Abstracts From the 12th Annual Scientific Meeting
Heart Failure Society of America
September 21–24, 2008
How Painful Is Advanced Heart Failure? Results from PAIN-HF

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While pain and physical discomfort has been reported in 40–70% of advanced heart failure (HF) patients in a variety of studies, we know little about the nature of pain in patients with HF, or the location, context and significance of their pain. PAIN-HF’s purpose was to identify the prevalence of pain, its location, relation to other problems and possible causes in community-living patients with advanced HF. Methods: We surveyed 349 patients with advanced HF in outpatient clinics and hospice care settings regarding the presence, severity, nature, and location of pain. A multi-symptom assessment, depression screen, and clinical assessment were used to evaluate the presence of co-morbid conditions and symptoms at enrollment and 2 weeks later. Results: Subjects were 65.9 years old (SD 15.0), 64.2% males, and 78% White race. They reported a 53.3% prevalence of pain at baseline, and 51.7% at follow up. Of those reporting pain at baseline, only 31.3% believed their pain was due to their HF condition. Among subjects with pain, the nature of moderate or severe pain was most commonly reported as tiring (62.7%), acheing (57.6%), or sharp (51.1%). One in five subjects reported severe pain. Chi-square tests of association revealed strong and significant associations between reporting pain and degenerative joint disease (p < .001), chronic back pain (p < .001), anxiety (p < .001), and depression (p = .001). Pain was moderately associated with fatigue (p = .001), shortness of breath (p = .008), and peripheral vascular disease (p = .002). Conclusions: Pain is prevalent among patients with advanced HF, and is associated with arthritis and other co-morbid conditions. This research is a first step to advance knowledge of etiology and outcomes of pain in persons with HF, and points to a need for strategies to assess and manage pain in patients with advanced HF.

A Modified Course of Enhanced External Counterpulsation Improved Myocardial Perfusion in Severe Ischemic Cardiomyopathy Patients


Introduction: Enhanced external counterpulsation (EECP) has been shown to improve exercise capacity and functional class in patients with chronic heart failure after a full course of more than 30 hours treatment. This study examines the effects of a reduced course of 10 one-hour daily EECP treatments in patients with severe ischemic left ventricular dysfunction (LVD), who were no longer candidates for invasive revascularization procedures.

Methods: 16 consecutive patients with severe LVD who were considered to be at high risk for coronary artery bypass graft (CABG) were treated with the reduced course of EECP. Their mean age was 55 ± 9 years. All the patients were subjected to pre and post rest myocardial perfusion studies by T-99m Tc-labelled 201Tl and 99m Tc-ECD-gated blood pool SPECT with the inner myocardial wall for systolic and diastole defined manually was used to calculate CV ejection fraction. Systolic territory score was used to analyze radionuclide perfusion data, and paired t-test was used to compare pre versus post EECP. Results: 56% of the 16 patients were hypertensive, 50% diabetic, 59% had history of prior MI, and 63% had triple vessel disease. There were no changes in both systolic (117 ± 15 versus 122 ± 16 mm Hg, p = 0.5) and diastolic blood pressure (79 ± 7 versus 83 ± 7 mm Hg, p = 0.5) pre and post EECP, but systolic pressure as expressed from 108 ± 16 to 117 ± 14 beats/hour, p < 0.03. Gated LVIFV increased from 26.6 ± 9.0% at baseline to 59.5 ± 13.6%, p < 0.003. Post EECP, the radionuclide territory score in the LAD region improved significantly from 44.1 ± 15.8 to 48.3 ± 16.1%, p < 0.001, as well as in the RCA region from 34.1 ± 7.3 to 39.8 ± 8.7, p < 0.02, but not in the LCX region (54.3 ± 9.7 to 48.9 ± 8.3, p = 0.1). After EECP 19% of the patients were considered revascularization candidates and underwent triple vessel CABG without complications. Conclusion: A one-hour daily course of EECP significantly improved myocardial perfusion in patients with severe left ventricular dysfunction. However, whether these beneficial effects can be sustained remains to be studied. Early experience has suggested that an initial short course of 10 hours of EECP followed with 1 or 2 hours of weekly treatment might sustain the benefit of EECP in heart failure patients.

Self-Care Behaviors, Symptom Status, and Health-Related Quality of Life in Patients with Heart Failure

