

**OP-13  
SILENT CEREBRAL INFARCTION IN PATIENTS WITH DILATED  
CARDIOMYOPATHY**

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**Objectives:** Patients with dilated cardiomyopathy (DCMP) and intracardiac spontaneous echo contrast have an increased risk of thromboembolic events. Prevalence of silent cerebral infarction (SCI) has not been investigated in this patients group. The aim of this study is to investigate (1) the prevalence of SCI detected on cranial magnetic resonance imaging (MRI) in patients with DCMP and (2) to determine the associations between SCI, cardiac spontaneous echo contrast and some hematological parameters.

**Methods:** Consecutive patients with DCMP (12 female, 29 male; mean age 61±13) underwent cranial MRI, transthoracic and transesophageal echocardiographic examination. Hematological parameters studied were hematocrite, hemoglobin, platelets, sedimentation rate, C-reactive protein and fibrinogen. **Results:** Prevalence of SCI was 35% in the study group. Frequency of SCI according to various SEC locations and grades is presented on the table. Patients with moderate-severe left atrial SEC has significantly higher MRI lesions compared to patients without and mild SEC (p<0.03). Presence of left ventricular and aortic SEC had no statistically significant effect on SCI. Hematocrite, hemoglobin were significantly lower and fibrinogen level was significantly higher in patients with SCI (p=0.006, p=0.008 and p=0.03, respectively). In multivariate analysis, SCI was significantly correlated with the presence of moderate-severe SEC and hematocrite level. Sensitivity, specificity, positive and negative predictivity of moderate-severe SEC for the detection of SCI was 88%, 54%, 56% and 87%, respectively.

Grd 0-1 LASEC	13%
Grd 2 LASEC	56%
LVSEC (-)	30%
LVSEC (+)	56%
AOSEC (-)	29%
AOSEC (+)	55%

**Conclusion:** In patients with DCMP presence of moderate-severe left atrial SEC is significantly associated with the presence of SCI on cranial MRI.

**PP-15  
COMPARISON OF P WAVE DISPERSION AS A PREDICTOR OF  
ATRIAL FIBRILLATION BETWEEN A GROUP OF PATIENTS WITH  
HYPERTHYROIDISM AND HEALTHY POPULATION**

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We compared P wave dispersions, a novel predictor of atrial fibrillation, of two groups the former composed of patients with hyperthyroidism and the latter composed of healthy subjects in the view of very few studies published previously. Sixty patients (39F, 21M) with hyperthyroidism and 25 healthy subjects (16F, 9M) were randomly selected for the study from the clinics of endocrinology and general medicine. The two groups were compared according to their total (T) T3, total (T) T4, free (F) T3, free (F) T4, TSH, lipids, Pmax, Pmin and Pd values. Pmax, Pmin and Pd values were supplied from the evaluation of 12-lead standard surface electrocardiograms. Unifactorial variant analysis and Pearson's correlation were used in statistical analysis. When the group of patients with hyperthyroidism was evaluated in itself between the values of T13, T14, F13, F14, TSH, lipids Pmin and Pd values, there was no statistically significant correlation (p>0, 05). In the control group of healthy subjects was evaluated in itself between the values of T13, T14, F13, F14, TSH, lipids Pmin and Pd values, there was no statistically significant correlation (p>0, 05). There is not enough published material about P dispersion in patients with hyperthyroidism. In our study, we compared patients with hyperthyroidism that did not have any episodes of PAF and healthy subjects according to their P dispersions in the view of previous studies. As a result, it is known that hyperthyroidism triggers PAF episode. Increase in P dispersion values can be determined as a predictor of PAF. Our patients with hyperthyroidism are still being followed up for the onset of PAF and the change of their P dispersion values as they reach euthyroidism by medical treatment.

Patients with Hyperthyroidism Healthy Subjects

P max	P min	P d
98, 33±16, 07	44±10, 11	54, 33±14, 19
92, 8±12, -12	62, 8±10, 21	30±10
NS	p<0.0001	p<0, 01

**PP-14**

**THE COMPARISON OF CARDIOVASCULAR RESPONSE TO  
ISOMETRIC AND ISOTONIC EXERCISE IN PATIENTS WITH  
CHRONIC ATRIAL FIBRILLATION**

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Treadmill test is isotonic exercise test, it can give clues about cardiovascular responses during activities dominated by dynamic component. Lifting, pushing and squeezing are conditions dominated by static component and they are evaluated by isometric exercise tests. The aim of our study is to evaluate cardiovascular response to isotonic and isometric exercise and exercise tolerance in patients with nonvalvular atrial fibrillation (AF).

Fifty patients (mean age 63.6±10.3 years; 25 female, 25 male) with chronic nonvalvular AF (AF duration >1 year) taken in to the study. Exercise test limited with symptom performed as isotonic exercise. The handgrip test was performed to same patients as isometric exercise. Heart rate (HR) and systolic-diastolic blood pressure (SBP-DBP) were measured at rest and during all stages of exercise. The exercise time and MET value were noted. Exercise time during treadmill test was 7.18±2.65 minutes and MET value was 5.32±1.38. The HR, SBP, HxP values at the end of the first stage and at the end of exercise were significantly higher (p<0.0001). With isometric exercise SBP measured at first minute and exercise were increased significantly (p=0.015 and p=0.011).

Finally, HR response to isotonic exercise was significantly higher compared to isometric exercise in chronic AF patients. SBP increase significantly compared to rest in both exercise, but this increase was much more significant with isotonic exercise.

**PP-16**

**THE EFFECTS OF L-THYROXINE SUPPRESSION THERAPY ON  
CARDIAC AUTONOMIC FUNCTIONS IN PATIENTS WITH SIMPLE  
GOITER**

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The aim of this study was to evaluate the effects of L-thyroxin suppression therapy on arrhythmia frequency and cardiac autonomic innervations in patients with simple goiter.

**Methods:** Thirty-two young female patients with simple goiter were randomized into treatment (Group 1, n=16) and control (Group 2, n=16) groups. Group 1 received L-thyroxin to keep TSH levels between 0.1-0.5mmol/L, whereas Group 2 did not receive any drug. Before and 6 months after therapy subjects underwent echocardiography and 24-hour Holter monitorization to evaluate arrhythmia frequency and heart rate variability.

**Results:** Groups were similar with respect to age, body mass index and baseline serum hormone levels (all p>0.05). The baseline left ventricular (LV) systolic and diastolic function parameters, mean HR, total power (TP, msec<sup>2</sup>), high frequency (HF, 0.15-0.40 Hz) and low frequency (LF, 0.04-0.15 Hz) parameters of both groups were also similar. No significant alterations was observed in mean HR, frequencies of ventricular and supraventricular arrhythmias with L-thyroxin therapy (p>0.05). After 6 months of thyroxin therapy TP (6790 ± 7549 vs. 14205±12865, p=0.028), LF nu (24.8±6.1 vs. 31.8±13.2, p=0.036) and HF nu (6.8±5.2 vs. 12.6±9.8, p=0.023) increased significantly with a tendency to the reduction in LF/HF ratio (3.7±3.0 vs. 2.7±2.0, p>0.05). As time domain analysis parameters pNN50 and triangular interpolation of RR histogram (ms) did not change after 6 months (p>0.05). L-thyroxin therapy significantly increased stroke volume (p=0.03), stroke index (p=0.024), cardiac output (p=0.048) and cardiac index (p=0.045), whereas all other systolic and diastolic function parameters remained unaltered (all p>0.05).

**Conclusion:** L-thyroxin suppression therapy significantly increases various systolic LV function parameters, but has no effect on resting HR and arrhythmia frequency. Increased TP, with a tendency for a reduction in parasympathetic/sympathetic ratio after therapy indicates the alteration of autonomic cardiovascular system activity with thyroid hormones.

## EFFECT OF THE SLOW CORONARY FLOW ON ELECTROCARDIOGRAM

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**Objective:** QT interval dispersion reflects regional variations in ventricular repolarization and cardiac electrical instability. Slow coronary flow (SCF) in epicardial coronary arteries is a rare and unique angiographic finding. Whether this pattern of flow is associated with electrocardiographic abnormalities is unknown. Therefore, this study was designed to investigate whether SCF leads to electrocardiographic (ECG) changes.

**Method and Results:** For this aim 24 patients with angiographically proven SCF (group I) and 25 patients without coronary artery disease (group II) were included to study. Both groups underwent a routine standard 12-lead surface electrocardiogram recorded at 50 mm/sec during rest. QT dispersion (QTd), corrected QT (QTc), corrected QT dispersion (QTcd) were calculated manually. Mean heart rate was similar in two groups (92±7 vs 90±6 ms, p>0.005). Mean QRS interval durations were similar in two groups (74±8 vs 77±7, p>0.005). In group I QTd, QTcd were significantly higher than those of group II (QTd:73±14 vs 40±14, QTcd 71±15 vs 42±9, p<0.005).

**Conclusion:** Increased QTc and QTcd in patients with SCF may result from ischemia at the microvascular level. Also, slow flow of dye in otherwise patent epicardial coronary arteries may be associated with ventricular heterogeneity.

## EFFECT OF PACLITAXEL ADMINISTRATION ON ELECTROCARDIOGRAPHIC PARAMETERS REFLECTING VENTRICULAR HETEROGENITY

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**Objective:** During past several decades the prototypic taxane paclitaxel which disrupt tubulin dynamics, has been widely used in treatment of solid malignancies, including non-small cell lung carcinoma, ovarian and breast head and neck cancer. However, a variety of cardiac adverse effects have been reported during paclitaxel therapy. Therefore, in this study effect of paclitaxel infusion on electrocardiogram was investigated.

**Method and Results:** Twelve patients (7 female, 5 male; mean 55±9 years) receiving paclitaxel chemotherapy because of breast (in 6 cases), ovarian (in 3 cases) and non-small cell lung (in 3 cases) carcinomas were included to study. For all patients just before infusion and 1 hour after the end of infusion electrocardiogram was recorded. All records were obtained a routine 12-lead surface electrocardiogram (ECG). Electrocardiographic parameters suggesting ventricular heterogeneity were calculated manually. Mean heart rate, QTmax, corrected QT and QRS interval duration did not change after infusion. However, corrected QT dispersion (QTcd) significantly increased after infusion. (QTcd 41±9 vs. 70±11 ms, p<0.005)

**Conclusion:** Increased QT dispersion after paclitaxel infusion reflects autonomic dysfunction and it may also suggest the risk of potential serious arrhythmias resulting from this drug.

## THE EFFECT OF FASTING ON THE CIRCADIAN RHYTHM OF ACUTE MYOCARDIAL INFARCTION IN THE MONTH "RAMADAN"

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This study was performed with 655 consecutive patients (502 male, 153 female; age range 24-90, mean age:58.3±11.6) admitted to coronary care units of 11 different hospitals of Istanbul during the "Ramadan" months of 1995-2002. Our purpose was to evaluate the effect of fasting on the circadian rhythm of acute myocardial infarction (AMI).

Patients were grouped according to their fasting status (Group A: fasting group, n=375; Group B: non-fasting group, n=280). The groups were evaluated with regard to age, gender, time of onset of AMI and the elapsed time for admission to the hospital after the onset of AMI. The circadian rhythm was evaluated by dividing 24 hours of the day into 3 hours periods.

**Results:** There was no significant difference in age, gender, risk factors (hypertension, diabetes, hyperlipidemia, smoking, obesity and heredity) and in hospital mortality of fasting and non-fasting patients with AMI. History of MI was more common in group B. Characteristics of the circadian rhythms are shown on the table.

Time of onset of AMI	00-03 hours	03-06 hours	06-09 hours	09-12 hours	12-15 hours	15-18 hours	18-21 hours	21-24 hours
Group A (n=375)	53	79	33	42	34	60	40	34
Group B (n=280)	30	34	36	34	32	37	50	27
p value	NS	0.004	NS	NS	NS	0.01	NS	NS

**Conclusion:** The frequency of having AMI between 03 a.m. and 06 a.m. (meal time before fasting) and between 3 p.m. and 6 p.m. (meal time after fasting) was greater in the fasting than in non-fasting patients in the month "Ramadan". No significant difference was found in other circadian rhythm periods.

## ELECTROCARDIOGRAPHIC LOCALIZATION OF MANIFEST ACCESSORY PATHWAYS DURING PARTIAL PRE-EXCITATION

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**Objective:** Manifest accessory pathways (AP) could be reliably localized by ECG during maximal pre-excitation. We aimed at determining the localization of AP during minimal or partial pre-excitation.

**Methods:** The 12-lead ECG of 111 patients was analyzed during partial pre-excitation. The QRS and delta wave axis in the frontal plane and the QRS polarity in V1-V3 leads were determined. The localization of the AP was fixed during standard electrophysiological study and proved by radiofrequency catheter ablation.

**Results:** The distribution of the AP was as follows: 14 left anterolateral, 28 left lateral, 8 left posterolateral, 13 left posteroseptal, 20 right posteroseptal, 2 right anterolateral, 4 right lateral, 2 right posterolateral, 17 anteroseptal, 2 midseptal, 1 nodofascicular. During partial pre-excitation: 1) left AP could be excluded by positive delta waves in the peripheral leads; 2) negative or iso-electric delta waves in I and aVL leads determine left lateral AP; 3) negative or iso-electric delta waves in II, III and aVF leads are marks of posteroseptal AP; 4) positive QRS polarity in V1-V3 leads determines left AP. Left and posteroseptal AP could be reliably localized by 12-lead ECG during partial pre-excitation and the respective approach for radiofrequency catheter ablation is determined.

PP-21  
COMPARISON OF PULMONARY VENOUS FLOW VELOCITIES IN  
CHRONIC AORTIC REGURGITATION AND HEALTHY SUBJECTS

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**Introduction:** Although alterations in pulmonary venous flows has been studied widely in mitral regurgitation, there is paucity of data regarding their alterations in aortic regurgitation. The purpose of this study was to evaluate pulmonary venous flow velocities (PVFV) in chronic aortic regurgitation (CAR) and compare them with those of healthy subjects.

**Method:** Thirty two patients (age 43±18, 17 men and 15 women) with moderate to severe CAR in sinus rhythm and 33 healthy subjects (age 40±9, 15 men and 18 women) without any known heart disease were included in the study. Pulmonary peak systolic (S), diastolic (D), and atrial reverse (AR) flow velocities, velocity-time integrals (S-VTI, D-VTI, AR-VTI) and deceleration time of D (DDT) were recorded by placing the sample volume 0.5-1 cm into the upper right pulmonary vein under the guidance of Color Doppler flow mapping from apical 4 chamber view. S/D ratios were calculated. Results: S, D, S/D, S-VTI and D-VTI was found similar in both groups. Twenty five of the patients with CAR (75%) and 9 of the healthy subjects (28%) had an S/D ratio >1. Peak AR was significantly higher. DDT was significantly longer in the patients with CAR.

S (cm/s)	D (cm/s)	S/D	AR (cm/s)	S-VTI	D-VTI	AR-VTI	DDT (ms)
56.8±13.4	50.7±14.2	1.12±0.37	27.7±6.2	10.7±4.4	10.6±3.3	2.7±0.9	239.4±97.6
47.8±8.1	48.2±9.7	0.96±0.23	23.4±3.0	9.5±2.9	9.8±3.2	1.7±0.5	182.2±38.2
NS	NS	NS	0.004	NS	NS	0.02	0.002

**Conclusion:** Alterations of PVFV observed in CAR may be thought as an indicator of diastolic dysfunction of left ventricle. These results show that PVFV can be used in evaluation of diastolic dysfunction seen in patients with CAR.

PP-23  
ATRIAL MECHANICAL FUNCTION AFTER CARDOVERSION OF  
ATRIAL FIBRILLATION

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Atrial fibrillation (AF) causes atrial dilation. Conversion of AF to sinus rhythm results in a transient mechanical dysfunction of atria (atrial stunning). By using echocardiography this study examined the effects of different modes of cardioversion on left atrial size and atrial functions in patients with AF. A total number of 32 patients were enrolled in the study in whom sinus rhythm was maintained pharmacologically in 17, spontaneously in 10 and electrically in 5 of them. A transthoracic echocardiography was performed before and within 4 hours of successful cardioversion and was repeated on day 1, 7 and 30.

The left atrium was dilated in all patients during AF (45.4±5.8 mm, 41.4±1.7 mm and 43±3.3 mm, respectively). The size of the left atrium decreased after restoration of sinus rhythm in all three groups (p=0.01). Although there were no significant changes in mitral E wave velocities and E wave velocity time integrals during the 30 days follow up period, A wave velocities (43±17 cm/sec, 64±21 cm/sec, 71±26 cm/sec and 72±23 cm/sec) and A wave velocity time integrals (3.9±2.5 cm, 4.9±3.4 cm, 5.6±3.1 cm and 6.1±3.9 cm) showed a significant increase in the follow up period (p<0.01 and p<0.01, respectively). Similarly to the mitral valve flow patterns, peak A wave velocity and A wave velocity time integrals recorded from the tricuspid valve measurements showed significant increase after cardioversion. However it was seen the recovery of the mechanical functions of the right atrium was earlier than the left atrium. There were no significant differences in groups of spontaneous, electrical and pharmacological cardioversion in 24 hour hours, 7 days and 30 days after cardioversion when compared for the development of atrial stunning. As a result; it was shown that the delay of the left atrial mechanical functions was not related with the cardioversion method and besides the left atrial mechanical dysfunction, right atrial mechanical dysfunction had also occurred, but the recovery of the right atrial mechanical activity was earlier.

PP-22  
COAGULATION, FIBRINOLYTIC SYSTEM ACTIVATION AND  
ENDOTHELIAL DYSFUNCTION IN PATIENTS WITH MITRAL  
STENOSIS IN SINUS RHYTHM

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Systemic embolism is an important complication of mitral stenosis (MS). Anticoagulation can prevent this complication in patients with atrial fibrillation (AF), but in sinus rhythm (SR) it is still in debate. Here, the hemostatic parameters of MS patients in SR and also the systemic hemostatic parameters of patients both in AF with left atrium spontaneous echo contrast (LASEC) and without LASEC and normal population were studied. 46 patients with MS contributed to this study. 28 of them were in SR and 18 were in AF. None of them had left atrial thrombus in transesophageal echocardiography. We studied systemic venous fibrinogen, D-dimer, antitrombin-III (AT-III), tissue plasminogen activator (tPA), plasminogen activator inhibitor-I (PAI-I), von Willebrand factor (vWF), platelet factor 4 (PF 4) in these patients. The patients were divided into subgroups, first according to their rhythm as SR and AF, those with LASEC and SR, those with LASEC and AF, those without LASEC and SR, those without LASEC and AF. All of these groups were compared with the control group. The results suggest that fibrinogen, D-dimer, AT-III, vWF, PF 4 levels were greater in SR and AF groups than the control group (p<0.05). Also in the presence of LASEC both in SR and AF fibrinogen, D-dimer, AT-III, vWF and PF 4 levels were significantly higher when compared to the control group (p<0.05). Without LASEC fibrinogen, AT-III, vWF levels were high only in the AF group (p<0.05). D-dimer and PF 4 were greater in AF and in SR than controls (p<0.01). These parameters were also high in AF than SR (p<0.05). We studied also tPA and PAI-I levels. Only tPA levels were higher in AF group than SR and control group (p<0.05).

In patients with MS but in SR, especially in patients with LASEC, coagulation activation, platelet activation and endothelial dysfunction are similar with patients in AF.

