

Summaries of Articles

Clinical Investigations

Clinical Significance of Relation Between Coronary Collateral Circulation and ST-segment/T-wave Changes in Acute Myocardial Infarction

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Following acute myocardial infarction (AMI), some patients retain ST segment elevation and upright T waves, a pattern usually seen within minutes to hours of AMI, even, after 72 hours. It often identifies a transmural AMI which results from a persistent total obstruction of the infarct-related coronary artery and inadequate collateral flow. Twenty-two patients were studied to test the hypothesis that absence of adequate collateral flow was responsible for persistent ST elevation and that adequate collateral flow was associated with the more typical resolution of ST elevation. The study group consisted of 22 patients with AMI admitted to the coronary care unit between 1995 and 1997 in whom a totally obstructed infarct-related artery by coronary angiography were observed. Group A consisted of 10 patients with an ECG demonstrating ST-segment elevation and upright T waves ≥ 72 hours after AMI. Group B consisted of 12 patients with an ECG demonstrating resolution of ST-segment elevation accompanied by inversion of T waves within 72 hours of the AMI. There were no significant differences between the two groups regarding age, sex, risk factors, preinfarction angina, maximum and total reciprocal changes. Total ST segment elevation, maximum ST segment elevation were higher in group A vs group B ($p < 0.01$, $p < 0.01$, respectively). QRS scores, heart failure, low ejection fraction and wall motion disturbances score were significantly higher in group A vs group B ($p < 0.05$, $p < 0.05$, $p < 0.01$, $p < 0.05$, respectively). Collateral circulation by coronary angiography was Rentrop grade 3 in all group B patients versus none in group A ($p < 0.01$).

In conclusion, ST segment elevation and upright T waves in ECG after 72 hours of AMI may identify a transmural AMI which results from persistent total

obstruction of infarct-related artery which in turn may cause greater hemodynamic deterioration.

Key words: Acute myocardial infarction, collateral flow, electrocardiography

Usefulness of Precordial T-wave Increase During Exercise Stress Test in Detecting Coronary Artery Disease

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The usefulness of T-wave changes observed in precordial derivations (V_{1-6}) during exercise stress testing (EST), in detecting coronary artery disease (CAD) was evaluated in this study. For this purpose, 163 patients were enrolled. Precordial T-wave amplitudes were recorded before exercise, immediately after peak exercise and at late recovery period. Coronary angiographic examination was performed later on. Normal coronary arteries in 55 patients (Group-1), single-vessel disease in 73 patients (Group-2) and multi-vessel disease in 35 patients (Group-3) were found.

In evaluation of precordial T-wave amplitudes at base and in maximal heart rate during EST, significant T-wave amplitude increase was found in leads V_{3-6} in patients with normal coronary arteries (Group-1), and in leads V_{2-6} in patients with CAD (group 2-3). In all precordial leads, V_2 had the highest sensitivity and specificity (21% and 87%, respectively) in detecting coronary artery disease when 3 mm or more increase in T-wave amplitude was accepted as a positive criterion for CAD (cut-off value=3).

An increase of ≥ 3 mm in T-wave amplitude was observed mostly in proximal LAD disease among all patients (13/33, 39%) and when only T-wave criterion was evaluated, overall specificity was increased slightly (from 78% to 87%, $p > 0.05$). When T-wave amplitude increase and ST segment depression were evaluated individually, significant increase in sensitivity was detected only in the single-vessel group (from 56% to 71%, $p < 0.002$) and a slight increase in diagnostic accuracy was

observed in all patients and in single-vessel disease (from 70% to 74% and from 66% to 70%, respectively, $p>0.05$). Combining these two criteria, the overall sensitivity decreased to 10%, however specificity increased from 78% to 96% ($p<0.005$).

In conclusion, an increase of 3 mm or more in T-wave amplitude in lead V_2 during EST is evident especially in severe proximal LAD stenosis among all patients, and evaluation of this criterion on ST segment depression individually, may be useful especially in increasing sensitivity in one-vessel disease, combining these criteria with ST segment depression may be useful in diminishing false-positive results in EST.

