

# Summaries of Articles

## *Clinical Investigations*

### **Prevalence of Coronary Mortality and Morbidity in the Turkish Adult Risk Factor Study: 10-year Follow-up Suggests Coronary "Epidemic"**

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The *Turkish Adult Risk Factor Study*, initiated in 1990 on a random sample of 3687 adults (20 years of age or over) residing in 59 communities scattered to all regions of Turkey, was followed up lastly in the summer of 2000. This paper reports 10-year cumulative data on the prevalence of coronary and all-cause mortality as well as of new coronary events based on a follow-up of 28790 person-years. Cardiovascular history and physical examination were obtained, and a 12-lead ECG was recorded at rest. New coronary events were defined to include fatal and nonfatal myocardial infarction, newly developed stable angina with or without associated myocardial ischemia. 2563 participants (of whom 1294 women) were examined or were reported to have died. Of the 290 deaths cumulated over 10 years, 42% were attributed to coronary origin.

Overall annual death rate was 12.3 per 1000 men and 8 per 1000 women in a relatively young cohort the mean age of which moved from 37 to 50 years over the follow-up period. Coronary heart disease (CHD) mortality was found 5.2 per 1000 men and 3.2 per 1000 women. This indicated the occurrence of a coronary mortality of approximately 153.000 in the year 2000. In the age bracket of 45-74 years, overall mortality per 1000 was high, namely 20.3 in men and 12.9 in women. CHD mortality in the same age bracket was 8.0 in men and 4.7 in women. Rates in men were among the five highest European countries while rates in women exceeded even those of Ukraine women.

Prevalence of CHD was estimated to be as 90 men and 71 women per 1000 adults, an observation which permitted to infer that 2.0 million Turkish adults currently suffer from CHD. Annual incidence of new coronary events which included fatal coronary events was estimated as 260.000, a very high rate for a "young" nation and suggesting that the CHD prevalence is rising at an annual rate of 5%. In order to stem the tide of the recent coronary "epidemic",

these findings necessitate far more effective implementation of cardiovascular preventive measures among Turkish adults.

Key words: Cardiovascular diseases, coronary events, mortality, Turkish adults

### **Comparison of Left Ventricular Global Ejection Fraction and Wall Motion With Tc<sup>99m</sup> Tetrofosmin Gated SPECT and Radionuclide Ventriculography**

S. Ünal

The aim of this prospective study was to compare left ventricular global ejection fraction (EF) and wall motion with Tc<sup>99m</sup> Tetrofosmin Gated SPECT (GSPECT) and radionuclide ventriculography (MUGA). Material and method: The patient population comprised 45 patients (22 female, 23 male) with an age range of 38-74 years (mean age 62.3±7.8). GSPECT stress and MUGA were performed within a week to all patients. The patients were divided in 3 groups according to myocardial perfusion findings. Fifteen patients had normal myocardial perfusion (N), 14 had ischemia (I) and 16 had myocardial infarction (MI). Comparison between MUGA and GSPECT ejection fractions were performed with Student paired t test. Correlations between MUGA and GSPECT EF were evaluated using linear regression. The agreement for evaluation of regional wall motion was assessed using kappa statistics. Results: In the first group the ejection fractions were 64.5±6.4 %, 65.9±6.4 % (p<0.17). In the second group the ejection fractions were 58.6±10.6 % 55.1±12.3 % (p<0.06), in the third group 44.5±13.1 %, 39.5±12.1 % (p<0.007) for MUGA and GSPECT respectively. Comparison of evaluation of regional wall motion between the two methods demonstrated excellent agreement (the kappa value was 0.899).

I concluded that GSPECT and MUGA provided good correlation of global EF measurements in normal persons, and patients with ischemic heart disease or previous myocardial infarction.