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Background: Symptomatic patients with heart failure (HF) report that health-related quality of life (HRQOL) is as important as survival. Most patients with HF experience physical symptoms such as dyspnea and fatigue, and HRQOL in patients with HF is poorer than that in patients with other chronic illness. Physical symptoms can limit patients’ daily activities, and this limitation can be related to poor HRQOL. Both physical symptoms and HRQOL are related to comorbidity and mortality in HF. Poor self-care behaviors such as self-management, medication adherence, and dietary adherence may worsen physical symptoms and in turn worsen HRQOL. However, the impact of self-care behaviors on symptom status and HRQOL has not been examined fully. Aims: To determine the relationship among self-care behaviors (self-management, maintenance, medication, and confidence), medication adherence, and dietary adherence and symptom status and HRQOL. Methods: One hundred ninety-nine patients (61 ± 13 years old, 67% female, 50% NYHA class II/IV) provided self-management, maintenance, and confidence data on the Heart Failure Questionnaire, symptom status (Symptom Status questionnaire), self-management (Self-Care of Heart Failure Index), medication adherence (Motoric Outcomes Study Specific Adherence Scale), dietary adherence (24-hour urine sodium), and demographic and clinical characteristics. Multiple regression analyses were used to examine the specific aims. Results: One self-management variable, lower confidence, was related independently to worse symptom status (R² = .15, p < .001). Lower confidence and dietary adherence were related independently to poorer HRQOL (R² = .31, p < .001). When self-care was added, self-care was no longer a significant predictor of HRQOL. Worse symptom status was related to poorer HRQOL (R² = .58, p < .001). Medication adherence was not related to symptom status or HRQOL. Conclusion: Attention should be given to self-management and symptom status to improve symptom status and HRQOL. Further research is needed to determine the causal relationship among self-care behaviors, symptom status, and HRQOL.

The Granov Factor – A New, Effective Impedance Algorithm for Non-Invasive Ambulatory Assessment of Preclinical Congestive Heart Failure

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Introduction: There are two synonymous clinical titles for the onset of left ventricular systolic dysfunction (LVSD), which is the first stage in the evolution of congestive heart failure (CHF). According to the ACC/AHA, the term is Stage B Heart Failure (HF), and it is defined as a "structural disorder of the heart, which has never developed symptoms of HF". The Framingham Study uses the term Asymptomatic Left Ventricular Systolic Dysfunction (ALVD), and defines it as the phase of 40–45% ejection fraction (EF) <59%. The average prevalence of ALVD in the adult population is approximately 5%. Hypothesis: Since the diagnosis and management of LVSD in its asymptomatic phase may halt its deterioration to the fatal CHF for years, we assume that the availability of a portable apparatus for diagnosing ALVD in the community population will dramatically change the fate of CHF.

Methods: A medical instrument which consists of an ordinary laptop computer in which the CD-ROM has been replaced by an impedance device called Nicas (Non-Invasive Cardiac System) has already been described elsewhere. Recently, a new algorithm, called the Granov Factor, which is based on the systolic time intervals (STI), was specifically developed for detection of ALVD by the Nicas. One hundred patients underwent a Helsinki approved determination of EF <55% by echocardiography and a study by the Nicas for STI. The resulting STI was < 0.100 within 30 minutes intervals, at the Wolfson Hospital, Israel. Results: EF < 55% was found by echo in 21 patients, and comparison of the Nicas versus Echo results revealed two false negative and one false positive Nicas results. This is a sensitivity of 90.48%, specificity of 98.63%, and positive and negative predictive values of 99.29 and 97.52%, respectively. Conclusions: We introduce here an ideal portable diagnostic tool which can be used by any doctor anywhere, for the incidental diagnostic of ALVD either during an ordinary physical examination, or through screening the community population.
378 Thermal Vasodilation by Portable Device in Decompensated Severe Heart Failure with Intrastop Support
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Purpose: Thermal vasodilation using sauna bathing has been demonstrated hemodynamic useful in heart failure. However, in decompensated phase with intravenous isotropic support, patients are restricted at bed. Consequently thermal vasodilation by sauna bathing is not applicable. We studied hemodynamic effects of heating by portable thermal blanket in decompensated severe heart failure. Methods: We selected patients with severe heart failure hospitalized by decompensation, LVEF <40%, in use of intravenous isotropic support. Patients were divided alternately in 2 groups (T and C). Group T was submitted to thermal vasodilation therapy by infrared blanket to achieve 50°C of extra-corporeal temperature. Hemodynamic measures, by thermistor method, were done at baseline and 1 h after. ANOVA by repeated measures was used to P < 0.05. Results: We studied 22 years, with 59 years old patients, 50% had ischemic cardiomyopathy, 87.5% used dobutamine, and SNP was 1,343 µg/ml. Baseline cardiac index was 2.38 l/min and systemic vascular resistance was 1,917 dynes/sec cm-5. Cardiac index increased 53.9% in group T, and decreased 6.0 % in group C (P = 0.008). Systemic vascular resistance decreased 31.7% in group T and increased 18.3% in group C (P = 0.006). Conclusion: Thermal vasodilation by portable device increased cardiac index and decreased systemic vascular resistance. This method is possible useful in management of decompensated heart failure. Further studies are necessary to clarify this matter.