Key words: Coronary artery disease, exercise testing, T-wave.

Anti-ischaemic and Anti-anginal Effects of Nisoldipine and Ramipril in Patients with Cardiological Syndrome X

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We investigated anti-ischaemic and anti-anginal effects of nisoldipine and ramipril in patients with the cardiological syndrome X. After a two-week wash-out period, 18 patients (7 men, 11 women; mean age: 46 ± 10 years) with cardiological syndrome X (stable angina pectoris, positive exercise test, negative ergonovine test, and normal coronary angiography) were given nisoldipine 5 mg twice daily for four weeks. And after a second two-week wash-out period, the same patients were given ramipril 2.5 mg daily for four weeks. Treadmill exercise test with modified Bruce protocol was performed at the end of each period.

The time until anginal attack occurred ($p=0.006$ vs $p=0.02$), total exercise time ($p=0.0008$ vs $p=0.02$), and mean metabolic equivalent ($p=0.0016$ vs $p=0.01$) were increased significantly after nisoldipine and ramipril therapy periods. The time until ST segment depression by 1mm occurred ($p=0.002$) was increased significantly after nisoldipine therapy. The time until ST segment depression recovery ($p=0.016$ vs $p=0.012$), the weekly number of angina pectoris ($p=0.00$ vs $p=0.028$), and the weekly number of sublingual

nitroglycerin consumption ($p=0.00$ vs $p=0.012$) were decreased significantly after nisoldipine and ramipril therapy periods.

We conclude that 10 mg/daily nisoldipine or 2.5 mg/daily has anti-ischaemic and anti-anginal effects in patients with cardiological syndrome X.

Key words: Calcium channel blocker, angiotensin converting enzyme inhibitor, cardiological syndrome X

Cardiac Death in Patients with Peripheral Vascular Disease and QT Dispersion

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In patients with peripheral artery disease, additional cardiac diseases such as coronary artery disease and hypertension are frequent findings. The existence of coronary atherosclerosis is the leading factor predicting prognosis. The aim of study was to investigate cardiac death in patients with peripheral artery disease without cardiac symptoms and its relation with QT dispersion.

The study group consisted of 35 patients (aged 61 ± 7 years, 32 males, 3 females) who underwent surgical treatment because of peripheral arteriopathy and 72 age-matched controls (aged 61 ± 1 years, 54 males, 18 females). In all subjects, risk factors were evaluated with physical examination and laboratory findings. Echocardiographic and 12-lead electrocardiographic examinations were made and QTc interval and QT dispersion were calculated. The study group was followed for two years and cardiac deaths were recorded.

Echocardiographic findings were normal in 13 patients (37%), left ventricular hypertrophy and left ventricular dilatation (isolated or accompanying an increase in left ventricular wall thickness) were detected in the remaining patients (63%). In the control group, echocardiographic findings were normal except in 2 subjects (3%). QT, QTc interval and QT dispersion were significantly prolonged in the patients group compared with the controls. Subjects with a QT dispersion longer than 50 ms (mean of the control ± 2 SD) were 18 cases in the patients group and one in the control group. During

the follow-up period, patients died due to cardiac events in the patients group, whereas nobody in the control group. In patients with peripheral artery disease, a QT dispersion of 50 ms had 86% sensitivity, 57% specificity, 33% positive predictivity and 94% negative predictivity in predicting cardiac death. In 5 of the 7 patients who died during the study period, left ventricular dilatation and a QT dispersion longer than 50 ms had been detected.

It is concluded that in patients with peripheral artery disease who are asymptomatic for cardiac diseases, echocardiographic findings and QT dispersion are useful methods to predict the risk of cardiac death.