PP-24  
THE CHANGES IN P WAVE DISPERSION IN THE ELDERLY  
POPULATION LIVING IN OLD AGE ASYLUM

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**Objective:** P wave dispersion is a recent ECG marker that reflects discontinuous and inhomogeneous conduction of sinus impulses. We examined the P wave dispersion (PWD) in the elderly population living in old age asylum.

**Method:** The study included 70 elderly subjects (mean age 74±9 years) and 32 healthy young volunteers (mean 36±6 ages). The 12-lead ECG was recorded at a paper speed of 50 mm/s. Maximum (Pmax) and minimum P wave duration (Pmin) was measured manually with a caliper and difference between two values was defined as PWD.

**Results:** P max and PWD were significantly higher in the elderly population compared to the young population. (97.9±8.0 vs. 92.8±7.5; 40.1±11.6 vs. 34.4±13.2, respectively). On correlation analysis, a positive correlation was detected between PWD and Pmax and age. (r=0.27, p=0.006; r=0.24, p=0.015, respectively). In the elderly group, when patients with hypertension, angina pectoris and heart failure were excluded, Pmax and PWD were still significantly higher than the young population. (Pmax: 97.4±7 vs. 92±6, p=0.008 and, PWD: 40±10.9 vs. 29.4±8.0, p=0.0001).

**Conclusion:** It was concluded that P wave duration and PWD increases in the very elderly population and it may be a useful marker for estimating the risk of atrial fibrillation seen in advanced ages.

### THE CHANGES IN QT DISPERSION IN THE ELDERLY POPULATION LIVING IN OLD AGE ASYLUM

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**Objective:** Increased QT dispersion is associated with increased risk for ventricular arrhythmias and sudden death. We examined the QT dispersion in the elderly population living in old age asylum and compared with healthy young subjects.

**Method:** The study included 75 elderly subjects (range 56-93 years; mean 75±9 years) and 36 healthy young volunteers (range 24-50 years; mean 36±6 years). All subjects had a 12-lead electrocardiogram recorded at 50 mm/s at rest. The QT interval was measured manually with a caliper.

**Results:** There was no significant difference in QT dispersion (QTd) and corrected QT dispersion (QTcd) between the two groups. However, when subgroup analysis was done in the elderly population, the individuals over 75 years had significantly higher QTcd than the ones under 75 years (43.7±19.4 vs. 33.5±13.9, p=0.011). Furthermore, there was no difference between the ones over 75 years and the ones under 75 with respect to the risk factors that could be responsible for increased QT interval duration including hypertension, heart failure, coronary artery disease, smoking and history of angina pectoris.

**Conclusion:** We found that QT dispersion increased significantly especially over the age of 75 and that increase in QT dispersion with aging was independent of the presence of hypertension, heart failure, coronary artery disease, smoking and history of angina.

### THE EFFECT OF ST RESOLUTION ON QT DISPERSION AFTER INTERVENTIONAL TREATMENT IN ACUTE MYOCARDIAL INFARCTION

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It has been reported that reperfusion treatment reduces QTd in acute myocardial infarction (AMI) cases. Successful myocardial perfusion is not synonymous with TIMI III flow. It has been demonstrated that in AMI, ST resolution grade is strongly correlated with left ventricle (LV) function and mortality, after primary angioplasty. In this study we investigated the relation between ST resolution grade and QTd and the feasibility of using QTd as the determinant of successful myocardial tissue perfusion in cases whose TIMI III flow in infarct related artery (IRA) is restored by interventional treatment in Amite study included 57 cases whose IRA was provided by primary angioplasty after the diagnosis of anterior AMI with ST elevation. The cases were allocated into three groups depending on the grade of ST resolution. In Group I (n=19-33%) there were full ST resolution cases; Group II (n=26-47%) included cases with partial ST resolution and Group III (n=12-20%) included those with unsuccessful ST resolution. 38 were male and their average age was 54.4±11.6 years. There were no differences among groups in terms of risk factors, stent diameters, symptom onset-balloon time, LV functions and preprocedure QTcd (p=0.274). After the procedure, a significant reduction in QTcd was found within the groups (p=0.0001 in Group I; p=0.004 in Group II; and p=0.011 in Group III). The comparison of reductions in QTcd after the procedure showed a 24.2±14.2 ms reduction (from 74.2±15.7 ms to 50±13.7 ms) in Group I; an 11.8±16.1 ms reduction (from 67±14.8 ms to 55.1±14.7 ms) in Group II and a 12.5±11.5 ms reduction (from 64.5±19.3 ms to 52±16.7 ms) in Group III. There was a statistically significant difference of p=0.015 between Groups I and II and a p=0.028 difference between Groups I and III. There was no statistically significant difference between Groups II and III (p=0.916). As a result it was established that in AMI, TIMI III flow led to a reduction in QTcd and the full provision of myocardial perfusion made an additional contribution to the electrical stability of the myocardium.

### HEART RATE VARIABILITY IN PATIENTS WITH SYSTEMIC SARCOIDOSIS

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**Aim:** The identification of subjects with systemic sarcoidosis at higher risk for sudden death is an unresolved issue. An influence of the autonomic activity on the genesis of ventricular arrhythmias was postulated. Heart rate variability (HRV) analysis provides a useful method to measure autonomic activity, and is a predictor of increased risk of death in various conditions. For these reasons, the aim of the study was to evaluate HRV in patients with systemic sarcoidosis. **Methods:** The study included 35 patients with systemic sarcoidosis who were not taking antiarrhythmic medications. The diagnosis of systemic sarcoidosis was made by biopsy. Thallium scintigraphy was performed to all patients with systemic sarcoidosis. The cardiac sarcoidosis was accepted as abnormal thallium scintigraphy and normal coronary arteriography. The Time-domain analysis of HRV was expressed as the standard deviation of all normal to normal NN intervals (SDNN) detected during 24-hour Holter monitoring. Twenty-four healthy subjects represented a control group for HRV analysis. **Results:** The patients characteristics and 24-hour Holter monitoring results were presented in table.

	Age (years)	Female (n)	LV EF (%)	Mean Heart Rate (bpm)	SDNN (msec)
Abnormal Thallium (n=16)	44±13	10	63±10	88±9*	72±32*,†
Normal Thallium (n=19)	42±15	13	67±8	83±13	110±46*,†
Control (n=24)	40±10	13	69±6	75±10	152±36

\*: Comparison with control group (p<0.017)

†: Comparison between two patients groups (p<0.017)

**Conclusion:** This is the first study showing that HRV is decreased in patients with systemic sarcoidosis compared to the control group. This decreasing is more obvious in patients with cardiac sarcoidosis.

### THE EFFECT OF BETA-BLOCKERS ON QT DISPERSION AND VENTRICULAR LATE POTENTIALS IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION RECEIVING THROMBOLYTIC THERAPY.

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We do not know any relationship between ventricular late potentials (LP) and QT dispersion (QTd) as non-invasive markers of arrhythmogenic substrate. Our aim was to evaluate the effect of Beta Blockers (BB) on LP and QTd/OTd values in patients (Pts) with acute myocardial infarction (AMI) receiving TT. **Methods:** We studied 51 Pts presenting with AMI (<6 hours). All Pts received TT and were evaluated with coronary angiography at pre-discharge. Group I includes 25 Pts received Metoprolol (15 mg IV on admission followed by 50 mg BID). Group II includes 26 Pts not received Metoprolol. SAECC recording were obtained prior to TT and 10 days later. Gomes criteria were used for evidence of LP's. QT and corrected dispersion (QTcd) values were calculated manually on 12 lead ECG. Changes observed in SAECC recording and QTd values after TT were correlated with regard to usage of BB. **Results:** There were no significant differences between the clinical characteristics, risk factors, and angiographic findings of the groups. Baseline SAECC findings and QT dispersion values were also similar between groups. Incidence of LP, QTd and QTcd values significantly decreased after TT in BB group, however this change was not observed in Pts who did not received BB.

	Group I		P Value	Group II		P Value
	Baseline	At discharge		Baseline	At discharge	
QTd (ms)	61.3±20.6	50.56±15.4	0.042	67.69±23.4	59.0±25.0	NS
OTcd (ms)	69.0±25.8	56.02±20.52	0.048	78.4±27.5	65.0±30.0	NS
LP (+) (%)	4 (%16)	2 (%8)	0.0001	5 (%19)	6 (%9)	NS

**Conclusion:** Beta Blockers reduce the incidence of LPs and QTd/OTcd values following TT in Pts with AMI. This might be explained by the possible beneficial effect of BB on the arrhythmogenic substrate.

PP-29  
HEART RATE VARIABILITY IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Heart rate variability (HRV) is a useful tool for the detection of sympathetic-parasympathetic balance in the autonomic nervous system. Autonomic nervous system involvement in patients with rheumatoid arthritis (RA) has rarely been studied, and has shown conflicting results. Our purpose was to determine if HRV showed in a changes in patients with RA in comparison with normal population.

A short time analysis of HRV was performed for both the frequency at the time domain in 48 patients (35 female and 13 male, mean age  $47 \pm 11, 2$  years) with RA and 44 matched controls. In the time domain analysis, patients displayed lower standard deviation of the mean (SDNN) than did healthy subjects ( $104.5 \pm 46.7, 140.4 \pm 19.8; p < 0.0001$ ). Patients tended to display higher pNN50 ( $10.9 \pm 11.8, 8.0 \pm 4.9$ ) and RMSSD ( $33.8 \pm 23.7, 29.7 \pm 9.8$ ) values than did healthy subjects, but the differences were not statistically significant ( $p > 0.05$ ). In the frequency domain analysis the spectral measures of HRV showed a reduction of high frequency (HF) values ( $26.3 \pm 13.2, 35.1 \pm 8.4$ ) and an increase of low frequency (LF) values ( $67.3 \pm 17.6, 52.7 \pm 12.4$ ); as a result, the ratio between low and high frequencies (LF/HF) ( $3.64 \pm 1.9, 2.14 \pm 1.2$ ), representative of sympathovagal modulation, was significantly increased ( $p = 0.001, p = 0.012$  and  $p = 0.003$ , respectively).

Our data suggests an increase in the sympathetic control of the heart rate in patients with RA. This increased sympathetic activity could play a key role in the development of ventricular tachyarrhythmias in patients with RA, and may be relevant with the higher incidence of sudden death in this disorder compared to controls

PP-31  
CORONARY ARTERY ECTASIA LEADS TO VENTRICULAR REPOLARISATION ABNORMALITIES

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QT interval and QT dispersion (QTd) are valuable ECG parameters for evaluating the ventricular repolarisation abnormalities in different cardiac conditions. Prolonged QT interval and increased QT dispersion have been shown in patients with atherosclerotic coronary artery disease. However ventricular repolarisation parameters evaluated using QT interval and QT dispersion have not been studied widely in patients with coronary artery ectasia (CAE).

**Methods:** Ninety patients underwent coronary angiography were enrolled in this study, 30 patients had CAE, 30 patients had significant coronary artery lesion without ectasia and 30 patients had normal coronary artery. QT interval measurements were done from twelve lead surface ECGs. QT dispersion was calculated as a difference between QT max-QT min.

**Results:** There was no significant difference between groups in age and gender ( $p > 0.05$ ).

	CAE	CAD+	CAD-
QT max (ms)*	409±21	402±18	388±20
QT min (ms)**	347±19	350±17	352±16
QT dispersion (ms)***	50±8	51±9	34±6

\*CAE vs CAD+;  $p = 0.18$ ; CAE vs CAD-;  $p = 0.03$ ; CAD vs CAD-;  $p = 0.04$

\*\*CAE vs CAD+;  $p = 0.6$ ; CAE vs CAD-;  $p = 0.5$ ; CAD vs CAD-;  $p = 0.8$

\*\*\*CAE vs CAD+;  $p = 0.4$ ; CAE vs CAD-;  $p = 0.01$ ; CAD vs CAD-;  $p = 0.01$

**Conclusions:** We found that QT interval was prolonged and QT dispersion was increased in patients with CAE and patients with CAD. Our findings suggest that the ventricular repolarisation abnormalities in patients with CAE may be due to myocardial ischemia caused by slow coronary flow seen in this patient population.

PP-30

TIME-RELATED HEART VEGETATIVE BALANCE CHARACTERISTICS

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Changes of the heart vegetative balance between morning (8 to 9h) and afternoon (14-15 h) measurements were studied in 22 healthy subjects. The selection of these two daytime periods was substantiated by the established higher risk of cardiovascular incidents in the morning and the relatively invariant heart autonomic control in the afternoon hours. The changes were analyzed by RR-variability indices from ECG recordings in resting state and with vegetative nervous system stimulation by handgrip test and Valsalva maneuver. Using a non-parametric statistical criterion, it was shown that there were no significant differences between the morning and afternoon values of the respective indices, between morning and afternoon handgrip tests and between morning and afternoon Valsalva maneuvers. However, there were significant differences in comparison of the indices values between resting state and handgrip test and resting state and Valsalva maneuver, both from morning and afternoon measurements. Moreover, the significantly differing indices were clustered in different constellations, when comparing resting state recordings with morning and afternoon stimulation tests. For this reason, the authors introduced an indicator for time-related vegetative balance changes. The indicator quantitatively evaluates the power of each RP-variability index to respond to changes in the autonomic control, in comparisons between resting state and stimulation data in the morning and afternoon measurements. These evaluations showed the low power of the frequency-domain indices VLF, LF and HF to respond to time-related balance changes in stimulation, with respect to its resting state. The reason for this finding is that these indices have a high sensitivity even toward small changes in the balance. Thus, their values change in the same direction, with stimulation tests versus resting state, both in morning and afternoon measurements for all subjects. Therefore, they cannot respond to specific differences in sympathetic and parasympathetic tone in morning and afternoon hours. The time-domain indices have considerably higher power to react to relative morning and afternoon changes in the two vegetative nervous system components. Based on the estimations of the RR-variability indices obtained by the introduced indicator, a profile was synthesized to represent time-related heart vegetative balance changes in healthy subjects. It can be used for comparable assessment of vegetative balance changes in healthy subjects. It can be used for comparable assessment of vegetative balance changes in subjects with cardiovascular disease. It was established, that in spite of the relative stability of the vegetative nervous system in healthy subjects, hypersympatheticotonia and relatively lower parasympathetic tone were present in the risky morning hours.

PP-32

COMPARISON OF TILT TABLE TEST RESULTS BETWEEN MALES AND FEMALES

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**Introduction:** There may be gender differences in response to tilt table testing (TTT). We investigated the effect of gender on TTT results.  
**Methods:** We retrospectively studied 135 patients (46 males and 89 females; aged 13-78, mean  $42.1 \pm 14.5$ ) who had undergone TTT with complaint of syncope or presyncope. Type of response to the TTT were compared between males and females.

Positive response to TTT was seen in 86 (63.7%) patients. Test positivity did not differ between males and females ( $n = 28$  [60.9%], and  $n = 58$  [65.2%], respectively;  $p = 0.706$ ). Males were older than females (mean ages,  $45.9 \pm 15.2$  vs.  $39.8 \pm 13.7$ ;  $p = 0.031$ ). Positive response was mostly syncope in males, and presyncope in females (Table 1). The most frequent type of response was the mixed type in both gender. Vasodepressor response was more frequent in females, however other types were not significantly different in terms of gender (Table 1).

	Response to TTT (Syncope, n(%))	Syncope, n(%)	Response type (Mixed, n(%))	Cardioinhibitory, n(%)	Vasodepressor n(%)
Males (n:28)	12(42.9%)	16(57.1%)	20(71.4%)	5(17.9%)	3(10.7%)
Females (n:58)	38(65.5%)	20(34.5%)	33(56.9%)	4(6.9%)	21(36.2%)
p	0.036		0.02*		

**Conclusion:** Frequency of syncope and presyncope in response to TTT is different in terms of gender. Although mixed type response is the most frequent type in both gender, frequency of vasodepressor type was significantly higher in females.

PP-33

### IPRATROPIUM BROMIDE DECREASES CARDIAC VAGAL MODULATION MORE THAN SALBUTAMOL DURING MILD EXERCISE: A RANDOMIZED, DOUBLE BLINDED, PLACEBO-CONTROLLED, CROSSOVER STUDY

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**Objective:** It is well known that systemic administration of beta adrenergic agonists and anticholinergic drugs impair autonomic control of the heart. The aim of this study was to compare the effects of therapeutic doses of inhaled salbutamol (S) and ipratropium bromide (IB) on autonomic modulation to the heart by using heart rate variability (HRV) parameters.

**Method:** The study consisted of 10 healthy male volunteers (mean age 27±1 years). Participants were studied in a randomized double-blind crossover manner. S (200 mg), IB (40 mg) and placebo were administered using metered-dose inhalers. Time and frequency domain parameters of HRV were calculated in supine position and during handgrip exercise before and after taking each drug.

**Results:** In time domain HRV parameters, IB administration resulted in a reduced RMSSD during exercise compared with baseline values (42±16 versus 26±3, respectively,  $p=0.021$ ). This effect was not seen with S or placebo administration. None of the agents influenced frequency domain parameters of HRV.

**Conclusion:** IB has unfavorable effects on autonomic control of the heart compared to S, especially during mild sympathetic stimulation such as handgrip exercise.

PP-35

### THE ROLE of ORGANIC CARDIAC DISEASE in PATIENTS UNDERGOING ELECTROPHYSIOLOGICAL STUDY for SYNCOPE

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This study aims to show the effects of organic cardiac disease (OCD) on electrophysiologic study (EPS) results in patients with syncope and presyncope of undetermined etiology. The study group consisted of 215 patients (65 female, 150 male; mean age 50,8±15,3 years). Patients were had standard work-up towards syncope etiology. Patients whose etiology remained unidentified with these non-invasive measures were enrolled in the study. The presence of OCD was assessed with echocardiography and coronary angiography, if needed. After baseline measurements were taken, sinus node function and atrioventricular (AV) conduction characteristics were assessed. Subsequently, supraventricular tachycardia (SVT) and ventricular tachycardia (VT) induction were attempted. There was OCD in 111 patients [OCD (+) group] and not in 114 patients [OCD (-) group]. Left ventricular ejection fraction was higher in OCD (-) group than in OCD (+) group (65,2±5,8% vs. 49,5±15,2%, respectively) ( $p<0.0001$ ). Inducibility of ventricular arrhythmia was more in the OCD (-) group than OCD (+) group ( $p<0.005$ ). On the other hand, induction of SVT was achieved in 13,5% of patients in the OCD (-) group and 6,3% of patients in the OCD (+) group ( $p<0.05$ ). AV conduction defect was more frequent in the OCD (+) group than the OCD (-) group. There was no difference between groups in respect with sinus node dysfunction. It was shown that patients with OCD and syncope/presyncope of undetermined etiology had a higher incidence of ventricular arrhythmia and conduction system defects than those without OCD. On the other hand, SVT was induced at a higher rate in patients without OCD.

PP-34

### THE LONG QT SYNDROME IN CHILDREN WITH CONGENITAL DEAFNESS IN WESTERN ANATOLIA

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**Objectives:** The long QT syndrome (LQTS) is associated with recurrent syncope and cardiac arrhythmia. The syndrome may be associated with congenital deafness. The aim of this study is to determine the prevalence of the LQTS in children with congenital deafness in western Anatolia.

**Method:** We attempted to investigate the prevalence of the long QT syndrome in schools for children with hearing loss from three different cities (Afyon, Kütahya, Eskişehir) in the western Anatolian region. The study included 10 children (age 7-18 years) with congenital deafness and 12-lead electrocardiogram was obtained from all patients. The corrected QT interval (QTc) was calculated using Bazett's formula.

