

Summaries of Articles

Clinical Investigations

Relationship Between Plasma Endothelin-1 Levels and Corrected TIMI Frame Count in Patients with Slow Coronary Artery Flow

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Purpose: The aim of this study is to compare the endothelin levels between patients with slow coronary flow and normal healthy subjects, and to investigate the relationship between endothelin-1 levels (ET-1) and corrected TIMI frame count (cTFC) between the two groups.

Method: The resting ET-1 levels were compared between two groups (in 31 patients with slow coronary flow (group A) and 15 healthy subjects (group B)). At the same time the relationship between ET-1 and cTFC was also investigated.

Results: Resting ET-1 levels were found significantly high in patients with slow coronary flow when compared with healthy subjects ($4,35 \pm 1.3$ pg/ml vs 2.52 ± 0.5 pg/ml, $p < 0.01$). When the coronary vessels were compared with each other according to the TIMI frame count and ET-1 levels, if the dominant slow coronary flow was especially LAD artery (cTFC highest), ET-1 levels were found higher in these patients than in the ones with dominant Cx ($p < 0.02$) or right coronary artery ($p < 0.03$). (LAD; 5.826 ± 0.75 pg/ml, Cx; 4.12 ± 1.17 pg/ml, RCA; 3.89 ± 1.49 pg/ml). But if slow coronary flow was dominant in Cx or RCA artery, not significant relationship between cTFC and ET-1 levels was detected. When patients were classified according to the number of the diseased vessels, ET-1 levels were found highest in patients with 3-vessel disease (3-vessel; $5,78 \pm 1,2$ pg/ml, 2-vessel; $4,23 \pm 1.16$ pg/ml, single vessel; $3,41 \pm 0,7$ pg/ml. $p < 0,001$).

Conclusion: Resting ET-1 levels are high in patients with slow coronary flow as compared with healthy subjects and show a significant correlation with cTFC. The increase in ET-1 levels may be responsible for the development of the chest pain in patients with slow coronary flow. Additionally much more clinical studies are necessary to determine the

exact role of ET-1 in the development of microvascular dysfunction.

Key words: Slow coronary artery flow, endothelin-1, corrected TIMI frame count.

Serum Neopterin Levels Acute Coronary Syndrome as a new Inflammation Marker

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Intracoronary thrombus occurring by disruption of atherosclerotic plaque is the cause of acute coronary syndromes. Vulnerable atherosclerotic plaques were found to contain a large number of macrophages and T lymphocytes and that the secretion of neopterin from activated macrophages increased in vulnerable plaques. Our study aimed to assess serum neopterin concentrations as an indicator of intracoronary plaque inflammation and their relation to coronary artery disease severity in patients with acute coronary syndrome (ACS).

Consecutive 43 patients with chronic stable angina pectoris (group I), 118 patients with ACS (group II) and age-matched 30 healthy subjects as a control group (group III) were enrolled in our study. Serum neopterin concentration was measured with "enzyme-linked immunosorbent assay" technique. Selective coronary angiography was performed all patients. Significant coronary artery disease was defined as $>50\%$ narrowing on coronary angiogram. Severity of coronary artery disease was evaluated using Gensini score.

Serum neopterin concentrations were found 12.33 ± 3.94 nmol/L in group I, 22.46 ± 6.75 nmol/L in group II, and 9.02 ± 2.57 nmol/L in group III. Serum neopterin levels were found significantly higher in ACS than in patients with chronic stable angina pectoris ($p < 0.0001$) and in control group ($p < 0.0001$). Neopterin level in group I were also found higher than the control group ($p = 0.048$). Neopterin was not found to be associated with the number of significantly diseased coronary vessels. Significant

correlations existed between serum neopterin level and severity of coronary artery disease in patients with ACS ($r=0.68$; $p<0.001$), but not in patients with stable angina pectoris ($r=0.25$; $p>0.05$).

We concluded that the level of serum neopterin, an indicator of cellular immune activation in patients with acute coronary syndromes, increased considerably, and this may be used as a sign of atherosclerotic plaque inflammation.