379 Does Completion of Enhanced External Counterpulsion Treatment Improve Outcomes in Heart Failure Patients
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Background: Enhanced External Counterpulsion (EECP) non-invasively improves quality of life and functional capacity in ischemic cardiomyopathy patients (pts). We report a prospective 30 hour course of EECP in heart failure (HF) decompensation and MACE in ischemic HF pts is unknown. Methods: The IEPR2 is a prospective, sequential registry of 3,000 treated pts. EECP drops, when immediate treatment events are excluded, provide a comparable group of durable effects. The demographics, immediate and 1 year outcomes of HF pts completing ≥ 30 hrs of EECP (C) were compared with pts receiving < 30 hrs (IC). Analysis was performed with Kaplan Meier, chi square, or unpaired t test as appropriate, significance at p < 0.05. Results: There were 481 C:116 IC pts with 94.5% 1 year follow-up. At baseline the CIC cohorts were similar in age (70 ± 11:69 ± 11 yrs), male gender (72%:68%), HBP (82%:85%), dyslipidemia (both 89%), diabetes (54%:56%), CCS class II/IV angina (98%:97%), prior MI (84%:82%), PCI (72%:70%), CABG (76%:75%), multi vessel CAD (39%:32%), EF (37%:35%:5.5%:15%), NYHA class, and DASI scores (8.4-7.1:7.2±7.3). There were CIC differences in rehospitalization (21%-31%; p = 0.03), current smoking (7%:13%; p = 0.03), BB therapy (79%-66%; p = 0.02), ACEI (55%:44%; p = 0.04), statins (78%:69%; p = 0.05). During the usual 6-8 week of EECP CIC groups differed significantly in heart rate (HR; 64±13 vs. 60±12; p = 0.03), blood pressure (BP; 114±17 vs. 118±13; p = 0.02, 0.04), systemic vascular resistance (SVR; 12±2 vs. 11±1; p = 0.01), DASI scores 13.8 ± 10.6 ± 10. p = 0.03), overall MACE (15.8%:25.4%; p = 0.01) and sustained improvement in CCS angina class (63%:23%; p < 0.01). Conclusions: Completion of ≥ 30 EECP is associated with decreased morbidity and mortality during treatment and over one year follow-up. However, the incidence of clinical events post EECP course in HF pts may warrant new EECP regimens (e.g. short initial course with weekly 1 or 2 hours maintenance EECP).

380 Long Term Results of Levosimendan Therapy on Patients with Acute Coronary Syndrome and Cardiogenic Shock
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Calcium sensitizer levosimendan enhances myocardial contractility which could be advantageous in patients with myocardial ischemia requiring isotropic support. During three years 3852 patients with high risk acute coronary syndrome (ACS) underwent percutaneous coronary intervention (PCI) in our department. Post PCI in the ACS was complicated with cardiogenic shock (mean age: 68.6±1.2). The mean time interval between onset of chest pain and PCI was 7.5± 0.9 hours long. Short and long term effects of levosimendan on cardiac functions and survival of cardiogenic shock patients were analyzed. Levosimendan was administered in 196 patients and long term mortality of patients treated with levosimendan (30% vs. 30%, p = 0.05). Most of these patients died because of cardiac failure. During the follow-up (mean time 204.6±29.9 days) all cause mortality was also lower in the levosimendan treated patient group (54% vs. 68%, p = 0.06), however this difference seems to be on a lower level of significance. The time interval between the onset of infarction and PCI (6.6±0.7 vs. 9.7±2.6 hours, p = NS) did not influence the effect of levosimendan on short and long term mortality. Levosimendan may improve cardiac function and decrease short term and even long term mortality in high risk patients with acute myocardial ischemia when cardiogenic shock developed independently of time interval of myocardial infarction.

381 Stages of Hypertension as a Predictor for Cardiovascular Events in Heart Failure Patients
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Hypertension is an identified risk factor for cardiovascular disease and affects millions of Americans. Previous research supported a lower target blood pressure range of 130/80 mm Hg for the diabetic and renal patient. Within these previous studies, heart failure patients were excluded from the patient population. The purpose of this study was to examine the incidence and relationship of cardiovascular events within the stages of hypertension for patients with heart failure. A retrospective study was conducted on a consecutive sample of patients 65 years old and over treated at a large teaching hospital. This was an observational study, not a randomized controlled trial. These patients were under the care of a cardiologist for at least one year, and did not have diabetes or renal disease. An electronic medical record system served as a tool for data collection. Blood pressure recordings were collected for each office visit. For each blood pressure reading, the New York Heart Classification, Stage of Heart Failure, and adverse events were entered into the data. If the ejection fraction and left atrial size were assessed, the findings were also entered. There were a total of 390 blood pressure recordings collected for the sample of 50 patients. The following are the identified adverse events and major adverse coronary events (MACE) identified in the chart review; hospitalization, dyspnea, chest pain, cyanosis, fatigue, edema, percutaneous coronary angiography (PTCA), internal cardiac defibrillator/ permanent pacemaker (ICD/PMM), coronary artery bypass graft (CABG), revascularization, syncope, ICD shock, episode of arrhythmia, ablation, palpitations, aortic valve replacement/mitral valve replacement (AVR/MVR), and transplant. Although there was no significant identification between MACE and stage of hypertension, x2(3, N = 1163:3:08, p = 0.04, a post hoc analysis showed significance between hypertension, x2(3, N = 922:2:6; p = 0.05:1.4:0:05; 1.4:1.3:0.1:0.05; 1.4:0:05. The relationship between MACE and the NYHA class showed strong statistical significance, x2(4, N = 11630:724, 0.05, p = 0.05, p = 0.05, p = 0.05, p = 0.05, p = 0.05).