

sel disease. This study examined the prognostic value of exercise thallium imaging in 221 medically treated pts with normal resting ECG who also had coronary angiography (of those, 88 pts had multivessel CAD). During a mean follow-up of 52 ± 26 months there were 24 cardiac events (death or non-fatal myocardial infarction). The pts with events had more diabetes mellitus (25% vs 8%, P < 0.02) and larger perfusion abnormalities (16 ± 13% vs 9 ± 11%, P < 0.005). Using multivariate Cox survival analysis, the size of perfusion abnormality and diabetes were independent predictors of events. Of the pts with large defects (≥ 15% of the myocardium) and diabetes, 50% had events while of pts with no or small defects and no diabetes only 6% had events. Using Kaplan-Meier survival curves, the event-free survival was significantly lower in pts with large defects and diabetes than in pts with small defects. Thus, pts with normal resting ECG have a fairly low annual event rate (2.5%/year). These pts can be further stratified into a low risk group with an event rate of 1%/year and a high risk group with an event rate of 12%/year using exercise SPECT thallium imaging.

**779 Studies of Endothelium Function**

Wednesday, March 27, 1996, 8:30 a.m.—10:00 a.m.  
Orange County Convention Center, Room 224F

8:30

**779-1 Transient Impairment of Endothelium-Dependent Brachial Artery Vasoactivity Following a Fatty Meal**

Gary D. Plotnick, Mary C. Corretti, Robert A. Vogel. *University of Maryland School of Medicine, Baltimore, MD*

Flow-mediated (endothelium-dependent) brachial and coronary vasoactivity are impaired by coronary risk factors, including hypercholesterolemia. To determine whether a single fatty meal impairs vasoactivity independent of long-term effects on serum cholesterol, we evaluated flow-mediated brachial artery vasoactivity in 5 normocholesterolemic male volunteers before and hourly following 900 calorie high- and low-fat breakfasts (high-fat: Egg McMuffin®, Sausage McMuffin®, Hash Browns vs. low-fat: dry cereal, skim milk, orange juice). Flow-mediated brachial artery vasoactivity was measured using 7.5 MHz ultrasound and expressed as % diameter change from baseline to hyperemic conditions (1 minute following 5 minutes of blood pressure cuff arterial occlusion). Flow-mediated vasoactivity decreased from 20.4 ± 4.2% at baseline to 9.3 ± 7.5% 3 hours and 8.2 ± 2.5% 4 hours post fatty meal (both p < 0.05). Vasoactivity returned to preprandial levels within about 6 hours. The drop in vasoactivity corresponded to an transient increase in serum triglycerides of 82% and occurred in individuals with serum cholesterol as low as 150 mg/dl (mean 163 ± 13 mg/dl). Ingestion of the low-fat breakfast did not result in a significant decrease in vasoactivity. These data suggest high-fat meals transiently impair endothelial function independent of long-term effects on serum cholesterol.

8:45

**779-2 Acute Administration of Estrogen Improves Coronary Vasomotor Response to Acetylcholine in Men**

Roger S. Blumenthal, Sean T. Gloth, Steven E. Reis, Alan W. Heldman, Jon R. Resar, Vicki J. Coombs, Gary Gerstenblith, Jeffrey A. Brinker. *Johns Hopkins Medical Institutions, Baltimore, MD*

The acute administration of intravenous estrogen enhances coronary blood flow following intracoronary acetylcholine (ACH) infusion in postmenopausal women. To determine whether estrogen has vasoactive properties in men which may be similarly mediated via an endothelial-dependent mechanism, we measured the coronary vasomotor response to ACH (10<sup>-7</sup>, 10<sup>-6</sup> M) in 12 men in a mildly diseased epicardial artery (< 30% diameter stenosis) before and 15 minutes after intravenous Premarin (0.625 mg). We also assessed the coronary hemodynamic responses in 8 other men before and 15 minutes after administration of placebo. We employed quantitative coronary angiography

	Pre-EST	Post-EST	Pre-PL	Post-PL
F before ACH:	48 ± 4	41 ± 5	38 ± 7	38 ± 11
F after ACH:	51 ± 6	54 ± 8	42 ± 8	39 ± 10
p	0.19	0.02	NS	NS
% change in F:	10 ± 8	32 ± 12*	17 ± 15	9 ± 11
R before ACH:	2.4 ± 0.3	2.8 ± 0.3	3.1 ± 0.6	4.1 ± 0.8
R after ACH:	2.5 ± 0.4	2.4 ± 0.4	2.8 ± 0.5	3.9 ± 0.8
p	0.59	0.17	NS	NS
% change in R:	6 ± 10	-16 ± 9**	-5 ± 15	-0.5 ± 10

(\*p = 0.03, \*\*p = 0.04 for % change pre vs post estrogen)

and intracoronary doppler ultrasonography to measure coronary flow (F, ml/min) and vascular resistance (R, mmHg/(ml/min)). Mean values ± S.E.M. before and after estrogen (EST) administration and before and after placebo (PL) were as shown in the table.