**Results:** Among the study group there were 5 children with long QT interval. They were diagnosed as having LQTS according to Schwartz criteria (5,4%, 5 children).

**Conclusion:** This study is the first study conducted in Turkey on relatively large scale. Also the prevalence (5,4 %) is the highest one detected in Turkey so far. The reason for this could be the consanguineous marriage frequency in Turkey. In our study we established that the frequency of consanguineous marriage was 57,8% in deaf children's family. Thus, all children with congenital deafness must be evaluated for LQTS by taking an electrocardiogram.

OP-36

### THE FINDINGS OF INTRAVASCULAR ULTRASOUND FOLLOWING ORTHOTOPIC HEART TRANSPLANTATION: The first experience in Turkey

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To investigate the extent of cardiac allograft vasculopathy (CAV), 15 (mean age: 51±11,6 years, female n = 6) heart transplant recipients were studied 12±3 months after transplantation with intravascular ultrasound (IVUS). One hundred thirty and six coronary artery segments (15 left main coronary, 45 left anterior descending artery, 40 left circumflex artery and 36 right coronary arteries) were studied. The vasculopathy was defined as a site with intimal wall thickness (IWT) ≥0,5mm. Dobutamine stress echocardiography (DSE) and coronary angiography (CA) were performed in all patients (pts). Biopsy score was considered as the average numerical value assigned to each grade of rejection divided by the total number of biopsies within 1 year.

**Results:** The extent of coronary vessel wall alterations on ultrasound correlated to donor age ( $r=0.46$ ,  $p=0.02$ ) but not to perioperative ischemia time and the other coronary artery risk factors ( $p>0.05$ ). The 67% of patients had ≥ 2 affected arteries and 22% segments were located distally. The mean of IWT was 0,66±0,1 mm in pts with CAV. And the intimal thickening was more pronounced in segments of the LAD than the other arteries ( $p=0.03$ ). The 85 % of all segments was normal in CA, The DSE was normal in all pts. The value of biopsy score was demonstrated a correlation between the grade of rejection and the mean intimal thickening ( $r = 0.48$ ,  $p = 0.002$ ).

**Conclusion:** The IVUS is a sensitive method for the detection of CAV, even severe can often not be shown by CA. Also IVUS shows a large variability of CAV involvement between different coronary arteries and segments in each patient.

OP-37  
**THE VALUE OF MRI ON THE EVALUATION OF MYOCARDIAL VIABILITY AFTER DIFFERENT PCI STRATEGIES IN ANTERIOR WALL MYOCARDIAL INFARCTION**

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**Purpose:** The aim of study was to assess the value of MRI (Magnetic Resonance Imaging) in middle-term follow-up after primary or facilitated PCI (Percutaneous Coronary Intervention) on myocardial viability.  
**Methods:** Twenty-five patients with mean age  $54 \pm 10$  years who had primary or facilitated PCI with culprit stenosis in LAD artery were examined after a mean period of 4 months. All Patients were examined by MRI (1-rest cine GRE evaluation 2-delayed enhancement study) to assess myocardial viability. Global cardiac function and wall motion were assessed with cine-gradient echo sequences in resting conditions. Late enhancement was examined 15-20 min after contrast injection (0.2 mmol/kg Magnevist) with use of Turbo-Flash sequences (Inversion Time 250-300 ms). Heart was examined in 2-chamber transversal projection and 4-chamber longitudinal projection, and been divided into 17 segments for evaluation.  
**Results:** Total 425 segments were examined. Mean EF (Ejection Fraction) by MRI was 51% ( $\pm 9\%$ ). 48 segments (11%) were hypokinetic, 16 (3%) were akinetic in rest evaluation. 22 (5%) were hypokinetic and 17 (4%) akinetic after low-dose dobutamine injection. Late enhancement was visualized in 17 akinetic and 5 hypokinetic segments during dobutamine stress. Late enhancement in earlier hypokinetic (in stress) segments was visualized only in subendocardial layer of myocardium, but in all akinetic segments was visualised in all myocardial layers. Akinetic segments with late enhancement were identified as non-viable area.  
**Conclusion:** Both rest-cine MRI and late enhancement study can be use & together in patients' follow-up after primary or facilitated PCI for evaluating myocardial viability.

OP-39  
**DIAGNOSTIC VALUE OF ECG-GATED RECONSTRUCTION WITH MSCT ON DETECTION OF CORONARY BYPASS GRAFTS PATENCY**

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**Introduction:** Contrast enhanced MSCT is moderately safe and risk free assessment for non-invasive evaluation of bypass grafts' patency.  
**Methods:** We evaluated 84 patients between 42-75 years with coronary bypass grafts. Totally 235 bypass grafts (26 arterial, 209 venous) were evaluated: 65 venous grafts to RCA, 71 venous and 26 arterial graft to LAD- and 73 venous grafts to Cx. Images were obtained throughout the entire cardiac cycle and then reconstructed at diastole with retrospective ECG gating, MSCT examination and coronary angiography were performed and evaluated by two different teams as a double blind study.  
**Results:** With MSCT 165 grafts (147 venous and 18 arterial) were identified as patent and 70 grafts (62 venous and 8 arterial) were diagnosed as occluded, or had significant stenosis ( $>50\%$ ). With coronary angiography 169 patent (149 venous and 20 arterial) and 66 occluded, or significantly stenosed (60 venous and 6 arterial), 8 bypass grafts (2 arterial and 6 venous: 4 to LAD and 2 to Cx) considered as occluded by MSCT, while they found patent by conventional angiography. Also, 4 grafts found patent by MSCT while have been reported as occluded grafts in angiography (1 to LAD, 2 to Cx, 1 to RCA). The specificity and sensitivity of MSCT in detection of graft patency were 94.7% and 96.4% respectively.  
**Conclusion:** MSCT is a valuable method in evaluation of coronary bypass grafts patency. Might also be effective on screening patients after CABG procedures.

OP-38  
**HEART TO LUNG RATIO OF Tl-201 DURING DOBUTAMINE STRESS AS A MARKER OF PRESENCE AND SEVERITY OF CORONARY ARTERY DISEASE**

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Although it is well defined that hemodynamic parameters obtained during dobutamine stress are similar to exercise test, there were a few data evaluating the usefulness of Tl-201 lung uptake in CAD patients. The aim of the study was to determine whether lung uptake of Tl-201 during dobutamine stress could be a marker of disease or its severity. Tl-201 SPECT with dobutamine pharmacological stress was applied to 63 patients (25 female, 38 male, mean age:  $59.4 \pm 8.1$ ) who also underwent coronary angiography (CAG) within a month period. CAG revealed significant CAD in 37 patients (single vessel: 24, multivessel: 13). Lung and heart Tl-201 values and heart to lung ratios (HLR) were measured from anterior projection images by drawing ROIs. HLR's were also compared with summed stress scores (SSS) and TID index of the left ventricle. Perfusion SPECT images were evaluated according to five-point scoring system using a 20-segment model. Defect extent was quantified using an automated algorithm ( $-2.5SD$ , percent to total left ventricle area) from normalized quantitative polar maps. Significant differences were observed for HLR between normals and patients with CAD,  $p < 0.001$ . (single vessel:  $p < 0.05$ , multivessel:  $p < 0.001$ ) Increased HLR were inversely correlated with SSS ( $p < 0.001$ ,  $r = -0.92$ ) and defect extent ( $p < 0.001$ ,  $r = -0.65$ ) TID index were found to be abnormal in only 6 patients with CAD and there was not any correlation between TID and HLR. Smoking status were effective on HLR in normal group (smokers:  $2.35 \pm 0.44$ , nonsmokers:  $2.88 \pm 0.21$ ,  $p < 0.05$ ) but not in CAD patients (smokers:  $2.09 \pm 0.49$ , nonsmokers:  $2.17 \pm 0.53$ , ns). Increased Tl-201 lung uptake during dobutamine stress could be considered as a significant marker of severe and extensive CAD and it is well correlated with anatomic and functional evidences of disease.

OP-40  
**IS THERE ANY CIRCADIAN VARIATION OF HEART RATE VARIABILITY IN CHILDREN WITH NEURALLY MEDIATED SYNCOPE? VARIABILITY IN CHILDREN WITH NEURALLY MEDIATED SYNCOPE?**

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The purpose of our investigation was to examine serial changes in autonomic nervous system activity along with measurements of heart rate variability, in assessing the mechanism that underlie neurally mediated cardiac syncope (NMCS) in children. Previous researches that used heart rate variability analysis alone to understand changes in autonomic activity during tilt-table testing (HUTT) that result in NMCS has provided conflicting results. We performed heart rate variability over 24-hour electrocardiography to assessed sympatho-vagal balance in the absence of external stimuli in children with NMCS. Heart rate variability was examined at nighttime and daytime periods in 28 patients with recurrent episodes of NMCS within the last 2 years (10 male: mean age  $14.5 \pm 1.34$  years) and 14 healthy individuals were selected our outpatient clinic (10 male, mean age  $14.07 \pm 1.85$  years). Time domain parameters (pNN50 and rMSSD), indexes of vagal tone, and frequency domain parameters, expressing the overall heart rate variability, vagal (HF) and sympathetic (LF) activity, and autonomic balance (LF/HF ratio) were compared between groups by student-t test. Significant reduction of vagal tone were found for patients with NMCS, together with increased sympathetic activity (increased LF/HF ratio) in nighttime period. This findings could open new insights in the pathogenesis of vasovagal syncope because of the shift of the autonomic balance toward sympathetic activation near the syncopal episode.

OP-41

THE DETERMINANT OF THE ABNORMAL PHASIC CORONARY FLOW PATTERN IN PATIENT, WITH OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY

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**Background:** Advancement in transthoracic Doppler echocardiography (TTDE) provides noninvasive measurement of coronary flow velocities (CFV) in the distal epicardial coronary arteries. Objective: We aimed to visualize the CFV of pts with obstructive hypertrophic cardiomyopathy (OHCM) by using TTDE, and to evaluate the relationship between the abnormal CFV pattern and conventional echocardiographic measurements.

**Methods:** In 21 patients with OHCM, CFV in the distal LAD were measured by TTDE (3.5MHz) under the guidance of color Doppler flow mapping. In addition, standard 2-D TTE was performed. The results were compared with 10 controls.

**Results:** The LV mass index was significantly higher in OHCM than controls (112±15 vs.257±35, p<0.001). Peak diastolic velocity and VTI was also higher in OHCM than controls (63±21 cm/sec-18, 5±4 cmvs.41±11 cm/sec-14, 2±5, p<0.01 for both). The qualitative analysis of systolic velocities revealed abnormal flow patterns in 15 (71%) pts with OHCM (11 reversal flow and 4 no systolic flow). Since the CFV were in normal antegrade form in all controls (p<0.0001), the peak velocity and VTI were significantly higher than OHCM (24±9cm/sec-9, 5±4cmvs.-17±10cm/sec-4, 5±6cm, p<0.001). A significant positive correlation between diastolic CFV and IVS thickness index and a moderate negative correlation between systolic CFV and IVS thickness index has been determined (r:0.79, p:0.0001, r:0.64, p:0.008, respectively). However, there was no significant correlation between any CFV measurement and systolic obstruction gradient.

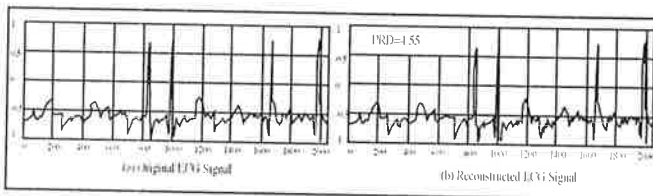
**Conclusion:** CFV measurements of distal LAD by TTDE demonstrate a significant increase in diastolic velocities whereas a significant reduction of systolic velocities in pts with OHCM. The local functional and structural changes regulating coronary flow may more effective in the generation of abnormal CFV patterns that closely correlate with septal thickness rather than obstruction severity in pts with OHCM.

OP-43

A NEW MODELING METHOD OF THE ECG SIGNALS BASED ON OPTIMISED PREDEFINED FUNCTIONAL DATABASE

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ECG signals are important data requiring various representation forms for long time data storage, ambulatory recording systems, transmission over the GSM or conventional telecommunication systems. Besides, these signals are indicative of and are utilized for diagnosis and therapy of many diseases etc. ECG signals present quasi-stationary behavior. Therefore in this work, on a frame basis, ECG signals  $X_i(t)$  is modeled by the form of  $X_i(t) = C_i \omega_i(t) \phi_i(t)$ . In this model,  $\phi_i(t)$  is defined as the Predefined Signature Function (PSC);  $\omega_i(t)$  is referred to as Predefined Envelope Function (PEF) and  $C_i$  is called the Frame-Scaling Coefficient (FSC). The sets  $S = \{\phi_k(t)\}$  and  $E = \{\omega_r(t)\}$  constitute a "Optimised Predefined Functional Database (OPFD)" to describe any measured ECG signal. Almost optimum forms of OPFD, namely  $\{\omega_r(t)\}$ ,  $\{\phi_k(t)\}$  pairs are generated in the Least Mean Square sense. Thus, the ECG signal for each frame is described in terms of the two index numbers "R" and "K" of OPFD and  $C_i$ . This new method provides significant data compression (2-20:1). Furthermore, once OPFDs are stored on each communication node, transmission of ECG signals is reduced to the transmission of "R" and "K" of  $\{\omega_r(t)\}$ ,  $\{\phi_k(t)\}$  pairs and the  $C_i$ , which also result in considerable saving in the transmission band. In conclusion, the method attempts to reduce the dimensionality of the ECG signal with high compression rates, while retaining all clinically significant features including P, QRS and ST waves.



OP-42

RESTORING SINUS RHYTHM IN PATIENTS WITH ATRIAL FIBRILLATION IMPROVES EXCESSIVE CARDIOVASCULAR RESPONSE TO ISOMETRIC AND ISOTONIC EXERCISE

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The aim of our study was to compare the tolerance to isometric and isotonic exercises by determining if an improvement would exist or not in cardiovascular response to these exercises after reverting rhythm to sinus in patients with atrial fibrillation (AF). Twenty-five cases (mean age 63.10±11 years) were included in the study. Isometric (handgrip) and isotonic (treadmill) tests were performed with all patients before and 48 hours after the rhythm was reverted to SR. Heart rate (HR) and blood pressures were measured at rest, at each stage of the exercise. Unpaired student's-t test was used for statistical evaluation. HR at rest, improved, and 3rd minutes of the test were significantly low after reverting rhythm to sinus at isometric exercise (p=0.0014, p=0.002, p<0.0001). There were no significant difference between double-product at rest. It was significantly higher at the 1st, 2nd, and 3rd minutes before reverting rhythm to SR (p=0.049, p=0.048, p=0.022). In isotonic exercise HR and double-products at rest (p=0.0015), at 1st, 2nd, and 3rd minutes of first stage and the end of exercise (p<0.0001, for all) were found to be significantly low after restoring SR. The exercise times and MET values increased after the SR was restored (p=0.0014, p=0.005). In conclusion, after reverting rhythm to sinus the cardiovascular responses to these exercises were improved and exercise tolerance increased.

OP-44

MONOPHASIC VS BI-PHASIC IMPULSES DURING TRANSTHORACIC CARDIOVERSION IN PATIENTS WITH PERSISTENT ATRIAL FIBRILLATION

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We aimed at comparing bi-phasic and monophasic impulses during external cardioversion (CVS) in patients with persistent atrial fibrillation. **Methods:** 114 patients with persistent atrial fibrillation were planned for regularisation with transthoracic CVS. Anesthesia was performed with Propofol. Group A consisted of 63 patients and the CVS was realized by monophasic impulses (Hellige defibrillator), Group B consisted of 52 patients and the CVS was performed with bi-phasic impulses (FRED defibrillator). The cardiodepressive effect was assessed by measuring the ST-depression on 10 tenth second after DC shock and the onset of the first QRS complex. **Results:** The two groups were aged- and sex-matched and with no difference concerning heart disease, left atrial dimensions, ejection fraction, duration of the rhythm disturbance, and type of anti-arrhythmic therapy. The success rate in group A concerning regularisation for more than 1 minute was 93.6% (59 patients), and in group B - 88.4% (46 patients), p>0.05. The maximum effectiveness and the total energy of the bi-phasic shocks were less than those of monophasic DC shocks (121.6±43.4 J vs. 240.3±86.4 J; p<0.0001, and 305.1±204.7 J vs. 408.1±245.9 J; p<0.001, respectively). Also, the ST-depression was smaller (1.06±0.56 mm vs. 1.51±1.19 mm; p=0.014) and the onset of the first QRS complex was earlier (1.49±0.59 sec vs. 2.71±1.41 sec; p<0.0001). **Conclusion:** The bi-phasic impulses during transthoracic CVS in patients with persistent atrial fibrillation are equally effective to monophasic impulses. However, they have less energy and cardiodepressive effect.



OP-45  
**THE EFFECTS OF CHEST PAIN TO BALLOON TIME AND DIFFERENT REVASULARIZATION STRATEGIES ON VENTRICULAR ARRHYTHMIAS**

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**Introduction:** Ventricular arrhythmias in acute myocardial infarction are still one of the major reasons of sudden cardiac death. Prior adjunctive drug therapy and different revascularization strategies might improve microcirculation, prevent ischemic events and this complication.

**Aim:** We evaluated effects of chest pain to balloon time and different catheter based revascularization strategies on ventricular arrhythmias.

**Methods:** From June 2001 to December 2002, 806 patients between 22-92 years old with acute myocardial infarction were enrolled in this study. All patients were transferred from remote hospitals (3-139 km) and had percutaneous coronary intervention. Lown's Grading System has been used for arrhythmia classification. Patients were divided into 2 main groups (group A: pain to balloon time <6 hours, group B: 6 to 12 hours), and 3 subgroups (group 1: only PCI, group 2: 2b/3a inhibitors prior to PCI, and group 3: Alteplase+ 2b/3a inhibitors prior to PCI). All patients had continuous ECG monitoring during hospitalization. Patients who had cardiogenic shock prior cathlab admission were excluded.

**Results:** Patients in Group A1, A2 and A3 had lower Lown's Grade than Group B1 B2 and B3 (p values are 0.0043, 0.0047 and 0.0039 respectively) regardless of revascularization strategies.

	Lown 0	Lown 1	Lown 2	Lown 3	Lown 4a	Lown 4b	Lown 5
Group 1A	18	74	26	17	10	13	12
Group 1B	10	138	59	34	15	26	25
Group 2A	6	5	3	3	2	1	2
Group 2B	2	9	7	6	4	3	7
Group 3A	19	36	14	12	4	6	5
Group 3B	24	59	32	24	10	13	11

**Conclusions:** When pain to balloon time is less than 6 hours: catheter based interventions alone or adjunctive drug therapy with 2b/3a inhibitors and/or alteplase is more effective and may prevent serious ischemic ventricular arrhythmias.

PP-47  
**THE EFFECT OF PRAVASTATIN ON FIBRINOGEN, C-REACTIVE-PROTEIN AND C3 COMPLEMENT LEVELS**

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**Aim:** To investigate the effect of pravastatin on C-Reactive-Protein (CRP), fibrinogen, and C3 complement levels in hypercholesterolemia patients.

