rates for HF (34%) is consistent with that generally reported in NYHA Class II-III systolic dysfunction heart failure.


Background: Relations of left ventricular (LV) diastolic filling patterns to hypertension and overweight have been extensively examined in cross-sectional studies but there are few data on long-term evolution of LV filling parameters in population-based samples. Methods: LV filling parameters were measured by Doppler echocardiography 7.2±0.7 years apart in 247 American Indian participants (69% women; 58±7 years of age at baseline evaluation) in the population-based Strong Heart Study. Results: Between examinations, there were no significant changes in the systolic blood pressure (from 135±18 to 137±19 mmHg, NS) and body mass index (from 32.6±9 to 32.2±8 kg/m², NS). LV mass increased from 153±36 to 168±37 g with decreases in LV fractional shortening (35±3 to 33±5%, both p<0.001) and LV midwall shortening (17.6±2.3 to 17.1±2.3%, p=0.001). In parallel, there were decreases in the peak E wave velocity (59±16 to 52±13 cm/sec), peak A wave velocity (71±16 to 66±14 cm/sec) and the E/A ratio of transmitral flow (0.87±0.27 to 0.78±0.21, all p<0.001) accompanied by an increased prevalence of E/A ratio below a prognostically-validated partition value of 0.60 (from 14.6% to 17.4%, p=0.03). The decline in mitral E/A ratio was related to older age at baseline evaluation (r=0.19, p=0.002) and lesser decrease in ejec-
tion fraction (r=0.18, p=0.007) but not to gender or change in body mass index or sys-
tolic pressure. In multiple regression analysis, the decline in mitral E/A ratio was greater with higher initial age (p=0.01) and less with decline in LV ejection fraction (p=0.026) but was unrelated to temporal change in arterial pressure, LV mass, or body mass index. Conclusions: In a population-based sample of middle-aged and elderly adults, a 7-year follow-up of LV filling pattern among 247 American Indians participants showed that there was significant increase in the prevalence of transmitral E/A ratio below a prognostically validated partition value. The decline between examinations in the mitral E/A ratio was related to older age at baseline evaluation and less with decline in ejection fraction and was unrelated to temporal change in arterial pressure, gender difference, LV mass, or body mass index.

1136-82 Evidence of Impaired Left Atrial Function Response to Exercise in Hypertrophic Cardiomyopathy Patients With Heart Failure Crista Cambria, Francesco Palliccia, Antonio Aru, Fausto Cavalcanti, Antonino Granatelli, Giuseppe Richichi, Massimo Santini, San Filippo Neri Hospital, Rome, Italy

Background: Studies on determinants of symptoms of heart failure (HF) have been poorly investigated. To address this issue, we investigated the LA systolic function at rest and on exercise in a subset of HF pts with systolic and diastolic dysfunction. Methods: Fifteen HC pts in NYHA class II (Gr.A; age: 47±11 yrs) and 13 age- and sex-matched HC pts without symptoms of HF (Gr.B; age: 49±12 yrs) were studied. All pts underwent, echo, a symptom-limited exercise treadmill testing (25±18 sec). Doppler echocardiography was performed at baseline and at peak exercise. Indexes of LA morphology and function were derived from the apical 4- and 2-chamber views. Results: At baseline, the 2 groups exhibited similar LV morphology (i.e., maximal wall thickness and LV systolic function). LV ejection fraction (55±1 vs 62±5%, NS), and Doppler measures of LV diastolic performance, i.e. E-E/e' (45±7 vs 49±19 cm/s, NS) and A-e' (66±16 vs 42±15 cm/s, NS). Also, they had similar LA maximal volume (73±17 vs 71±21 cm³), LA stroke volume (11±8 vs 12±8 cm³), and LA emptying fraction (18±9 vs 25±10%). Exercise time was 441±220 sec in Gr.A and 566±297 sec in Gr.B. On exercise, LV ejection fraction did not change in Gr.A (-2±10%) but increased in Gr.B (+10±10%, p<0.05). No significant change with exercise in LA stroke volume (+4±5 cm³) and LA emptying fraction (+2±6%) were seen in Gr.A. On the opposite, Gr.B showed an increase with exercise in LA stroke volume (+9±8 cm³, p<0.01), and LA emptying fraction (+15±10%, p<0.01). Comparison of Doppler indexes of LV filling in Gr.A showed no change with exercise in E/e' (7±10 cm/s) and A/e' (9±10 cm/s). In Gr.B, conversely, there were an exercise a slight increase in E/e' (+4±5 cm/s, p=0.05) and a significant augment in A/e' (+32±19 cm/s, p<0.01). Conclusion: Along with LV dynamic abnormalities, an impaired LA function response to exercise plays a pathophysiologic role in determining symptoms of mild HF in HC. These findings provide evidence that the LA myocardium is involved by the myopathic process in a subset of pts with HC.

