Summaries of Articles

Clinical Investigations

Trends in Blood Pressure Levels in Turkish Adults: 5-year Follow-up of Original Cohort

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Two-thirds of the original cohort representing the Turkish adult population in 1990 could be traced in the summer of 1995. Excepting 118 subjects who were known to have died, a total of 2132 men and women were examined for blood pressure among other risk factors. Mean value of two readings in sitting position was taken in each survey. From the weighted differences of mean values in various age groups in the initial survey, it was predicted that aging by 5 years would result in a rise by 4.5/2.2 mmHg of systolic and diastolic pressure, respectively, in women, and by 2.8/1.4 mmHg in men. When these increments were adjusted for aging, mean systolic and diastolic blood pressures were noted to have remained stable overall in Turkish adults in both genders. Solely, in women aged 50-69 years, the two blood pressure values increased by 4/3 mmHg.

Hypertension (defined as a systolic pressure ≥ 140 and/or a diastolic pressure ≥ 90 mmHg, or being under antihypertensive medication) was prevalent in 39.3%, of women and 30.1% of men. These prevalence figures consisted of 13.6% and 9.8%, respectively, in young adults (ages 25-44) and rose to 84.6% and 68.3%, respectively, in participants aged 65 or over. It was observed that one-third of hypertensive individuals was using antihypertensive drugs, and exactly one-half of them were able to maintain their blood pressure within normal or mildly hypertensive levels. It was deduced that 5.8 million women and 4.4 million men in Turkey were hypertensive.

Significance of QTc Prolongation on Ventricular Arrhythmias in Patients with Left Ventricular Hypertrophy Secondary to Essential Hypertension

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The present study was designed to detect the arrhythmogenic effect of left ventricular hypertrophy (LVH), QTc duration, and the relationship between the QT duration and ventricular arrhythmias in patients with LVH secondary to essential hypertension (EH). We studied 68 hypertensive patients with LVH (28 men and 10 women, mean age 52±5 years) and without LVH (23 men and 7 women, mean age 51±6 years). Thirty healthy normotensive subjects (22 men and 8 women, mean age 49±6 years) were selected to serve as the control group.

We investigated the frequency of ventricular arrhythmias by means of 24-hours ambulatory electrocardiographic monitoring; and grade 3 and 4 arrhythmias according to modified Lown and Wolf classification were accepted as complex arrhythmias. The QT interval was measured from the beginning of the QRS complex to the end of the T wave in lead II. Using Bazett formula, QT interval was corrected (QTc) for heart rate.

Complex ventricular arrhythmias were observed more in hypertensive patients with LVH than in hypertensive patients without LVH and in normotensive subjects ($p<0.05$). Also, a positive correlation was found between QTc duration and left ventricle mass ($r=0.58$, $p<0.001$). Mean QTc interval was found 378±44 ms in hypertensive patients with LVH, and mean QTc interval was longer in hypertensive patients with LVH than in hypertensive patients without LVH and normotensive subjects ($p<0.001$). In conclusion, our results showed that in patients with LVH, there was a high prevalence of complex arrhythmias and QTc prolongation as compared with the other groups.

QT Dispersion in Patients with Ventricular Tachyarrhythmias Following Acute Myocardial Infarction

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Regional inhomogeneity of ventricular repolarizati-

on has been known to be the cause of serious tachyarrhythmias. QT dispersion (QTD) measured on surface electrocardiogram (ECG) has been reported to reflect disparities in ventricular recovery times.

Electrocardiographic tracings of 142 patients with acute myocardial infarction (MI) were reevaluated. While 50 patients developed ventricular tachycardia (VT) (sustained 22, nonsustained 11) or ventricular fibrillation (VF) (17 patients), 92 had none during their hospitalization. QT dispersion (QTD), QTcD, maximum adjacent (AdjQTD) and maximum adjacent corrected (AdjQTcD) values were 84.9±16.1 ms, 93.6±18.9 ms, 44.2±14.1 ms and 49.2±16.8 ms in patients with VT/VF and 51.3±19.1 ms, 55.3±19.1 ms, 31.3±10.4 ms and 33.7±10.7 ms in patients without VT/VF, respectively ($p<0.01$). QRSD value was 15.8±7.5 ms in patients with VT/VF and 15.1±4.9 ms in patients without VT/VF ($p>0.05$). In patients with VT only, the QTD, QTcd, Adj QTD and Adj QTcd values were 83.5±16.1 ms, 91.1±18.4 ms, 44.2±14.8 ms and 48.0±16.2 ms, respectively and in patients with VF alone these values were 87.5±16.2 ms, 98.4±19.6 ms, 44.4±13.2 ms and 51.5±18.1 ms, respectively. The difference between the two groups did not reach statistical significance. With respect to localization of MI; QTD, QTcd, AdjQTD and AdjQTcd values in patients with VT/VF (anterior 84.8±16.5 ms, 95.1±19.9 ms, 43.2±13.8 ms and 49.4±17.1 ms, inferior 85.1±15.9 ms, 91.0±17.4 ms, 44.5±15.2 ms and 47.9±14.9 ms, respectively) and in patients without VT, VF (anterior 51.3±19.0 ms, 55.3±19.1 ms, 31.3±10.7 ms and 33.7±10.8 ms, inferior 50.3±18.1 ms, 54.1±18.5 ms, 31.4±10.4 ms and 33.4±9.9 ms, respectively) did not have a statistically significant difference.