**Method:** Fifty-seven patients with hypercholesterolemia formed the study group. Patients were divided into two groups. Group 1 consisted of 37 patients (17 of them had hypercholesterolemia and hypertension, 5 had previous myocardial infarction, 15 had hypercholesterolemia). Mean age was 54.3 and mean cholesterol was 266 mg/dl. CRP levels were measured with nephelometric method and C3 levels were measured with Claus method. Those patients were initiated 10 mg pravastatin daily and CRP, fibrinogen and C3 levels were remeasured 2 months later. Group 2 consisted of 20 patients (15 had hypertension and hypercholesterolemia, 5 had hypercholesterolemia). Mean age was 56.3 and mean cholesterol was 239 mg/dl. Group 2 had diet therapy and they had their CRP, Fibrinogen, and C3 levels measured at the beginning of diet therapy and two months later.

**Results:** Group 1 had their fibrinogen and CRP levels lowered statistically significantly ( $p < 0.05$  and  $p < 0.001$ , respectively), but C3 levels did not change significantly ( $p > 0.05$ ). Group 2 also had some decreases in their CRP and fibrinogen levels which did not reach statistical significance. C3 levels also did not change significantly.

**Conclusion:** Pravastatin therapy, in hypercholesterolemic patients, decreased fibrinogen and CRP levels but did not have any effect on C3 levels.

OP-46  
**RADIOFREQUENCY CATHETER ABLATION USING NONCONTACT MAPPING SYSTEM in PATIENTS WITH UNMAPPABLE TACHYARRHYTHMIA with CONVENTIONAL METHODS**

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It may be very difficult to ablate in patients with hemodynamically intolerable or non-sustained ventricular tachyarrhythmias and post-operative scar related supraventricular tachyarrhythmias. The study material group consisted of 26 patients (10 female, 16 male; mean age  $42.6 \pm 19.8$  years; aged 16-74) with ischemic ventricular tachycardia (VT) (N: 6), idiopathic right ventricular outflow tachycardia (N: 5), cardiomyopathy (N: 1), arrhythmogenic right ventricular dysplasia (N: 1), typical atrial flutter (N: 6), scar-related atrial flutter after surgical correction of congenital heart disease (N: 4), incessant ectopic atrial tachycardia (N: 2) and WPW syndrome (N: 1). Three of six patients with coronary heart disease had very frequent shocks after implantable cardioverter defibrillator implantation. The number of failed antiarrhythmic drugs was  $3.21 \pm 1.62$ . The noncontact mapping system (ENSITE®) was used in all 26 patients. This system is a high resolution noncontact based mapping and catheter navigation system that is a unique for its ability to map the activation of a heart chamber during a single beat. The success rate of ablation was 100%. Complications were developed in 2 (one pericardial fluid, one thrombophlebitis) patients. The mean ensite balloon preparing time  $12.8 \pm 3.8$  min, balloon insertion time  $12.8 \pm 4.4$  min, heart chamber geometry creation time  $20.3 \pm 9.1$  min, mapping time  $19.6 \pm 3.5$  min, ablation time  $81.4 \pm 51.8$  min, post-ablation EPS time  $22.3 \pm 7.0$  min, total procedure time  $177.7 \pm 54.7$  min and fluoroscopy time  $52.7 \pm 17.8$  min. The recurrence developed in 2 patients with typical atrial flutter during the follow-up of  $8.5 \pm 3.5$  months. We conclude that noncontact mapping may have opportunities in performing catheter ablation and expanding indications in cases with complex arrhythmia.

PP-48  
**CONTRIBUTION OF PLASMA LIPID DISTURBANCES TO VASCULAR ENDOTHELIAL FUNCTION IN PATIENTS WITH SLOW CORONARY FLOW**

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**Objective:** Slow coronary flow (SCF) is not an infrequent finding and its etiology has not been well documented. This study was designed to determine lipid disturbances and its association with endothelial function in patients with SCF.

**Method:** Twenty-seven patients with SCF were included to study (group-A). 30 members who had normal coronary arteries served as control group (group-B). Plasma lipid levels and flow-mediated dilatation-endothelium dependent (FMD) and nitroglycerine (NTG)-induced dilatation (endothelial independent) were measured.

**Results:** In group-A, HDL level was found significantly lower than group-B, and in group-A, triglyceride level was found higher than group-B. There were no significant difference in the brachial artery diameter at rest between two groups. FMD in group A was significantly smaller than that of group B. The percent NTG-induced dilatation was not significantly different between group A and group B. On regression analysis, there was a significant relationship between HDL cholesterol and FMD and plasma triglycerid level.

**Conclusion:** In patients with SCF plasma lipid disturbances and reduced flow-mediated dilatation were detected and it was concluded that plasma lipid disturbances might contribute to pathogenesis of SCF.

PP-49  
CARDIAC SYNDROME X AND AORTIC STIFFNESS

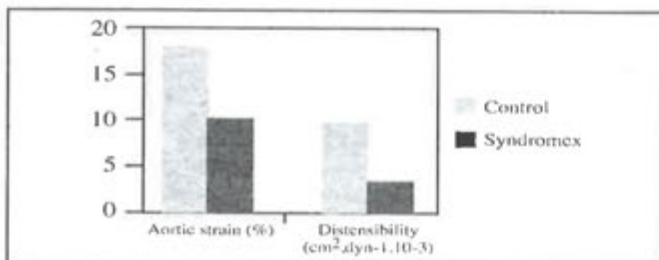
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**Aim:** In patients with syndrome X, the impairment of vasodilatory function of brachial artery has been detected and generalized vessel disease has been subjected. While excellent prognosis in patients with syndrome X makes someone to think of aortic stiffness should be in normal limits, on the other hand, generalized vessel involvement makes to think of opposite. This study aims to investigate aortic stiffness parameters in patients with cardiac syndrome X whose disorder believed to be a generalized disturbance of the vasodilator function of small arteries.

**Methods:** 18 patients with typical chest pain and angiographically normal coronary arteries associated with a positive exercise test were included in the study. The control group was consisted of 27 patients with angiographically normal coronary arteries and no ischemia on exercise testing. Anti-anginal medications were withheld 4 weeks before the study and transthoracic echocardiography was performed.

**Results:** The aortic diameter change was lesser in the syndrome X group than in the control group ( $0.15 \pm 0.04$  cm/m<sup>2</sup> versus  $0.28 \pm 0.12$ ,  $p < 0.001$ ). Likewise, aortic strain ( $9 \pm 3$  versus  $18 \pm 8$ ,  $p < 0.001$ ) and distensibility ( $4.01 \pm 1.71$  versus  $9.95 \pm 5.08$ ,  $p < 0.001$ ) was significantly lower in the syndrome X group than in the control group (see figure).

**Conclusion:** The deterioration in aortic elasticity properties in patients with cardiac syndrome X suggests that this disease might be a more generalized disturbance of the vasculature.



PP-51  
THE RELATIONSHIP BETWEEN SERUM IL-6 LEVELS AND THE EXTENT OF THE INFARCT AREA IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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**Background and Purpose:** Atherosclerosis is an inflammatory disease. High levels of IL6, a modulator of inflammatory response, are associated with poor prognosis in unstable angina and increased risk of future cardiac events in apparently healthy men. We aimed to investigate the relationship between IL6 levels and infarct size in acute myocardial infarction (MI). **Methods and Results:** A total of 57 patients: 23 with anterior, 28 with inferior, and 6 with non-Q MI were enrolled. Wall motion score indexes (WMSI) were calculated by echocardiographic examination. Serum IL6 levels were measured at 0 and 48 hours and the patients were grouped according to their IL6 levels. 19 % of patients with anterior MI, 9 % of patients with inferior MI and no patients with non-Q MI were in the highest IL6 group (IL6 level > 10 times normal). The patients with highest serum IL6 levels (> 10 times normal) at 0 and 48 hours had more serious systolic dysfunction (WMSI > 1.7) as compared to patients with mild to moderate elevations of IL6.

**Conclusions:** High IL6 levels seem to be related to infarct size as assessed by echocardiography in acute MI. Hence, serum IL6 levels can be a prognostic indicator for identifying acute MI patients with high risk. Whether high IL-6 levels are due to a larger infarct area or a larger infarct area is due to an exaggerated immune response marked by high IL-6 levels needs to be investigated.

PP-50  
ACUTE EFFECT OF CIGARETTE SMOKING ON VENTRICULAR REPOLARIZATION IN PATIENTS WITH CORONARY ARTERY DISEASE

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Hemodynamic effects of cigarette smoking have been well documented but acute effect of cigarette smoking on ventricular repolarization has not been adequately studied in patients with coronary artery disease (CAD). In this study, we investigated acute effect of cigarette smoking on ventricular repolarization in patients with CAD and compared the findings in individuals without CAD. For this purpose, 19 patients (18 male, 1 female, mean age  $54 \pm 10$  year) with angiographically proven CAD were included to the study. Twenty-one asymptomatic patients (17 male, 4 female, mean age  $43 \pm 8$ ) who had negative exercise ECG testing served as control group. Both groups were constituted from active smoker without hypertension, diabetes mellitus, congestive heart failure and left ventricular hypertrophy, medications that could affect heart rate and blood pressure had been withdrawn two days prior to the test in each group. After basal records (oxygen saturation with pulse oximetry, heart rate, noninvasive blood pressure and 12 leads ECG) were taken, patients smoked a cigarette. Recordings were repeated in 10 minutes intervals after cigarette smoking. QT dispersion (QTd) and corrected QT dispersion (QTcd) were calculated. The comparison of the two groups showed no significant difference in basal values, however QTd and QTcd values 10 minutes after smoking was significantly higher in patients with CAD than the control group. This difference disappeared 20 minute after smoking (Table). Finally, it is concluded that ventricular repolarization may impair shortly after smoking in patients with CAD. With this acute effect, cigarette smoking can trigger ventricular arrhythmias in those particular patients.

CAD	Control	p
43±12	48±17	NS
47±14	39±16	0.05
40±12	40±14	NS
50±12	50±18	NS
56±17	45±18	0.04
46±13	44±14	NS

PP-52  
THE FIBRINOLYTIC AND INFLAMMATORY POTENTIAL IN POST-MENOPAUSAL WOMEN: COMPARISON OF HORMONE REPLACEMENT THERAPY RECEIVER AND NON-RECEIVER

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The present study was undertaken to compare the fibrinolytic and inflammatory potential as well as the lipid profile of postmenopausal women, receiving HRT (HRT+) or not (HRT-) and to assess the significance of these parameters in low, moderate and high risk group women. 72 women (62 postmenopausal (mean age  $55 \pm 7$ ) and 10 premenopausal women (mean age  $39 \pm 5$ ) take part. There was no significant difference in age, blood pressure, BMI, risk factors, ECG findings, coronary risk score, menopause duration and therapy regimes between HRT (+) and HRT (-) groups. Only HDL-C levels were significantly higher in HRT (+) ( $p=0.031$ ). PAI-1 and CRP levels were found to increase with menopause (respectively premenopausal (I) (n=10)  $50.5 \pm 15.6$ , HRT (+) (II) (n=36)  $140.4 \pm 88.7$ , HRT (-) (III) (n=26)  $203.4 \pm 53.8$ ; I-II  $p=0.002^*$ , I-III  $p=0.003^*$ , II-III  $p=0.003^*$  and (I)  $3.1 \pm 1.5$ , (II)  $3.4 \pm 7.2$ , (III)  $15.5 \pm 9.8$ ; I-II  $p=0.001^*$ , I-III  $p=0.002^*$ , II-III  $p=0.018^*$ ). While PAI-1 levels were significantly lower in HRT (+) women, CPR levels were significantly higher. No significant difference was found between hormone user and non-user in respect to fibrinogen and d-dimer level ( $301.6 \pm 85.5$  vs  $325 \pm 119.9$  respectively,  $p > 0.05$ ;  $112.6 \pm 73.06$  vs  $116.6 \pm 91.06$ , respectively  $p > 0.05$ ). CRP level was significantly increased in the high risk group ( $p=0.04$ ), did not differ between short and long term HRT users and was not affected by the route or combination form of HRT. We concluded that the fibrinolytic system was preserved using HRT (I); the inflammatory potential increased with both the postmenopausal status and HRT, which may lead to the increased cardiovascular events during HRT.

PP-53  
IS HIGH LEVELS OF CRPA DETERMINANT OF HIGH RISK FACTOR PROFILE IN CASES WITH CORONARY ARTERY DISEASE?

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**Objectives:** Inflammation plays a role in every stage of atherosclerosis. Higher CRP levels are proved to be a marker of higher cardiovascular morbidity and mortality in patients with coronary artery disease (CAD) and healthy people as well. The reason of worse prognosis in patients with CAD with a high CRP levels may be attributable to the presence of excessive coronary risk factors. The purpose of this study was to investigate the relationship between CRP levels and other coronary risk factors in cases with coronary artery disease. **Material and Methods:** Our study group included 326 consecutive patients (251 males, mean age of 58.1±11.3) whose hs-CRP levels were determined during their hospitalization period. The cases with other diseases that may cause high CRP levels are excluded from the study. In all the cases data like diabetes mellitus, total cholesterol, smoking, hypertension, low density lipoprotein, high density lipoprotein, family history of premature CAD, obesity and central obesity based waist circumference were determined. The distribution of these risk factors was compared between the group of highest hs-CRP levels (100 patients) and the group of lowest hs-CRP levels (100 patients). **Results:** There was no difference regarding age, sex and clinical properties between two groups. In the group with a high hs-CRP level, the waist circumference and LDL-C levels were significantly higher (p<0.05). BMI and TC levels were also found to be higher which were nearly statistically significant. There was no difference regarding other risk factors between the two groups. **Conclusion:** These data support that there is a positive relationship between high plasma hs-CRP levels and other risk factors like obesity and hyperlipidemia in cases with coronary artery disease. Because of higher coronary risk profile patients with high CRP levels must be followed up closely.

PP-55  
THE EFFECT OF INSULIN RESISTANCE AND ESSENTIAL HYPERTENSION ON CARDIAC STRUCTURE AND FUNCTION

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**Objectives:** Insulin resistance (IR) is a common finding in essential hypertension (EH) and it might play a role in the development of left ventricular hypertrophy (LVH) and dysfunction. The aim of this study was to evaluate the effect of IR and EH on cardiac structure and function. **Methods:** We enrolled 73 subjects (21 men, age 56±9 years) with never-treated hypertension (BP >135 and/or 85 mmHg), body mass index <30 kg/m<sup>2</sup>, glycemia at fast <110 mg/dl and 32 matched normotensive controls were included. Transthoracic echocardiography, and blood samples were performed in all subjects. With respect to IR, homeostasis model assessment (HOMA) was calculated. HOMA-index = Fasting blood sugar (mg/dl) \* Immuno-noreactive insulin (mU/ml) / 405. Hypertensive patients was divided in two groups by mean HOMA index. **Results:** The HOMA index (p<0.001), atrial filling fraction (p<0.001), septal (p<0.013) and posterior (p<0.02) wall thickness was significantly higher in hypertensive patients than normotensive controls. Left ventricular velocity of flow propagation (p<0.03), E/A ratio (p<0.002) and ejection fraction (p<0.04) was significantly lower in EH than controls. Left ventricular mass index (p<0.03) and septal wall thickness (p<0.01) was significantly higher in higher HOMA index group of EH patients. HOMA-index was univariately related to TEI index (r=0.27, p=0.01) and septal wall thickness (IVS) (r=0.29, p=0.01), by Pearson correlation analysis in EH. **Conclusion:** These results demonstrated that hypertensive patients had both abnormal cardiac structure and function and higher IR index. The effect of hypertension on cardiac structure and function was correlated with IR.

PP-54  
THE RELATIONSHIP BETWEEN THE FREQUENCY OF CORONARY ATHEROSCLEROSIS AND THE LEVELS OF SERUM VITAMIN B12 FOLIC ACID AND HOMOCYSTEINE

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Increased levels of plasma homocystein increase the risk of coronary atherosclerosis and development of thrombosis. The level of plasma homocysteine determined by diet vitamin B12, folic acid and genetic factors. Methylene tetrahydrofolate reductase decreases the level of plasma homocysteine via converting the homocysteine to methionine. That is why the metabolism of homocysteine is related to folic acid and vitamin B12. The aim of this study was to investigate the relationship between the levels of plasma homocysteine vitamin B12, folic acid and the diffuseness of the coronary atherosclerosis. We included 171 subjects hospitalized for the coronary angiography. Before coronary angiography, levels of plasma vitamin B12, folic acid and homocysteine were measured in all subjects. Coronary artery disease is defined as coronary angiographic stenosis of >50%. According to results of coronary angiography subjects grouped into two. While group I included 114 subjects (mean age 58±10, 86 men) with coronary artery disease, group II included 56 subjects (mean age 51±13, 42 men) with normal coronary angiography. While levels of vitamin B12 found lower significantly in group I, levels of homocysteine found higher in comparison to group II. There is no significant difference between the levels of folic acid in two group (table 1).

	Group I (114)	Group II (56)	P value
B12 vit.(Pmol/L)	224.1±108.5	275.8±197.7	0.029
Folic Acid(nmol/L)	7.3±3.3	7.7±3.9	NS
Homocysteine(μmol/L)	14.9±5.2	12.8±4.8	0.012

As a result, higher levels of homocysteine and lower levels of vitamin B12 in coronary artery disease subjects might suggest the role of homocysteine and vitamin B12 in the pathogenesis of coronary atherosclerosis.

PP-56  
DOES ACE INHIBITOR ADMINISTRATION BEFORE ACUTE MYOCARDIAL INFARCTION REDUCE SUBSEQUENT MORBIDITY AND MORTALITY?

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The effects of ACE inhibitor administration before acute myocardial infarction (AMI) on infarct size and subsequent morbidity and mortality were investigated. Study population consisted of 146 consecutive patients admitted with a diagnosis of AMI. Data obtained was compared between groups of patients receiving ACE inhibitors at least three months prior to AMI (Group 1) and those who were not (Group 2). The two groups were compared according to the infarct size, left ventricular ejection fraction (LVEF) and wall motion score index (LVWMSI) and in-hospital cardiovascular events. 29 patients (20%) were receiving ACE inhibitors and 115 (80%) were not. There weren't significant differences with regard to the age, sex, infarct site, cigarette smoking, aspirin, beta blocker and thrombolytic therapy, frequency of hypertension and diabetes between the two groups. Patients in group 1 had a smaller MI size as determined by peak CK-MB elevation (262.90±86.43 U/L vs. 337.64±142.60 U/L, p<0.05) and by LVWMSI (1.49±0.35 vs. 1.64±0.37, p<0.05). LVEF was well preserved in group 1 (57.23±15.66 vs. 51.52±12.00, p<0.05). In group 1, in-hospital cardiovascular events were less frequent: recurrent angina (10.0% vs. 13.7%, p>0.05), reinfarction (3.3% vs. 9.4%, p>0.05), heart failure (10.0% vs. 13.8%, p>0.05), ventricular fibrillation (6.6% vs. 12.0%, p>0.05) and death (0% vs. 8.6%). The data showed that the patients receiving prior ACE inhibitor therapy experienced a smaller infarct size, well preserved left ventricular function and less in-hospital morbidity and mortality although not significant statistically. So, prior ACE inhibitor therapy may have cardioprotective effects during AMI.