1136-83 100 Patients Supported for Over One Year on an Implanted Left Ventricular Assist Device R. Heeter, R. Kherer, M. Vigeno, M. Gaspera, R. Kinmen, P. Prohrian. TBY Instruction on behalf of the Novacor LVAS Investigators, University of Ottawa Heart Institute, Ottawa, ON, Canada

Background: The use of mechanical circulatory support (MCS) devices during the bridge to transplant experience can provide clinical insight into the potential use of these devices for long-term support or "Destination Therapy". A review of the outcomes of first ever end-stage heart failure patients supported for greater than 1 year with an implanted left ventricular assist device (Novacor LVAS) was conducted. Methods: Utilizing data from the international registry, the patient characteristics and outcomes of 100 patients supported for >1 year at 40 international centers were analyzed. Results: The patients were 50% male with a mean age of 47 years (16-72 yrs). The disease etiology was cardiomyopathy in 69%, ischemic heart disease in 26% and other in 10%. The intent to treat was as follows: 58% as a bridge to transplant, 4% as a bridge to recovery (Europe) and 4% as an alternative to transplant. Mean support duration on the device was 1.7 years (370-1514 days) and 22 patients were supported over 2 years, 8 over 3 years and 2 over 4 years. Outcomes were favorable (offb or ongoing, transplanted or wooned) for 78% of patients. Subsequent analysis of patients supported over 6 months and 1, 2, 3 years respectively, yielded similar outcomes at each time interval. There were no deaths related to device failure and the majority of patients were able to return home to near normal activities. Conclusions: 1) A significant majority (76%) of these end-stage heart fail-
ure patients had favorable outcomes and extension of life. 2) Improved quality of life was demonstrated with the majority of patients discharged home (90%). Overall device safety has been demonstrated with no patient deaths due to device failure, and 3) Long-term device durability has been demonstrated with patients supported for over 4 years on a single device. These findings provide clear evidence that mechanical circulatory sup-
port could potentially provide substantial clinical benefits during long-term support or "Destination Therapy". 
* Due to space limitations only investigators with more than 5 patients supported over 1 year are listed.

POSTER SESSION

1137 Cardiac Transplantation: Clinical

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.


Background: The shortage of available donors limits cardiac transplantation. Transplan-
tation of hearts from marginal donors could expand the donor pool if accompanied by good recipient outcomes. Donor hearts from patients with hepatitis B core antibodies (HBcAb) have not been used due to concern about virus transmission. Similarly, donors with malignant brain tumors have also been excluded. We conducted a retrospective review to determine the success of transplanting hearts from donors who were HBcAb+ or had an intracranial tumor. Methods: We reviewed donor and recipient charts for patients transplanted at our center between January 1, 1997 and September 1, 2002. Results: Of 514 heart transplants performed in this time period, 46 (8.9%) used hearts from these marginal donors. Fourteen patients (age 59±11 years) received hearts from donors with an intracranial tumor (age 42±6 years) including 6 glioblastoma multiforme, 2 anaplastic astrocytoma, 1 astrocytoma, 1 medulloblastoma, 1 pinal tumor, 1 meningi-
a and 2 not specified. At 23±10 months of follow-up, no patient had clinical radi-
ologic evidence of tumor transmission. Thirty-two patients (age 46±10 years) received hearts from HBcAb+ donors (age 37±5 years). One patient (baseline HBSAg-) developed donor-transmitted HBV infection 10 months post-transplant that was successful-
ly treated with lamivudine. Two patients (baseline HBsAg+) had HBV seroconversion (HBsAb+) without evidence of HBV infection. Six patients were HBsAg+ pre-transplant and four patients (HBSAb-) received prophylactic lamivudine post-transplant. None of these patients developed donor-transmitted hepatitis; one lamivudine-treated patient...
developed HBOC seroconversion. Overall, survival in this small cohort was no different than that for all patients transplanted at our center during this time period. Conclusion: Transplantation of hearts from HBsAg+ donors is associated with a low HBOC transmission rate and transplantation of hearts from donors with intracranial tumors is not associated with tumor transmission. Use of hearts from these marginal donors should be considered safe and may help to augment the available donor pool.