Key words: Left ventricular ejection fraction; wall motion; gated SPECT

### **Superiority of the Tissue Doppler Imaging Technique on Determination of the Myocardial**

## Dysfunction in Patients with NonQ-wave Myocardial Infarction at Early Term

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After Q wave myocardial infarction (MI), decreased tissue Doppler velocity gradient in the effected segments was well known. The aim of this study demonstrates the myocardial dysfunction without segmental dysfunction by using tissue Doppler echocardiography in patients with nonQ-wave MI. Methods: As the study group (SG) 25 pts with nonQ-wave MI and without segmental dysfunction (18 F, 7 M; mean age  $57 \pm 10$ ) and as a control group (CG) 20 pts without coronary heart disease (14 F, 6 M; mean age  $51(15)$ ) were included the study. Systolic velocity gradient (Sm), the time from the electrocardiographic Q wave to the peak of the Sm (Q-Sm), early and late diastolic velocity gradients of mitral lateral anulus were measured by tissue Doppler imaging. During the catheterization, the ejection fraction (EF) and  $-Dp/Dt$  were calculated. Results: EF and  $-Dp/Dt$  were similar in both groups. When SG and CG compared, Sm ( $6.7 \pm 1.9$  vs  $9.8 \pm 2.9$  cm/sec,  $p < 0.00001$ ) and Em/Am were lower ( $0.9 \pm 0.4$  vs  $1.3 \pm 0.7$ ,  $p = 0.013$ ) and Q-Sm longer ( $172.9 \pm 29.8$  vs  $141.2 \pm 30.9$  msec,  $p = 0.0003$ ) in the SG. When correlated for Sm and Q-Sm with EF, moderate correlations were seen in both groups (in the SG 0.59, -0.55 and in the CG 0.70 and -0.61, respectively). In the SG and CG, moderate correlations were seen between Em/Am and  $-Dp/Dt$  (0.66 and 0.62, respectively). Conclusions: Systolic and diastolic parameters which provided by using the tissue Doppler imaging mentioned above, have moderate correlations between them selves and invasive measurements in patients with nonQ-wave MI. Although invasive systolic and diastolic measurements were normal, changes in the systolic and diastolic myocardial velocity gradients, showed by tissue Doppler imaging, are early noninvasive determinants of myocardial dysfunction.

Key words: NonQ-wave myocardial infarction, tissue Doppler imaging, myocardial dysfunction

## Nitric Oxide Levels in Smokers and Nonsmokers

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Endothelial cells by secreting continously nitric oxide (NO), endothelial cells regulate both vascular tone and blood pressure, and suppress thrombocyte adhesion and aggregation. In addition, it is

determined that they suppress the increase and migration of vein smooth muscle cells. Smoking cigarette causes functional disruptions in endothelial cells, and leads to a reduction in NO activity. The aim of this study was to investigate the effect OF smoking cigarettes on aggregation, thrombocyte adhesion and plasma NO level.

101 volunteer cases, aged 24-47 years, not subjected to any medication during the past week and having no health problem, were included in the study. The patients were classified into 3 groups. The first group (Group I, n:40) comprised 'heavy smokers with a smoking history of >20 cigarettes per day. The second one (Group II, n:38) consisted of 'moderate smokers' with a smoking history of >10-20 cigarettes per day. 23 nonsmokers were accepted as a control group (Group III).

Venous blood from the cases was injected after 15-minuter est following a 12-hour hunger period and 24-hour period without smoking. From this blood, the level of NO, thrombocyte aggregation and thrombocyte adhesivity was measured.

Serum NO concentration in group I was  $12.05 \pm 2.83$   $\mu$ M, and was  $13.98 \pm 2.52$   $\mu$ M in group II, while it measured  $18.69 \pm 9.91$   $\mu$ M in group III. NO concentrations in both group I and group II were significantly lowered as compared to that of group III (respectively  $p < 0.001$ ,  $p < 0.01$ ). In addition, NO concentration in group I was significantly lowered than of that of group II ( $p < 0.05$ ). Although there were slight distinctions among groups in regard to thrombocyte adhesivity and aggregation, they did not differ significantly ( $p > 0.05$ ).

Consequently, we concluded that NO level is diminished in smokers, more prominently among heavy smokers; but thrombocyte aggregation and adhesivity in ex vivo circumstances, does not appear to be affected by smoking.

