homoyzogotes, GC heterozygotes and CC heterozygotes (16, 0.256; 32, 0.256; 32, 0.64, respectively; p=ns). Conclusion: Our data suggest that the C (260) T polymorphism in the β2-adrenergic receptor gene and CD14 receptor gene C (174) C polymorphism of the Interleukin 6 gene, are not involved in modulation of the individual immune response to Cp infection in patients with ischaemic heart disease.

1136-09 Beta-2 Receptors Are Upregulated in Canine Ventricles With a Chronic Myocardial Infarction Philip B. Adamson, Travis Kanaly, Emilio Vanoli, Jennifer Suarez, Jeffrey Ardell, University of Oklahoma Health Sciences Center, Oklahoma City, OK, East Tennessee State University, Johnson City, TN

Background: Beta-1-adrenergic receptor densities decrease in end-stage cardiomyopha-
ytic with no significant change in beta-2 or alpha receptor density. The relative densities of beta-receptors after myocardial infarction (MI) with normal ventricular function are less well understood. This study examined beta-receptor densities in normal dogs and compared them with animals 45 days after MI. Methods: Four dogs were instrumented with an anterior MI by permanent ligation of the left anterior descending (LAD) coronary artery during lateral thoracotomy. 45 days were allowed for recovery and ventricular tissue was harvested during a terminal experiment. Tissue in the LAD distribution was compared with tissue in the circumflex (Cx) territory in post-MI dogs and normal animals (n=15). beta-receptor densities were measured with receptor specific quantitative film autoradiography.

Results: beta-receptors from normal animals were not different between the LAD (7.6±3 fmol/mg, 76% beta-1; 2.3±0.6 fmol/mg, 23% beta-2) and Cx (7.1±0.8 fmol/mg, 75% beta-1; 2.3±0.2 fmol/mg, 25%, beta-2) tissues. Beta-2 receptor densities in post-MI dogs were higher (p<0.04) in both the LAD (7.4±2 fmol/mg, 63%, beta-1; 4.3±1 fmol/mg, 37%, beta-2) and Cx (7.6±2 fmol/mg, 54%, beta-1; 4.7±2 fmol/mg, 46%, beta-2) territories, while beta-1 receptor densities did not change. Conclusions: Beta-2 adrenergic receptor densities increase following chronic MI and comprise a larger percentage of available adrenergic receptors in canine ventricles. These data may help explain why nonselective beta-blockers tend to be more effective in post-MI clinical populations.

1136-90 Relation of the –174 G/C and –572 G/C Promoter Polymorphisms of the Interleukin-6 Gene to Interleukin-6 and Highly Sensitive C-Reactive Protein Serum Levels and to the Extent of Infarction in Acute Myocardial Infarction Ative Cengel, Aycan F. Erkan, Mehmet Ali Ergun, Derya Kan, Sevda Menesev, Gazi University School of Medicine, Ankara, Turkey

Background: GG homoyzogotes for -174 G/C polymorphism and carriers of C allele for 572 G/C have higher Interleukin-6 (IL-6) levels and longer hospital stay after surgical coronary revascularization. Our aim was to test the hypothesis that promoter polymor-
phisms of the IL-6 gene may be associated with the extent of acute myocardial infarction (AMI), and the degree of immunological response in AMI. Methods: We enrolled 50 patients with the diagnosis of AMI. Patients with inflammatory or infectious conditions, malignancy, recent trauma or surgery were excluded. Serum IL-6 and C-Reactive Protein (CRP) levels were determined on admission, and at 48 and 72 hours. Deoxy-ribo nucleic acid was extracted from peripheral blood and amplified with polymerase chain reaction. The -174 G/C and -572 G/C genotypes were determined by direct sequencing. Results: There were no statistically significant differences between GG homozygotes and carriers of C allele for -174 G/C polymorphism and carriers of C allele for 572 G/C. Baseline CRP and IL-6 levels were significantly different in -174 GG patients when compared to -174 GC and CC patients. Ejection fraction was significantly lower and WMSI was significantly higher in -174 GG patients when compared to -174 GC and CC patients.