The results of the study imply that QT dispersion in acute MI might be an easily accessible, reasonably accurate, noninvasive method in the prediction of arrhythmogenic risk.

Comparison of Mitral Heart Valve Prostheses: ATS Versus St Jude-Medical

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ATS is a new rotatable, bileaflet pyrolytic carbon valve with a low profile. The haemodynamic performance of this new valve was assessed by Doppler-echocardiography and compared with the well-known bileaflet St Jude-Medical prosthesis, one year after implantation in mitral position. Among 20 patients who received an ATS and the remaining 9 patients a St Jude valve the following parameters were measured and calculated: maximum and mean pressure gradients, effective orifice area and performance index.

After one year of follow-up, the preliminary results of this study showed that the haemodynamic parameters by Doppler-echocardiography of this new ATS valve is excellent and similar to the St Jude medical valve in mitral position.

Relation of Myocardial Viability to the Status of Collateral Flow in Total Occlusion of Infarct-related Artery: Impact of Collateral Flow on Preservation of Left Ventricular Function

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This study attempted to determine the association between viable myocardium in the infarct area and collateral flow and also to assess the role of collateral flow on preservation of left ventricular function. We studied 20 patients with a first recent anterior myocardial infarction who had total occlusion of the proximal part of the left anterior descending coronary artery. The time interval between myocardial infarction and coronary angiography was 9±6 weeks. Angiographic collateral flow was assigned a numeric score between 0 and 3 (collateral index). Myocardial viability was determined by quantitative planar stress redistribution 201-Tl scintigraphy. 201-Tl reinjection protocol was used in 10 patients who had a >50% decrease in 201-Tl uptake on early images (severe perfusion defect) showed no redistribution on standard 3-hour images (persistent defect).

Patients were divided into two groups according to the presence (group 1, n=10) or absence (group 2,

n=10) of viable myocardium in the infarct area. Collateral index was significantly higher in group 1 than in group 2 (2.6±0.5 vs 0.9±0.7, p<0.001). Moreover, left ventricular end-systolic volume index (ESVI), end-diastolic volume index (EDVI), end-systolic shape index (SSI) and end-diastolic shape index (DSI) were significantly lower in group 1 than in group 2 (p<0.01, p<0.001, p<0.05, p<0.05, respectively), while ejection fraction and regional wall motion in the infarct area were significantly higher in group 1 compared with group 2 (p<0.05, p<0.05, respectively). These results indicate that myocardial viability is closely related to the status of collateral flow in the presence of recent myocardial infarction in total occlusion of infarct-related artery, and collateral flow affects preservation of left ventricular function.

Effect of Adding Diltiazem to Cold Blood Potassium Cardioplegia on Myocardial Protection

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It is still controversial whether the use of calcium channel blockers in cardioplegic solutions decreases ischemic and reperfusion damage. In this study, the effect of diltiazem addition to cold blood potassium cardioplegia in the induction phase on myocardial protection was investigated. A prospective, randomized trial was instituted to evaluate the hemodynamic and myocardial metabolic recovery in 20 patients undergoing elective aortocoronary bypass with either diltiazem in cold blood potassium cardioplegia (diltiazem group, n=10) or cold blood potassium cardioplegia (control group, n=10). In the diltiazem group, 150 mg/kg diltiazem was added to the cardioplegic solution in the induction phase of cardioplegia. In all cases, blood samples for measurement of lactate level and calculation of lactate extraction were taken from coronary sinus and radial artery at the beginning and the 30th minute of reperfusion period. CK-MB levels were measured in the intensive care at postoperative 6th and 18th hours. Tle hemodynamic findings of both diltiazem and control groups were compared in the preoperative and early postoperative periods. Lactate production was significantly lower in the diltiazem group at the beginning of the reperfusion period (p<0.01). Calculated lactate extractions were similar in the two groups at the 30th minute of reperfusion (p>0.05). CK-MB level was significantly higher in the control group in the postoperative period. Similar hemodynanic findings were obtained in both groups in the preoperative and the early postoperative periods. We concluded that diltiazem addition to cold blood potassium cardioplegia decreases ischemic and reperfusion damage and has a beneficial effect on myocardial protection.

Left Verticular Functions in Children with Aortic Stenosis assessed by Echocardioglaphy

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This study comprises 39 patients with valvular, 15 with subvalvular aortic stenosis and 40 healthy children for the evaluation of left ventricular systolic and diastolic functions by echocardiography. Ejection fraction (EF), fractional shortening (FS) and left ventricular mass indexes (LVMI) were estimated by means of M-mode echocardiographic parameters. EF and FS values were normal in valvular, and increased in subvalvular aortic stenosis. LVMI was significantly increased in both groups. Early filling velocity was decreased, atrial filling velocity (A velocity) was increased and E/A ratio was decreased in both aortic stenosis groups. Normalized peak filling rate was decreased and atrial filling rate was increased. Isovolumic relaxation time IVRT was prolonged in all patients. A weak positive correlation between LVMI and IVRT, and a negative correlation between IVRT and E/A, as well as between LVMI and EF were detected in patients with valvular aortic stenosis.

