

## Summaries of Articles

### Clinical Investigations

#### **Effect of Weight Loss Induced by Physical Exercise on Blood Pressure in Hypertensive Patients**

*N. Güler, M. Bilge, B. Eryonucu, L. Demiralp, Ü. Güntekin*

Exercise intervention studies have shown that moderate intensity long-term aerobic exercise lowers blood pressure in patients with mild, moderate and severe hypertension. However, it is not clear whether the reduction in blood pressure is caused independently by a weight loss or an increase in physical activity, or the combination of the two. In this study, we examined the efficacy of weight loss induced by an increased physical exercise in the treatment of hypertension in hypertensive patients.

To determine this, overweight or obese 33 patients with stage I-III essential hypertension were studied throughout a 7-week of moderate intensity aerobic exercise. The exercise program included moderate exercise, 3 days a week for 45-60 minutes at an intensity of 60% to 85% of maximal heart rate (220-age). After 7-week exercise program, participants were divided into two groups: the weight-loss group (n=13) and group II (n=20) with no weight loss.

After 7 weeks, there was a significant reduction in systolic pressures both in group I (167±19 mmHg vs 146±8 mmHg,  $P<0.001$ ) and group II (173±14 mmHg vs 165±21 mmHg,  $p<0,01$ ). Significant reduction in diastolic blood pressures also were observed in group I (116±8 mmHg vs 93±11 mmHg,  $p<0.001$ ) and group II (114±12 mmHg vs 104±13 mmHg,  $p<0.01$ ). After 7 weeks, systolic and diastolic blood pressures were significantly different, for comparison of changes from baseline, between the two groups ( $P< 0.001$ ). After 7-weeks exercise, although it was not statistically significant, blood pressures were more found at normal ranges in group I (5/13 (39%)) than in group II (5/20 (25%),  $p=0.4$ ).

In conclusion, 7-10% weight loss caused by moderate exercise increased the positive effect of exercise induced decrease in blood pressure.

**Key words:** Exercise, weight loss, essential hypertension

#### **Effect of Verapamil, Trandolapril and Fixed-Dose Combination of the Two on Ambulatory Blood Pressure Values in Essential Hypertension**

*O. Gençosmanoğlu, T. Timurkaynak, B. Boyacı, R. Yalçın, A. Çengel, Ö. Dörtlemez, H. Dörtlemez*

This study was conducted to investigate the therapeutic effect of verapamil, trandolapril and a fixed-dose combination of the two on blood pressure in essential hypertension (HT). 65 patients with essential hypertension (33F, 32M) (mean age 50.3±8.1) were evaluated with 24-hour ambulatory blood pressure values. Patients were randomized to one of the 3 treatment protocols: verapamil SR 240 mg, trandolapril 2 mg, verapamil SR 180 mg + trandolapril 2 mg. Both clinical and ambulatory BP measurements were repeated on the 8th week of therapy.

With trandolapril, verapamil SR and combination treatment clinical systolic and diastolic blood pressure (S/DBP) values decreased by 17.4/10.5, 15.0/9.3, 19.0/14.3 mmHg and 24-hour mean S/DBP by 14.4/11.5, 13.3/9.5, 17.4/12.1 mmHg. All three protocols were observed to be effective in mild to moderate HT treatment. Although there was no statistically significant difference between the results of the treatment protocols, a greater decrease in clinical and 24-hour mean BP values was observed in the combination treatment group.

Hence, all three treatment protocols proved to be effective, and randomised studies with larger patient populations should be conducted to evaluate the effect of fixed-dose combination therapy in mild to moderate HT.

**Key words:** Essential hypertension, ambulatory blood pressure monitoring, calcium channel blockers, angiotensin converting enzyme inhibitors

#### **Plasma Homocysteine, Folate and Vitamin B<sub>12</sub> Levels as Risk Factors for Coronary Artery Disease in a Turkish Cohort**

*M. Aksoy, M. Öç, Ş.N. Aksoy, M. Koldaş, M.B. Mihmanlı, V. Yazıcıoğlu, M. Gürsürer, A. Emre, A. Er, İ. Öz, B. Ersek*

Elevated levels of plasma homocysteine has emerged to be a new independent risk factor for coronary artery disease (CAD), but its importance in