Key words: Cigarette smoking, nitric oxide

## Does Theophylline Have a Role as an Adjunctive Agent for Immunosuppression in Heart Transplantation Patients?

T. Sayın, M. Özenci, M. R. Mehra

Despite new medical therapies in immunosuppressive regimen for heart transplantation patients, rejection still has an important role for morbidity and mortality especially in the first three months of transplantation. Theophylline is a drug which can be used to treat post-transplant bradycardia. This drug is also known

to have some immunomodulatory effects. In the present study we investigated the clinical and laboratory indices of rejection in 27 patients treated with theophylline for post-transplant bradycardia. We examined 29 patients treated with the same immunosuppressive regimen as the control group. The study was done retrospectively. The clinical risk factors for rejection were similar for both groups. We searched for endomyocardial biopsy scores, number of cellular and humoral rejection episodes and rejection episodes with hemodynamic compromise. We observed that number of cellular and humoral rejection episodes and number of episodes with hemodynamic compromise did not change with theophylline therapy. However, average biopsy scores were influenced favorably with theophylline therapy (control group  $0.98 \pm 0.51$ , theophylline group  $0.73 \pm 0.42$ ) ( $p=0.04$ ), and time to first rejection was prolonged in patients using theophylline (control group  $24 \pm 21$  days, theophylline group  $51 \pm 26$  days) ( $p=0.05$ ).

We concluded that adding theophylline to the standard immunosuppressive regimen might favorably affect the rejection process. Prospective, randomized, larger studies to test the potential role of theophylline as an adjunct therapy to the standard immunosuppressive regimen is probably indicated.

**Key words:** Theophylline, cardiac transplantation, bradycardia

### **Effect of Left Bundle-branch Block on Systolic and Diastolic Left Ventricular Functions With and Without Heart Failure**

*K. Özdemir, B. B. Altunkeser, B. Korkut, M. Tokaç, H. Gök*

We designed this study to examine the effect of left bundle-branch block (LBBB) on systolic and diastolic functions of the left ventricle (LV) in patients with heart failure and in subjects with isolated LBBB.

**Methods:** A comparison between 36 patients with heart failure and LBBB (group I), 36 patients with heart failure without LBBB (group II) and 41 subjects with isolated LBBB (group III) was made. Coronary angiography was performed in all patients with group I and group II, and in 20 patients of group III. LV end-diastolic pressure was calculated. Echocardiography was performed in all patients. LV ejection fraction and mean rate of circumferential shortening were calculated. The following Doppler parameters were also evaluated: peak rapid filling

velocity (E wave), peak atrial filling velocity (A wave), E and A wave integrals, E wave acceleration time, deceleration time (EDT) and rates (EAR and EDR), the E/A ratio and its integral, and diastolic flow time (DT). The ejection time (ET), isovolumetric relaxation time (IRT) and preejection period were measured using the aortic and mitral flow velocities.

**Results:** LV end-diastolic pressure was calculated as  $28 \pm 4$  mmHg in group I,  $22 \pm 5$  mmHg in group II, and:  $15 \pm 3$  mmHg in group III. Although the systolic function parameters in group-III patients were different, the diastolic function parameters were found to be quite similar in both patients with group II and III. Comparison with group I and group II patients showed that there was a similarity between LV systolic function parameters while the diastolic function parameters were statistically different (E/A,  $p=0.004$ ; EAR,  $p<0.001$ ; EDR,  $p<0.001$ ; EDT,  $p<0.001$ ; IRT,  $p=0.024$ ; DT,  $p=0.03$ ).

**Conclusion:** We confirmed that LBBB causes diastolic function impairment in subjects with isolated LBBB similar to those of patients with heart failure, and it also augments the impairment of diastolic function in patients with heart failure.

**Key words:** Diastolic function, left bundle branch-block, systolic function

### **Effect of Obesity on Ventricular Repolarization in Children**

*M. Başkan, G. Koçak, D. Gürses*

Obesity is known to be a risk factor of cardiac death, associated above all with cardiac arrhythmias. Delayed cardiac repolarization leading to the prolongation of the QT interval is a well recognized precursor of arrhythmias. The QT interval dispersion (QTD) and corrected QT interval dispersion (QTcD) reflect inhomogeneity of repolarization, and are measurable indices of ventricular arrhythmia risk. The aim of this study was to assess QT, QTc, QTD, and QTcD values in obese children, and find out whether repolarization abnormalities begin in childhood.

