

1061-102 Additional Hemodynamic Testing Enhances the Diagnostic Value of Head-Up-Tilt and Outcome of Treatment in Syncope

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The head-up tilt test (HUT) is an effective diagnostic tool for neurally mediated syncope as well as for other causes of syncope. However, it does not provide sufficient information in regard to the underlying cardiovascular predisposing factors. Consequently additional testing can enhance its diagnostic value and prognostication of response to therapy. 21 consecutive patients with a history of syncope were studied in Jan 96 (13 F:8 M, age 16-78 y). All but 3 were on medications for co-morbid conditions (6 Hypertension, 6 Diabetes, 1 CHF, 1 seizure, 1 COPD, 2 migraine, 1 Parkinson, 1 CFS, 2 depression). **Methods:** All had blood volume (RISA), HUT (15, 30, 45 degree for 2' each, then 60 degree for up to 20'), postural systemic hemodynamic evaluation (99mTc-first pass). **Results:** HUT was abnormal in 7 (4 Progressive Orthostatic Hypotension, 1 Postural Tachycardia, 1 VasoVagal, 1 VasoDepressor) and normal the in others. 99mTc hemodynamic test showed one or more abnormalities in all, defined as Venous Pooling in 20, HyperKinetic Circulation in 8, Hypovolemia in 3, and Autonomic Insufficiency in 2. **Treatment:** was based on the hemodynamic diagnoses. Six came for follow-up within 6 months, 12 had phone follow-up, and 3 were inaccessible. 14 pts followed our work-up recommendations and improved on planned treatment; 4 did not follow the recommendations and did not improve or only partially improved. **Conclusion:** The combination of HUT and hemodynamic testing achieves a more specific diagnosis of syncope that allows individualized treatment and prevention of recurrence of syncopal episodes.

1062 Hypertrophic Cardiomyopathy: Coronary and Myocardial Factors

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Presentation Hour: Noon-1:00 p.m.

1062-70 Stress-Induced Ischemia as a Prognostic Marker of Future Adverse Cardiac Events in Adult Hypertrophic Cardiomyopathy

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Myocardial ischemia may play a role in the natural history of hypertrophic cardiomyopathy (HCM). Aim of the study was to assess the prognostic value of dipyridamole-induced ischemia in patients with HCM. Ninety-four HCM patients (66 males; mean age = 48 ± 14 years) underwent high dose (up to 0.84 mg/kg over 10 min) dipyridamole stress echocardiography and were followed-up for a mean of 4.3 years. Forty-three patients (46%) showed echocardiographic (i.e., new regional dyssynergy; $n = 11$) or electrocardiographic (i.e., ST segment depression > 2 mV from baseline, $n = 32$) signs of myocardial ischemia during dipyridamole stress (Group I), whereas 51 (54%) had negative test for both echo and electrocardiographic criteria (Group II). The two groups were similar for age (Group I = 51 ± 14 vs Group II = 46 ± 15 years, $p = ns$), sex (% males 73 vs 69, $p = ns$), degree of left ventricular hypertrophy (septal thickness 20 ± 4 vs 18 ± 5 mm, $p = ns$), end-diastolic diameter (48 ± 6 vs 47 ± 5 mm, $p = ns$), percent of fractional shortening (37 ± 6 vs 41 ± 7 , $p = ns$) and frequency of left ventricular outflow gradient at rest (19% vs 15%, $p = ns$); duration of follow-up was also similar (50 ± 9 vs 56 ± 8 months, $p = ns$). Fourteen patients had events: 2 cardiac deaths; 2 myocardial infarctions; 8 worsening of angina, followed by coronary revascularization in 2 pts; 2 syncopes. Twelve events occurred in 43 pts of Group I and 2 in 51 pts of Group II (28% vs 4%, $p < 0.01$). All hard events (death and infarction) occurred in patients with dipyridamole-induced dyssynergy. In conclusion electrocardiographic and, even more strikingly, echocardiographic signs of myocardial ischemia elicited by dipyridamole identify patients with HCM at higher risk of adverse cardiac events, suggesting a potentially important pathogenetic role of inducible myocardial ischemia in determining prognostic outcome in these patients.