Turkish population is not well known. The present case-control study was designed to examine the relation between plasma homocysteine and CAD; and to establish whether the blood levels of folate and vitamin B<sub>12</sub> that modulate plasma homocysteine levels relate to CAD. We compared 168 patients with CAD with 126 age- and sex-matched controls. Conventional risk factors and levels of plasma homocysteine, folate and vitamin B<sub>12</sub> were documented. Concentrations of homocysteine levels were significantly higher in cases than in controls (geometric mean 12.6 [95% CI 12.4-12.8] vs 11.1 [10.8-11.3] µmol/L; p=0.001). Within the group of cases, there was a graded increase in the relative risk of CAD in the second, third, fourth and fifth quintiles of the homocysteine distribution (age-adjusted odds ratios 1.43, 1.87, 2.15, 2.37; p=0.05) relative to the first quintile. In addition, the odds ratio for CAD in subjects with a homocysteine concentration above the 90<sup>th</sup> percentile of the control group, as compared with those whose homocysteine levels were at or below that value, was 2.35 (95% CI 1.21-4.74, p=0.009). On multivariate analysis when all other conventional risk factors were accounted for, plasma homocysteine levels remained an independent significant predictor of CAD (p=0.02). Mean folate levels were similar in both case and control subjects (8.1±3.5 vs 8.8±4.1 ng/ml; p=0.1). However, a level of folate below the 10<sup>th</sup> percentile for control subjects conferred an odds ratio of 2.05 (95% CI 1.02-4.11, p=0.03) for CAD. Vitamin B<sub>12</sub> levels were not different in cases (341±137 pmol/L) and controls (357±163 pmol/L) (p=0.3), and vitamin B<sub>12</sub> deficiency (<10<sup>th</sup> percentile for control subjects) was not associated with an increased odds ratio for CAD (1.19; [95% CI 0.51-2.80], p=0.6). Furthermore, plasma folate and vitamin B<sub>12</sub> concentrations were inversely associated with homocysteine levels (r=-0.37, p<0.0001; r=-0.29, p=0.001, respectively). In conclusion, high plasma homocysteine levels are associated with an increased risk of CAD in Turkish population.

Key words: Homocysteine, folate, vitamin B<sub>12</sub>, coronary artery disease

### Relationship Between QT Dispersion and Coronary Angiography Findings in Coronary Artery Disease

M. Kanadaşı, Ş. Demircan, M. Demir, F. Akgül,  
E. Acartürk

The aim of this study was to evaluate the

relationship between severity of coronary artery lesions, left ventricular wall motion abnormalities and QT dispersion in patients with ischemic heart disease. Two hundred and eighteen patients (144 males, 74 females), age between 33-73 years (mean: 52.9±9.9) were included in the study. All patients had coronary angiography because of suspected coronary artery disease. Standard electrocardiogram (ECG) with simultaneous 12 lead acquisition were recorded at 50 mm/sec. QT interval was manually measured from the onset of QT till the end of T wave at each lead. The QT dispersion was defined as the difference between the maximum and minimum QT interval, occurring in any of the electrocardiographic leads. Using the Bazett's formula we corrected QT (QTc) and using this data, found out the corrected QT dispersion (QTcd). After coronary angiography, we divided the subgroups according to their coronary lesions and left ventricular wall motion abnormalities. The patients having 50% or more stenosis were taken as the group with coronary lesions. Wall motion score (WMS) was calculated and recorded for each patient considering contractility degree of wall segments on left ventriculography. QTcd was found to be significantly higher in patients with left anterior descending (LAD) artery stenosis in the group with one coronary artery lesion compared with the group with normal coronary arteries (p<0.001). QTcd was significantly higher in the groups with 2 and 3 coronary lesions compared to the normal group (p<0.001). We did not find a significant difference between circumflex (CX) and right coronary artery (RCA) lesions together or isolated CX and RCA. Patients with coronary artery disease were divided into two subgroups either having left ventricular wall motion abnormalities or not. We also compared the differences of QTd between these groups. QTcd was found to be significantly higher in the group with wall motion abnormalities.

Our study shows that QTcd is increased significantly in LAD artery lesions and/or coronary pathologies accompanying LAD artery lesions, especially in patients with left ventricular wall motion abnormalities due to ischemia or necrosis.

