

Summaries of Articles

Clinical Investigations

Relation of Myocardial Perfusion Abnormalities to Increased QT Dispersion and Value of QT Dispersion in Identification of High-risk Patients With Coronary Artery Disease

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This study sought to evaluate the relation of myocardial perfusion abnormalities to increased QT dispersion (QTd) and the relationship between QTd and scintigraphic high-risk parameters providing prognostic information in patients with coronary artery disease (CAD). 112 consecutive patients (52±9 yrs) referred to exercise TI-201 scintigraphy were studied, using reinjection protocol. SPECT images were divided into 20 segments; each segment was classified as normal, reversible defect, viable or nonviable fixed defect. Accordingly, cases were divided into 4 groups as normal subjects (n=45), patients with only reversible defects (n=28), patients with only nonviable fixed defects (n=22) and patients with reversible, viable and nonviable defects (n=17). Involvement of 5 or more segments, increased lung TI-201 uptake and transient left ventricular dilatation were considered as scintigraphic high-risk parameters. QTd was defined as the difference between maximal and minimal QT intervals in at least 8 leads of the surface ECG. Mean QTd was 39±9 msec in normal subjects, 62±20 msec in patients with only reversible defects, 65±22 msec in patients with only nonviable fixed defects and 67±19 msec in the remaining patients. There was a significant difference between normal subjects and patient groups ($p<0.0001$), whereas the 3 patient groups did not show a significant difference among them. Mean QTd was 77±17 msec in patients with ≥5 abnormal segments compared to 44±10 msec in patients with 1-4 abnormal segments ($p<0.0001$). A good linear correlation was found between the number of abnormal segments and QTd values ($r=0.65$). Patients with increased lung TI-201 uptake and left ventricular dilatation also had higher QTd values than those without (74±19 vs. 53±18, $p<0.0003$; 79±17 vs. 54±18, $p<0.0001$ respectively). In conclusion, 1) Increased QTd is related to myocardial ischemia or scar tissue; 2) A greater QTd value is closely related to scintigraphic high-risk parameters and might be of prognostic importance in patients with CAD.

Key words: QT dispersion, exercise TI-201 scintigraphy

Serum Transferrin Saturation and Ferritin Level as a Risk Factor in Coronary Artery Disease

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Epidemiologic studies have shown that serum iron can be a risk factor for coronary artery disease (CAD). The relation of serum ferritin level and transferrin saturation with CAD was investigated in this study. Four-hundred male patients (mean age 56±4) who were hospitalized for coronary angiography in our clinic were included in this study. Patients were divided into two groups: control group n=149 (coronary angiography normal), case group n=251 (CAD present). Transferrin saturation was categorized as ≤10% and >10%. Serum ferritin level was grouped as <200ng/ml and ≥200ng/ml. A non-significant weak negative relation ($p=0.5$) was identified between serum ferritin level and CAD by multivariate logistic regression analysis. No significant relation ($P=0.4$) was noted between serum transferrin saturation and CAD. The results did not gain statistical significance for both transferrin saturation and ferritin level when patients with high LDL-cholesterol level were included in the model.

Thus, our results do not support the hypothesis on a relation between serum iron stores and CAD.

Key words: Coronary artery disease, ferritin, transferrin saturation.

Role of Dobutamine ^{99m}Tc-Tetrofosmin Myocardial Perfusion SPECT in the Detection of Coronary Artery Disease

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This study investigates the significance of dobutamine ^{99m}Tc-tetrofosmin myocardial perfusion SPECT in the detection of coronary artery disease (CAD). Among those referred to the Nuclear medicine department of the Istanbul University, Istanbul Medical Faculty, 26 patients with CAD were included in the study. Dobutamine infusion was initiated at a dose of 5 µg/kg/min and gradually increased to 10, 20, 30 and to a maximum dose of 40 µg/kg/min every 3 minutes. Following cessation of the planned dobuta-

