$ at 3 years. Intraoperative echocardiography disclosed no significant aortic valve incompetence. One patient (5%) required IABP in the postoperative period because of the low cardiac output syndrome. The functional capacity was normal in all patients. On postoperative echocardiography, only one patient (5%) had aortic valve incompetence. Actuarial freedom from reoperation was $95 \pm 5\%$ at 3 years, except this patient. There were no thromboembolism and endocarditis. Actuarial freedom from valve-related complication was $95 \pm 5\%$ at 3 years.

Aortic valve replacement with homografts can be performed with low perioperative and mid-term mortality. Homograft-banks give us the opportunity to use these excellent valves for aortic valve disease. On the other hand, all aortic and pulmonary native valves of donors should be used as allograft unless they have been damaged.

Key words: Homograft, allograft, aortic valve replacement, aortic root, heart transplantation

Effect of Hyperinsulinemia on Coronary Collateral Circulation

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The effects of endogen hormones autocoids on

coronary collateral (CC) development are not wellknown. Our study sought to investigate the effects of endogen insulin (EI) and C peptid (Cp) on CC development in cases with and without NIDDM. As a study group (SG), we have taken 75 cases (23 with DM, 52 without DM), had >%90 coronary stenosis at only one coronary artery and without critical coronary stenosis (>%50) at others with retrograd CC, and as a control group (CG) we have taken 17 nondiabetic cases, had >%90 coronary stenosis at only one coronary artery and without critical coronary stenosis (>%50) at others, but no CC. EI and CP levels (after 8 hours fasting) were examined for all patients following coronary angiograms. In both groups age, sex, blood pressure, degree of coronary stenosis were similar. In SG mean CC was found less in cases with diabetes than without diabetes ($1,35\pm 0,65$ and $1,73\pm 0,74$ respectively; $p=0,018$). Although no significant difference was found between SG and CG for insulin levels ($11,8\pm 7,9$ and $12,5\pm 7,7$ UIu respectively; $p>0,05$), Cp level was higher in SG ($4,3\pm 2,8$ and $2,4\pm 1,2$ ng/ml respectively; $p=0,004$). In SG, no significant difference was found between the cases with and without diabetes for EI levels ($14,1\pm 8,6$ and $10,8\pm 7,5$ UIu respectively; $p>0,05$), while Cp level was higher in diabetic group ($5,4\pm 3,2$ and $3,8\pm 2,5$ respectively; $p=0,021$). Cases without diabetes in SG and CG when compared, no significant difference was found for EI levels ($10,8\pm 7,5$ and $12,5\pm 7,7$ UIu respectively; $p<0,05$), while Cp level was higher in cases without diabetic in SG ($3,8\pm 2,5$ and $2,4\pm 1,2$ respectively; $p=0,014$). Inside SG, no direct correlation was found between EI and Cp levels with CC ($r=0,08$ and $r=0,11$ respectively).

Conclusion: CC development seems to be more related to Cp level than EI level. The degree of CC has found higher in cases with elevated Cp level. But inverse relationship has seen with diabetics and this is thought to be related to peripheral insulin resistance.

Key words: Insulin, C-peptid, coronary collateral

Evaluation of Right Ventricular Diastolic Function in Normal Children by Doppler

Echocardiography and Comparison with Left Ventricular Diastolic Function

A.G. Eroğlu, A. Sarıoğlu

This study was performed to provide normal values of right ventricular diastolic function, compare them with left ventricular diastolic function and examine the effects of age and body surface area on diastolic function parameters in normal children with pulsed Doppler echocardiography. Pulsed Doppler echocardiograms of transtricuspid, transmitral, pulmonary arterial and vena cava superior flows were recorded in 50 normal children aged 3.3 years to 17.9 years (mean $8.5\pm 3,7$ years). E velocity, A velocity, E velocity time integral, E/A velocity, E/A velocity time integral, E/total velocity time integral were significantly lower across the tricuspid valve than across the mitral valve ($p<0.0005$, $p<0.004$, $p<0.0005$, $p<0.0005$, $p<0.0005$ and $p<0.0005$, respectively). A/total velocity time integral was significantly higher across the tricuspid valve than across the mitral valve ($p<0.0005$). There was no significant difference in transtricuspid and pulmonary arterial flow pulsed Doppler measurements between children less than 9 years old ($n=27$) and children older than 9 years old ($n=23$). Transmitral E velocity, A velocity and vena cava superior diastolic flow velocity were significantly higher in children less than 9 years old than children older than 9 years old ($p<0.003$, $p<0.005$ and $p<0.04$ respectively). The present study documents in detail the normal pulsed Doppler flow characteristics of the right ventricle and compares them with the normal left ventricular diastolic function parameters in children. These results can be used for comparison with patterns found in disease states.

Key words: Diastolic function, right ventricle, left ventricle

Systemic Arteriovenous Fistulas of the Head and Neck in Children and Endovascular Therapy

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Systemic arteriovenous fistulas of the head and neck are rare lesions. Seven children with systemic arteriovenous fistulas of the head and neck region (five spontaneous and two traumatic) were treated

by endovascular embolization techniques, resulting in complete fistula closure in all patients. Five patients had vertebral arteriovenous fistula. In two patients arteriovenous fistulas were supplied by branches of the external carotid artery. Six patients were treated by transarterial balloon embolization. In one patient, detachable coils were placed to the fistula site by transarterially and transvenously. This rare condition and its endovascular therapy in children were discussed in this article.

Key words: Systemic arteriovenous fistula, embolization, vertebral artery

Case Report

Surgical Treatment of Cardiogenic Shock Due to Huge Right Atrial Thrombus

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An unusual case of thrombus in the right atrium associated with cardiogenic shock and multiple pulmonary micro-embolism was reported. Two-dimensional echocardiography demonstrated a large irregular mass in the right atrium floating freely, prolapsing through the tricuspid valve into the right ventricle during diastole, and leading to inflow and outflow obstruction. An emergency operation was performed and the thromboembolic material was successfully extracted from the right atrium without using cardiopulmonary bypass. This exemplary case highlights the benefit of surgical intervention rather than more conservative approaches such as anticoagulation and/or thrombolysis.

Key words: Right atrial thrombus, heart surgery, two-dimensional echocardiography