1136-91 Contribution of Genetic Characteristics of Vascular Adrenergic Receptor to Variant Angina Bang-He Joo, Jae-Bin Seo, Shu-Ying Zhang, Jin-Sik Park, Young-Seok Cho, Jin-Hee Choi, Byung-Sun Koo, Youn-Koo Cha, Hee-Soo Kim, Dae-Won Chon, Byung-Hee Oh, Myoung-Mook Lee, Young-Bae Park, Yun-Shik Choi, Seoul National University College of Medicine, Seoul, South Korea, Seoul National University Hospital, Seoul, South Korea

Background: The α2 or β2-adrenergic receptor in vascular smooth muscle mediate vasoconstriction or dilation respectively in response to adrenergic agents, and β2-adrenergic receptor in heart muscle mediate chronotropic and inotropic changes. We hypothesized that adrenergic receptor gene polymorphism is associated with vasopastic angina, and would explain the different prevalence of variant angina between Koreans and Caucasians. We investi-
gate the relationship of vasopastic angina and four kinds of adrenergic receptor poly-

1137-00 Long-Term Cost-Effectiveness of Clopidogrel in Patients Having Percutaneous Coronary Intervention Early After Acute Coronary Syndrome: Results From PCI-CURE William S. Weintraub, Elizabeth M. Mahoney, Shamir Mehta, Andre Lambiy, Yong Yuan, Roland Chen, Joseph Jackson, Sylvie Gabriel, Oliver Boun, Julie Spiesser, Salim Yusuf, Emory University, Atlanta, GA, McMaster University, Hamilton, ON, Canada

Background: The efficacy of clopidogrel up to 1 year after percutaneous coronary inter-
vention (PCI) following non-ST-elevation acute coronary syndrome (ACS) was demonstrat-
ed in PCI-CURE. Methods: We evaluated long-term cost consequences of clopidogrel after PCI during the initial hospitalization in PCI-CURE; patients received clopidogrel pre-treatment (n=481) or placebo (n=909). After PCI, >80% received open-label ADP-receptor antagonist for ~4 weeks, then study drug for up to 1 year. This PCI-CURE subgroup characterizes US PCI practice pattern. The composite CV death, stroke or MI occurred in 76 (9.3%) clopi-
dogrel vs 116 (12.8%) placebo patients (RR 0.67, p=0.02). Hospitalizations were assigned a DRG; costs were estimated from: 1) Medicare, 2) MEDSTAT (private insurance) , 3) MEDSTAT age <65 and Medicare age >65. Clopidogrel was assigned a cost of $3.22/day. Lost life expectancy associated with CV death, MI and stroke was estimated from Framingham data, discounted 3%, 95% CIs for costs differences were obtained by bootstrap.

Results:

<table>
<thead>
<tr>
<th></th>
<th>Clopidogrel</th>
<th>Placebo</th>
<th>Difference</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicare Cost</td>
<td>$4,185</td>
<td>$4,176</td>
<td>$91</td>
<td>-$713, $839</td>
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<tr>
<td>MEDSTAT Cost</td>
<td>$2,195</td>
<td>$2,377</td>
<td>$182</td>
<td>-$1,258, $837</td>
</tr>
<tr>
<td>MEDSTAT/Medicare</td>
<td>$1,832</td>
<td>$1,987</td>
<td>$155</td>
<td>-$1,131, $816</td>
</tr>
<tr>
<td>Lost Life Expectancy in Years (Framingham)</td>
<td>0.3426</td>
<td>0.4452</td>
<td>0.1027</td>
<td>-0.0452, 0.2581</td>
</tr>
</tbody>
</table>

The incremental cost-effectiveness ratio was $882/yr gained (LY) with Medicare (37.6% dominant, 4.8% dominated, 90.8% <$50,000/LY), dominant with MEDSTAT (58.4% dominant, 3.3% dominated, 91.7% <$50,000/LY), dominant with MEDSTAT/Medi-
care (56.0% dominant, 3.6% dominated, 92.0% <$50,000/LY). Conclusions: Long-term clopidogrel therapy, up to 1 year after early PCI in the setting of ACS, is both effective and highly cost-effective in cost per LY gained.

1137-93 Carvedilol Preserves Cellular Integrity and Improves Outcome in Patients With Chronic Hibernating Myocardium After Revascularization Ernst R. Schwag, Tushopong Diep, Erik C. Skobbel, Bernd Nowak, Sawfa Kostin, Beate Grohmann, The University of Texas Medical Branch, Galveston, TX, Rheinisch Westfaelische-Technische Hochschule, Aachen, Germany