mine perfusion, 8-10 mCi ^{99m}Tc -tetrofosmin was injected and stress SPECT images were obtained. After 3 hours, resting SPECT images were taken following 14-22 mCi ^{99m}Tc -tetrofosmin injection. With doses of and above 10 $\mu\text{g}/\text{kg}/\text{min}$ dobutamine perfusion, increases in heart rate and systolic blood pressure were found to be statistically significant ($p<0.0001$ and $p<0.05$, respectively). No significant side-effects were observed during dobutamine perfusion. Sixteen patients received a diagnosis of CAD after coronary angiography. The sensitivity of the method was 94%, while the specificity was 90%. Taking into consideration the 78 perfusion areas of 3 major vessels in 26 patients, the sensitivity and specificity of the method were 80% and 94%, respectively. For each coronary artery, these values were as follows: for LAD 82% and 100%, for RCA 100% and 82% and for Cx 40% and 100%, respectively. In the diagnosis of CAD, the dobutamine ^{99m}Tc -tetrofosmin SPECT was confirmed to be a valuable diagnostic, easily applied myocardial perfusion imaging method with no major side-effects.

Key words: Coronary heart disease, Dobutamine - SPECT

Comparison of QRS Score, a New Exercise Index, and Conventional ST Segment Criterion in Detecting Coronary Artery Disease

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Although ST segment depression, during exercise stress test (EST) is the most commonly used electrocardiographic (ECG) criterion for myocardial ischemia, its diagnostic value is limited because of low sensitivity and specificity. It was shown that not only ST depression, but also Q, R and S wave changes occur during EST, but these changes also have limited value in the diagnosis of myocardial ischemia when evaluated individually. However, it was hypothesized that incorporation of these individual changes with exercise, into a composite index (QRS score) might improve sensitivity and specificity. In this study, the diagnostic value of this new exercise index in detecting myocardial ischemia was investigated and its sensitivity and specificity was compared with the conventional ST segment criterion. For this purpose, 171 patients were enrolled in the study and divided into 3 groups as group 1: normal coronary artery group (n=55), group 2: patients with one-vessel disease (n=73), group 3: patients with multi-vessel disease (n=43). All

patients underwent maximal EST with standard Bruce protocol and coronary angiography.

Using a cut-off point of ≥ 0 as normal, QRS score had a higher sensitivity than ST segment criterion in all patients (79% and 65%, respectively, $p<0.005$), however, no difference existed in specificity and positive predictive value. In one-vessel disease group (group 2), QRS score had a sensitivity of 77%, whereas conventional ST segment criterion had a sensitivity of 56% ($p<0.001$). In group 3, who had multi-vessel disease, no difference was found in sensitivity and specificity between the QRS score and conventional ST segment criterion. Nevertheless, a relatively high relationship was observed between negative QRS scores and number of obstructed coronary arteries (QRS score was -3.2 ± 2.5 in one-vessel disease and -6.1 ± 2.9 in multi-vessel disease, $p<0.05$) and QRS score under (-2) were always associated with coronary artery disease.

Radiofrequency Catheter Ablation Treatment of Atrioventricular Nodal Reentrant Tachycardia: Results in 53 Consecutive Patients

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The efficacy and safety of radiofrequency catheter ablation to eliminate atrioventricular nodal reentrant tachycardia (AVNRT) was evaluated in 53 consecutive patients with typical AVNRT. Primarily, slow pathway ablation was performed in 52 patients, and fast pathway ablation in 1 patient. Success was achieved in the patient in whom fast pathway ablation was attempted. Slow pathway ablation was successful in 47 patients out of 52 (% 90). In 3 of the remaining 5 patients, fast pathway ablation was attempted after unsuccessful slow pathway ablation. Success was achieved in one of them, atrioventricular (AV) block occurred in one and ablation was unsuccessful in the third one. There was no statistically significant change in the atria-His interval (79 ± 19.2 msec before and 77.9 ± 13.7 msec after ablation) or effective refractory period of the fast pathway (289.5 ± 51.3 msec before, 271.7 ± 40.6 msec after ablation) after selective ablation of the slow pathway. However AV Wenckebach rate (294 ± 35.2 msec before, 315.7 ± 78.9 msec after ablation, $p=0.05$) and AV nodal refractory period (217.6 ± 37.4 msec before, 259.4 ± 52.4 msec after ablation, $p=0.003$) increased after slow pathway ablation. Retrograde conduction remained intact in

45 of 47 patients after slow pathway ablation, while there was an increase in the maximum 1:1 ventriculoatrial conduction rate in two patients. Over a mean follow-up period of 11.2 ± 10.5 months, AVNRT recurred in two patients, who were successfully treated in a second slow pathway ablation session.

