sition parameters. CC was quantified using a volumetric score and the annualized percent change was calculated. To determine their influence on progression, LDL-cholesterol, hypertension, diabetes, smoking and family history were included as independent variables in a multivariate regression analysis.

Results: Mean CC was 396.2±692 mm3 in the initial EBT scan and 454.3±753 mm3 at follow up, the mean annualized progression in CC was 21.8±33%. Only LDL (slope 0.29; 95% confidence interval 0.13-0.46: p<0.001) could be identified as a predictor with an independent influence on the progression of CC. The overall data fit of the model for progression of CC was r2=0.06. In a second analysis, patients were divided into quartiles according to LDL (I: 156 mg/dl, see figure). The annualized progression of CC in the two highest quartiles (28.2±32% and 43.1±51%, respectively) was significantly more pronounced than in the lowest quartile (13.5±24%; p<0.01).

Conclusion: In this retrospective analysis, hypercholesterolemia was found to be a significant independent predictor of the progression of coronary calcification. Over a wide range of LDL-cholesterol levels, progression of calcification increased with increasing LDL.

1166-57   **Direct Comparison of Electron Beam Tomography and Dobutamine Stress Echocardiography for the Detection of Significant Coronary Artery Disease**

Dieter Ropers, Stephan Achenbach, Clarissa Kuefner, Theresa Menéndez, Karsten Pohle, Tom Giesler, Frank A. Flachskampf, Werner G. Daniel, Werner Moshage, Uwe Nixdorff, University of Erlangen-Nuremberg, Erlangen, Germany.

We directly compared the accuracy of electron beam tomography (EBT) and dobutamine stress echocardiography (DSE) to detect significant coronary artery disease (presence of stenosis > 70% diameter reduction).

Methods:101 patients (43 women, 58 men; mean age 63 y) who were admitted for primary coronary angiography were studied. By EBT, coronary calcification was assessed and quantified using the Agatston Score. In addition, noninvasive coronary angiography was performed after i.v. injection of contrast agent. Presence of significant coronary artery disease (CAD) was assumed if the calcium score exceeded 400 or the contrast-enhanced EBT images displayed significant lumen reduction. DSE was performed using a standard protocol (5 to 40 μg/kg/min dobutamine plus atropine if necessary). Wall motion analysis adhered to the 16 segment model of the American Society of Echocardiography. EBT and DSE were independently evaluated and results were compared to invasive coronary angiography.

Results: In EBT, 2 patients and in DSE, 7 patients were unevaluable and excluded from analysis. In the remaining 92 patients, 41 (45%) showed significant CAD by invasive angiography. EBT demonstrated higher sensitivity but lower specificity than DSE for the detection of significant CAD (see table). By combining EBT and DSE, the sensitivity increased to 98% with a specificity of 59%.

Conclusion: In a direct comparison,EBT demonstrated higher sensitivity but lower specificity than DSE for the detection of significant CAD.

	Sensitivity	Specificity	Accuracy	Positive Predictive Value	Negative Predictive Value
EBT	90% (37/41)	73% (37/51)	80% (74/92)	73% (37/51)	90% (37/41)
DSE	73% (30/41)	82% (42/51)	78% (72/92)	77% (30/39)	79% (42/53)
EBT and DSE	98% (40/41)	59% (30/51)	76% (70/92)	66% (40/61)	97% (30/31)

1166-58   **Coronary Calcium Predicts Presence and Extent but Not Localization of Exercise-Induced Myocardial Perfusion Defects**

Axel Schmermund, Katja Brandt-Mainz, Andreas Bockisch, Dietrich Gronemeyer, Rainer Seibel, Raimund Erbel, Dept. Cardiology, University Clinic Essen, Essen, Germany, Dept. Nuclear Medicine, University Clinic Essen, Essen, Germany.

Background: Coronary calcium determined by electron-beam computed tomography (EBCT) represents underlying coronary atherosclerotic plaque burden. Myocardial perfusion scintigraphy examines the physiologic consequences of flow-limiting stenoses. EBCT and Scintigraphy may yield complementary information, but the relationship between the topographic distribution of calcified plaques and scintigraphic perfusion defects has not been assessed.

Methods & Results: One-hundred and twelve patients (53 ± 10 years, 63% men) with suspected coronary artery disease underwent EBCT and Thallium-scintigraphy (rest and bicycle-exercise) using a digital triple head gamma camera within one day. The EBCT-derived calcium score (Agatston criteria) was calculated for each of the major coronary arteries. Scintigraphic radionuclide redistribution, paradoxical distribution, and lack of uptake were scored on a scale from 0 - 4 in each of 25 myocardial segments. An overall perfusion score representing the number of diseased segments was computed. This score was also separately calculated for the perfusion territory of the major coronary arteries. In a multivariate analysis incorporating age, sex, the established coronary risk factors, and the total calcium score, the latter was the only independent predictor of the perfusion score (T = 2.9, p = 0.004). Fourteen patients with a calcium score > 400 all had 5 or more segments with perfusion defects. The highest calcium score was most frequently observed in the LAD (42%), whereas the highest perfusion score was most frequently observed in the RCA-territory (49%). In a per-patient analysis, there was no relationship between the major coronary artery with the highest calcium score and the myocardial perfusion territory with the highest perfusion score.