### THE EFFECTS OF ATORVASTATIN VERSUS PRAVASTATIN ON CORONARY ARTERY RESTENOSIS AFTER STENT IMPLANTATION

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Hydrophilic statins such as pravastatin, was found less effective on smooth muscle cell proliferation, compared to lipophilic statins (atorvastatin). Both atorvastatin and pravastatin have been shown to inhibit platelet aggregation, reduce inflammatory responses of the vascular wall. These properties of statins play a key role in modulation of atherosclerosis and restenosis. This study was planned to compare the effects of atorvastatin and pravastatin on restenosis in patients with high preprocedural CRP levels. Of 53 patients, 26 was randomized to pravastatin (40 mg/day) and 27 to atorvastatin (20 mg/day) after successful stent implantation in stable or unstable coronary heart disease. The primary end-point was angiographic restenosis, measured by quantitative coronary angiography. Clinical end-points were death, myocardial infarction, angina pectoris or revascularization. Total of 37 patients (17 pravastatin and 20 atorvastatin) had angiographic follow-up. Restenosis rate per lesion was 8/26 (30.8%) in the pravastatin group and 9/28 (32.1%) in the atorvastatin group (P=0.9). Clinical composite end-points did not differ significantly between groups (52.9% for pravastatin vs. 60% for atorvastatin). Although atorvastatin has been shown to have better efficacy on apoptosis, and smooth muscle cell proliferation, we in this study found out that both statins had similar effects on angiographic outcomes at the target lesion 6 months after stent implantation.

### INFLAMMATORY RESPONSE AFTER PERCUTANEOUS CORONARY INTERVENTIONS: DIRECT VERSUS CONVENTIONAL STENTING

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Disruption of culprit coronary lesions may cause inflammatory response (rise in CRP) which may be associated with adverse outcomes after PCI. Direct coronary stenting (DS) is associated with lesser inflammatory response due to lesser trauma and lower incidence of dissection compared to conventional stenting (CS). The purpose of this study was to compare the CRP elevations before and after stent implantation (24 and 72h) with CS or DS approaches in stable angina. CRP levels increased from  $12.7 \pm 6.8$  mg/L to  $17.3 \pm 7.7$  mg/L and  $17.9 \pm 14.3$  mg/L at 24h and 72h respectively in CS and from  $16.2 \pm 16.3$  mg/L to  $21.0 \pm 18.9$  mg/L and  $25.2 \pm 32.0$  mg/L at 24h and 72h respectively in DS. Although these increases were found to be significant ( $p=0.001$ ) within the groups, there was no difference among the groups. A rise of more than 10 mg/L of CRP were found in 9 out 14 (64.3%) patients in DS and 13 out 14 (92.9%) patients in CS. Although this difference was not statistically significant ( $p=0.056$ ), there seemed to be a very strong trend and this could have been due to small number of patients enrolled in the study. The low incidence of CRP rise in DS group might have been due to lesser trauma and inflammation and as a result lesser myocardial events during 6 months follow-up.

### THE CORRELATION BETWEEN THE CLINICAL FINDINGS AND THE "TOMBSTONING" ELECTROCARDIOGRAPHIC PATTERN IN PATIENTS WITH ACUTE ANTERIOR MYOCARDIAL INFARCTION

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**Background:** The tombstoning electrocardiographic pattern of a particular kind of ST segment change, observed in some patients during the early stages of acute myocardial infarction, is well known to be of prognostic value. However, there is little understanding of the causes and the relations of these changes. In this study, the correlation between the clinical findings and the tombstoning electrocardiographic pattern was examined in patients with acute anterior myocardial infarction.

**Method:** 106 consecutive patients with acute anterior myocardial infarction were enrolled in the study. During the first 12 hours, the electrocardiograms of the patients were obtained for future evaluation. The preinfarct angina, coronary risk factors and in-hospital complications were recorded.

**Results:** Tombstoning electrocardiographic pattern was present in 23 (21.6%) of the patients. The coronary risk factors in the tombstoning and non-tombstoning groups were similar. In the tombstoning group, CK-MB ( $397 \pm 162$  v  $290 \pm 197$ , U/L,  $p<0.02$ ) were higher and left ventricular ejection fractions ( $42 \pm 13$  v  $51 \pm 11$ , %,  $p<0.03$ ) were lower. The preinfarct angina (39.1 v 63.9, %,  $p<0.03$ ) was significantly lower in the tombstoning group. Death, cardiogenic shock and complex ventricular arrhythmias were more prevalent in the patients with tombstoning pattern.

**Conclusion:** In patients with tombstoning electrocardiographic pattern, the infarction size is larger; left ventricular ejection fraction and preinfarct angina are lower and in-hospital complications are higher. The absence of the beneficial effects of the preinfarct angina could, in part, be responsible for these detrimental findings.

### THE RELATIONSHIP BETWEEN REGIONAL ISOVOLUMIC RELAXATIONS TIME DETECTED WITH TISSUE DOPPLER ECHOCARDIOGRAPHY AND ANGIOGRAPHIC FINDINGS

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In myocardial ischemia diastolic functions impairs earlier than systolic functions. The aim of this study is to investigate the predictability of LAD lesions by studying isovolumic relaxation times in patients with inferior myocardial infarction. The study included 51 (44 males) patients. Apical four chamber views basal septum, mid septum, apical two chamber views basal anterior, mid anterior IVRT's were measured before coronary angiography in all patients. Forteen patients (group I) with critical LAD lesions detected after coronary angiography and the regional IVRT of 37 patients (group II) with no LAD lesions detected were compared.

	Group (I), n=14	Group (II), n=37	p
Basal septum IVRT	68±20	61±19	>0.05
Mid septum IVRT	68±18	62±15	>0.05
Basal anterior IVRT	77±17	70±22	>0.05
Mid anterior IVRT	73±24	67±14	>0.05

While basal septum, mid septum basal anterior, mid anterior IVRT were longer in the group with critical LAD lesions the difference was not statistically significant ( $p>0.05$ ). Regional IVRT's were not predictive of LAD lesions (OR:0.97, CI:0.94-1.01,  $p=0.26$ )

In conclusion regional IVRT's were found to be unproductive of LAD lesions while they were longer in patients with myocardial infarction.

PP-61  
**THE EFFECT OF PREINFARCTION ANGINA ON CORONARY THROMBOLYSIS IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION RECEIVING THROMBOLYTIC THERAPY**

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**Background:** When a myocardial infarction is preceded by angina, the infarct size tends to be smaller than when there is no preinfarction angina (PA). The beneficial effects of PA on infarct size have been attributed to the development of ischemic preconditioning (IP). But the mechanisms of IP not defined clearly. Our aim was to evaluate the effect of PA on coronary reperfusion time in patients (pts) with acute myocardial infarction (AMI) receiving TT.  
**Methods:** We studied 49 Pts presenting with AMI (<6 hours). All pts received thrombolytic therapy (TT) and were evaluated with coronary angiography (CA) at pre-discharge. The pts were divided into those who experienced a new onset of prodromal angina within 72 h before the onset of AMI [PA(+), group I] and those who had a sudden onset of AMI without the preceding angina [PA(-), group II]. The successful myocardial reperfusion criteria after TT was ST segment resolution on the ECG accompanying disappearance of angina precursors and early enzyme peak. The time to reperfusion was recorded after TT. CA was performed all pts at mean 6±4 day. The pts excluded from the study who had no patent infarct related arteries in CA.  
**Results:** There were no significant differences between the clinical characteristics, risk factors, and angiographic findings of the groups. The clinical reperfusion time was 173.63±174.1 min in PA(+) and 191.85±148.8 min in PA(-) group. The differences of reperfusion time between groups were statistically significant ( $p<0.0001$ ).  
**Conclusion:** In pts with AMI preceded by PA, as compared with those without PA, TT resulted in more rapid clinical reperfusion. Earlier myocardial reperfusion may thus account for smaller infarct size and better prognosis in pts with PA.

PP-63  
**THE SAFETY AND EFFICACY OF T-PA COMBINED WITH LOW DOSE TIROFIBAN VS T-PA ALONE IN ACUTE ST SEGMENT ELEVATION MYOCARDIAL INFARCTION (STEMI)**

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**Background:** Adequate coronary patency (TIMI 2-3 flow) is achieved in only 30% of the patients with fibrinolytic therapy. Thrombolytics dissolve the fibrin bonds of the thrombus and thrombin that stimulates platelet activation is released. Combining a potent antiplatelet agent with thrombolytics may solve this problem.  
**Objective:** The objective is to compare the safety and efficacy of t-PA combined with low dose tirofiban and t-PA alone in acute STEMI.  
**Methods:** 24 patients received t-PA alone (Group I) and 24 patients received t-PA combined with low dose tirofiban (Group II). Patients in group II received a weight adjusted iv bolus of tirofiban after the completion of t-PA bolus, and iv infusions of tirofiban and heparin were continued for 48 hours. In group II, tirofiban bolus dose and infusion rate were adjusted as half of the dose recommended for UA/NSTEMI. Coronary angiography was performed to assess visual stenosis, TIMI flow and thrombus score in the infarct related artery.  
**Results:** TIMI 3 flow rate was 53, 1% in group II and 46, 9% in group I (p=NS). However the visual diameter stenosis was significantly less in group II than that in group I (64±31, 7% and 82, 5±21, 3%, respectively,  $p=0, 02$ ). No major bleeding was encountered, minor bleeding was seen in two patients receiving t-PA and tirofiban.  
**Conclusions:** Visual diameter stenosis was significantly less in the t-PA and tirofiban arm. We hypothesized that these patients had less plaque burden and more thrombus. Thrombi may have rapidly dissolved with the synergistic effects of t-PA and tirofiban, leaving only a non-critical lesion on coronary angiography. The combination of t-PA with low dose tirofiban did not increase the incidence of severe bleeding. We concluded that the combination of t-PA with low dose tirofiban is a safe and effective treatment for STEMI.

PP-62  
**THE RELATIONSHIP BETWEEN THE LEFT VENTRICULAR SYSTOLIC FUNCTIONS AND hs-CRP LEVELS IN ACUTE CORONARY SYNDROMES**

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**Objectives:** The incidence of cardiovascular mortality and morbidity is higher in patients with acute coronary syndromes (ACS) and high levels of C-reactive protein (CRP). In ACS one of the most important markers of early and late mortality is left ventricular (LV) function. The aim of our study was to determine the relationship between the high sensitive CRP (hs-CRP) levels and left ventricular functions in the patients with ACS.

**Material and Methods:** Our study group consists of 73 consecutive cases (57 males, mean ages 59.1±10.4) that are hospitalized in our intensive coronary care unit with ACS. Plasma hs-CRP levels are measured within the first 2 days of the acute coronary event. Cases with other diseases that can increase hs-CRP levels are excluded from the study. Transthoracic echocardiography is done to all the patients at the same day of serum hs-CRP samples are taken. LV end systolic diameter, LV end diastolic diameter, LV ejection fraction, LV fractional shortening, LV wall motion index, LV wall thickness, left atrial diameter are compared between 20 cases with the highest levels of hs-CRP (Group I) and 20 cases with the lowest levels of hs-CRP (Group II).  
**Results:** There were no differences in age/sex, treatment modality, and clinical presentation between the groups. In the group I, LV end diastolic diameter, LV end systolic diameter, LV wall motion indexes were higher and LV ejection fraction and LV fractional shortening were significantly lower than the group II.

**Conclusion:** In patients with ACS and high level of hs-CRP levels, LV systolic function indices are more severely depressed. This may be one explanation of high cardiovascular morbidity and mortality in ACS cases with high hs-CRP levels.

PP-64  
**THE RELATIONSHIP OF THE POSITIVE T-WAVE WITH CLINICAL AND ANGIOGRAPHIC FINDINGS IN EARLY STAGE OF ACUTE MYOCARDIAL INFARCTION**

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**Background:** The restored positive T-wave at the chronic stage of the myocardial infarction (MI) is related with nontransmural MI which contains a viable tissue. At the early stages of MI, the causes and relations of the positive T-wave is not clear. We evaluated the clinical and angiographic relationship of the positive T-wave which appears at the early stage of MI in 188 patients with MI.  
**Methods:** Patients were divided into two groups according to the direction of the T wave: Patients with positive T-wave (n=30) and negative T-wave (n=158). Coronary risk factors, preinfarction angina, CK-MB level, left ventricle ejection fraction and angiographic findings were obtained. Death, cardiogenic shock, ventricular tachycardia/fibrillation and high degree atrioventricular block were recorded as in-hospital complications.

**Results:** The positive T-wave was present in 15.9% of the patients. None of the patients with positive T-wave had 3-vessel disease. In patients with positive T-wave, 3-vessel disease (0.0% v 21.5%,  $p<0.04$ ) was lesser than in patients with negative T wave. In-hospital complications were similar in the positive T-wave and negative T-wave groups.

**Conclusions:** At the early stage of myocardial infarction, 3-vessel disease was lesser in patients with positive T-wave.

PP-65

**KNOWLEDGE LEVELS OF PATIENTS ABOUT CHEST PAIN WHO HAVE EXPERIENCED ACUTE MYOCARDIAL INFARCTION, AND THROMBOLYTIC TREATMENT AND FACTORS EFFECTING EMERGENCY SERVICE APPLICATION PERIODS**

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Providing early reperfusion treatment (in the first 4 hours) in acute myocardial infarction (AMI) reduces mortality and morbid levels related to infarction significantly. Delay in early reperfusion treatment arises mostly from reasons related with the patient. The aim of our study was to evaluate the knowledge levels of patients admitted to the hospital with chest pain arising from AMI, coronary artery illness (CAD), AMI, importance of being admitted to the hospital early and thrombolytic treatment. For the study, 150 patients (126 male, 24 female) were selected randomly who have applied to Istanbul University Cardiology Institute, Şişli Etfal Hospital and Cerrahpaşa Medical Faculty Emergency Units with chest pain complaints and admitted with AMI diagnosis between 01 September 1998 and 28 February 1999. A questionnaire comprising 70 questions was to be completed by the patients when interviewing them in the first 7 days of, 62% of the patients who were included in the study had chest pain previously. It was observed that 17%, 18.3%, 27.5%, 15.3% and 21.4% have applied to the hospital respectively within first 30 minutes, between 30 minutes and 1 hour, between 1 and 3 hours, between 3 and 6 hours and far later after the symptoms have started. 68% of the patients had no knowledge about AMI, whereas 96% of the patients had no knowledge of anti-hospitalisation thrombolytic treatment. Consequently, majority of the patients who have experienced AMI, usually apply to the hospital after the first 4 hours because of lack of knowledge about the subject which is very important for early reperfusion treatment. Therefore necessary education programs must be implemented to ensure the patients apply to the hospital earlier.

PP-67

**ASSESSMENT OF DIASTOLIC FUNCTION WITH DOPPLER TISSUE IMAGING IN PATIENTS WITH HYPERTENSION**

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Diastolic dysfunction is common in patients with hypertension and often associated with a typical, but non-specific, mitral inflow pattern of delayed relaxation with increased isovolumic relaxation time (IVRT) and a low E/A ratio. Mitral valve annular motion as measured by Doppler tissue image (DTI) is a new modality which may be useful in the assessment of diastolic function. In this study, we examine the velocity pattern of mitral annulus motion in 52 hypertensive patients, age 38 to 76, and correlated it with mitral inflow velocity and left ventricular mass index (LVMI). The velocity signal from the lateral aspect of mitral annulus was recorded from the apical window with an Acuson DTI system. Annular motion in diastole is biphasic with first motion away from the apex during the early filling (E) and second in atrial systole (A). Twenty seven patients was found to have the E/A ratios of both annular motion and mitral inflow consistently lower than 1 (0.73 ± 0.02 vs. 0.62 ± 0.02), and ten patients showed consistent E/A ratio > 1 (1.38 ± 0.02 vs. 1.22 ± 0.01). However, fifteen patients with the E/A ratio of mitral inflow > 1 (1.09 ± 0.01) had the E/A ratio of annular motion < 1 (0.67 ± 0.01). The inconsistent group showed intermediate values on annular E velocity (6.9 ± 0.1 vs. 5.8 ± 1 & 10.6 ± 0.3 cm/s), IVRT (90.2 ± 2.0 vs. 95.6 ± 2.5 & 74.4 ± 0.9 ms), LVMI (114.4 ± 2.4 vs. 135.9 ± 5.3 & 97.5 ± 1.9 g/m<sup>2</sup>) and age (50.3 ± 0.8 vs. 59.2 ± 1.0 & 52.1 ± 1.0 yrs). The results suggested the velocity of mitral annulus motion easy to obtain with pulsed DTI may be more sensitive in the detection of the abnormalities of LV diastolic filling than mitral inflow velocity in patients with hypertension.

PP-66

**THE ASSESSMENT OF CARDIAC TOXICITY OF 5-FLUOROURACIL INFUSION WITH CARDIAC CYCLIC VARIATION OF INTEGRATED BACKSCATTER**

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*Aim:* A prospective study was performed to determine the cardiac toxicity under treatment of IV 5-fluorouracil (5-FU) infusion. The chief mechanism responsible for cardiac toxicity of 5-FU is classical coronary spasm without formal evidence. Since acoustic properties of the myocardium are sensitive to the myocardial structure and the contractile conditions of myocyte, we evaluated cardiac toxicity based on the cyclic variation of myocardial integrated backscatter (CVIBS). *Method:* We examined 16 cancer patients (M/F 10/5 mean age 65±9) with normal cardiac functions, who had received 5-FU IV infusion (1000 mg/m<sup>2</sup>) 2 days. Clinical examination, ECG, laboratory tests and transthoracic echocardiography (TTE) was monitored in all cases. For each patient septum, posterior areas were chosen in the parasternal long-axis TTE image. Baseline, post 5-FU infusion and 15th day control (C) measurements of CVIBS were performed. We determined the magnitude of CVIBS in decibels as the difference between the maximal and minimal values in a cardiac cycle. *Results:* None of the patients developed symptoms suggestive of cardiotoxicity. Also pre and post-treatment ECG and conventional TTE evaluations did not detect any significant difference. There was a statically significant decrement in the myocardial CVIBS after 5-FU infusion which was equal in all myocardial segments. On 15th day CVIBS values was returned to normal and did not show any difference from baseline.

	CVIBS ANTERIOR	CVIBS POSTERIOR
Pre FU 1	9.1±1.3	9.0±0.8
Post FU 2	7.7±1.4	7.4±0.9
C 3	9.0±1.2	8.9±1.1
P 1-2	<0.003	<0.002
P 1-3	NS	NS
P 2-3	<0.003	<0.003

*Conclusion:* This study suggested that a new echocardiographic method, "integrated ultrasonic myocardial backscatter" may be a useful tool for determination of asymptomatic cardiac events as well as in further evaluation of the underlying mechanisms of 5-FU induced myocardial toxicity.

PP-68

**PROGNOSTIC FACTORS AND ECHOCARDIOGRAPHY IN INFECTIVE ENDOCARDITIS**

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*Objective:* The aim of the study was to evaluate the prognosis, course and developments in the diagnosis and treatment of infective endocarditis (IE). *Methods:* We retrospectively reviewed the clinical files of 66 patients hospitalized with the final diagnosis of IE (Duke criteria), between 1992 and 2001. Predisposing factors, symptoms, physical findings, microbiological, biochemical, hematological, radiological and echocardiographic findings, clinical course, treatment methods, cause of death, and the factors effecting prognosis were evaluated. The findings were compared with corresponding data from the period between 1978 and 1992. *Results:* The two groups were comparable regarding age and gender. Rheumatic heart disease was the most frequent predisposing factor in both periods (48 % vs. 66 %, p NS) followed by prosthetic heart valves (27 % vs 15 %, P<0.001). The most frequently encountered manifestation was fever (77 %). Staphylococci were the most encountered microorganisms in both periods (51 % vs. 42 %, P=NS). Congestive heart failure (CHF) was the most common reason for surgery which had increased in frequency (64 % vs 23 %, p<0.001). Mortality, although statistically not significant, had decreased from 32% to 22%. CHF was the most frequent reason for death (%46 in both periods). *Conclusion:* Although the frequency of rheumatic heart disease decreased in the last decade, it is still the most common predisposing factor. Prosthetic valve endocarditis has increased significantly. Improvements in the personal hygiene, diagnosis and treatment methods seems to be the main causes of the decrease in the mortality rates of IE.