Key words: Coronary artery disease, coronary angiography, QT dispersion

### Electrocardiographic Abnormalities Occurring After Radiofrequency Catheter Ablation of

## Manifest Accessory Pathways in the Wolff-Parkinson-White Syndrome

İ. Erdinler, E. Ökmen, A. Akyol, E. Oğuz,  
K. Gürkan, A. Emre, T. Ulufer

Electrical abnormalities such as negative and abnormally tall-peaked T waves are seen in ECGs after radiofrequency (RF) catheter ablation of manifest accessory pathways in the Wolff-Parkinson-White syndrome. The aim of the study was to evaluate the ECG changes which occurred after manifest and concealed accessory pathway ablation in patients with WPW syndrome and ablation of slow pathway in atrioventricular (AV) nodal reentrant tachycardia. Twenty-five patients with manifest accessory pathway were included in group 1, and 12 patients with concealed accessory AV connection plus 15 patients having AV nodal modification were included in group 2. Successful RF ablation was achieved in all patients ECG samples were recorded before ablation, after 2 hours and after 5 weeks T wave changes, T wave axes, QRS-T angle, numbers of ablation lesions and peak creatin kinase (CK-MB) values were compared between the two groups. Repolarisation abnormalities were seen in 24 of 25 patients (%96) with manifest accessory pathways. There were no repolarisation abnormalities in group 2 ( $p < 0.001$ ). Abnormal T wave axis, QRS-T angle and repolarisation abnormalities returned to normal in group 1. These parameters did not change in group 2. The pre-excited QRS duration was significantly longer in patients having repolarisation abnormalities after RF ablation. Because of the numbers of ablation lesions and peak CK-MB values were not significantly different between the two groups, we considered that repolarisation abnormalities were not a result of myocardial injury. According to the "T wave memory" which had been conupt was proposed to describe the mechanism of repolarisation abnormalities, the myocardium can remember its normal repolarisation pattern after establishing. Normal depolarisation cascade in patients with WPW. We conclude that this phenomenon may also be the cause of repolarisation abnormalities that occurred in our patients with WPN syndisul

Key words: Electrocardiography, radiofrequency catheter ablation, Wolff-Parkinson-White syndrome.

## Estimation of Left Ventricular end-diastolic Pressure by color M-mode Doppler Echocardiography and Tissue Doppler Imaging

S. Dağdelen, N. Eren, H. Karabulut, İ. Akdemir,  
M. Ergelen, M. Sağlam, M. Yüce, C. Alhan,  
N. Çağlar

The aim of this study is to estimate the left ventricular end diastolic pressure (LVEDP) noninvasively by tissue Doppler imaging and color M-mode echocardiography.

Material and method: Three group of patients angiographically proven to be free of significant coronary artery lesions ( $< 40\%$  stenosis) with LVEDP  $< 10$  mmHg (Group A: n:24, 16 males, mean age  $\pm$  SD:  $55 \pm 13$  years); LVEDP = 10-15 mmHg (Group B: n:21, 17 males, mean age  $\pm$  SD:  $56 \pm 11$  years); and LVEDP  $> 15$  mmHg (Group:C: n:35, 20 males mean age  $\pm$  SD:  $58 \pm 9$  years) were studied. Using an Aloka SSD 2200 echocardiography device tissue Doppler imaging of the lateral mitral annulus and color M-mode imagings of the mitral valve in apical 4-chamber view were obtained. Early and late diastolic velocities (Em, Am), Em deceleration time (EmDT), Am time (Am-t), mitral propagation velocity time delay (VpDT) were measured in every patient.

Results: In group A sensitivity and specificity for EmDT being  $\leq 100$  msec, Am-t  $\leq 90$  msec, Em/Am  $\geq 1$ , and VpDT  $\leq 45$  msec were found to be 0.57 and 0.89, 0.66 and 0.88, 0.86 and 0.92, 0.73 and 0.89; respectively. In Group B sensitivicity and specificity for EmDT being between 100-120 msec, Am-t between 90-110 msec, Em/Am between 1-0.5 and VpDT between 45-60 msec were found to be 0.57 and 0.84, 0.69 and 0.82, 0.66 and 0.75, 0.55 and 0.83, respectively. In Group C sensitivicity and specifity for EmDT being  $> 120$  msec, Am-t  $> 110$  msec, Em/Am  $< 0.5$  and VpDT  $> 60$  msec were found to be 0.88 and 0.81, 0.71 and 0.80, 0.86 and 0.72, 0.78 and 0.86; respectively.

