

thrombus was created in the mid-LAD of 25 dogs. Risk area (RA) was measured using myocardial contrast echocardiography. Percutaneous transluminal coronary angioplasty (PTCA) was performed 2 hr later and successful recanalization was confirmed. A novel compound (CP4715, Meiji) that inhibits both IIb/IIIa and $\alpha_v\beta_3$ was administered in 9 dogs (Group 1) 10 min before PTCA and for 3 hr thereafter. Groups 2 and 3 dogs received either IIb/IIIa antagonist (tirofiban, n=9) or normal saline (controls, n=7). ^{99m}Tc -labeled platelet glycoprotein IIb/IIIa inhibitor (DMP444, Bristol Myers Squibb Medical Group) was used to determine platelet aggregation within the RA. Microbubbles conjugated to echistatin were administered to measure $\alpha_v\beta_3$ inhibition. IS was determined using post-mortem triphenyltetrazolium chloride staining. **Results** RA (% of left ventricular cross sectional area) was similar in all 3 groups (44±7, 41±13, and 43±11). The IS/RA ratio was smallest in Group 1 and largest in Group 3 (24±12, 37±15, and 59±13). There was a 59% decrease in IS by CP4715 compared to controls (p<0.01) and 35% reduction compared to tirofiban (P<0.05). ^{99m}Tc activity was similar in Groups 1 and 2 dogs and significantly lower (p<0.05) than Group 3 (1.6±0.4, 1.7±0.3, and 2.7±1.0) indicating substantial IIb/IIIa inhibition by CP4715 or tirofiban. Signal from echistatin conjugated microbubbles was the lowest (p<0.05) in Group 1 (80±31, 118±37, and 111±36) indicating $\alpha_v\beta_3$ antagonism by CP4715. **Conclusions** Dual antagonism of IIb/IIIa and $\alpha_v\beta_3$ caused a marked reduction in IS, which was greater than a decrease in IS by IIb/IIIa antagonism alone. Thus, combined inhibition of both IIb/IIIa and $\alpha_v\beta_3$ may have an important role in reducing IS during acute coronary thrombosis.

12:24 p.m.

1025A-MP-205 Insulin Reduces Myocardial Flow Heterogeneity During Reperfusion

Xuedong Shen, Huagui Li, Feng Xie, Thomas R. Porter, John Lof, Leng Jiang, The Cardiac Center of Creighton University, University of Nebraska Medical Center, Omaha, NE, Baystate Medical Center, Springfield, MA

We have demonstrated that insulin improves myocardial microcirculation after acute ischemia with hyperglycemia (HG) using power pulse inversion imaging (PPI) and Neutron Activated Microspheres (MIC). The myocardial flow heterogeneity (FH) reflects the perfusion distribution. We hypothesized that insulin can reduce FH. Six dogs were studied by using myocardial contrast echocardiography during a continuous intravenous infusion of perflurocarbon exposed sonicated dextrose albumin microbubbles. The study included 3 sequential stages: 1) myocardial ischemia produced by ligation of left anterior descending coronary artery, 2) reperfusion (RP) with HG produced by glucose injection (plasma concentration of 407±54mg/dl), 3) reperfusion with HG and after insulin intravenous injection. Left ventricle was imaged on short-axis at mid-papillary muscle level. Ischemic and non-ischemic (IR, NIR) regional myocardial blood flow (MBF) was estimated and FH was defined as SD/mean MBF*100%. MIC was used for validation. **Results:** 1) There was no change from stage 1 to 3 in diastolic aortic pressure, heart rate and left ventricular end-diastolic pressure (p>0.05). 2) PPI-derived MBF correlated well with MIC-MBF (r=0.91, p<0.0001). 3) During stage 1, FH was 81.3% in IR, 69.9% in NIR. 4) During stage 2, FH mildly worsened in IR (87.9%, p=0.11), and significantly deteriorated in NIR (117.6%, p=0.01). 5) During stage 3, FH significantly improved both in IR 49.3%, p=0.006 and in NIR (38.2%, p=0.0002). **Conclusion:** Insulin reduces myocardial flow heterogeneity during reperfusion when hyperglycemia is present, suggesting the benefit of intensive insulin therapy for diabetic patients during acute ischemia and reperfusion.

12:36 p.m.

1025A-MP-206 Quantitative Intravenous Myocardial Contrast Echocardiography Predicts Recovery of Left Ventricular Function After Revascularization in Chronic Coronary Artery Disease

Shota Fukuda, Takeshi Hozumi, Takashi Muro, Hiroyuki Watanabe, Eiichi Hyodo, Minoru Yoshiyama, Kazuhide Takeuchi, Junichi Yoshikawa, Osaka City University School of Medicine, Osaka, Japan

Background. Quantitative intravenous myocardial contrast echocardiography (MCE) has been shown to measure regional myocardial blood flow velocity noninvasively. The purpose of this study is to determine whether quantitative intravenous MCE can be used clinically to predict functional recovery after revascularization in patients with chronic coronary artery disease.

