Thus might contribute to the neoangiogenesis during cardiac repair processes.

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Background: Inflammation and infection have been suggested to play a role in atherosclerosis. The CD16 receptor is a mediator for the activation of monocytes by lipopolysaccharide of gram-negative bacteria. The T allele of the C(-260)—T polymorphism in the promoter of CD16 receptor gene has been shown to enhance transcriptional activity and expression of CD16 receptor on monocytes. The aim of this study was to assess whether this polymorphism is associated with increased risk of developing acute coronary syndromes (ACS) and atherosclerosis.

Methods: We studied 428 patients who underwent heart catheterization between 1994 and 1997. Shoulder scores 50% or more in at least one coronary artery were seen in 334 patients, whereas 94 had a normal angiogram. Patients with coronary artery disease were subdivided in two groups: 1) no history of ACS (n: 140; 64±9 years; men: 79%) and 2) patients with a history of ACS (n: 104; 64±9 years; men: 83%). The T allele frequency was compared by the chi-square test and logistic regression adjusted by age, body mass index and conventional cardiovascular risk factors.

Results: Genotypes were in Hardy-Weinberg equilibrium. Patients with prior ACS had a significantly higher frequency of the T/T genotype than patients without a history of ACS (30% vs. 20.0%; P<0.001). After adjustment, genotype T/T was found to be an independent risk factor for ACS (OR 1.8 1.1 to 3.1 CI 95% P=0.002). When normal patients and patients with prior ACS were compared, the OR after adjustment was 3.1 [1.3 to 7.4] CI 95% (P<0.012). T/T genotype was not significantly different between patients without a history of ACS and normal patients (20.0% vs. 22.3%, P=0.17).

Conclusions: C(-260)—T polymorphism in the promoter of the CD16 gene is associated with a history of ACS, and it may represent a genetically determined risk factor for ACS. The response of monocytes to infectious stimuli determined by this polymorphism could play an important role in atherosclerotic plaque vulnerability.

Extrinsic Rapid Electrical Stimulation Modulates Sarcoplasmic Reticulum Ca2+ Regulatory Proteins in Cultured Rat Cardiomyocytes

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Background: Tachycardia is commonly present in patients with heart failure (HF). However, its role in the development of failing myocardium has received little attention. We studied the effects of rapid electrical stimulation (RES) of contraction on sarcoplasmic reticulum (SR) Ca2+ regulatory proteins in cardiomyocytes in vitro. Methods: Neonatal rat ventricle cardiomyocytes were cultured as confluent monolayers and then subjected to RES (3.0Hz) for up to 180 min. The expression of SR Cap+-ATPase (SERCA), ryanodine receptor (RyR) and inositol 1,4,5-trisphosphate receptor type 1 (IP3R) were identified by Western blot method and RT-PCR. Contraction and relaxation characteristics of cardiomyocytes were monitored with contractility data acquisition systems. Results: The expression of SERCA protein significantly increased after 60 min compared with control (0.50±0.17 vs. 0.24±0.08, P<0.05), and its level returned to the control level after 180 min stimulation. The expression of SERCA mRNA tended to decrease after 180 min of RES, though not significantly, compared with control. The expression of RyR protein significantly increased after 180 min (1.76±0.56 vs 0.68±0.45, P<0.05), however RES did not affect the expression of IP3R mRNA. RES also caused a significant increase in IP3R protein expression, however its mRNA level significantly decreased after 180 min (0.62±0.06 vs 0.11±0.05, P<0.01). There were no significant differences in terms of the time to peak tension, the time to 70% relaxation, departure velocity, and return velocity. Conclusion: In the early stage of RES, in vitro, the expression of SR Ca2+ regulatory proteins was upregulated due to increased protein degradation in a different time course, leading to the maintenance of contractile relaxation characteristics.

Glycogen Protein 130 Mediated Induction of Vascular Endothelial Growth Factor in Human Adult Cardiac Myocytes

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Background: Vascular endothelial growth factor (VEGF) is an endothelium-specific growth factor that induces proliferation, migration and NO synthesis in endothelial cells and is able to stimulate neoangiogenesis in ischemic organs. A significant increase of VEGF-A serum levels was shown after myocardial infarction. These data suggest the importance of VEGF-C serum levels during reperfusion and neovascularization. Recent data showed that glycoprotein 130 (gp130) is involved in the regulation of VEGF-A. Therefore we investigated whether oncostatin-m (OSM) or Leukemia Inhibitory Factor (LIF) are possible regulators of VEGF-A in Human adult cardiac myocytes (HACM) in vitro and thus might contribute to the neoangiogenesis during cardiac repair processes.