Recent Outcomes in Cardiac Transplant Patients Receiving Hepatitis C Allografts: A Single Center Experience

Jayanjus P Patel, Jignesh K Patel, Brandt T Cule, Maria Epaoo Vasiliakos, Lynne Kessler, Bernard Kubak, Jon A Kobaishgawa, The David Geffen School of Medicine at UCLA, Los Angeles, CA

Background: Hepatitis C infection in the non-immunocompromised population is a chronic progressive disease with clinical manifestations after several years. The long-term effect of hepatitis C following heart transplantation remains unclear.

Methods: Medical records pertaining to heart transplant recipients receiving allografts from hepatitis C positive donors between August 1991 and August 2002 were reviewed retrospectively. 23 patients were identified as having received allografts from hepatitis C positive donors. Of these, 7 recipients were hepatitis C positive prior to transplantation and 9 patients were Status 1 listing. Overall survival was determined. The presence of diabetes mellitus, hypertension, renal function, post-transplant albumin, donor age, pre-transplant hepatitis C status and type of immunosuppression used were determined to assess possible risk factors for outcomes.

Results: Overall survival in patients receiving hepatitis C positive allografts was 57% at one year and 17% at 5 years. This compared to an overall one-year survival of 84% at one year and 70% at 3 years for all adult heart transplants. Causes of death were due to rejection (5), sepsis and/or sepsis (2), liver failure (2), transplant coronary artery disease (2), unexplained sudden death (2), malignancy (2), rejection (1), and pulmonary embolism (1). By multivariate analysis and logistic regression, the only significant predictor for mortality was hepatitis C positive status. Pre-transplant hepatitis C status or type of immunosuppression used did not significantly affect outcome.

Conclusion: Patients receiving hepatitis C positive cardiac allografts have a significantly worse outcome when compared to the outcome for all adult heart transplants in our institution. The use of cardiac allografts from hepatitis C positive donors should be restricted to critically ill patients awaiting transplantation for whom other treatment modalities are not available.

The Vagary of B-Type Natriuretic Peptide Levels in Heart Transplant Recipients Receiving Tacrolimus

Daniel Cruz, Maria Esposito Vasiliakos, Jignesh K Patel, Alan Garfinkele, Gregg Fonarow, Jaime Mortuchi, Jon A Kobaishgawa, The David Geffen School of Medicine at UCLA, Los Angeles, CA

Background: Tacrolimus (FK506) is a potent immunosuppressant often used in place of cyclosporine (CSA) in heart transplant (HT) patients. Prior studies on HT patients on CSA have demonstrated that B-type natriuretic peptide (BNP) levels are elevated and even continue to rise after HT. However, studies utilizing BNP as a marker of filling pressures and/or rejection and/or aortic dissection have been discordant. It is unknown if the latter BNP patterns exist for HT recipients receiving FK506.

Methods: We retrospectively analyzed BNP levels in 49 patients receiving FK506, who were transplant evaluated between August 2001 and August 2002. 300 BNP levels were drawn at the time that hemodynamic measurements and ventricular biopsies were performed. Mean follow-up was 5.8 months. Recipients with end-stage renal disease and those followed by outside institutions were excluded. Results of 12 patients on tacrolimus with normal BNP levels (n=26, 2001-2002) vs 233 patients (78%) reached BNP levels of <100 pg/ml by 4 months. Both the CSA and FK506 groups had similar ejection fraction, pulmonary capillary wedge pressure (PCW), and creatinine. In FK506 recipients, a weak correlation coefficient (r=0.4) was observed between PCW and BNP. Utilizing a BNP level of 150 pg/ml and PCW of 14 mmHg, the sensitivity of the assay decreased from 100% during the first two months to 21% during the subsequent months. In contrast, the specificity of the assay increased from 34% to 88% during the same time period. There were 7 episodes of rejection (3 cellular and 3 humoral) in 6 HT recipients. Causes were not preceded by an increase in BNP in the days to weeks prior to presentation. Conclusions: Most patients on FK506 achieve normal BNP levels by 4 months in contrast to those reported HT patients on CSA. In HT patients on CSA, BNP appears to be an inadequate assay to screen for rejection or volume status. The mechanism by which FK506 suppresses BNP levels after HT deserves further investigation.

Effects of Growth Hormone Therapy Following Pediatric Cardiac Transplantation

Seema Mehta, Alexis Andron, Barbara Softness, Daphne T. Hsu, Jacob M. Lamour, Linda J. Addoutom, Columbia University, New York, NY

Background: Growth hormone (GH) is used to treat growth failure following cardiac transplantation (Tx). GH can increase cardiac muscle mass and improve function in patients with cardiomyopathy. We evaluated the safety, efficacy and cardiac effects of GH in children following cardiac Tx.