Key words: Neopterin, acute coronary syndrome

Comparison of Seven Algorithms to Localize the Accessory Pathway in Patients with Wolff-Parkinson-White Syndrome

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The purpose of this study was to compare the sensitivity, (+) predictive value (PPV), inter and intraobserver variability of published 7 algorithms (Skeberis et al, Xie et al., Chiang et al., Fitzpatrick et al., Davilla et al., Adalet et al., and Arruda et al.) which were developed to localize atrioventricular accessory pathways (AP's) in patients with the Wolff-Parkinson-White (WPW) syndrome. One hundred consecutive patients, diagnosed to have WPW syndrome from 12-lead electrocardiogram (ECG), who underwent successful radiofrequency catheter ablation of a single overt AP, were included in the study. The 12-lead ECGs were evaluated for two of each in different times by three independent and experienced electrophysiologist.

The sensitivity and PPV was found to vary between 29-51% and 31-60%, respectively. Chiang's algorithm was shown to have the highest sensitivity and PPV amongst the 7 algorithms (51% and 60%, respectively). In general, for localizing the APs, best results were obtained in left lateral APs (mean 70%). Adalet's algorithm had the highest sensitivity to differentiate the right and left APs (75% and 77%, respectively). The PPV tended to be lower when delta-wave polarity was not included in the

algorithm's architecture (34% and %43.3, respectively, $p=0.045$). The strongest correlation in inter and intraobserver variation was found in Chiang's algorithm ($\kappa=0.78-0.82$ and $\kappa=0.76$, [%95 CI: 0.73-0.79], respectively), nevertheless Fitzpatrics's algorithm exhibited the weakest intra and interobserver agreement ($\kappa=0.56-0.72$ and $\kappa=0.40$, [%95 CI: 0.36-0.44], respectively).

In conclusion, the sensitivity and PPV of the included algorithms were clearly lower than those reported by the corresponding authors. Left lateral APs were the only pathways that could easily be recognized by all algorithms. The algorithms that included the delta-wave polarity was shown to increase PPVs. In our series, consisting of 100 patients with the WPW syndrome, Chiang's algorithm had the highest PPV and inter and intraobserver agreement amongst all algorithms. These findings should be considered when using these algorithms in clinical settings or when building new ones.

Key words: WPW syndrome, algorithm, ECG, ablation

Effectiveness of Cytoimmunologic Monitoring for Rejection Follow-up in Orthotopic Heart Transplant Patients

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Heart transplant patients need close monitoring of acute rejection in the postoperative period. Histopathological assessment of the endomyocardial biopsy (EMB) is essential for the diagnosis of acute rejection after heart transplantation. However cytoimmunologic monitoring (CIM) is a simple noninvasive method in the diagnosis of acute rejection which can be performed daily. In this prospective study we investigated the efficacy of CIM in the early diagnosis of acute rejection in 13 cardiac allograft recipients. We compared the data of CIM, EMB and the clinic status of patients. The sensitivity of CIM was calculated as 85,7 percent, the specificity 75 percent and the predictive value 85,7 percent. We conclude that CIM helps timing of EMB and allows

for reduction of its frequency. However, according to its limited help, it should be used together with other methods of rejection diagnosis.

Key words: Heart transplantation, acute rejection, endomyocardial biopsy, cytoimmunologic monitoring

Change in Aortic Stiffness with Nitroglycerin and Extent of Coronary Artery Disease

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The main objective of this study was to investigate the extent of coronary artery disease by using the effect of nitroglycerin on aortic stiffness. Two study groups were composed according to coronary angiographic results. 21 patients having single vessel disease and 22 patients multivessel disease. Pulse pressure, aortic diameter change, aortic strain and distensibility were used as aortic stiffness parameters. Antianginal medications were withheld 48 hours before the study. The patients were allowed to use sublingual nitroglycerin as necessary, but caution was taken that no nitroglycerin medication was performed within 3 hours of its administration. Echocardiographic assessment was performed in all patients before and at least 5 minutes after intravenous nitroglycerin administration.