Key words: Peripheral artery disease, echocardiography, QT dispersion

A Method for Evaluating the Success of Slow Pathway Ablation: PR>RR Finding During Rapid Atrial Pacing

U. K. Tezcan, H. Tıkız, A. D. Demir, Y. Albay, M. Soylu, Ş. Korkmaz, S. Göksel

Atrioventricular nodal reentrant tachycardia (AVNRT) occurs in patients with dual atrioventricular (AV) nodal physiology. However, dual AV nodal physiology cannot be demonstrated in a significant proportion of patients with AVNRT. During rapid atrial pacing at the maximum rate with consistent 1:1 AV conduction, PR interval often exceeds the pacing cycle length in patients with AVNRT. This finding, described as PR>RR, was proposed to be consistent with antegrade slow pathway conduction and useful method for evaluating the success of slow pathway ablation in patients with AVNRT and without demonstrable dual AV nodal physiology. The purpose of this prospective study was to determine the diagnostic value of the PR>RR finding as an indicator of antegrade slow pathway conduction and AVNRT.

The PR and RR intervals were measured during rapid atrial pacing at the maximum rate with consistent 1:1 AV conduction in 2 groups of patients. Group 1: patients with AVNRT (n=20) and Group 2: control subjects (n=21). Radiofrequency catheter ablation of the slow pathway was performed

in all Group 1 patients. After slow pathway ablation, the study protocol was repeated in Group 1 patients. PR>RR finding was present in 10 of 20 Group 1 patients (50%) and 2 of 21 Group 2 patients (9.5%, p=0.006). After slow pathway ablation, PR>RR finding was no longer present in any Group 1 patients. The finding of PR>RR had a sensitivity of 50 % for AVNRT, a specificity of 90%, a negative predictive value of 66% and a positive predictive value of 84%.

In conclusion, although the sensitivity of PR>RR finding for AVNRT is low, because of its high specificity and positive predictive value, this finding may be useful for evaluating the success of slow pathway ablation in patients with AVNRT in whom tachycardia induction is not reproducible and dual AV nodal physiology cannot be demonstrated.

Key words: AV nodal reentrant tachycardia, RF catheter ablation, dual AV pathway.

Assessment of Insulin Resistance by the Hyperinsulinemic Euglycemic Glucose Clamp Technique in Young Men With Coronary Artery Disease

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Insulin resistance has an important role in the pathogenesis of metabolic disorders such as hyperinsulinemia, glucose intolerance, obesity, and dyslipidemia, all established risk factors for coronary artery disease (CAD). In a number of prospective studies, an independent relationship was noted between CAD and hyperinsulinemia and insulin resistance; and has been suggested that insulin resistance is a risk factor for CAD.

In this study, insulin resistance was studied by the hyperinsulinemic euglycemic glucose clamp technique in 16 male patients with CAD (Group 1), diagnosed all by coronary angiography and in 16 male healthy controls (Group 2), younger than 35 years.

In our study, "M" value was found as a 4.37±1.1 mg/kg/min in Group 1, and 7.9±1.1 mg/kg/min in Group 2. Insulin resistance was found in 7 of 16 in

Group 1, while Group 2 no insulin resistance was found, ($p<0.05$).

In the patient group triglyceride, total and LDL-cholesterol, insulin and C-peptide levels were statistically higher than controls ($p<0.05$).

We found that young patients with newly diagnosed CAD, did show insulin resistance, in variance from other studies. As a result, insulin resistance is an important risk factor in premature CAD.

Key words: Insulin resistance, coronary artery disease

The Safety and Efficacy of Intravenous Enalaprilat In Acute Cardiogenic Pulmonary Edema

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Angiotensin-converting enzyme (ACE) inhibitors which have been used for the treatment of chronic congestive heart failure, can also be used for the treatment of acute cardiogenic pulmonary edema. In this condition, patients are hemodynamically unstable and have high renin levels. The studies in this area are limited. The purpose of this study was to evaluate the efficacy and safety of intravenous enalaprilat in patients with acute cardiogenic pulmonary edema.