PP-69  
AORTIC DISTENSIBILITY IN ENDURANCE ATHLETES

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**Objectives:** The aim of this study was to determine aortic elastic properties in endurance athletes compare with normal subjects.  
**Methods:** Twenty elite middle-distance runners and twenty age-matched healthy male controls were included. All subjects were underwent echocardiographic examination. We measured left ventricular cavity dimension at systole and diastole, wall thickness, diastolic parameters, and aortic diameter at 3 cm above the aortic valve, at systole and diastole.  
**Results:** Maximal oxygen uptake in athletes was higher than controls ( $60.6 \pm 5.6$  v  $43.9 \pm 3.2$ ,  $p < 0.001$ ). Also, the aortic distensibility index was found to be increased in athletes compared with controls ( $5.29 \pm 1.73$  v  $3.39 \pm 1.34$   $\text{cm}^2 \cdot \text{dynes}^{-1} \cdot 10^{-6}$ ,  $p < 0.001$ ). The aortic stiffness index was significantly lower in athletes than in controls ( $3.41 \pm 0.37$  v  $2.78 \pm 0.29$ ,  $p < 0.001$ ). There was a good positively correlation between distensibility and maximal oxygen uptake.  
**Conclusions:** Increased aerobic capacity can cause higher aortic distensibility. This effect may be due to aortic physiological adaptation to exercise. In conclusion, the results of this study suggest that increased aortic distensibility in endurance athletes can be caused by aerobic exercise.

PP-71  
THE EFFECT OF HIGH-NORMAL BLOOD PRESSURE ON  
DIASTOLIC FUNCTIONS ON LEFT VENTRICLE

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**Background:** A systolic blood pressure between 130 -139 and/or a diastolic blood pressure between 85-89 mmHg known as High-Normal Blood Pressure (HNBP). In a recent study found that, the HNBP is associated with increase of cardiovascular disease risk.  
**Metod:** In the present study there was 30 subjects with HNBP have not diabetes mellitus, coronary artery disease or another known systemic disease and 20 subjects with optimal blood pressure (OBP). We compared diastolic functions of left ventricle (LV). In all cases measured on apical view transmitral peak E velocity, peak A velocity, E/A ratio with transmitral pulsed Doppler and early diastolic velocity (Ea), late diastolic velocity (Aa) and Ea/Aa ratio at annuli of lateral walls of LV and interventricular septum with Doppler tissue imaging.

	Midrat E	Midrat A	Midrat E/A	Septal Ea	Septal Aa	Septal Ea/Aa	Lateral Ea	Lateral Aa	Lateral Ea/Aa
OBP	0.81±0.17	0.55±0.16	1.52±0.32	0.11±0.02	0.07±0.02	1.63±0.72	0.13±0.01	0.08±0.02	1.75±1.01
HNBP	0.57±0.30	0.58±0.26	1.00±0.36	0.08±0.03	0.09±0.31	0.90±0.31	0.11±0.04	0.10±0.02	1.5±0.30
P	<0.05	<0.05	<0.005	<0.05	<0.05	<0.005	>0.05	>0.05	<0.005

**Results:** The mean systolic blood pressure of the subjects with HNBP is  $131.5 \pm 6.5$  and diastolic  $84.5 \pm 4.5$  mmHg. The same values of subjects with optimal BP was  $118.9 \pm 1.1$  and  $73.1 \pm 10.4$ . The ECHO findings summarized in table  
**Conclusions:** In the present study found that the diastolic functions of LV is impaired in subjects with HNBP, particularly in interventricular septum. This condition must regard in management of subjects with HNBP. We concluded that we need to establish whether the intervention to HNBP reduce the cardiovascular disease risk.

PP-70  
LIMITATION OF CARDIAC OUTPUT BY TOTAL ISOVOLUMIC TIME DURING PHARMACOLOGICAL STRESS IN PATIENTS WITH DILATED CARDIOMYOPATHY: ACTIVATION MEDIATED EFFECTS OF LEFT BUNDLE BRANCH BLOCK AND CORONARY ARTERY DISEASE

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**Background:** Mechanisms limiting cardiac output (CO) during stress in dilated cardiomyopathy (DCM) are unclear. Left bundle branch block (LBBB) and coronary artery disease (CAD) may do so by prolonging total isovolumic time (t-IVT).  
**Objectives:** To separate the effects of associated LBBB and CAD on peak CO during dobutamine stress in patients with DCM.  
**Methods:** 59 patients with DCM. 34 with CAD (20 normal activation [NA], 14 LBBB), and 25 without CAD (15 NA, 10 LBBB) were studied. T-IVT (in s/min, calculated as  $160 - (\text{total ejection time} + \text{total filling time})$ ) and CO were measured by Doppler echocardiography.  
**Results:** Rest: T-IVT was 8s/min longer with LBBB ( $p < 0.001$ ), was unaffected by CAD, and did not correlate with resting CO. Stress: CO correlated with t-IVT ( $r = -0.73$ ,  $p < 0.001$ ) in all 4 patient groups. In the absence of CAD, t-IVT shortened (NA: by  $7 \pm 3$  s/min, LBBB: by  $9 \pm 4$  s/min) and correlated with a fall in QRS duration (NA:  $r = 0.87$ , LBBB:  $r = 0.91$ ), and CO increased with stress (NA: by  $4.7 \pm 2.7$  l/min, LBBB: by  $4.0 \pm 2.3$  l/min, all  $p < 0.001$ ). With CAD, t-IVT did not shorten normally with stress. Instead, t-IVT was 5.6s/min longer, and CO 3.3 l/min lower, than without CAD (both  $p < 0.001$ ), and t-IVT did not correlate with QRS duration.  
**Conclusions:** In dilated cardiomyopathy, total isovolumic time (in s/min) during pharmacological stress depends on changes in ventricular activation induced by left bundle branch block or coronary artery disease, and is itself a major determinant of peak cardiac output during stress.

PP-72  
MECHANICS OF THE LEFT VENTRICLE WALL IN TOP LEVEL ATHLETES

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Recently, in the set of indexes for evaluation of myocardial contractility the index for midwall fractional shortening /which better defines the myocardial function and predicts prognosis especially in presence of left ventricular hypertrophy/ was forced more and more. But definition of this index was very complicated when we used the "two shell" method, based on the data related to the relative migration of the circumferent middle fibers towards the epicardium during the systole.  
**Objective:** Having in mind the fact that tissue Doppler, M-mode gives us the possibility to track the movement of every point by ensuring the tissue point rate and its coordinates of movement, we make it our aim to analyze the midwall mechanics of the left ventricle using this new method.  
**Material, method and results:** Conventional and tissue Doppler echocardiography was performed in 10 top athletes /mean age  $20 \pm 4$ / with increased left ventricular muscle mass /240 g/kg/m/ as well as in 10 healthy men with similar antropometric indexes. The midwall fractional shortening was defined by "two shell" method used as a standart. The data were compared to the endocardial fractional shortening using conventional M-mode echocardiography. Even this endocardial fractional shortening did not show differences between the two groups /  $32 \pm 5\%$  towards  $30 \pm 4.8\%$ / the midwall fractional shortening was / even not significantly suppressed / over 12 mm /  $15.8 \pm 5\%$  towards  $18.8 \pm 3\%$   
**Conclusion:** Tissue Doppler technics can precisely and accurately define the midwall fractional shortening. The estimation of the midwall mechanics compared to the conventional fractional shortening should be preferred in the assessment of myocardial contractility in left ventricular hypertrophy.

PP-73

FIVE YEAR FOLLOW-UP OF THE EVOLUTION and QUALITY OF LIFE AMONG PATIENTS WITH TYPE B AORTIC DISSECTION

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The aim of the study was to analyze the early and the late results in the patients with aortic dissection type B Stanford /type III De Bakey/ Material and methods: We have studied the results from medical examinations and echocardiography in 40 patients with type B aortic dissection for 5 years. The patients were asked to fill up a questionnaire about the quality of life, the psychic recovery and the return to the professional activities. We compared the following parameters from the serial transesophageal examinations: the biggest width of the thoracic aorta; the site of the rupture: above 35 cm or beneath 35 cm from the teeth; the size of the rupture /mm/: the flow direction and the velocity through the rupture orifice.

Results: There were 77 % men and 23 % women involved in the study. The mean age of the group was 59.6 y for the men and 52.2y for the women. The rate of survival was 60% in the acute phase and 42% in the second year and remained almost the same in the next 5 years. The mean diameter of the thoracic aorta was 36.5 ± 5.1 mm at the time of the first examination and increased progressively with 2,5 ± 1.2 per year. In 6 patients was found an abrupt enlargement more than 5 mm per year. They all had a diameter of the rupture orifice > 7 mm, a proximal localization of the rupture site and bidirectional flow there. Spontaneous healing of aortic dissection we found in 13 pts. 11 patients had a complete thrombosis of the false lumen without any flow in it; 2 pts had a remarkable segmental thickening of the aortic wall. The rupture site was proximal in 22 pts and distal in 9 pts. We could not find it in 9 pts.

Conclusions: The acute aortic dissection type B is a disease with high mortality. The bad prognostic signs in the acute phase which may influence the late results are: aortic diameter > 50 mm, proximal localization of the rupture site, an orifice > 7 mm, bidirectional flow. The quality of life depends on the rate of accompanying atherosclerosis and arterial hypertension and it also depends on the regular visits for control examination.

PP-75

ROLE OF TISSUE DOPPLER ECHOCARDIOGRAPHY IN THE EVALUATION OF LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN OBESITY

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Background: It has been shown that obesity causes left ventricular (LV) diastolic dysfunction, but diastolic filling parameters obtained by PW Doppler may be masked due to increased intravascular volume in obesity. In this study, we investigated the role of tissue Doppler imaging (TDI) that would not be affected by the alterations in preload in the evaluation of LV diastolic function of young obese people.

Method: Thirty young and normotensive obese (15 men, 15 women; age 31.9±5.4; BMI 36.7±3.7) and age and sex matched 30 healthy people were included in the study. Mitral early (E) and late (A) peak diastolic flow velocities were obtained by PW Doppler. Systolic (Sm), early diastolic (Em) and late diastolic (Am) myocardial velocities were recorded from 4 regions of mitral annulus (inferior, septal, anterior and lateral) by TDI. Average of these measurements were taken.

Results: In obese group, E, E/A, mean Em and mean Em/Am was significantly lower, and A and mean Am was significantly higher. In obese group, there were 5 cases (16.7%) with E/A<1, but in the control group all cases had E/A>1 (p<0.05). In all of 5 cases, inferior Em/Am was found less than 1 (p<0.001). In obese group, cases with mean Em/Am<1 (30% vs 3.3%, p<0.05) and inferior Em/Am<1 (53% vs 3.3%, p<0.01) were significantly higher in number.

E(cm/s)	A(cm/s)	E/A	m Em (cm/s)	m Am (cm/s)	m Em/Am
67.9±13.6	57.2±12.3	1.22±0.3	12.5±2.5	10.7±1.3	1.2±0.3
78.4±16.5	50.5±11.7	1.57±0.3	16.0±2.3	9.0±2.4	1.9±0.5
<0, 05	<0, 05	<0, 001	<0, 001	<0, 01	<0, 001

Conclusion: These data obtained by conventional echo parameters and TDI show that obesity causes LV diastolic dysfunction in young people and this is obvious especially in inferior region of LV.

PP-74

INFLUENCE OF OBESITY ON RIGHT HEART CHAMBERS AND RIGHT VENTRICULAR FUNCTION

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Background: Although it has been shown that obesity has a disturbing effect on left ventricular morphology and function, its effect on right ventricle (RV) has not been investigated in detail. In this study, we investigated the effect of volume and pressure overload of obesity on the thin walled RV and right atrium (RA).

Method: Thirty young and normotensive obese (15 men, 15 women; mean age 31.9±5.4 years; mean BMI 36.7±3.7 kg/m<sup>2</sup>) and age and sex matched thirty healthy individuals (15 men, 15 women; mean age 29.9±5.1 years; mean BMI 22.3±2.5 kg/m<sup>2</sup>) were included in the study. The diameter and wall thickness of RV from parasternal long axis, right atrial diameter from apical 4 chamber view were measured. Systolic (Sm), early (Em) and late (Am) diastolic peak flow velocities of RV free wall were measured at the level of tricuspid annulus by TDI from apical 4 chamber view. Em/Am ratios were calculated.

Results: In the obese group, RA and RV diameter and the wall thickness of RV was increased significantly. Sm and Am was similar in both groups while Em and Em/Am was found significantly lower in the obese group.

RA (mm)	RV (mm)	RV wall thickness (mm)	Tr Sm (cm/s)	Tr Em (cm/s)	Tr Am (cm/s)	Tr Em/Am
34.5±4.1	30.7±3.3	3.8±0.8	13.1±2.3	13.3±2.4	13.6±5.1	1.08±0.36
30.6±4.2	25.6±3.6	2.4±0.3	13.2±2.2	15.5±2.7	12.1±3.4	1.37±0.44
0.001	<0, 001	<0, 001	NS	0, 001	NS	0, 007

Conclusion: These data obtained by 2D echo and TDI show that obesity leads to hypertrophy and dilatation of RV and dilatation of RA, and disturbs the diastolic function of the RV similar to its effect on the left heart.

PP-76

THE COMPARISON OF ECHOCARDIOGRAPHIC PARAMETERS IN SEVERE RHEUMATIC MITRAL STENOSIS WITH OR WITHOUT ATRIAL FIBRILLATION

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Mitral stenosis (MS) causes left atrial (LA) enlargement, atrial fibrillation (AF) and thrombus formation in the LA cavity. In this study, we tried to evaluate the transthoracic/ transesophageal echocardiographic differences between patients with or without AF in severe rheumatic MS. 46 patients (8 men, 38 women) with rheumatic severe MS were included in this study, 28 of them were in sinus rhythm and 18 were in AF. The echocardiographic data obtained was summarized in the table below.

In the comparison of the patients, significant differences were established in the maximal and minimal areas of the LA appendix (LAA), ejection fraction of the LAA and the peak outward flow velocity of the LAA. Also, these differences helps to explain the cause of stasis in the LAA and the mechanic factors that effect the thromboembolic complications in patients with severe rheumatic MS.

	SINUS RHYTHM	ATRIAL FIBRILLATION P
NUMBER		28/18
AGE		32±5 / 35±9 NS
LA(cm)		4.6±0.6 / 4.7±0.4 NS
LVER(°)		67±4.7 / 64±4.2 NS
PUL.A.PRES.(mmHg)		42±9.5 / 41±5.6 NS
MVA(cm <sup>2</sup> )		1.0±0.3 / 1.1±0.3 NS
MEAN GRADIENT(mmHg)		11.7±2.5 / 10.1±4.9 NS
LAA MAX AREA(cm <sup>2</sup> )		493±130 / 535±74 / P<0.05
LAA MIN AREA(cm <sup>2</sup> )		362±11 / 443±63 / P<0.05
LAA EF(°)		26±6.8 / 17±3.8 / P<0.05
LAA INWARD V. (m/sn)		0.157±0.049 / 0.152±0.034 NS
LAA OUTWARD V. (m/sn)		0.178±0.043 / 0.149±0.039 / P<0.05



PP-77  
THE INFLUENCE OF AMBULATORY BLOOD PRESSURE PROFILE ON LEFT VENTRICULAR GEOMETRY

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**Background:** Besides causing a hypertrophy in the left ventricle, hypertension results in a change in the geometry of the left ventricle. The blood pressure not decreasing enough during the night, leads to structural changes in the left ventricle. In this study, the influence of 24 h blood pressure profile on the left ventricular geometry was examined.

**Methods:** Ambulatory blood pressure monitoring was applied to 60 patients with mild to moderate hypertension who had never been treated and standard echocardiographic evaluation was conducted thereafter. The patients were divided into two groups with respect to the ambulatory blood pressure profiles: The patients whose night blood pressure levels decreased by 10% compared to their daytime blood pressure levels (dipper) and those whose levels did not decrease that much (non-dipper). The left ventricle mass index and the relative wall thickness of the patients were calculated. With respect to the left ventricle geometry, mass index and relative wall thickness of the patients were determined as: having normal geometry, concentric remodeling, eccentric hypertrophy and concentric hypertrophy.

**Results:** Age, gender, systolic and diastolic blood pressure were similar within the dipper and non-dipper groups. Normal geometry, concentric remodeling and concentric hypertrophy ratios were similar in both groups. Eccentric hypertrophy was higher in the non-dipper group compared to the dipper group (%42.9 v %6.3,  $p<0.03$ ).

**Conclusion:** Patients with mild to moderate hypertension, whose blood pressure does not decrease enough, develop eccentric hypertrophy.

	Normal geometry, %	Concentric remodeling, %	Eccentric hypertrophy, %	Concentric hypertrophy, %
Dipper (n=28)	25.0	25.0	6.3	43.8
Non-dipper (n=32)	14.3	21.4	42.9	21.4
p	0.3	0.5	<0.03	0.1

PP-79  
ASSOCIATIONS BETWEEN FREE TRIIODOTHYRONINE/FREE THYROXINE RATIO, ECHOCARDIOGRAPHIC PARAMETERS AND MORTALITY IN PATIENTS WITH DILATED CARDIOMYOPATHY

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**Purpose:** Abnormalities in thyroid function tests occur in patients with dilated cardiomyopathy (DCMP) and are related to adverse prognosis. However, their relations to echocardiographic parameters have not been adequately investigated. The aim of this study was (1) to investigate the correlations of thyroid hormone levels with echocardiographic parameters and (2) to evaluate their associations with subsequent mortality in this patients group.

**Methods:** Serum levels of free triiodothyronine (FT3), free thyroxine (FT4), and thyroid-stimulating hormone (TSH) were measured in 53 consecutive patients with DCMP (16 female, 37 male, mean age  $60\pm 7$  years). All patients underwent transthoracic and transesophageal echocardiographic examination. Follow-up period was 17+4 months.

**Results:** Twenty patients (38%) had abnormalities in thyroid function tests. FT3/FT4 ratio was significantly correlated with left atrial diameter ( $r=-0.31$ ;  $p=0.03$ ), right ventricle ( $r=-0.37$ ;  $p=0.01$ ), right atrium ( $r=-0.52$ ;  $p=0.001$ ), ejection fraction ( $r=0.30$ ;  $p=0.04$ ), isovolumetric relaxation time ( $r=0.42$ ;  $p=0.003$ ), left atrial appendix emptying velocity ( $r=-0.30$ ;  $p=0.03$ ), hematocrit ( $r=0.30$ ;  $p=0.03$ ) and fibrinogen level ( $r=-0.41$ ;  $p=0.004$ ). Six patients (11%) died in the follow-up period. Their FT3/FT4 ratio was significantly lower than the patients who survived ( $p=0.001$ ). FT3/FT4 ratio  $\leq 1.6$  was associated with an increased risk of mortality (hazard ratio 1.7; 95% confidence interval: 1.1 to 2.5;  $p=0.001$ ), independent of ejection fraction and diastolic filling type. Sensitivity, specificity, positive and negative predictivity of FT3/FT4 ratios  $\leq 1.6$  for detecting death was 100%, 74%, 40% and 100% respectively.

