

## Summaries of Articles

### Effects of Hypothermia on Blood Endogenous Endotoxin Levels During Cardiopulmonary Bypass

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Endotoxins activate white blood cells and complement and produce a spectrum of clinical syndromes ranging from fever to septic shock. Although, production of endogenous endotoxemia during cardiopulmonary bypass (CPB) has recently been reported, the role of hypothermia on endotoxemia is not clear. In this study, we evaluated the effects of moderate (24-28°C) and mild (32-34°C) hypothermia on blood endotoxin levels. The study population consisted of 20 patients who underwent CABG with CPB. Moderate hypothermia was applied during aortic cross-clamping in 10 patients (Group 1) and mild hypothermia was applied in the remaining 10 patients (Group 2). The mean rectal temperatures were 26,8 ± 1,2 ° C in Group 1 and 33,8 ± 0,8° C in Group 2.

Blood samples for endotoxin level measurements were obtained before CPB, during aortic cross-clamping, immediately and 20 minutes after the release of the cross-clamp, after CPB and 24 hours postoperatively. Endotoxins were absent in any of the samples before CPB, but were detected after CPB in both groups. The endotoxin levels were significantly higher in Group 1 than in Group 2. Endotoxin levels become higher when hypothermia gets deeper, probably due to intestinal ischemia. The present study suggests that when hypothermia is the technique of choice, the deleterious effects of endotoxemia on patients with poor conditions must be considered.

### Comparison of Exercise Stress Testing with Simultaneous Dipyridamole Stress Echocardiography and Technetium-99m Isonitrite Single-Photon Emission Computerized Tomography for Non-Invasive Diagnosis of Coronary Artery Disease

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To compare the value of exercise stress testing with simultaneous dipyridamole stress echocardiography and technetium-99m isonitrite single photon emission computed tomography for the diagnosis of coronary artery disease, twenty-six patients with suspected coronary artery disease underwent simultaneous dipyridamole stress echocardiography and dipyridamole technetium-99m isonitrite single photon emission computed tomography and treadmill exercise test, after stopping the antianginal treatment. All patients underwent coronary angiography as a gold standard reference. Dipyridamole mibi SPECT showed higher overall sensitivity than exercise testing (93 vs 69%,  $p<0.05$ ) and similar sensitivity to dipyridamole echocardiography (93 vs 81%,  $p>0.05$ ). This was mainly due to higher sensitivity of dipyridamole mibi SPECT than exercise testing in two-vessel disease (100 vs 57%,  $p<0.05$ ). Dipyridamole mibi SPECT showed even higher sensitivity than dipyridamole echocardiography in two-vessel disease (100 vs 71%,  $p<0.05$ ). All three tests showed similar sensitivities in one (75, 75 vs 50%,  $p>0.05$ ) and three-vessel disease (100, 100 vs 100%,  $p<0.05$ ). Also, all of them showed similar diagnostic accuracy (88, 85 and 70,  $p>0.05$ ). The results of dipyridamole mibi SPECT and dipyridamole echocardiography were concordant in 20 patients (78%,  $Kappa=0.58$ ).

In this study, dipyridamole mibi SPECT showed the highest sensitivity; where the difference between the sensitivities of dipyridamole mibi SPECT and exercise test was statistically significant, but between mibi SPECT and dipyridamole echocardiography was not significant. All three tests showed similar specificities. It also disclosed that the combination of dipyridamole with mibi SPECT is an effective, valuable and safe method, which in combination with echocardiography reaches a similar diagnostic accuracy as mibi SPECT combination.

### Factors Determining the Perioperative Cardiac Morbidity in the Patients Undergoing Noncardiac Surgery

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Perioperative cardiac morbidity seen in patients undergoing noncardiac surgery is directly related to the underlying coronary artery disease. 52 patients who had noncardiac surgery were studied for detecting the preoperative clinical and diagnostic test predictors of perioperative cardiac morbidity. Among all the factors studied, being bedridden preoperatively due to a noncardiac cause was found to be the single predictor ( $p=0.0085$ ). Major noncardiac surgery ( $p=0.056$ ) and Goldman's clinical cardiac index ( $p=0.078$ ) had limited predicted value. Being bedridden preoperatively predicted perioperative cardiac morbidity in 4 of the 9 patients (44.4%) with, and in 40 of 43 patients (93.2%) without perioperative cardiac morbidity correctly.