Conclusion: EmDT, Am-t. Em/Am and VpDT measurements obtained noninvasively by left ventricular tissue Doppler imaging and mitral flow propagation velocity were found meaningful in estimating LVEDP.

Key words: tissue Doppler imaging, color M-Mode, diastolic function

## Case Reports

Warm Heart Surgery in a Case with Cold Agglutinins

B.H. Şirin, A. Keskin, A. Baltalarlı

Cold-reactive antibodies may cause complications such as hemolysis and myocardial damage due to their activity at low temperatures during cardiac surgery. The detection of cold agglutinins in a patient before the operation may change the operative strategy. This report describes a case with coronary artery disease in which cold agglutinins with high-titer and high-thermal amplitude were detected preoperatively. The operation was conducted with normothermic cardiopulmonary bypass and warm blood cardioplegia. The management of this rare situation remains controversial but currently, warm heart surgery appears to be the most expedient method.

Key words: Cold agglutinin, cardiac surgery; cardiopulmonary bypass, hypothermia.

#### **A New Approach in the Treatment of Refractory Angina: Spinal Cord Stimulator**

Y. Çavuşoğlu, A. Ünalır, B. Timuralp, A. Aslantaş, B. Görenek, N. Ata, E. Tel

Angina pectoris is an important symptom of coronary heart disease. Antiischemic drugs, interventional cardiologic procedures and by-pass operations are usually helpful in the relief of angina. In some patients who had previously revascularisation procedures or not suitable for revascularisation procedure, it may be difficult to control angina pectoris. In these patients new treatment strategies are necessary. Spinal cord stimulation is an alternative way of controlling angina. Dorsal spinal cord could be stimulated by high frequency electrical waves with the use of spinal cord stimulator (SCS). This device inhibits the delivery of pain originating from myocardial ischemia to thalamus and brain cortex and inhibits the sympathetic activity. Thus, pain, oxygen consumption of myocardium and coronary vasomotor tonus decrease. We implanted a SCS to a patient who had chest pain despite maximal medical treatment after by-pass operation. His coronary arteries were not suitable for a new revascularisation procedure. After implantation of SCS, the frequency, duration and severity of anginal episodes decreased and his quality of life was improved. This is the first case report of SCS application in Turkey and it opens a new perspective in the management of patients with refractory angina pectoris.

Key words: Spinal cord stimulator, angina pectoris

#### **An Unusual Complication After Aortic Coarctation Repair: Spinal Cord Injury**

T. T. Elmacı, A. Dindar, Ü. Aydoğan, E. Onursal

Spinal cord ischemia after coarctation repair is a rare complication in the pediatric population. In this report, we described a 5-year-old boy with aortic coarctation who became paraplegic after repair.

Key words: Aortic coarctation, spinal ischemia, paraplegia

#### **Transvenous Antegrade Balloon Angioplasty for Coarctation of the Aorta in a Newborn**

Ü. Aydoğan, F. Meriç, T. Ertuğrul

The major complications encountered in heart catheterization via the arterial pathway are femoral artery injury and blood loss in newborn babies. The incidence of these complications would increase if angioplasty/valvuloplasty via arterial route is performed. We report a 2900-gr baby with coarctation of the aorta and ventricular septal defect in whom balloon angioplasty was performed transvenously.

Key words: Balloon angioplasty, coarctation of the aorta, newborn

#### Review

#### **General Principles of Transvenous Lead Extraction of Permanent Pacemaker and Internal Cardioverter Defibrillator Systems**

O. Erdoğan

Technological improvements and enlarging indications during the last decade resulted in increased implantation rate of pacemakers and implantable cardioverter defibrillators. Despite the proven benefits of these devices in certain medical conditions, the patients who underwent implantation of pacemakers and internal defibrillators are sometimes prone to develop complications such as infection or lead problems. In such circumstances it might be mandatory to extract the whole system from the body and replace a new system at a later date. With the advent of new techniques and tools, extraction of infected leads and pacemakers became much easier than previously thought. This article comprehensively describes general principles and indications as well as the current technique how to perform lead extraction.

Key words: pacemaker, lead extraction