Methods: Ten pediatric cardiac Tx recipients with growth failure were followed serially for 4 years before and after GH therapy. Parameters followed included growth velocity (GV), systolic function, levels of rejection episodes, echocardiographic measures of cardiac function and dimensions, and hemodynamic measurements. To determine the GV and outcome, the follow-up time was broken into the first 6 months, 6-12 months, and 1-3 years. Baseline levels and conclusions were related to increased GV or to a direct effect of GH. GH therapy is in the short-term improvement in ventricular mass, cardiac function and hemodynamics. Whether these beneficial effects are sustained in the long term remains to be determined.

Survival Pre and Post-Heart Transplantation in Patients Listed as UNOS Status 2: Do UNOS Status 2 Patients Benefit From Transplantation?

Javier Jimenez, Leigh Bennett Edwards, Robert Higgins, Joseph Bauern, Shmuel Mallon, John Comel Memorial Cardiac Center, Miami, FL. United Network for Organ Sharing, Richmond, VA

Introduction: Improved outcomes with contemporary medical therapy in patients with advanced heart failure questions the benefit of transplantation (TX) in UNOS status 2 patients.

Methods: Between January 1999 and June 2001, 4,255 patients were listed for heart TX as UNOS status 2. Using a competing risk method, probabilities of remain on the waiting list were computed. Additionally, a time dependent proportional hazards model was used to determine predictors of death prior to or post TX.

Results: Demographics of this cohort revealed a mean age of 56.0 years, female gender (23%), ischemic etiology (48%), diabetes (21%), white race (85%), and mean time on the waiting list (398.5 days). Relative risks of death (>1 indicates an increased risk) compared to patients remaining on the waiting list as status 2 were: upgrade to status 1A; RR 14.9 (95%CI 9.7-22.5), upgrade to status 1B; RR 3.4 (95%CI 2.4-4.7), 0.7-7 days following TX as status 2: RR 16.7 (95%CI 9.3-30.2) and 7-33 days following TX as status 2; RR 6.6 (95%CI 5.7-11.2). All factors were significant at p<0.0001. The overall relative risk of death following TX (365+ days) for status 2 patients initially listed as status 2 compared to those that continue to wait as status 2 is shown below: RR 0.92 (95%CI 0.5-1.58, n=240).

Conclusion: After accounting for early perioperative mortality, there appears to be little survival benefit at one year in transplantsing UNOS status 2 patients. The point of optimal benefit from TX in UNOS status 2 patients may need to be further defined.

Cytomegalovirus Infection Negatively Influences Coronary Remodeling Modalities in Heart Transplant Recipients: A Prospective Study

Luciano Ponte, Francesco Grigioni, Fabio Cocolo, Gaia Magnani, Paolo Ortolani, Cinzia Mazzorini, Antonino Marzocchi, Simona Sorbello, Anna C. Musuraca, Carlo Maggi, Angelo Branzi, University of Bologna, Bologna, Italy

Background: Graft coronary disease (GVD) is a major determinant of mortality after heart transplantation (HT). This peculiar form of atherosclerosis has been recently identified as the result of the interaction between intimal hyperplasia and vessel wall response (i.e. vascular remodeling). Although immunological and traditional risk factors are known to be implied in GVD pathogenesis, their contribution to remodeling process remains undetermined.

Methods: 37 consecutive HT recipients were prospectively studied (age 52±11 years, 75% male, median age 52±11 years). Intracoronary ultrasound (IVUS) of proximal mid-left anterior descending was performed at 1 and 12 months after HT. Vessel, lumen and intimal volume changes over this period were analyzed.

Results: 1195 IVUS images were obtained. Overall intimal volume increased (+80%, p<0.001), while vessel volume remained unchanged (n.s.) and thus, lumen volume decreased (-9%, p=0.01). Among all the clinical and demographic characteristics analyzed (e.g. donor features, immunosuppression, lipid panel, biopsy score), only the presence of cytomegalovirus (CMV) infection was associated with increased lumen loss (p=0.047). Patients who presented CMV infection (n=14) showed a higher increase in intimal volume (118% vs. 59%, p<0.07), but not in vessel volume (+1% vs. -4%, p=0.5). Therefore, CMV infected patients showed a more significant lumen loss (13% vs. 9%, p=0.04). A trend towards an association between LDL and intimal growth was present only in CMV infected recipients (R=0.46, p<0.07).

Conclusions: This prospective study suggests for the first time that occurrence of CMV infection during the first post-HT year negatively affects vascular remodeling, ultimately resulting in coronary lumen loss. LDL serum levels might contribute to lumen loss interfering with CMV infection in stimulating intimal growth.