**Conclusion:** In patients with DCMP, FT3/FT4 ratio is significantly related to worse left ventricular systolic and diastolic function. Determination of FT3/FT4 ratio may be a valuable and simple predictor to identification of patients with DCMP who are at high risk of subsequent mortality.

PP-78

LEFT AND RIGHT VENTRICULAR FUNCTIONS IN PATIENTS WITH SYSTEMIC SARCOIDOSIS

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**Aim:** This study was designed to evaluate the left and right ventricular functions in patients with systemic sarcoidosis.

**Methods:** The study included 59 subjects: 24 healthy controls and 35 systemic sarcoidosis. The diagnosis of systemic sarcoidosis was made by biopsy. Thallium scintigraphy was performed to all patients with systemic sarcoidosis. The cardiac sarcoidosis was accepted as abnormal thallium scintigraphy and normal coronary arteriography. The Doppler-derived myocardial performance index (MPI), defined as the sum of isovolumetric contraction and relaxation durations divided by ejection time, was obtained as a marker of both left and right ventricular function.

**Results:** The patients characteristics and echocardiographic findings are presented in table.

	Age (years)	Female (n)	Heart rate (bpm)	LVMl (g/m <sup>2</sup> )	LV EF (%)	Left MPI	Right MPI
Thallium (+) (n=16)	44±13	10	79±13	86±20	63±10	0.82±0.18**	0.59±0.17*
Thallium (-) (n=19)	42±15	13	77±15	83±18	67±8	0.60±0.15**	0.51±0.14*
Control (n=24)	40±10	13	82±11	84±21	69±6	0.50±0.12	0.39±0.09

\*: comparison with control group ( $p<0.017$ )

#: comparison between two patients groups ( $p<0.017$ )

**Conclusion:** The right ventricular function is impaired in patients with systemic sarcoidosis irrespective of cardiac involvement. The left ventricular function is also impaired in these patients and its more obvious in patients with cardiac involvement.

PP-80

CLINICAL AND ECHOCARDIOGRAPHIC FACTORS ASSOCIATED WITH SPONTANEOUS ECHOCARDIOGRAPHIC CONTRAST IN THE DESCENDING AORTA AND ITS ASSOCIATION WITH EMBOLIC EVENTS IN PATIENTS WITH DILATED CARDIOMYOPATHY

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**Objectives:** Spontaneous echocardiographic contrast (SEC) is a frequent finding in patients with dilated cardiomyopathy (DCMP) and it is associated with embolic events when it occurs in the left atrium. However little is known about SEC in the descending aorta (DA-SEC) and its associations with embolic events. In this study, we investigated the frequency and clinical correlates of DA-SEC and its association with peripheral embolic events after 16 months follow-up.

**Methods and Results:** Consecutive patients (47 male, 20 female, mean age  $60\pm 11$  years) underwent transthoracic and transesophageal echocardiography. DA-SEC was found in 26 patients (38%) and was associated with lower cardiac index ( $p=0.03$ ), left atrial SEC ( $p<0.001$ ), left ventricular SEC ( $p=0.01$ ), slightly larger aortic root ( $p=0.04$ ), and complex aortic atherosclerosis ( $p<0.0001$ ). Age, gender, presence of coronary artery disease, diabetes mellitus and hypertension were not associated with DA-SEC in this study group. In multivariate analysis, factors that were related to DA-SEC were aortic atherosclerosis ( $p<0.001$ ), left atrial SEC ( $p=0.002$ ) and cardiac index ( $p=0.007$ ). Seven of the patients (10%) died due to sudden death or terminal heart failure and 5 (7%) experienced cerebrovascular embolic events in the follow-up period. Three of the patients with clinical embolic events had DA-SEC, whereas left atrial SEC was present in all of these patients. Peripheral embolic events were not observed in the study group.

**Conclusion:** DA-SEC can often be detected by transesophageal echocardiography in DCMP patients and is associated with aortic atherosclerotic plaques, higher frequency of SEC in other cardiac chambers and low cardiac index. Although total number of embolic events is not very high, they seem to be more likely associated with left atrial SEC rather than DA-SEC.

PP-81  
ECHOCARDIOGRAPHIC FINDINGS IN PULMONARY SARCOIDOSIS

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**Background:** Sarcoid heart disease is a major concern in patients with sarcoidosis. The aim of this study was to evaluate echocardiographic findings in pulmonary sarcoidosis.

**Method:** Thirty consecutive patients with biopsy specimen-proved pulmonary sarcoidosis were underwent echocardiographic study. Patients were divided into two groups: with diastolic dysfunction(A) and without diastolic dysfunction(B).

All patients were assessed clinically and 12-lead ECG, serum ACE levels, thorax CT, pulmonary function tests, arterial blood gas levels, carbon monoxide (CO) diffusion capacity and bronchoalveolar lavage(BAL) were ordered.

**Results:** Echocardiographic evidence of left ventricular diastolic dysfunction was detected in 19 (63.3%) patients. In comparison of the diastolic indexes in group A and B, it was disclosed that there were significant prolonged isovolumic relaxation time (IVRT), deceleration rate of early diastolic flow (DT) values and reversal of E/A ratio in group A. Low PaO<sub>2</sub> levels were detected in seven patients with group A and none of group B(p=0.029), low forced vital capacity (85.16±19.04% vs 101.18±14.61%, p=0.023) and much more symptoms like dyspnea and nonspecific chest pain (63.2% vs 18.2%, p=0.026) were observed in patients with diastolic dysfunction. There were no statistically significantly difference between two groups when they compared regarding the patient characteristics, radiological stage, frequency of bilateral hilar lymphadenopathy, extra pulmonary involvement, serum ACE level, percentage of lymphocyte in BAL, CO diffusion capacity.

**Conclusion:** There was a significant prevalence of abnormal left ventricular diastolic dysfunction in patients with sarcoidosis even if no clinical suspicion of cardiac involvement. The significance of these abnormalities is unknown and therefore the usefulness of echocardiography as screening tool in the detection of early sarcoid cardiomyopathy is uncertain and warrants further studies.

PP-83  
ECHOCARDIOGRAPHIC DETERMINANTS OF PULMONARY CAPILLARY WEDGE PRESSURE IN DILATED CARDIOMYOPATHY

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**Background:** Pulmonary capillary wedge pressure (PCWP) is an important index of cardiac function and has been shown to correlate with symptoms, exercise capacity, and prognosis in patients with known heart disease. Therefore the aim of the present study was to assess the influence of the degree of MR, LV systolic, diastolic properties and configurational changes on PCWP in a consecutive group of patients with dilated cardiomyopathy (DCM).

**Methods:** We studied 42 (18 female, mean age: 41.2±17.9 years) DCM patients with normal sinus rhythm. Left atrial (LA) diameter, LV systolic, end diastolic volumes, ejection fractions (EF), LV sphericity index (LVSI) at end-systole and end-diastole, dP/dt were measured by transthoracic echocardiography. Transmittal flow was obtained by pulsed wave Doppler echocardiography by positioning a sample volume at the level of the mitral tip in the apical four-chamber view. Peak velocities during early (E) and late (A) filling, E-wave deceleration time (EDT) and isovolumic relaxation time (IVRT) were measured. Mitral regurgitant (MR) volumes and orifice area were calculated by proximal isovelocity surface area method.

**Results:** Significant correlations were observed between mean PCWP and the following: LA diameter (r = 0.51), LV systolic (r = -0.53), diastolic (r = -0.49) volumes, EF (r = -0.56), dP/dt (r = -0.35), MR volume (r = 0.46), MR orifice area (r = 0.47), early peak velocity of mitral flow (r = 0.51), EDT (r = -0.47), systolic (r = -0.54) and diastolic (r = -0.69) LVSI. Stepwise multiple linear regression analysis selected MR volume and diastolic LVSI independent predictors of PCWP in DCM patients.

**Conclusion:** Our results indicate that PCWP is affected by MR volume and LVSI confirms that LV configurational changes and in related to this, MR are its main determinants in DCM patients.

PP-82  
ECHOCARDIOGRAPHIC DETERMINANTS OF COLOR M-MODE FLOW PROPAGATION VELOCITY IN DILATED CARDIOMYOPATHY

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**Background:** Color M-mode Doppler flow propagation velocity (Vp) measures spatial and temporal propagation of early diastolic flow and its velocity in left ventricular (LV) cavity. This index can be useful in routine clinical evaluation of diastolic function. The aim of this study was to investigate the independent influence of LV systolic, diastolic function and degree of mitral insufficiency on Vp in patients with dilated cardiomyopathy (DCM).

**Methods:** We studied 42 (18 female, mean age: 41.2 ± 17.9 years) DCM patients with normal sinus rhythm. LV systolic, end-diastolic volumes, ejection fraction, LV sphericity index (LVSI) at end-systole and end-diastole, dP/dt were measured by transthoracic echocardiography. Transmittal flow was obtained by pulsed wave Doppler echocardiography by positioning a sample volume at the level of the mitral tip in the apical four-chamber view. Peak velocities during early (E) and late (A) filling, E-wave deceleration time and isovolumic relaxation time (IVRT) were measured. Vp was measured by using color M-mode echocardiography of mitral inflow in apical four-chamber view. Mitral regurgitant (MR) volumes and orifice area were measured by proximal isovelocity surface area method.

**Results:** We found modest but significant bivariate relation between Vp and age (r = -0.40, p < 0.01) and IVRT (-0.43, p < 0.007). In main determinants of Vp at multivariate stepwise regression analysis were IVRT (p < 0.0001) and dP/dt (p < 0.04).

**Conclusion:** Our results indicate that Vp is not affected by MR and confirms that not only LV relaxation but also LV contractility and pump functions are its main determinants in DCM patients.

PP-84  
QUANTITATIVE ASSESSMENT OF SEGMENTAL VENTRICULAR FUNCTION, TISSUE DOPPLER IMAGING VS M-MODE

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**Background:** Tissue Doppler recording of myocardial velocities has been widely used for assessing ventricular function particularly in patients with coronary artery disease, but its accuracy has not received as much attention as its utility.

**Aims:** To compare the accuracy of TDI velocity measurements with those obtained from digitized M-mode.

**Methods:** We studied 100 consecutive subjects, 51 with coronary artery disease, mean age 53±15 years using TDI and M-mode techniques. TDI velocity signals were measured at three levels: outer, inner and middle envelope and compared with peak velocities obtained from digitized long axis M-mode. **Results:** Peak systolic (S) and early diastolic (E) TDI velocities correlated closely with peak long axis shortening and early lengthening velocities at left, septal and right ventricular free wall. Middle TDI signal velocity showed the strongest correlation with the respective M-mode velocities at all site (shown in table).

		Left		Septal		Right	
		Mean	r	Mean	r	Mean	r
S	Outer	8.9±2.0	0.84	8.0±1.8	0.83	11.7±2.5	0.87
	Middle	6.6±1.8	0.92	5.6±1.4	0.91	9.2±2.4	0.91
	Inner	4.3±1.9	0.85	3.3±1.1	0.81	6.8±2.5	0.83
	M-mode (cm/s)	6.5±1.9	0.92	5.6±1.6	0.89	9.5±2.7	
E	Outer	10.8±3.4	0.94	8.5±2.4	0.94	10.2±3.2	0.84
	Middle	8.5±3.3	0.89	6.4±2.2	0.89	9.2±2.4	0.89
	Inner	6.2±3.3		4.4±2.2		6.8±2.5	0.88
	M-mode	7.7±3.3		5.9±2.3		8.1±3.3	

**Conclusion:** Myocardial tissue Doppler velocities are a simple and easily obtainable measure of overall long axis function at different ventricular segments. Since the middle signal velocity is the most closely related value to that of the digitized M-mode, it should be recommended for routine practice in order to guarantee accurate measurement.

PP-85  
EVALUATION OF RIGHT VENTRICULAR SYSTOLIC FUNCTION WITH B-MODE, B COLOR AND B COLOR CONTRAST ECHOCARDIOGRAPHY IN ROUTINE PRACTICE.

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**Objective:** Color encoded two dimensional and color contrast echocardiography improves opacification and border delineation in cases with suboptimal endocardial border. The purpose of this study was to evaluate the right ventricular systolic function with B-mode, B color encoded and B color contrast echocardiography in routine practice.

**Methods:** Twenty healthy subjects (9 female, 11 male; mean age 32±9.1 years) with sinus rhythm undergoing transthoracic echocardiography (TTE) were included. Right ventricular systolic and diastolic short, long axis diameter and area were measured by apical four chamber in left lateral position. Elipsoidal Shell model was used for measurement of RVEF based on RV systolic and diastolic volume. All measurements were repeated by B color encoded and B color contrast echocardiography. In addition, tricuspid annular motion (TAM) was used for evaluation of RV systolic function.

**Results:** Right ventricular systolic and diastolic area, volume, RVEF and TAM values did not differ between B-mode, B color encoded and B color contrast echocardiographic methods (NS).

	RVSA	RVDA	RVESV	RVEDV	RVEF	TAM
B-mode	10.16±0.11	18.7±0.2	31.9±1.8	68.6±6.8	53.5±2.3	1.7±0.1
Color encoded	9.9±1.2	17.7±3.4	29.3±7.7	67.7±17.1	54.9±9.7	1.8±0.2
Contrast Color Encoded	10.2±1.3	17.1±2.7	31.4±8.6	68.4±13.5	53.2±9.6	1.8±0.3
P value	NS	NS	NS	NS	NS	NS

NS: not significant

**Conclusion:** The results of this study demonstrate that B mode color encoded and color contrast echocardiographic methods may be used for evaluation of RV systolic function as two dimensional method in routine echocardiography.

PP-87  
BLOOD CONCENTRATIONS OF 2, 3-DIPHOSPHOGLYCERATE AND LACTATE IN CONGESTIVE HEART FAILURE

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Erythrocytic 2, 3-diphosphoglycerate (2, 3-DPG) is an intermediate product of the glycolytic pathway; it has an important role in the oxygen transport and release of hemoglobin. 2, 3-DPG binds to oxyhaemoglobine and reduces its affinity to oxygen. In the lack of oxygen, more 2, 3-DPG is synthesized and it binds to hemoglobine. So, more oxygen delivery to tissues is achieved. In this study, we tried to evaluate the prognostic significance of changes in blood 2, 3-DPG and lactate concentrations in congestive heart failure. Blood 2, 3-DPG, lactate and haematocrite concentrations were investigated in 16 patients (8 men and 8 women) with class III-IV heart failure and 28 control subjects (14 men and 14 women). 2, 3-DPG concentrations were higher in patients with congestive heart failure (6.5±1.1 mmol/L, erythrocyte vs. 4.1±1.2 mmol/L, erythrocyte, p<0.05); but there was no difference between the admission and discharge values 6.5±1.1 mmol/L, erythrocyte vs. 6.4±1.0 mmol/L, erythrocyte, p>0.05). Lactate concentrations were within normal range in both groups but there was a statistically significant difference between the patients and the control group (18.4±7.4 mg/dl vs. 11.7±9.7 mg/dl, p<0.05); but there was no difference between the admission and discharge values of the patient group (18.4±7.4 mg/dl vs. 17.3±8.2 mg/dl, p>0.05). A negative correlation was found between the haematopoietic system and 2, 3-DPG in female patients. In conclusion, concentrations of 2, 3-DPG, lactate and hematocrite increases in hypoxic conditions but they don't have an impact on prognosis of patients with congestive heart failure.

PP-86  
MYOCARDIAL PERFORMANCE INDEX AND MYOCARDIAL MASS IN CONTINUOUS AMBULATORY PERITONEAL DIALYSIS PATIENTS WITH LEFT VENTRICULAR HYPERTROPHY

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**Background:** Hypertrophy of left ventricle (LV) as a response to the increased afterload can be viewed as protective up to a certain point. Beyond that point, LV dysfunction may accompany LV hypertrophy. Continuous ambulatory peritoneal dialysis (CAPD) is a selective dialysis method, which is useful for patients which depressed LV functions. The purpose of the study was to determine the effects of LV hypertrophy on myocardial performance index (MPI) of left and right ventricles in patients with CAPD.

**Methods:** Thirtyfive patients in CAPD program were examined by echocardiography. Beyond conventional assesment, LV mass and MPI were determined in 20 CAPD patients with LV hypertrophy (Group A, ages 44.05±11.37, 14 female) and in 14 patients with normal LV mass index (Group B, ages 42.43±10.89, 6 female). Two groups compared with respect to clinical and echocardiographic findings.

**Results:** We did not determine any difference in age, sex, systemic disease, hemoglobine levels, chronic renal failure and CAPD periods between A and B Groups. Mass indexes of LV of groups A and B were significantly different (158.45±50.18 vs 94.35±20.59 gr/m<sup>2</sup>, p= 0.00). Heart rates, LV ejection fractions, LV end diastolic, end systolic and stroke volumes, cardiac outputs and indexes, E/A ratio, deceleration and isovolumic relaxation periods were similar between groups (All p>0.05). Left ventricular MPI (0.42±0.18 vs 0.42±0.18, p=0.93) and right ventricular MPI (0.21±0.13 vs 0.167±0.14, p=0.26) of both groups were not found significantly different. Left ventricular MPI also was not correlated with LV mass in A and B groups (r=-0.26, p=0.26 vs r=-0.75, p=0.79).

**Conclusion:** Hypertrophy of LV does not change MPI in CAPD patients with similar systolic and diastolic LV functions. Left ventricular mass index also has not a correlation with LV MPI not only in cases with normal LV mass, but with LV hypertrophy as well. We should explore it with larger scale studies and in other populations.

PP-88  
EFFECTS OF HEMODIALYSIS ON RIGHT VENTRICULAR MYOCARDIAL PERFORMANCE INDEX IN CHRONIC RENAL FAILURE

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**Background:** Right ventricular myocardial performance index (RVMPI), has been described as an echocardiographic measure of global right ventricular function. The aim of the study was to determine the effects of hemodialysis (HD) on RVMPI, right atrium diameter (RAD) and mean pulmonary artery pressure (MPAP).

**Methods:** Twenty-one patients in chronic HD program (ages 32.9±9.1, 11F, Group 1) were compared with 17 healthy cases (ages 31.2±5.9, 11F, Group 2). Right ventricular myocardial performance index, RAD and MPAP were determined by echocardiography once in Group 2 and before and after 1 hour of HD in Group 1.

**Results:** Groups 1 and 2 were age matched (p=0.7). In Group 1, pre HD RVMPI was significantly higher (0.26±0.18 to 0.12±0.10, p=0.007) than Group 2. The RAD and MPAP was similar between the two groups (3.3±0.4 cm to 3.1±0.3 cm, p=0.06) and (24.8±13.3 mm Hg to 21.8±9.6 mm Hg, p=0.523). This index was not correlated with RAD (r=0.22, p=0.34) and MPAP (r=0.21, p=0.36). After a mean weight reduction of 2.33±0.92 kg with HD, the RVMPI decreased almost significantly (0.26±0.18 to 0.19±0.13, p=0.073) and was found normal like Group 2 (0.19±0.13 and 0.12±0.10, p=0.10). With HD, MPAP did not change (24.8±13.3 mm Hg to 25.2±16.3 mm Hg, p=0.9). RAD significantly decreased (3.3±0.4 cm to 2.8±0.8 cm, p=0.02) and RVMPI was correlated with MPAP (r=0.46, p=0.04), but not with RAD (r=0.25, p=0.28).