#### Value of Proximal Isovelocity Surface Area Method in Calculation of Mitral Valve Area in Patients with Mitral Stenosis

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Proximal isovelocity surface area method (PISA) is a new technique based on the continuity principle, and its use in the measurement of orifice areas is still being developed. The aim of our study is to estimate the value of that method in the measurement of mitral valve area (MVA) in cases with mitral valve stenosis, to compare its accuracy with traditional echocardiographic methods, planimetry and Doppler pressure half-time and to investigate the factors which affect MVA measurements.

MVAs of 30 consecutive patients with mitral valve stenosis (mean age  $43\pm 14$ -25 female, 5 male) referred to echocardiography laboratory were obtained with planimetry, Doppler pressure half-time and PISA and their results were compared by coefficient of correlation ( $r$ ). Patients were also evaluated due to their image quality, presence of additional factors such as atrial fibrillation, mitral regurgitation and aortic regurgitation.

MVAs measured by PISA are closely correlated to classical echocardiographic methods, especially to planimetry. Coefficients of correlation between that method and planimetry and Doppler were  $r=0.86$  and  $r=0.68$  respectively. The most important problem in the estimation of MVA by PISA was the accurate determination of the aliasing radius ( $r$ ). when

the latter was less than 1 cm PISA results are not comparable to these of other methods. In the presence of atrial fibrillation, mitral regurgitation and aortic regurgitation, PISA was more comparable to planimetry which is a reliable method in these situations. However, in cases with inadequate image qualities, planimetry lost its reliability, and measurements of PISA was not affected its results were closer to Doppler pressure half-time.

It is concluded, that PISA is a useful technique in the measurement of MVA and can be used as third echocardiographic method in patients with unreliable results with classical echocardiographic methods.

#### Usefulness of Simplified Formula for Calculation of Valve Area by Proximal Isovelocity Surface Area Method in Non-calcified Mitral Stenosis

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We investigated usefulness and accuracy of a simplified formula derived from the parameters obtained by proximal isovelocity surface area (PISA) method. The study group consisted of 41(28F, 13M) patients with a mean age of  $32.2\pm 7.8$  years. All patients had non-calcified mitral stenosis and were being evaluated for timing and type of cardiac interventions. 16 patients had mild aortic regurgitation, 9 patients had mild mitral regurgitation. Of 41 patients 18 were in atrial fibrillation and the rest of them had normal sinus rhythm.

The standard PISA method was applied. Mitral valve area (MVA) was calculated by the simplified formula for each patient. Assumption of funnel angle by non-calcified mitral leaflets was empirically considered as 118 degrees.  $118/180=0.65$  (Constant for angle correction),  $2\pi=6.28$ , Constant value(C)= $0.65\times 6.28=4.1$

$$MVA= 4.1\times AV\times r^2/MV$$

Assessment of MVA by standard PISA formula was compared with the pressure half time (PHT) and planimetry (PLN) methods. Concerning valve areas there were significantly positive correlations between the results of simplified PISA formula and the standard method. PISA(C) vs PHT  $r=0.85$ , PISA(C) vs PLN  $r=0.85$ , PISA(C) vs PISA  $r=0.96$ .

As a conclusion the simplified formula provides acceptable agreement between standard PISA and other well known methods. Thus, this formula is recommended for routine clinical practice in assessment of mitral valve area estimation in patients with non-calcified mitral stenosis

### Left Atrial Appendage Function in Rheumatic Mitral Stenosis and Severe Mitral Regurgitation: Transesophageal Echocardiographic Study

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Although there are several studies related to the incidence of spontaneous echo contrast (SEC) and thrombus (THR) in the left atrial appendage (LAA), between patients (pts) with rheumatic mitral stenosis (MS) and severe mitral regurgitation (MR), there is no study evaluating LAA function in these groups. To investigate LAA function in these groups, 68 pts with MS (group I, 45 F, mean age:  $43 \pm 14$ , 32 pts with sinus rhythm (SR) and 45 pts with severe MR (group II, 27 F, mean age:  $45 \pm 15$ , 28 pts with SR) and a control group (group III) including 47 pts (32 pts with SR, 15 pts with nonrheumatic atrial fibrillation [AF]) were evaluated. Transesophageal echocardiography was performed routinely in all patients, and during this procedure, in order to investigate LAA function, flow velocities and ejection fraction of LAA were measured with concomitant evaluation of incidence of SEC and THR. Left atrial appendage function and incidence of SEC and THR in the LAA were compared according to the cardiac rhythm (SR and AF).