Chronic hibernating myocardium (HM) might undergo progressive cellular degeneration and replacement fibrosis due to apoptosis and necrosis in the setting of recurrent myo-
cardial ischemia. Carvedilol has been shown to provide anti-oxidant and anti-apoptotic effects in experimental animal studies in addition to its alpha- and beta-blocking effects.
The effects of Carvedilol on myocardial morphology and functional outcome were studied in patients with chronic HM undergoing cardio-vascular bypass grafting (CABG). Nineteen patients (13 males, 62±9 years) eligible for CABG due to severe CAD were randomized into two groups: patients in group 1 (n=10) received Carvedilol (25 mg/day), patients in group 2 received placebo (n=9), starting from randomization 7-8 weeks prior to CABG until follow-up 4-6 months postoperatively, in addition to standard antianginal therapy and aspirin. Left ventricular ejection fraction (EF) and regional wall motion abnormalities (WMA, centerline method) were quantitated in cineventriculography at baseline and follow-up. Viability was assessed by Tc99m scintigraphy and F-18-FDG positron emission tomography. Intraoperatively, transmural needle biopsies were obtained for microscopic analysis and immunohistochemistry from hypokinetic but viable myocardial regions. EF in group 1 increased from 31±5% to 44±4% postoperatively (p<0.005), EF in group 2 increased from 30±6% to 40±6% (p=0.05 versus preoperatively and versus group 1). WMA in the center of myocardial dysfunction in group 1 increased from 2.1±1.0 to 0.0±6.2 (p=0.05), WMA in group 2 increased from 2.3±6.9 to 1.6±6.2 (p=0.05 versus pre and versus group 1). Microscopic analysis showed mild degenerative changes in group 1 with mild fibrosis (28±7%) and no evidence for apoptosis. Biopsies in group 2 showed more apoptotic cell changes and progressive cardiac myocyte degeneration but similar mild-to-moderate fibrosis (32±6%). Early treatment with Carvedilol in patients with hibernating myocardium might delay progressive cardiac myocyte degeneration possibly due to anti-apoptotic and anti-oxidant effects, which might result in improved recovery of contractile function after revascularization.

**T137-94**

Age and the Lack of an Adverse Effect of Diabetes Explain the “Obesity Paradox” in Patients With Myocardial Infarction

Scott Wright, Joseph G. Murphy, Thomas G. Allison, Anil Nigam, Wayne L. Brent, A. Williams, Ana G. Rosales, Guy S. Reeder, Allan S. Jaffe, Mayo Clinic, Rochester, MN

Background: The “obesity paradox” refers to improved survival among obese patients following acute myocardial infarction (AMI). The nature of this remains poorly defined. Methods: We analyzed the outcome of 941 patients with AMI from 1988 until 2001. Obesity was defined as BMI ≥ 30, overweight as 25 < BMI < 30 and normal weight as BMI < 25. Univariate and multivariate predictors of survival were analyzed. Results: Obese patients were younger and less likely to be female at time of admission (p<0.01). The prevalence of diabetes was higher in obese patients (24%) compared to overweight (15%) or normal weight patients (13%), p<0.05. There were no differences in other clinical characteristics. Long-term mortality was significantly lower in the obese (RR 0.64) and overweight (RR 0.76) patients compared to normal weight patients (RR 1.0), p=0.04. Long-term survival among all three groups was less than age-predicted (see figure). Diabetes was not a univariate predictor of mortality risk in obese patients (RR NS) but was in non-obese patients (RR 1.77, 95%CI 1.26, 2.48), p<0.01. After adjustment for age and diabetes, there were no longer significant differences. Obese (RR 0.74), overweight and overweight (RR 0.70) vs normal (RR 1.0), p=0.14. Conclusion: The obesity paradox following AMI appears to be largely a function of younger age at time of presentation and the lack of impact of concomitant diabetes. When adjusted for age, the long-term RR of death in obese and overweight patients is similar to normal weight individuals.

**T137-95**

Demographics, Treatment, and Outcome of Acute Coronary Syndromes: 17 Years of Experience in a Tertiary Care Center

Jean-Pierre S. Awada, Jocelyne Dupuis, Pierre Théroux, Michel Joyal, Pierre De Guise, Serge Doucet, Luc Bilodeau, Jean-François Tanguay, Richard Gallio, Jean Grégoire, Philippe Laviole-Lallier, Laurent Macle, Anil Nigam, Montreal Heart Institute, Montreal, PQ, Canada

Background: There is limited epidemiological information about the evolution of demographics, treatment, and outcome of patients admitted to tertiary coronary care units (CCU) over the past 15 years. Methods: We prospectively studied 18,719 patients admitted from April 1986 to March 2001 in a 22 bed CCU. The attending physicians filled in the discharge form, which was then entered in a computer database designed for the study. Results: From 1986 to 1997, the number of admissions increased from 937 to 1577/year while hospital stay decreased from 7.5 to 3.5 days; mean age increased from 58.4 to 63.4 years and the proportion of males remained stable at about 70%. Use of coronary angiograms increased from 49.8% to 81.1% of all patients while fibrillation dropped from 12.2% to 0%. In-hospital mortality dropped from 9% to 1.5%. The percentage of Swan-Ganz decreased from 8.1% to 0.7% while intra-aortic balloon pump insertion remained stable. From 1995 till 2003, the proportion of stenting during PTCA increased dramatically from 0 to 86%. In the past 5 years, surgical revascularization remained stable around 20% of all admissions. Conclusions: There has been a tremendous increase in efficiency with approximate doubling of the admissions turnover rate in a tertiary care CCU. Patients with acute coronary syndromes are stratified faster and treated more invasively. Therapeutic advances are reflected by an almost linear 0.5%/year decrease of in-hospital mortality.