**Conclusion:** Before HD, RVMPI was significantly higher than normal in chronic renal failure. This may be related to the uremia and hypervolemia beyond other metabolic effects. This hypothesis has been supported by the improvement of RVMPI by HD. After HD, we have seen no change on MPAP, but reduction in RAD which is well known to be more volume dependent. Hemodialysis emphasizes the correlation between RVMPI and MPAP, in patients with chronic renal failure. More informative results can be obtained by larger studies.

### ASSESSMENT OF VOLUME REDUCTION ON RIGHT VENTRICLE FUNCTION IN HEMODIALYSIS PATIENTS BY DOPPLER TISSUE IMAGING

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Doppler tissue imaging (DTI) is a new echocardiographic application which allows non invasive assessment of left ventricular systolic and diastolic performance. But the results on right ventricle function by DTI is not clear yet. Hemodialysis procedure is known to be associated with acute reduction in intravascular volume. To assess the impact of volume reduction on right ventricular diastolic filling indexes obtained by DTI, 40 patients (mean 48 ± 14 years) on chronic hemodialysis were consecutively studied before, and 1 hour later after hemodialysis. Mean volume ultrafiltrated on hemodialysis was approximately  $3 \pm 1$  liters. Doppler echocardiography and pulsed DTI echocardiography were performed by the same physician to hemodialysis patients before and after hemodialysis. We measured the right ventricle ejection fraction (RVEF) by the modified Simpson method, the diastolic waves (E, A) and isovolumic relaxation time (IVRT) from the apical, mid, and basal of right ventricle. RVEF did not change after hemodialysis significantly ( $p=0.146$ ). E wave decreased in apical, mid, and basal portions of right ventricle significantly ( $p < 0.001$ ). A wave did not change in apical portion ( $p=0.10$ ) but it decreased in both mid ( $p=0.002$ ) and basal portion ( $p < 0.001$ ) significantly. IVRT did not also change in apical portion ( $p=0.74$ ) but it also decreased in both mid and basal portion ( $p = 0.001$ ) significantly. E/A ratio did not significantly change in each three portions ( $p > 0.05$ ).

In conclusion, assessment of diastolic indexes by DTI in both mid and basal portion of right ventricle had been effected from volume reduction. But E/A ratio was volume independent parameter in each three portions of right ventricle.

### EFFECTS OF BIVENTRICULAR PACING ON LEFT VENTRICULAR DIASTOLIC FUNCTION IN PATIENTS WITH DILATED CARDIOMYOPATHY

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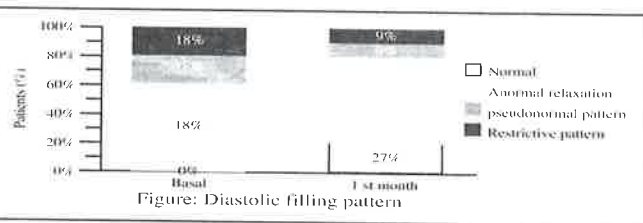
**Background:** Conduction abnormalities, such as left bundle branch block, right bundle branch block, and nonspecific conduction delay, are observed commonly in patients with dilated cardiomyopathy. Intraventricular conduction delay especially LBBB is associated with uncoordinated contraction pattern leads to impaired systolic and diastolic function.

The aim of this study was to evaluate the effects of biventricular pacing on left ventricular diastolic Doppler parameters and diastolic filling pattern by echocardiography.

**Methods:** Eleven patients (mean age:  $59 \pm 12$  years) with dilated cardiomyopathy (left ventricular ejection fraction  $\leq 35\%$ ) and left bundle-branch block who had symptoms of heart failure despite optimal medical therapy underwent implantation of biventricular pacing system. Echocardiography was performed at baseline and after 1 month.

**Results:** All patients presented clinical improvement after implantation. The duration of QRS ( $176 \pm 15$  ms vs  $141 \pm 11$  ms,  $p=0.01$ ) decreased and ejection fraction increased ( $24 \pm 7\%$  vs  $33 \pm 12\%$ ,  $p=0.01$ ). Significant improvements were observed in mean NYHA functional class ( $3.1 \pm 0.5$  vs  $2.3 \pm 0.4$ ,  $p=0.007$ ) and exercise time ( $8.8 \pm 4$  min vs  $12.6 \pm 6.9$  min,  $p=0.01$ ). Echocardiographic diastolic parameters did not change significantly except mitral A velocity ( $0.87 \pm 0.3$  vs  $0.65 \pm 0.2$ ,  $p=0.007$ ). Left ventricular diastolic filling pattern improved significantly ( $p=0.03$ ) (Figure).

**Conclusion:** Cardiac resynchronization therapy may change echocardiographic diastolic parameters and improves left ventricle diastolic filling pattern.



### EFFECT OF CARDIAC RESYNCHRONIZATION THERAPY ON LEFT ATRIAL SPONTANEOUS ECHO CONTRAST, LEFT ATRIAL REVERSE REMODELING AND LEFT ATRIAL TOTAL EMPTYING FRACTION

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**Background:** Cardiac resynchronization therapy (CRT) restores ventricular synchrony and has beneficial effects on left ventricular (LV) systolic function. Recent studies revealed a reverse remodeling in LV with CRT. However, changes in left atrial remodeling and effects on spontaneous echo contrast (SEC) have not been adequately evaluated. The aim of this study was to investigate the long-term effects of CRT on SEC, left atrial reverse remodeling and left atrial total emptying fraction (LATEF). LV systolic function and reverse remodeling in patients with dilated cardiomyopathy (CMP).

**Material and Methods:** Five-teen patients with NYHA Class III to IV, a LV ejection fraction  $< 35\%$ , complete left bundle-branch block (LBBB), and a QRS  $> 150$ ms underwent implantation of biventricular pacemaker devices. Transthoracic and transesophageal echocardiography, Naughton Exercise testing were performed before one week and after one and six months of implantation. Parameters after one and six months of CRT were compared with basal parameters.

**Results:** After CRT, significant clinical improvement and significant increase in exercise duration was observed in all patients. LV end-systolic and end-diastolic dimensions and LV end-systolic and end-diastolic volumes decreased significantly after one and six months of CRT. LV ejection fraction, fractional shortening and cardiac index also increased after CRT. Mitral regurgitation reduced significantly after CRT. Left atrial minimum (LAVmin) and left atrial maximum volumes (LAVmax) decreased significantly after one and six months of CRT. LATEF increased, and frequency and intensity of SEC decreased gradually after CRT.

**Conclusions:** CRT results in atrial and ventricular reverse remodeling, increases atrial total emptying fraction and LV systolic function, and reduces frequency and intensity of atrial SEC.

### PHYSIOLOGICAL RESPONSES TO THE STEPPER EXERCISE IN SEDENTARY MIDDLE-AGED MEN

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**Purpose:** The purpose of the study is to evaluate the acute effects of stepper exercise on cardiopulmonary parameters in sedentary middle-aged 20 healthy (mean age  $51.4 \pm 8.9$  years) and 26 myocardial infarction patients (mean age  $53.8 \pm 8.9$  years).

**Methods:** All subjects have undergone stepper exercise. The cardiopulmonary responses were measured before, at peak exercise and at the end of recovery period. Minute ventilation were measured using the oxygen analyzer. Rate-pressure product and oxygen-pulse were calculated. The statistical significance was tested by t-test.

**Results:** Stepper exercise was better than tolerated by the healthy subjects ( $20.0 \pm 8.2$  min) than the patients with myocardial infarction ( $14.7 \pm 8.8$  min). In these two groups although the duration of exercise is different, similar MET values are obtained. In myocardial patients 76.4% of maximal heart rate and in healthy subjects 73.4% of maximal heart rate was reached. The other all cardiopulmonary parameters were similar between two groups.

**Conclusions:** In stepper exercise no complications was seen and all patients reached 70% of maximal heart rate. The functional physical activities such as stepper should be encouraged for sedentary, middle-aged patients with myocardial infarction to increase cardiopulmonary fitness.

PP-93  
THE CARDIOPULMONARY RESPONSES TO STATIC AND DYNAMIC  
ARM EXERCISE IN HEALTHY SUBJECTS

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**Purpose:** Static and dynamic activities cause different hemodynamic responses. This study is designed to investigate the effects of daily dynamic and static activities. Primary goal of cardiopulmonary rehabilitation is planning safe physical activities without causing cardiovascular risk.

**Subjects:** The study population consisted of 14 healthy subjects (7 male, 7 female, mean age 50.6±8.7 years) who underwent a routine check-up evaluation in cardiology.

**Methods:** All subjects underwent an isometric handgrip test (3 minutes at 50% of maximum) and leveled submaximal dynamic armcrank test. Oxygen consumption were measured during both tests. The cardiopulmonary responses were measured before, at peak exercise and at the end of recovery period. Because isometric exercise test was limited to 3 minutes, third minute results of the arm-crank test was used for comparison. Minute ventilation, ventilatory frequency, tidal volume, oxygen consumption per kg, ventilatory equivalent and Met were measured using the oxygen analyzer. Heart rate and blood pressure were recorded. Rate-pressure product and oxygen-pulse were calculated. The statistical significance was tested by t-test.

**Results:** During isometric exercise systolic ( $p<0.02$ ) and diastolic ( $p<0.02$ ) blood pressure raised significantly. All other cardiovascular parameters were higher during arm-crank test.

**Conclusion:** In daily life some activities required static efforts. These activities is required using arms. Exercise programs for adults should be designed after assessing individual hypertension risk.

PP-95  
EVALUATION OF EXERCISE STRESS TEST PARAMETERS IN  
PATIENTS WITH SIGNIFICANT LEFT MAIN CORONARY STENOSIS

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The aim of this study was to determine the exercise test parameters shown in patients who have significant LMCA disease.

**Methods:** Thirty three pts (Group A; 7 F, mean age 58±10) who had significant LMCA disease (>50% stenosis) on coronary angiography were compared with 58 pts (Group B, 12 F, mean age 57±9) who had three vessel disease and 52 pts (Group C; 14 F, mean age 55±10) who had two vessel disease regarding with their exercise test parameters (Bruce Protocol). None of the pts had previous MI and any pathologic Q wave on their ECGs. Typical angina symptom and/or  $\geq 1$  mm horizontal ST depression at least two sequential leads were accepted as positive test result.

**Results:** There was no statistical difference between groups as far as their ages, genders, baseline blood pressures and heart rates were concerned. In Group A, maximal ST depression was shown in lead II. In group A, persisting 5 minutes ST depression into recovery, involving 5 leads to ST depression were found significantly higher than group B and C ( $p<0.05$  for all). Comparing the Group A, B and C; maximal exercise time (4.5±2.2, 5.1±2.1 and 6.8±1.7 min respectively), rate-pressure product (24.7±5.1, 25.3±5.7 and 29.1±7.0 mmHg x beat/min respectively), maximal ST depression 2.9±0.7, 2.5±0.8 and 2.0±0.6 mm respectively), number of the leads involving ST depression (6.3±1.5, 5.0±1.6 and 4.6±1.5 leads respectively) and Duke treadmill score index (-16.3, -15.4 and -9.6 respectively) were found similar for Group A and B ( $p>0.05$ ), but found significantly different for Group A and C ( $p<0.05$  for all above parameters).

**Conclusion:** Only two parameters, persisting  $\geq 5$  minutes ST depression into recovery and involving  $\geq 5$  leads to ST depression were found significantly higher in patients with LMCA disease. Although other exercise parameters mentioned above were similar in patients with LMCA and three vessel disease, all parameters were significantly different in patients with LMCA and two vessel disease.

PP-94

IN PATIENTS WITH CORONARY ARTERY DISEASE. EXERCISE  
QRS-SCORING SHOW NOT ONLY THE PRESENCE OF ISCHEMIA,  
BUT ALSO ITS LOCALIZATION

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Exercise-induced changes in Q, R and S wave amplitudes and their incorporation into a composite index (Athens-QRS-score) have been reported to increase the diagnostic value of the exercise-ECG. The aim of this study is to compare the localization of the coronary lesions in patients with single vessel disease and the exercise-QRS-scores.

The study included 309 patients with single vessel disease detected by coronary angiography. QRS-score was calculated based on exercise included changes of the Q, R and S waves in derivations a VF and V5.

Patients were divided into 3 groups according to the localization of the lesion defined by coronary angiography, Group-I: Patients with lesion in proximal vessel location, Group-II: Patients with lesion in mid vessel location, group-III: Patients with lesion in distal vessel location. The control group (Group-IV) consisted of patients with normal coronary artery. The mean QRS-scores were found to be -5.19±4.15, -1.74±1.88, 1.56±1.74 and 3.14±3.10 respectively. QRS-score of Group-I was significantly less than those of group III and IV ( $p<0.0001$ ). There was a significant difference between group III and IV ( $p=0.0009$ ).

**Conclusion:** Exercise-QRS-score index can be used to predict not only the presence of coronary artery disease but also the localization of the lesion.

PP-96

IS MYOCARDIAL PERFORMANCE INDEX CORRELATED WITH  
HYPERTENSION AND LEFT VENTRICULAR MASS IN  
CONTINUOUS AMBULATORY PERITONEAL DIALYSIS PATIENTS?

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**Background:** Continuous ambulatory peritoneal dialysis (CAPD) is an attractive treatment method of chronic renal failure. The first aim of this study was to determine the effects of hypertension on myocardial performance index (MPI) which is known as an echocardiographic measure of global ventricular functions. The second aim was to investigate the correlations of left ventricular (LV) MPI with LV mass in CAPD.

**Methods:** Thirty-five patients in CAPD were involved. Twenty-four hour ambulatory blood pressure (BP) monitorization was performed. If daytime BP were higher than 140/90 or nighttime BP were higher than 120/80 mm Hg, cases were accepted as hypertensive. Nineteen hypertensive (Group A, ages 43.05±11.63, 10 F) and 16 normotensive (Group B, ages 44.38±10.51, 10 F) were examined by echocardiography. Conventional parameters, LV mass index and MPI of LV and right ventricle (RV) were determined.

**Results:** Heart rates and LV ejection fractions were similar (All  $p>0.05$ ). Group A's LV end diastolic volumes (143.36±37.76 vs 91.48±17.12 ml,  $p=0.00$ ) and systolic volumes (59.10±27.66 vs 36.72±10.26 ml,  $p=0.009$ ), stroke volumes (84.10±22.28 vs 54.15±13.38 ml,  $p=0.000$ ), cardiac outputs (7.27±2.07 vs 4.32±1.43 l/dk,  $p=0.000$ ), cardiac indexes (4.30±1.3 vs 2.61±0.86 l/dk/m<sup>2</sup>,  $p=0.00$ ) and LV mass indexes (152.37±56.61 vs 109.20±33.59 g/m<sup>2</sup>,  $p=0.01$ ) were higher. Neither LV MPI's of two groups (0.41±0.20 vs 0.44±0.15,  $p=0.49$ ) nor RV MPI's (0.22±0.12 vs 0.16±0.13,  $p=0.22$ ) were different. Left ventricular MPI was not correlated with LV mass index in Group A and B ( $r=-0.143$ ,  $p=0.570$  and  $r=0.138$ ,  $p=0.609$ ).

**Conclusion:** Hypertension in CAPD patients, causes higher LV volumes and cardiac output. Left ventricular mass is higher in them than normotensive. In CAPD patients, MPI doesn't change with hypertension. Left ventricular MPI doesn't correlate with LV mass independently from presence of hypertension. Left ventricular MPI is not correlated with BP and LV mass in CAPD patients.

### THE ABNORMALITIES IN THE COAGULATION FACTORS IN PATIENTS WITH ESSENTIAL HYPERTENSION, AND RELATIONSHIP BETWEEN COAGULATION ABNORMALITIES AND END ORGAN DAMAGE

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Hypertension is one of the important health problems in the world due to its high incidence and the fact that it may cause mortality and morbidity during its course. Mortality and morbidity in hypertensive patients are caused by damage of the target organ. Hypertensive patients are found to have impairments in the coagulation mechanism in comparison to normotensive people. The relation between coagulation abnormalities in the hypertensive population and damage of the target organ is debatable. In this study we aimed to investigate the presence of coagulation abnormalities in hypertensive patients and the relation between the possible abnormality and target organ damage. Fifty patients (28 female and 22 male; mean age  $49.6 \pm 12.2$  years) with essential hypertension and 50 healthy cases (26 female and 24 male; mean age  $45.1 \pm 8.0$  years) as a control group were included in the study. In all cases coagulation parameters (fibrinogen, D-dimer,  $\pm$  anti-thrombin III) and target organ damage were investigated in addition to routine physical examination and specific laboratory tests. Coagulation parameters for hypertensive cases and healthy people comprising the control group were as follows respectively: Fibrinogen (mg/dl), D-dimer and AT III (%) (m/dl):  $440.34 \pm 61.26$ ,  $3.9 \pm 86.80$ ,  $80 \pm 26$ ;  $229.38 \pm 77$ ,  $56.57 \pm 60$ ,  $100.37 \pm 34$  ( $p < 0.001$ ). The difference in terms of impairments of coagulation parameters was not statistically significant between hypertensive cases with target organ damage and other hypertensive cases ( $p > 0.005$ ). As a result, we did not find a significant increase in coagulation parameters in the hypertensive group when compared to the control. Coagulation impairments of hypertensive cases with target organ damage and hypertensive cases without target organ damage were not different.

### THE PIVOTAL ROLE OF DIURNAL BLOOD PRESSURE PATTERN IN STRATIFICATION OF HYPERTENSIVE PATIENTS

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**Background:** The level of blood pressure value is not the only determinant of adequate blood pressure control in treated hypertensive patients. The study was designed to identify the role of the impaired diurnal pattern of blood pressure on target organ damage.

**Methods:** Ambulatory blood pressure monitoring and transthoracic echocardiography were performed in treated 39 patients with long-standing sustained class 2-3 hypertension. The patients were classified according to their nocturnal systolic blood pressure fall. On the basis of their dipping status: 10 (26%) patients were dippers (fall between %10-20; 14 (37%) patients were nondippers (fall between %0 and %10); and 15 (38%) patients were risers or reverse dippers (with < 0%). Left ventricular mass index (LVMI) was calculated from M-Mode echocardiography  $135 \text{ g/m}^2$  in males and  $110 \text{ g/m}^2$  in females were taken as cut-off for increased mass index.

**Results:** Although no difference was seen concerning sex, age and 24-hour mean systolic blood pressure, there were significant correlation between LVMI and blunted nocturnal blood pressure in nondippers and a more significant correlation between LVMI and high nocturnal blood pressure in reverse dippers (Table 1). Also, a close relationship with previous cerebrovascular (transient ischemic attacks, stroke) events and cardiovascular (coronary artery bypass grafting operation, percutaneous coronary intervention) procedure frequency in nondippers and reverse dippers group attracted our attention.

**Conclusion:** We concluded that abnormal dipping pattern plays an important role in revealing target organ damage in hypertension.

Dip	Non	Rev	P Dip-Non	P Dip-Rev
$1.16 \pm 0.08$	$1.35 \pm 0.12$	$1.49 \pm 0.19$	0.002	0.0001
$1.11 \pm 0.09$	$1.28 \pm 0.11$	$1.29 \pm 0.2$	0.007	0.005
$4.2 \pm 0.4$	$5.0 \pm 0.35$	$5.2 \pm 0.54$	0.001	0.0001
$119 \pm 25.7$	$192 \pm 39.4$	$231 \pm 75.7$	0.0001	0.0001
0	43	66	0.02	0.004

ToD: Target organ damage, Non-rev p value  $> 0.05$ .