1062-71 Clinical and Prognostic Significance of Dipyridamole Stress Thallium-201 Perfusion Abnormalities in Patients with Hypertrophic Cardiomyopathy

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Thallium-201 (Tl-201) perfusion defects are common in patients (pts) with hypertrophic cardiomyopathy (HCM) and may be prognostic markers in the young. Dipyridamole Tl-201 scintigraphy and washout analysis was performed in 216 consecutive pts with HCM. Fixed defects (FD) occurred in 25%, reversible defects (RD) in 22%. Seven % had both FD and RD. FD were associated with: syncope (17 of 46 vs 36 of 170, $p = 0.03$); larger left ventricular (LV) end-diastolic (46.9 ± 7.4 vs 43.3 ± 6.4 mm; $p = 0.001$) and end-systolic dimensions (30.2 ± 8.4 vs 24.5 ± 5.9 mm, $p < 0.0001$); increased left atrial (LA) diameter (46.1 ± 8.1 vs 40.5 ± 7.7 mm, $p < 0.0001$); decreased fractional shortening (35.9 ± 10.4 vs $43.8 \pm 8.6\%$, $p < 0.0001$); and reduced maximal exercise oxygen consumption (24.2 ± 8.1 vs 29.4 ± 8.8 ml/min/kg, $p < 0.0001$). RD did not relate to symptoms but were associated with: higher LV outflow gradients (36 ± 52 vs 17 ± 24 mmHg; $p < 0.001$); and greater maximal LV wall thickness (24.0 ± 7.0 vs 21.6 ± 7.0 mm, $p = 0.003$). Total Tl-201 washout was lower in pts with angina (34.8 ± 10.2 vs $38.3 \pm 11.4\%$, $p = 0.03$) and inversely correlated with maximal LV wall thickness ($r = -0.46$, $p < 0.0001$). Pts with RD had lower total washout ($33.0 \pm 12.3\%$ vs $38.2 \pm 10.5\%$, $p = 0.004$). Mean follow up time was 41 ± 21 months, (0.6-124). Cardiac death was defined as: sudden death (including survivors of VF) ($n = 9$), progressive heart failure ($n = 3$), orthotopic transplantation ($n = 2$). No pts that died had a RD and 5 had FDs. Neither Tl-201 regional defects nor "low" ($< 30\%$) total washout related to cumulative survival in young or adult pts. FD in patients with HCM are associated with impaired LV function. RD correlates with neither symptoms nor prognosis at any age. Thus the role of thallium-201 scintigraphy in the prognostic evaluation of patients with HCM is limited.

1062-72 Changes in Phasic Coronary Blood Flow Velocity Profile And Relative Coronary Flow Reserve in Patients With Hypertrophic Obstructive Cardiomyopathy

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Studies of the coronary circulatory responses in patients with hypertrophic obstructive cardiomyopathy (HOCM) are limited. In this study we investigated the CFV in HOCM and also tested the hypothesis of different coronary flow reserve (CFR) of coronary arteries perfusing left ventricular regions with nonuniform myocardial hypertrophy measuring the relative CFR. CFV was assessed in the left anterior descending (LAD) and left circumflex (LCX) artery in 18 patients with marked hypertrophy only in the ventricular septum, and in 9 age- and sex-matched normal subjects at rest, during rapid atrial pacing and after dobutamine infusion (5 to 30 μ g/kg/min). CFR was evaluated by means of papaverine infusion response. Relative CFR was estimated as the ratio of absolute CFR of the LAD to absolute CFR of the LCX. A systolic retrograde CFV wave was recorded in early systole in the LAD, in all patients with HOCM and in none of the controls. In the LCX there was no or only a very small retrograde CFV and changes were trivial during hemodynamic interventions. In patients coronary flow (CF) at rest was increased in the LAD compared to the LCX with a ratio LAD/LCX 1.25 \pm 0.11, while in controls CF was equal in the two vessels with a ratio LAD/LCX_{CF} 1.0 \pm 0.1 ($p < 0.001$). At peak rapid atrial pacing and during dobutamine stress LAD/LCX_{CF} was reversed in patients (0.82 \pm 0.07 and 0.079 \pm 0.06 respectively) while it remained unchanged in controls (1.0 \pm 0.05 and 1.0 \pm 0.05 respectively, $p < 0.001$). Relative CFR was 0.62 \pm 0.05 in HOCM patients while it was 1.05 \pm 0.05, ($p < 0.001$) in normal subjects. There was an inverse correlation between relative coronary flow reserve and peak systolic outflow tract gradient ($r^2 = 0.74$, $p < 0.001$). **Conclusions:** Regional distribution of hypertrophy in some patients with HOCM resulted in regional impairment of CF. Relative CFR can estimate regional disturbances of CF and may help in patient selection for new interventional therapeutic techniques.