**T137-96**

Clustering of Novel Risk Factors Correlates With the Metabolic Syndrome

Matthew A. Hook, John H. Chiu, Arman Asaki, Niranjan Seshadri, Gregory L. Pearce, Dennis L. Sprecher, The Cleveland Clinic Foundation, Cleveland, OH

Background: Homocysteine, fibrinogen, lipoprotein (a) (Lp(a)), and C-reactive protein (CRP) have been shown to be independently associated with cardiovascular disease (CVD). However, little is known regarding the clustering of these novel risk markers and their correlation to the metabolic syndrome. Methods: Data were collected from primary and secondary prevention patients entering a cardiology clinic (n=1306, mean age 55±9 years, 36% female (n=469), 19% diabetics (n=249), mean waist circumference 88cm, 8% current tobacco users (n=110), mean systolic blood pressure 122 mmHg, median LDL 126 mg/dL, median HDL 43 mg/dL), including novel risk markers. We sought to determine whether the novel risk markers were clustered in distribution and/or correlated to the variables of metabolic syndrome, as defined by ATP III guidelines. Results: These four novel biomarkers were clustered more than would be expected under the assumption of independence (p<0.001). The expression of metabolic syndrome increased from 11% when none of the four were evaluated to 28% when 3 or 4 were evaluated (p<0.001). Conclusions: Homocysteine, fibrinogen, Lp(a) and CRP cluster in an elevated state and are not independent of one another. The number of elevated novel biomarkers directly correlates to the presence of the metabolic syndrome.

**T137-97**

Soluble CD40 Ligand in Predicting Coronary Anatomy Disease and Long-Term Outcomes in Stable Patients With angiographically Defined Disease States

Jason M. LaGoue, John F. Carquist, Jeffrey L. Anderson, Matthew J. Kolek, Benjamin D. Horne, Bryant M. Whiting, Heath U. Jones, Robert R. Pearson, Johnny Walker, Joseph B. Muhlestein, LDS Hospital, Salt Lake City, UT, University of Utah, Salt Lake City, UT

Background: Elevated levels of soluble CD40 ligand (sCD40L) have been reported in patients with acute coronary syndrome and have been found to independently predict risk of future events in this population. However, to date, no study has correlated sCD40L levels and the long-term risks associated with coronary artery disease (CAD) in non-MI patients. Methods: Serum sCD40L levels using ELISA (R&D Systems) were measured in 909 patients evaluated by angiography for the presence of CAD. Patients presenting with acute MI were excluded. A three-way matching scheme (by age [±5 years], gender, and time period of catheterization [±1 year]) was used to identify 303 patients with CAD (>50% stenosis in ≥1 major vessel) who experienced a cardiac event (death, MI) within one year, 303 patients with CAD but with no events at one year, and 303 with no CAD. Results: The three groups were balanced, with patient age averaging 64±11 years, 74% males. Median (IQR) sCD40L levels were different for non-CAD patients (8.6 [5.6] pg/mL compared to CAD (24.8 [86] pg/mL, p<0.01) and to CAD/event (233 [63] pg/mL, p<0.001) but not between CAD and CAD/event patients (p=0.24). After separating sCD40L levels into quartiles, performing logistic regression, adjusting for standard risk factors and C-reactive protein, and performing Bonferroni adjustment for multiple comparisons (p-critical = 0.017), there was a non-significant trend toward decreased risk of CAD vs no-CAD (Q4 vs. Q1: odds ratio [OR]= 0.71, 95% confidence interval [CI]=0.44-1.13, p=0.15) and CAD/ event vs no-CAD (Q4 vs. Q1: OR=0.59, CI=0.37-0.96, p=0.03), but not for CAD/event vs. Q1: OR=0.89, CI=0.56-1.41, p=0.81). Analyses showed no differences between men and women. Conclusions: In contrast to previously reported information in patients with acute coronary syndrome, sCD40L levels were lower in patients with CAD than non-CAD patients, but not for CAD/event vs. non-CAD patients.