Conclusion: These data suggest that, radiofrequency catheter ablation, especially slow pathway ablation technique, is safe and highly effective for the treatment of AVNRT.

Key words: AV nodal reentrant tachycardia, RF catheter ablation

A Multicenter Study for Comparison of Direct (Primary) PTCA with Thrombolytic Therapy in Unheralded Acute Myocardial Infarction; Early and Late results: STIMULUS Study Group

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The rate of reperfusion with thrombolytic therapy is higher in patients with acute myocardial infarction (AMI) and previous angina pectoris than in patients with unheralded AMI. The effectiveness of primary PTCA and thrombolytic therapy have not been compared yet in patients with unheralded AMI. In this multicenter study, we prospectively compared these two strategies in patients with unheralded AMI presenting within 6 hours after the onset of chest pain. Patients with diabetes mellitus were excluded. Seventy-three patients were enrolled and thirty-eight patients underwent direct (primary) PTCA. Time to thrombolytic therapy and PTCA were 2.4 ± 1.1 and 3.0 ± 2.2 hours after onset of chest pain, respectively. Two patients in each group died during the hospital period. Baseline characteristics of both groups were not statistically different. Coronary angiography was performed 7 ± 3 days after the infarction in all patients. In the direct PTCA group, rate of TIMI III flow (88.9% vs 69.7%; $p < 0.005$) and left ventricular ejection fraction ($63 \pm 9\%$ vs $54 \pm 11\%$ $p < 0.005$) were higher. Rate of reintervention during the hospital period in the thrombolytic group was statistically higher (75.8% vs 16.7%, $p < 0.001$). During the follow-up period of 17 ± 6 months, reinfarction, coronary bypass surgery and death rates were not different in both groups.

In this multicenter prospective study comparing direct PTCA with thrombolytic therapy for unheralded AMI there was a relative benefit towards

angioplasty in the hospital period concerning TIMI III flow, left ventricular ejection fraction and reintervention.

Preservation of Myocardial Metabolism in Acute Coronary Artery Occlusions with Retrograde Coronary Sinus Perfusion and L-Carnitine in Dogs

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Necrosis will be the eventual fate of myocardial ischemia which occurs after acute coronary occlusion. As antegrade reperfusion will be time consuming, a retrograde circulation will decrease the intensity of necrosis and the infarcted area will be reduced after the blood flow is rearranged.

In our study, we performed retroinfusion of L-carnitine, which activates the pyruvate dehydrogenase enzyme and by this way increasing the aerobic utilisation of glucose, in our simplified retroperfusion system. There were ten mongrel dogs, divided equally into carnitine and control groups. After taking the basal values, the left anterior descending artery was occluded. At the fifteenth minute, in the carnitine group, 0.15 mmol/kg of carnitine retroinfusion was performed. Then, hemodynamic and biochemical measurements were made till the end of 120 minutes. The control group had no retroinfusion or medical therapy. The occlusion was ended in 60 minutes in both groups.

In the carnitine group, there was statistically significant difference for cardiac output (1375 ± 50 ml/dk in control, 1625 ± 75 ml/dk in carnitine group, $p < 0.05$), cardiac index (62.5 ± 2.3 ml/kg/min in control, 81.25 ± 3.7 ml/kg/min in carnitine group, $p < 0.05$), mean arterial pressure (71 ± 6 mmHg in control, 89 ± 5 mmHg in carnitine, $p < 0.05$), mean pulmonary artery pressure (33 ± 6 mmHg in control, 25 ± 4 mmHg in carnitine, $p < 0.05$), myocardial oxygen extraction ($59 \pm 3\%$ in control, $50 \pm 2\%$ in carnitine, $p < 0.05$) and myocardial lactate extraction (-0.19 ± 0.05 mmol/L in control, -0.09 ± 0.03 mmol/L in carnitine, $p < 0.05$). Administration of L-carnitine combined with simplified retrograde coronary infusion has protective effects on ischemic myocardial metabolism and further investigations are needed for the clinical trials.