Methods. Twenty-eight patients with chronic stable coronary artery disease and resting regional left ventricular dysfunction were included in this study. The study permits myocardial perfusion analysis by intravenous MCE before revascularization with continuous infusion of Levovist and intermittent ultrasonic exposure. Wall motion assessment by echocardiography at rest was repeated after long-term follow-up period (7±2 months). In dysfunctional segments, we analyzed myocardial perfusion quantitatively by fitting to an exponential function, $Y=A(1-e^{-\beta t})$ to obtain the rate of rise (β) of background-subtracted intensity which represented myocardial blood flow velocity. **Results.** Of 101 revascularized dysfunctional segments, MCE was adequately visualized in 91 (90%) segments, and wall motion was recovered in 45 (49%) segments. The value of β in recovery segments was significantly higher than that in non-recovery segments (0.80±0.50 vs. 0.39±0.24, p<0.001). The value of β >0.5 predicted recovery of segmental function with a sensitivity of 71%, specificity of 78%. **Conclusion.** Quantitative intravenous MCE can predict functional recovery after revascularization in patients with chronic coronary artery disease.

1025A-MP-207 Intravenous Versus Intracoronary Myocardial Contrast Echocardiography for the Evaluation of No-Reflow After Primary Coronary Angioplasty

Jong-Min Song, Jae-Hwan Lee, Young-Hak Kim, Duk-Hyun Kang, Jae-Kwan Song, Myeong-Ki Hong, Seong-Wook Park, Seung-Jung Park, Asan Medical Center, Seoul, South Korea

Background: Although no-reflow detected by intracoronary myocardial contrast echocardiography (IC-MCE) after primary coronary angioplasty in patients with acute myocardial infarction could predict a poor outcome of left ventricular function, clinical usefulness of intravenous myocardial contrast echocardiography (IV-MCE) for the evaluation of no-reflow remains to be elucidated. **Methods:** IC-MCE using Levovist injection, and IV-MCE using continuous infusion of PESA (power Doppler mode, triggered interval 1:8) were performed for the evaluation of no-reflow immediately after percutaneous coronary intervention (D1) of 22 patients with anterior wall acute myocardial infarction (age: 60±9 yrs, 5 females). IV-MCE was repeated at the next day of the intervention (D2), and left ventricular ejection fraction (LVEF) and regional wall motion index (RWMI) were measured at D2 and 30 days later (D30). Data about MCE and other echocardiographic findings were analyzed independently. **Results:** There was a good agreement in determining no-reflow between IC-MCE and IV-MCE at D1 (kappa=0.72, p<0.005) as well as between IV-MCE at D1 and D2 (kappa=1.0, p<0.001). The patients with no-reflow on IC-MCE (n=10) showed no improvement in LVEF (-0.6±4.2%, p=0.66) and RWMI (-0.06±0.09, p=0.10) at D30 compared to D2, while those with reflow on IC-MCE (n=12) demonstrated significant improvement in LVEF (+6.8±6.3%, p<0.005) and RWMI (-0.23±0.17, p<0.005). The patients with no-reflow on IV-MCE at D2 (n=9) showed no improvement in LVEF (-1.2±3.8%, p=0.36) and RWMI (-0.05±0.08, p=0.14) at D30 compared to D2, whereas those with reflow on IV-MCE at D2 (n=13) demonstrated significant improvement in LVEF (+6.6±6.1%, p<0.005) and RWMI (-0.22±0.17, p<0.001). **Conclusion:** IV-MCE at D2 could be substituted for IC-MCE performed immediately after the angioplasty for the evaluation of no-reflow and prediction of left ventricular systolic function after 1 month in patients with anterior wall acute myocardial infarction.

POSTER SESSION

1043 Contrast Echocardiography: Perfusion, Flow, and Flow Reserve

Sunday, March 30, 2003, Noon-2:00 p.m.

McCormick Place, Hall A

Presentation Hour: 1:00 p.m.-2:00 p.m.

1043-27 Diagnostic Accuracy of Myocardial Perfusion by Sonazoid-Enhanced Ultraharmonic Imaging During Dipyridamide Stress Test

Xiao-Fang Xu, Jeanne Drinko, Christine Whitman, Jianbao Li, Kathy Morris, Neil L. Greenberg, James D. Thomas, The Cleveland Clinic Foundation, Cleveland, OH

Background: We aimed to study the feasibility and accuracy of myocardial perfusion by Sonazoid-enhanced Ultraharmonic Imaging (UHI), in predicting significant coronary artery disease.

Methods: 25 patients (63±12 years old; 18m), with suspected coronary disease and no history of infarction, underwent MCE during dipyridamide stress test. 3 apical views were acquired by UHI (Phillip Sonos 5500; MI 1.5; systolic triggered at sequential pulsing intervals at 1, 2, 4, 8 beats), during Sonazoid infusion (0.01ul/kg/min). Myocardial perfusion was graded as normal, reversible, and fixed defect in 16 segments. All patients underwent coronary angiography. Coronary circulation was divided into two territories, LAD and RCA/LCX. Agreement between 2 independent readers was determined by Kappa's coefficient of concordance (κ). Diagnostic value in predicting >50% and >70% stenosis was ascertained.

Results: 17% (68/400) segments from MCE were not assessable due to artifacts. Agreement between two readers was 83% ($\kappa = 0.68$). Table showed the diagnostic accuracy in predicting significant coronary stenosis (25pts, 50 territories).

	>50% stenosis	>70% stenosis
Sensitivity	74%	76%
Specificity	87%	84%
Positive predicted value	87%	82%
Negative predicted value	74%	77%

Conclusions: MCE pharmacological stress, using UHI and Sonazoid infusion, is feasible and accurate in detecting significant coronary stenosis. Large studies are needed to verify this finding.