Methods: HACM were isolated from recipients' hearts after heart transplantation and characterized by positive staining for actin, troponin-I and cardiac. The cells were negative for fibroblast-specific protein-1 (FSP-1) and as well as for desmin and vWF indicating the absence of fibroblasts, smooth muscle cells and endothelial cells. Characterized HACM were treated with OSM or LIF for 24 hours and VEG-F-A was determined by a specific ELISA in the conditioned media of these cells. We performed a RT-PCR in order to detect VEGF-A, interleukin-6 receptor (IL-6R), IL-1 receptor (IL1R) or OSM receptor (OSMR).

Results: We showed that OSM, but not LIF increased VEGF-A expression in HACM dose dependently. The effect of OSM could be reversed using AG-100, a specific Jak inhibitor, indicating that OSM increases VEGF-A expression via the Jak-STAT pathway. These results could be confirmed on the level of specific mRNA expression as determined by RT-PCR. We detected the expression of gp130 and OSMR and to a lesser extent LIF and IL-6-R on HACM by RT-PCR.

Conclusion: Our data suggest, that selective expression of the IL-6 super-family-receptors on cardiac myocytes might be involved in the induction of VEGF-A mediated neoangiogenesis in the heart.

Trace Element Hair Sample Analysis by Inductively Coupled Plasma-Mass Spectrophotometer with a Standardized Preparation Offers the Potential for Additive Risk Stratification. An Inexpensive and Sensitive Methodology in the Evaluation of Patients with Suspected CAD.

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INTRODUCTION Trace elements (TE) have been implicated in the pathogenesis of diseases including cancer (Se), diabetes (Zn), and cardiovascular disease (Cu). Further, specific interactions are not well understood, in part related to complexities of traditional harvest, and storage methods. Our studies involved hair analysis, which clearly, an improved method would be advantageous. Since hair samples offer an atrumatic technique with a ten-fold higher concentration of TE than serum, we investigated the feasibility of TE analysis in hair samples and with documented CAD.

METHODS We hypothesized that using a new, highly sensitive technique, Inductively Coupled Plasma Mass-Spectrophotometer (ICP), TE may offer a novel non-invasive and inexpensive manner in which to screen populations for CAD.

RESULTS No significant relationship of TE with HTN, diabetes, race or family history was found. However, TE concentrations diverged between the CAD+ and the CAD- group, in 14 of 16 TE's. Mean TE concentrations in the CAD+ patients were lower than CAD patients in Co, Cr, Ca, Cu, Fe, Mg, Mn, Pb, Rh, Sr, Sb, Sn, Sr, Ti and Zn with ultra-high resolution and low dark noise results detected in TE to pg/ml. Caibinated preparation: acetone, double distilled H2O, and digestion with 20% high purity NH4OH at 60°C for 2 weeks prior to analysis. Mann-Whitney U and Newman-Keuls were used to test significance.

CONCLUSION Trace element hair sample analysis by Inductively Coupled Plasma Mass Spectrophotometer with a standardized preparation offers the potential for additive risk stratification, an inexpensive and sensitive information in the evaluation of patients with suspected CAD.

POSTER SESSION 1133 Predictors of Risk in Hypertensive Patients

Monday, March 31, 2003, 3:00 p.m.-5:00 p.m.
McCormick Place, Hall A
Presentation Hour: 4:00 p.m.-5:00 p.m.

Repeated Exposure to Caffeine Increases Arterial Stiffness

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Background: Caffeine (C) is the most widely consumed pharmacological substance. With repeated use (WR) along the arterial wall, an increased index of arterial stiffening and cardiac afterload, is involved in the pathogenesis of hypertension. We studied the effect of C on WR and especially that of repeated exposure because of the possible tolerance that develops to C.

Methods: Twelve healthy volunteers (age 29±4 yro) were studied in a randomized, placebo-controlled, crossover fashion (100 mg of C orifice-equivalent to 1 cup of coffee and 120 min later another 100 mg of caffeine). WR was evaluated using a validated system (Sphygmocor®) that employs 1) high-fidelity arterial tonometry for the non-invasive registration of arterial pulse and 2) a microcomputer for pulse wave analysis. Augmentation index (AIx) was measured as an index of WR.

Results: The first dose of C led to a substantial increase in AIx indicating increased effect of WR from the periphery. The second dose increased AIx again, but to a lesser extent (figure). Aortic pressures also increased (systolic: by 2.6 mmHg with the 2nd; diastolic: by 4.3 and by 5.2 mmHg respectively).