Key words: Acute coronary artery occlusion, myocardial metabolism, retrograde coronary sinus perfusion, L-carnitine

Assessment of Relation of Personality Types With The Prevalence of Exercise-Induced Silent Ischemia and Myocardial Ischemic Burden by TI-201 Scintigraphy in Patients with Coronary Artery Disease

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Type A patients with coronary artery disease (CAD) tend to ignore symptoms or underreport angina during challenging tasks such as the treadmill exercise test. This study sought to evaluate whether type A patients with CAD might be more likely than type B patients to have silent ischemia during exercise and also greater ischemic burden by TI-201 scintigraphy. 112 patients with angiographically defined CAD and a positive treadmill exercise test were studied. All patients underwent exercise TI-201 SPECT imaging and a psychological test (SCL-90) to assess type A personality. Scintigraphic images were divided into 20 segments and the number of redistribution and fixed defects were calculated in each patient. 78 patients were of type A and 34 patients were of type B according to psychological testing. 40 type A patients (51%) and 25 type B (73%) patients reported typical angina during exercise. Type A patients were more likely to have silent ischemia than type B patients ($p < 0.05$). However, when patients were classified as type A plus symptomatic ischemia, type A plus silent ischemia, type B plus symptomatic ischemia and type B plus silent ischemia into four subgroups, the number of redistribution defects as an indicator of myocardial ischemic burden were 3.64 ± 2.4 , 3.42 ± 2.2 , 3.28 ± 1.9 , 3.46 ± 2.6 , respectively. There were no significant differences among them. In conclusion, although type A patients were more likely to have silent ischemia than type B patients during exercise, there was no significant difference with regard to ischemic burden among CAD patients classified according to their personality types and presence of symptoms during exercise.

Key words: Type A personality, coronary artery disease, exercise TI-201 SPECT.

Case Reports

Aorticopulmonary Window: A Report of Two Cases

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Aorticopulmonary window (APP) is an uncommon cardiac anomaly in which there is a communication between the ascending aorta and pulmonary trunk. Because of its large left-to-right shunt, it needs early diagnosis and surgical treatment to avoid irreversible pulmonary lesion. In this report, two cases with aorticopulmonary window were presented. One of them, APP type I, could not be operated because of the coexisting Eisenmenger syndrome. The other one having APP type 2 and a ventricular septal defect, underwent surgical correction.

Key words: Aorticopulmonary window, Eisenmenger syndrome, congenital heart disease

Congestive Heart Failure and Complete Heart Block with Primary Lymphoma of the Heart

G.F. Hobikoğlu, Ö. Peker, T. Akbulut, S. Çelik, R. Tosun, H. Tezel, T. Tezel

Primary lymphoma of the heart is an extremely rare condition which is usually diagnosed postmortem. We report the case of a 26-year-old man who presented with congestive heart failure and complete heart block. Transthoracic echocardiography demonstrated right atrial mass and increased interventricular and posterior wall thickness. Transesophageal echocardiography and magnetic resonance imaging confirmed the right atrial mass and increased wall thickness. Operative myocardial biopsy revealed high-grade giant cell malignant lymphoma. Since further diagnostic studies failed to demonstrate extracardiac lymphoma involvement, diagnosis of primary lymphoma of the heart was considered.

History of Cardiology and Philately Corner:

William Harvey (1578-1657) and the Circulation

T. Onat

Harvey studied medicine at Caius College, Cambridge and Padoa, Italy. He is famous with his book with detailed description of the movement of heart and circulation: "Exercitatio Anatomica De Motu Cordis Et Sanguinis In Animalibus" (1628). He also has experimentally proven that the valves of the veins exist to forward the direction of blood flow towards the heart and to prevent the backward flow, in contrast to the views of his teacher Girolamo Fabricio. Seven stamps and 4 postal cancellations on Harvey and Fabricio are presented.