The study was performed in 12 patients (7 men, 5 women; mean age 57.2 ± 7.4 years) with acute cardiogenic pulmonary edema due to dilated cardiomyopathy, coronary artery disease, hypertensive heart disease or coronary and/or hypertensive heart disease. Hemodynamic and clinical parameters were measured and evaluated before and 10 minutes after infusion of enalaprilat. Enalaprilat increased cardiac output, cardiac index and stroke volume ($p<0.01-0.001$); decreased systemic vascular resistance, pulmonary vascular resistance, systemic and pulmonary arterial pressures, heart rate and respiratory rate significantly ($p<0.01-0.0001$). Thus, these results indicate there is an early improvement in hemodynamic and clinical parameters and that

there was no side effect after intravenous enalaprilat therapy.

In conclusion, intravenous enalaprilat therapy is effective and well tolerated in patients with acute cardiogenic pulmonary edema.

Key words: Acute cardiogenic pulmonary edema, enalaprilat, hemodynamic effects.

Continued Boom in 1997 in International Medical Publications from Turkey

A. Onat

A search was made of medical publications arising from institutions in Turkey appearing in medical periodicals covered by the Science Citation Index and comprised in the ISI CD-ROM 1997 Annual. This revealed a total of 1640 medical items making up almost half of all scientific publications originating from Turkey. When adjusted for publications jointly materialized with foreign medical centers and with nonmedical Turkish faculties (which constituted roughly 8% of the total), and when letters to the editor and meeting abstracts were excluded, 1010 articles in full text remained (including editorials and reviews). This represented 0.5% of share in the respective world medical publications and a rise of 25% over the previous year. Thus Turkey doubled her output of international medical publications each 3 years over the past decade - a remarkable feat.

The rise pertained to publications in basic (preclinical) fields as well as in clinical disciplines. The seven medical faculties (located in the three big cities) which produced 51% of all medical publications were as follows: Hacettepe, Ankara, İstanbul, Aegean, Cerrahpaşa, Gazi and September 9th. The most significant trend over the previous years was a diversification of the publishing centers, in particular the rise to 17% of the share of nonacademic institutions. In cardiovascular medicine, 52 articles in full text appeared in 1997 which represents a share of more than 0.4% in the world. References of each of these articles are provided as an appendix.

Review

Beta-blocking Drugs in the Treatment of Congestive Heart Failure

D. Güzelsoy, Z. Yiğit

Despite basic and clinical research in congestive heart failure, this disorder continues to remain a major challenge therapeutically and there is a need for innovative drugs that alter the prognosis of heart failure. In recent years, research directed toward understanding of the pathophysiology of congestive heart failure showed that the level of neurohumoral activation is the predictor of survival. Clinical studies documented that the inhibition of overactivated renin-angiotensin-aldosterone system by angiotensin-converting enzyme inhibitors may improve symptoms and mortality. There is also increasing evidence of beneficial effects of beta blocking drugs which counteract the long-term deleterious effects of overstimulated sympathetic nervous system. Several trials strongly suggest that beta-blockers should be used for the management of heart failure, especially in patients with dilated cardiomyopathy. Mortality data from the carvedilol studies are also encouraging. However, there is still a need to await the result of planned large-scale trials in larger numbers of patients with different

etiologies for routine usage of beta blockers in all patients with congestive heart failure.

Key words: Congestive heart failure, neurohumoral activation, beta-blocking drugs.

History of Cardiology and Philately Corner:

Marcello Malpighi (1628-1694) and the Capillary Circulation

T. Onat

A graduate of Bologna Medical Faculty in 1653, and later prof. of medicine (1662), Malpighi pioneered the experimental study of living organisms and founded the science of microscopy. He discovered the capillary circulation (1661), red blood corpuscles (1666), described the structure of the skin (M. layer), papillae of the tongue, bodies in the spleen and kidneys (M. bodies and corpuscles) and the pulmonary alveoli. Microscopic examination in frogs while the heart was beating, revealed opposite direction of blood in adjacent vessels and he observed further that blood broke into the empty space and was collected again by a gaping vessel. Two stamps and a postal cancellation depicting his portrait are presented.