Thirty-four obese children (6-16 years, mean  $10,7 \pm 2,5$  years) were included in the study. Obesity was defined according to the body mass index (BMI). Sixty control patients (7-15,5 years, mean  $10,6 \pm 2,4$  years) were matched in age and gender with the obese patients. A 12-lead conventional electrocardiogram was performed in all children. A

blood sample was obtained for measuring hemoglobin and of concentrations plasma electrolytes.

Hemoglobin and electrolyte levels showed no statistically significant difference between patients and controls. QT and QTc intervals were similar in both groups ( $p>0,05$ ), but QTD and QTcD values were significantly higher in obese children than in controls ( $p<0,001$ ) (patients QTD= $51\pm 18$  ms, QTcD= $72\pm 24$  ms; controls; QTD= $40\pm 10$  ms, QTcD= $48\pm 10$  ms). There was no correlation between BMI values and the QT intervals.

Our findings suggest that, increased QTD and QTcD in obese children indicate ventricular repolarization abnormalities, and that these changes start in the childhood period of obesity.

Key words: Childhood, obesity, QT interval, QT dispersion

### **Clinical Significance of Exercise-Induced T Wave Normalization in Patients With Q-Wave Myocardial Infarction: Comparison With Myocardial Perfusion Scintigraphy**

*C. Ermeýdan, B. Mutlu, O. Demirkol, N. Kurtođlu, Y. Bařaran*

In clinical practice, determination of viable myocardium in infarcted area is important for subsequent management and prognosis. The aim of the study was to evaluate the relationship between T-wave normalisation during exercise testing and detection of viable tissue in infarcted area by Thallium-201 re-injection study.

Study group included 75 patients (71 M,4 F, mean age  $55\pm 10$ ) with myocardial infarction that was diagnosed 2-7 months before exercise testing. Thallium-201 stress re-injection myocardial perfusion scintigraphy (SPECT) was performed in all patients. The study group was divided into two subgroups according to the presence or absence of transient T-wave normalisation associated with Q-wave leads corresponding to the infarcted area. During exercise testing, T-wave normalisation was observed in 45 patients in at least two contiguous leads (group 1). T-wave normalisation was not observed in the remaining 30 patients (group 2). The prevalence of viable tissue in infarcted area was higher in group 1 than group 2 (66% vs. 30%;  $p<0,001$ ). The sensitivity, specificity, and accuracy of T-wave normalisation for detection of viable tissue were 76%, 56%, and 64%, respectively.

In conclusion, T-wave normalisation during exercise testing is associated with higher prevalence of viable tissue in infarcted area compared to patients with persistent wave inversion.

Key words: T wave normalization, viable tissue, myocardial perfusion scintigraphy

### Case Reports

#### **Spontaneous Resolution of Iatrogenic Coarctation of the Aorta after Coil Occlusion of a Patent Ductus Arteriosus in an Infant**

*Ü. Aydođan, G. Batmaz, G. Ahunbay*

Coil occlusion of patent ductus arteriosus was performed in an 8.5-month-old infant who had frequent lower respiratory tract infections and growth retardation due to big left-to-right shunt through a wide arterial duct. Post-occlusion echocardiographic examination revealed iatrogenic coarctation of the aorta with typical Doppler echocardiographic findings because of the protrusion of the loops of the coil into the descending aorta. The problem was resolved spontaneously during follow-up.

Key words: Coil occlusion, complication, interventional cardiology, patent ductus arteriosus

#### **Severe Left Ventricular Inflow and Outflow Tract Obstruction due to Congenital Mitral Valve Pathology**

*T. Paker, T. Alkan, A. Akçevin C. Ersoy, D. Ařkın, Ü. Aydođan, A. Aytaç*

An 11-month-old, 6 kg. male child was operated on due to mitral valve pathology, left ventricular outflow tract obstruction and moderate degree of pulmonary hypertension. He had had an open heart surgery and pericardial patch reconstruction of supra-avalvular aortic stenosis 5 months ago. During reoperation, mitral valve was looking like a granulomatous mass and it was causing significant left ventricular inlet and outlet obstruction. After mitral resection the valve was replaced with St. Jude (no.21) aortic prosthesis. Aortic prosthesis was reversed and implanted on 4-5 mm above the mitral annulus.

He was discharged on the 10th day. One year later he became quite active and is growing up without any restriction.

Key words: Congenital mitral stenosis, mitral valve replacement, child