We concluded that diastolic properties of the left ventricle may be changed even in asymptomatic patients with mild and moderate aortic stenosis, in addition to the normal systolic functions.

Coronary Artery Anomalies in Tetralogy of Fallot

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In order to evaluate the preoperative coronary arterial anatomy in patients with tetralogy of Fallot before total correction, we used a new selective coronary angiographic method in 62 patients between April 1994 - July 1995. There were 62 patients (36 male and 26 female) aged 1 - 13 (mean 3.16 ± 2.17) years, their weight ranged from 6.7 to 32 (mean 12±4.44) kg. Coronary angiography was performed in the lateral, left anterior oblique, 30° left anterior oblique, 40° caudal (aortic orifice view), posterior-anterior and right anterior oblique positions. In the evaluation of the coronary angiograms, we found single coronary orifice in 3 (%4.8) patients (1 with single right, 2 with single left), a left anterior descending (LAD) arising from the right coronary artery and crossing the right ventricular outflow tract (RVOT) in 1 patient (1.6 %), accessory LAD (two of them crossing the RVOT) in 4 patients (6.5 %), large conal branch in 9 atients (14.5 %), coronary-branchial collateral in 13 patients (20.9 %) and right coronary artery-right atrium fistula in 1 patient. The anomalous coronary artery-RVOT relation was seen best in the "aortic orifice view" position.

We conclude that selective coronary angiography can demonstrate in detail the coronary arterial anatomy and anomalies which are frequently seen in patients with tetralogy of Fallot.

Case Reports

Sinus Node Function and Electrophysiologic Alteration Following Superior-septal İncision.

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Electrophysiologic study was performed in two cases in sinus rhythm who had mitral valve repair using superior-septal approach, in order to evaluate sinus node function and sinoatrioventricular conduction. Corrected sinus node recovery time (<200 msec), and H-V intervals (<50 msec) were found in normal limits. Long P-A intervals were recognised. Maximum chronotropic response of the sinus node was excellent (169-199/min) in both cases. These findings support the clinical impression that sinus node function is well preserved although the sinus node artery is severed due to the superior-septal incision. P-R lengthening and different P wave morphology appeared on surface ECG compared to preoperative ECG findings. Superior-septal incision causes such ECG alterations probably due to the intraatrial conduction delay rather than either impaired sinus or AV nodal function. Activation propagation originating from atrial pacemaker complex goes only through the posterior preferential pathway because the anterior and middle ones were cut off. This single path to reach the AV node changes the electrical vector so that the P wave morphology becomes different, and causes intraatrial conduction delay with consequent PR segment prolongation.

These findings, although limited with only two cases, may help understand electrophysiologic alterations following superior-septal incision. Further clinical studies involving electrophysiologic evaluation may encourage liberal use of this incision in cases with sinus rhythm.

Pacemaker Twiddler's Syndrome: Report of four cases

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Pacemaker twiddler's syndrome describes an infrequent cause of pacemaker failure as a result of spontaneous, subconscious or purposeful twisting of pulse generator in its pocket leading to the endocardial electrode rotation around the pulse generator and retraction into the superior vena cava or subclavian vein. In this report we describe four patients with pacemaker twiddler's syndrome encountered during the last ten years. All four patients mentioned frequent oval massage on the pacemaker pocket. The first patient was very obese and the second, third and fourth patients were very thin. The obese patient had abundant subcutaneous fat tissue, and in the very slim patients the subcutaneous tissue was loose. Three of four patients were elderly. These predisposing factors might be important in the development of this condition. All four patients were symptomatic. The diagnosis of twiddler's syndrome was made on symptoms, ECG and fluoroscopic or chest X-ray findings. In the first and third patients, a new lead was implanted and in the second and fourth patients the same lead was repositioned and reimplanted.

In conclusion, twiddler's syndrome must be considered in patients with pacemaker dysfunction especially in the elderly, thin or obese patients. It may be prevented by an appropriately sized pocket and fixing the electrodes at the site of the implanted device and placing and fixing the pacemaker under the pectoralis muscle fascia.

Percutaneous Balloon Valvuloplasty in Newborn with Critical Pulmonary Stenosis: Report of Two Cases

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Percutaneous balloon angioplasty was performed in two neonates with critical pulmonary stenosis with intact ventricular septum aged 5 and 7 days. Because of technical insufficiency, only coronary angioplasty balloons with maximum diameter of 4 mm were used in each patient. The gradients were only reduced by 30 and 40 mm Hg, respectively; however, clinical cyanosis of the patients ameliorated, prostaglandin infusion could be discontinued and urgent surgery was no longer needed. After 2.5 months, the angioplasty was repeated in one patient. Both patients are still in good clinical condition.