The incidence of LAA SEC formation in group I with either SR or AF was significantly higher than in the other groups (SR, AF respectively,  $p < .05$ ,  $p < .001$ ). The incidence of LAA THR formation in group I with AF was significantly higher than in the other groups with AF ( $p < .05$ ), but in pts with SR, incidence of LAA THR was not different between these groups ( $p = .06$ ). Left atrial appendage maximal area in group I ( $6.58 \pm 3.7$ ,  $7.26 \pm 3.9$  cm<sup>2</sup>) and group II ( $7.04 \pm 3.1$ ,  $8.2 \pm 4.1$  cm<sup>2</sup>) was larger than in the group III ( $3.56 \pm 1.9$ ,  $5.51 \pm 3.3$  cm<sup>2</sup>) (SR, AF respectively  $p < .05$ ,  $p < .05$ ). In SR, LAA flow velocities and ejection fraction in group I ( $0.23 \pm 0.11$  m/sn, %  $31.5 \pm 14.5$ ) was significantly lower than in group II

( $0.48 \pm 0.16$  m/sn, %  $45 \pm 15.3$ ) and group III ( $0.44 \pm 0.17$  m/sn, %  $54 \pm 16.2$ ), ( $p < .05$ ,  $p < .05$ ). In AF, similarly, LAA flow velocities and ejection fraction in group I ( $0.10 \pm 0.10$  m/sn, %  $15 \pm 11.3$ ) was significantly lower than in group II ( $0.36 \pm 0.13$  m/sn, %  $33.6 \pm 13.7$ ) and group III ( $0.28 \pm 0.1$  m/sn, %  $28.5 \pm 12.3$ ), ( $p < .05$ ,  $p < .05$ ). No significant differences were found between pts with MR and the control group in regard to LAA function in either cardiac rhythm.

Conclusion; although MS and MR share the same etiology and afflicted pts have a dilated LAA area, in pts with MS LAA function was found to be deteriorated, and thus incidence of SEC/THR was much more frequently detected in LAA. By contrast, LAA function is preserved and thus SEC/THR formation prevented in pts with MR. The disparity between pts with MS and MR groups is thought to be due to different hemodynamics influencing both left atrium and LAA.

### Rapid Rise Recently of Turkey's Performance in International Cardiology

A. Onat

A brief analytical review of Turkish cardiological publications in international journals covered by the Science Citation Index and of presentations at the annual congresses of the European Society of Cardiology indicated a remarkable growth. In the former regard, a total of 95 (full-texted) articles were registered during the three years between 1994 and 1996 which corresponded in the last year to an estimated share of 4 per mille in the world. With respect to the ESC congresses, oral and poster presentations at the 1997 meeting rose to 31 in number. This represented 11.4 per mille of the total presentations and provided rank 13 among European nations, ahead of Russia, Finland, Norway and Austria.

### Case Report

#### Aortic Intimo-Intimal Intussusception: An Infrequent Complication of Aortic Dissection Case Report and Review of the Literature

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Intimo-intimal intussusception is an infrequent manifestation of acute aortic dissection in which the intimal tear occurs circumferentially with intussusception of the ascending aortic intima downstream. Certain diagnostic tools may be inadequate to confirm the diagnosis. Here, we report such a case with a review of the pertinent literature. Neurologic presentation associated with severe aortic regurgitation must raise the probability of aortic dissection complicated with intimal intussusception.

### **A Case of Hypoplastic Left Heart Syndrome Diagnosed by Fetal Echocardiography**

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Fetal echocardiography can now be used to detect congenital heart disease before birth, and increased experience with the four-chamber view has led a greater number of fetuses referred to pediatric cardi-

ologists for confirmation or exclusion of a cardiac lesion. Hypoplastic left heart syndrome includes hypoplasia of the ascending aorta, aortic valve atresia or severe stenosis, a small left ventricle, and mitral atresia or stenosis. Without surgical intervention, the condition is fatal and around 95% of newborns die in the first month of life. A 23-week old fetus was referred for echocardiography with a suspicion of congenital heart disease and was diagnosed to have hypoplastic left heart disease (atretic aortic valve, small left ventricle, hypoplastic ascending aorta, mild hypoplasia of the mitral valve) and a large trabecular ventricular septal defect. Termination was undertaken at 24 weeks gestation and postmortem examination confirmed the echocardiographic findings. The details of the fetal echocardiographic and postmortem macroscopic findings are presented in this report. Since long-term results of staged palliation remain disappointing, families tend to opt for the challenging decision of terminating the pregnancy.