Conclusion: Overall coronary calcified plaque burden as determined by EBCT is associated with exercise-induced myocardial perfusion defects but is unable to predict their localization. Even extensive localized plaque formation does not necessarily result in a myocardial perfusion defect.

855FO   **Featured Oral Session...Radionuclide Imaging of Myocardial Perfusion in Special Populations**

Tuesday, March 19, 2002, 10:30 a.m.-Noon
Georgia World Congress Center, Room 257W

10:45 a.m.

855FO-2   **Identifying High Risk Asymptomatic Diabetics Who Are Candidates for Screening Stress SPECT**

Navin Rajagopalan, Todd D. Miller, David O. Hodge, Robert L. Frye, Raymond J. Gibbons, Mayo Clinic, Rochester, Minnesota.

Background: The value of stress testing in asymptomatic populations including diabetics is not well established according to ACC/AHA Guidelines for Exercise Testing. However, screening testing in diabetics has been advocated due to their higher prevalence of silent coronary artery disease (CAD).

Methods: Between January 1986 and December 2000, 1741 asymptomatic diabetics without known CAD underwent stress SPECT perfusion imaging. Patient characteristics included: mean age 60±13 years, male 70%, insulin use 45%, smoking history 57%, hyperlipidemia 53%, hypertension 70%, family history of premature CAD 28%, ECG Q waves 9%, ECG ST-T abnormality 34%, pharmacologic stress 48%. A multivariate logistic regression model was developed using these variables to identify "high-risk" scans (defined on the basis of published criteria).

Results: An abnormal SPECT scan was present in 59% and a high-risk scan in 20%. The multivariate model to identify patients with a high-risk scan included:

Variable	χ^2	p
ECG Q waves	49.6	<0.001
Pharmacologic stress	18.5	<0.001
Male gender	13.5	<0.001
Age	12.2	<0.001
ECG ST-T abnormality	6.3	0.01
Hypertension	5.0	0.03
Insulin use	4.8	0.03

Model χ^2 = 129.9, p < 0.001.

In men ≥ age 65 with an abnormal ECG (19% of the population), a high risk scan was present in 27%. Coronary angiography was performed in 47% of patients with a high-risk scan with the following results: 0-vessel CAD 6%, 1-vessel CAD 28%, 2-vessel CAD 26%, 3-vessel or left main CAD 40%.

Conclusions: Stress SPECT perfusion scans are frequently abnormal in asymptomatic diabetics. A high-risk scan occurs in a substantial percentage of these patients, especially older men with resting ECG abnormalities.

11:00 a.m.

855FO-3   **Significance of Stress Myocardial Perfusion Imaging for Screening of Asymptomatic Patients With Noninsulin-Dependent Diabetes Mellitus**

Sabahat Bokhari, Steven R. Bergmann, Columbia University and New York Presbyterian Hospital, New York, New York.

Background: Patients with non-insulin dependent diabetes mellitus (DM) have more frequent silent myocardial ischemia than patients without diabetes. Nonetheless, current guidelines do not advocate screening of asymptomatic patients with DM for coronary artery disease (CAD). This study was done to evaluate the prevalence of myocardial ischemia in these patients.

Method: We evaluated 74 non-insulin dependent DM (mean age 64 +/- 9 (SD) years; range 42-80). 34 of these patients (20 F,14M) were referred to stress myocardial perfusion imaging for chest pain syndromes, while 40 (22M,18F) were asymptomatic but referred for non-cardiac pre-operative evaluation or for screening for CAD. The two groups had similar clinical characteristics in terms of risk factors such as smoking, hypertension, or hyperlipidemia. All underwent treadmill testing using the Bruce protocol in conjunction with SPECT imaging.

Results: Overall 30 of 74 patients (41%) had reversible perfusion defects on SPECT imaging. Of the patients with chest pain, 16 of 34(47%) had reversible perfusion defects (69%SVD,31%DVD,0%TVD), but this was not different from the incidence in the patients without chest pain (14 of 40, 35%, p=NS). The sensitivity and specificity of the treadmill ECG for detecting CAD (compared with myocardial perfusion imaging) was 32% and 70%, respectively.

Conclusion: The results indicate a substantial prevalence of CAD in asymptomatic patients with non-insulin dependent DM. In addition, screening of these patients by stress myocardial perfusion imaging is more sensitive than the treadmill ECG, and would be benefeical in the identification of sub-clinical CAD in this patient population.