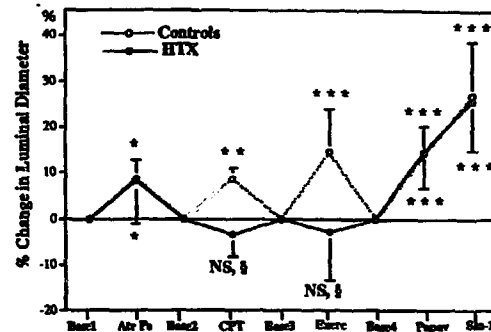
Thus, intravenous conjugated estrogen favorably modulates endothelial-dependent coronary flow and resistance responses in men.

9:00

**779-3 Sympathetic Stimulation Attenuates Flow-Mediated Endothelium-Dependent Epicardial Coronary Vasodilation in Transplant Patients**

Eduardo Aptevar, Patrick Dupouy, Christophe Benvenuti, Emmanuel Teiger, Herbert Geschwind, Daniel Loisanco, Jean-Luc Dubois-Randé, Henri Mondor Hospital, INSERM U 400, Créteil, FRANCE

To determine if denervation hypersensitivity contributes to abnormal coronary vasomotion in heart transplant patients (HTX), we studied 12 HTX 3 ± 1 mo after surgery and 6 control patients with angiographically normal coronary arteries. Quantitative angiography and coronary blood flow velocity (Doppler wire) were measured in the left anterior descending coronary artery at rest, after rapid atrial pacing (atrPa), during cold pressor test (CPT), at peak bicycle supine exercise (Ex), after distal intracoronary papaverine (Papav) and after intracoronary linsidomine (Sin-1). A stable baseline preceded each intervention. Blood catecholamine (Noradrenaline (NA)) was assessed at all baselines and during atrPa, CPT and Ex. All stimuli but Sin-1 increased coronary blood flow velocity significantly in both groups. NA increased significantly in both groups during CPT and Ex, and did not change during atrPa. Results regarding vasomotion responses are shown (\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001 vs base. NS, not significant vs base. †p < 0.001 vs controls):



Responses to atrPa and distal Papav show that flow-mediated, endothelium-dependent vasodilation is preserved in HTX early after surgery. However, sympathetic stimulation (CPT, Ex) attenuates normal coronary vasodilation in HTX, suggesting that vascular hypersensitivity to catecholamines is present in denervated hearts.

9:15

**779-4 Peak Coronary Vasodilation Occurs After Peak Flow With Both Endothelium-Dependent and Independent Agents: A Study Using Simultaneous Intravascular Ultrasound and Doppler Wire**

Paul Tamburo, Maryl R. Johnson, Lloyd W. Klein, Tony L. Hursey, Diana Spokas, Maria Rosa Costanzo, Joseph E. Parrillo, Steven M. Hollenberg. *Rush Medical College, Chicago, IL*

Previous studies utilizing either intravascular ultrasound (IVUS) imaging or Doppler probes to evaluate endothelial function fail to distinguish between flow-mediated and receptor-mediated vasodilation. Simultaneous IVUS and Doppler wire measurements allowed for assessment of flow-mediated epicardial vasodilation due to resistance vessel dilation. *Methods:* Diameter and velocity responses were studied in 18 patients 1 to 83 months (mean, 15 ± 6 months) status post heart transplant, all with normal coronary angiograms, using a 3.5 F 30 mHz IVUS catheter positioned over a 0.614" Doppler wire in the LAD. Sequential intracoronary infusions of adenosine (Aden, 16 and 32 µg bolus), acetylcholine (Ach, 54 µg over 2 min) and nitroglycerin (NTG, 200 µg bolus) were given, with continuous IVUS imaging and Doppler velocity measurements. Maximal vessel cross-sectional area and coronary flow velocities were measured and are expressed as % of baseline. Flow was calculated as the product of vessel area and velocity. *Results:* Peak flow with the endothelium-independent resistance vessel dilator Aden occurred at 18 ± 2 sec; area increased later (44 ± 5 sec, p < 0.001). Peak flow in response to Ach, an endothelium-dependent small and large vessel va-