Results: Nitroglycerin exerted an increase in aortic diameter change (1.1 ± 0.5 versus 1.6 ± 0.6 before and after nitroglycerin, respectively; $p=0.002$) and aortic strain (6 ± 3.51 vs. 9 ± 4 before and after nitroglycerin, respectively; $p<0.001$) only in the single vessel group. A decrease was observed in pulse pressure after nitroglycerin in the single vessel group (59 ± 16 vs. 49 ± 12 before and after nitroglycerin, respectively; $p<0.001$). Aortic distensibility improved after nitroglycerin in the single vessel group (2.29 ± 1.58 vs. 4.06 ± 2.43 before and after nitroglycerin, respectively; $p<0.01$), while no change was observed in the multivessel group (2.61 ± 2.43 vs. 3.78 ± 2.77 before and after nitroglycerin, respectively; $p>0.05$).

As compared to findings before nitroglycerin administration, the improvement of the elasticity properties of the aorta with nitroglycerin may be helpful to determine the extent of coronary artery disease.

Key words: Nitroglycerin, aortic stiffness, coronary artery disease

Review

Efficacy, Safety and Usage of "Antitachycardia Pacing" Algorithms

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Indications of implantable cardioverter defibrillator (ICD) implantation, which have been shown to be effective in prevention of sudden death resulting from ventricular tachyarrhythmia, were progressively widened especially during the last decade. Most of the available ICDs possess "antitachycardia pacing" properties. ATP comprises some algorithms that prevent degeneration of ventricular tachycardia into ventricular fibrillation, and need to defibrillation. As a consequence, ATP therapy, which has been proved to be effective and safe in most patients, provides a better quality of life by decreasing the need for shock therapy aside that it saves battery energy. In this article, usage of ATP, safety and efficacy of different ATP algorithms is reviewed.

Key words: Sudden death, ventricular arrhythmias, implantable cardioverter defibrillator, anti-tachycardia pacing.

Case Reports

Double-orifice Mitral Valve Associated with Nonisolated Myocardial Noncompaction

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Double-orifice mitral valve is a rare congenital anomaly. Although it is more frequently associated with other cardiac abnormalities, it may occur as an isolated lesion. There are two forms of myocardial

noncompaction: isolated and non-isolated myocardial noncompaction. Nonisolated myocardial noncompactions are occasionally reported postnatally in association with congenital heart anomalies such as VSDs, pulmonic stenosis, and ASDs. To our knowledge, this is the first case reporting a double orifice mitral valve associated with nonisolated myocardial noncompaction.

Key words: Double-orifice mitral valve, nonisolated myocardial noncompaction

An Asymptomatic Case With ECG Findings of the Brugada Syndrome: What Should/Could Be Done?

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A 52-year-old man who had an acute abdominal pain was hospitalized and treated at the department of general surgery with the diagnosis of "acute cholecystitis". His ECGs, recorded during his first admission in the emergency service, was evaluated retrospectively for a study project. An incomplete right bundle-branch block and ST segment elevation in V₁₋₃ leads were found. The patient underwent a detailed investigation considering a possible diagnosis of the Brugada syndrome. No change was observed in the ECG findings during the provocation test with propafenone infusion and no ventricular tachycardia was induced during electrophysiological study. There were no similar findings in the ECGs of the family members. This case is reported because of the rarity of the Brugada syndrome, and the possible diagnostic investigations in asymptomatic cases with the ECG findings of this rare clinical situation were discussed.

Key words: Asymptomatic, ECG, Brugada syndrome

Pulmonary Arteriovenous Fistulas Without Hereditary Hemorrhagic Telangiectasia: Case Report

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Pulmonary arteriovenous fistula is a rare anomaly, almost always associated with hereditary hemorrhagic telangiectasia. It can lead to life-threatening complications if undiagnosed or untreated. The most striking clinical findings for diagnosis are due to hereditary hemorrhagic telangiectasia which accompanies pulmonary arteriovenous fistulas. We report bilateral pulmonary arteriovenous fistulas in a case without hereditary hemorrhagic telangiectasia.

Key words: Pulmonary arteriovenous fistula, systolo-diastolic murmur

Guide-wire Perforation and Valvuloplasty of the Atrietic Pulmonary Valve in an Underweight Newborn

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Pulmonary valvuloplasty was performed in a 51-day-old, 2160-g baby with the diagnosis of pulmonary atresia with intact ventricular septum after perforating the pulmonary valve with the stiff end of a guide-wire. This type of technique and perforation of pulmonary valve in such a small baby has not been reported before in Turkey.

Key words: Pulmonary atresia, interventional cardiology, transcatheter perforation