pulsed Doppler of the mitral inflow), and blood sample for BNP assay. The following parameters were obtained: ejection fraction (EF), E and A waves maximum velocities, E/A relation and the deceleration time of the E wave. Patients were grouped according to the LV function: Group 1 – normal LV function; Group 2 – isolated LV diastolic dysfunction; Group 3 – LV systolic dysfunction. Follow-up was performed during one year, with records of cardiovascular events (heart failure or dead).

Results: Patients were included in groups as follows: group 1 – 33.7%; group 2 – 30.7%; group 3 – 35.6%. These groups had diferent levels of BNP (68.3 ± 72.6; 168.0 ± 110.5; 339.1 ± 249.9 pg/ml; p = 0.001). The median age was 58.3 ± 12.6 years. Patients with restrictive pattern of ventricular filling had highest values of BNP, wich was independent of LV sistolic function. The event incidence was: group 1 – 2.9%; group 2 without restrictive pattern – 8.7% and group 2 with restrictive pattern – 25%; group 3 without restrictive pattern – 29.4% and group 3 with restrictive pattern – 60%. Nevertheless, the multivariate analisis demonstred that BNP was the only factor with independent relationship with prognosis in this population of patients.

Conclusion: There is a relationship between BNP levels and the severity of LV dysfunction. This factor is an important prognostic marker with independent significance. There is a need to investigate if the terapeutic variations of this neurohumoral marker are acompained with changes in prognosis.

P99/10541 The impact of obesity on survival in chronic heart failure patients

C.H. Davos, W. Doehner[1], M. Rauchhaus, M. Cicoira, D. Francis, A.J.S. Coats, S.D. Anker[2]. *Dept. of Cardiology, National Heart & Lung Institute, London; [1]Cardiac Medicine, National Heart and Lung Institute, London, United Kingdom; [2]Franz-Volhard-Klinik at MDC, Charité, Berlin, Germany*

Whether high or low body weight and particularly the presence of obesity relates to survival in chronic heart failure (CHF), indepentently of the presence of cardiac cachexia, has never been studied.

Methods: From April 1992 to December 1999, we studied 577 consecutive CHF patients (486 males, age 61 ± 12 y) for body mass index (BMI: weight/height 2), presence of cardiac cachexia (>7.5% weight loss, 60 patients: 3 y-survival 45% [95%CI 31–60%]), and NYHA class. The 517 non-cachectic (nc) patients were divided in 5 groups according to their BMI: <24 (G1, n = 107), <26 (G2, n = 110), <28 (G3, n = 101), <32 (G4, n = 122), and >32 (G5, n = 77). Treadmill peak oxygen consumption (peak VO_2 in ml/kg/min) was assessed in 432, and LVEF in 341 ncCHF patients (Table).

Results: Censoring the follow-up in December 1999, 160 ncCHF had died (1 y-survival 87% [84–90%], 3 y-survival 73% [69–77%]). In univariate analysis, age, NYHA class, peak VO_2, LVEF (all p < 0.0001), and BMI (p = 0.01) predicted survival. Overall, best survival was seen in G4 (1 y-survival 91% [95%CI 86–96], 3 y-survival 82% [74–90]): p = 0.35 vs G5 (RR 1.32); p = 0.014 vs G3 (RR 1.87); p = 0.06 vs G2 (RR 1.61); p = 0.001 vs G1 (RR 2.3). In ncCHF worst survival was seen in G1 (1 y-survival 75% [95%CI 67–84], 3 y-survival 64% [54–74%]). Survival of patients in G2-5 was similar up to 18 months. Thereafter survival was consistently the best in G4. In multivariate analysis, BMI-quintiles predicted prognosis (p < 0.02), independently of NYHA class and age.

Conclusions: Obese patients with chronic heart failure do not show impaired survival compared to non-cachectic patients with body weights within recommended normal limits. Particularly, mildly obese patients show the best survival. High fat stores may indicate preserved metabolic efficiency and/or energetic reserves.

P100/10400 End stage heart failure in ambulatory patients: Reliability of a clinical score to predict survival of patients with Congestive Heart Failure

M. Bobbio, S. Dogliani, G. Giacomarra, K. Aaronson[1]. *Cardiologia Universitaria, Ospedale Molinette, Torino, Italy; University of Michigan, Ann Arbor, MI, United States*

Background: Cardiologists managing end stage heart failure ambulatory patients have to face the important clinical problem to predict their survival in order to decide whether to refer them to the Heart Transplantation (HT) program. Different prognostic models were derived and validated in population belonging to the same center. This method may falsely enhance the validity of the model because of the homogeneity of patients and variables' evaluation.

Aim of the Study: To validate the Heart Failure Survival Score (HFSS) in patients referred for a clinical evaluation to a HT center different from the one where the score was developed.

Patients and Methods: We retrospectively analyzed all patients referred to our heart failure center between March 1996 and February 1997 and we included in the study 107 patients who had all the variables needed to calculate the score: VO_2 max, rest HR, mean BP at rest, EF%, serum Na, IHD/DCM, QRS width 0.12 sec at a 12 lead standard ECG. At entry the mean age was 51.4 + 8 years; 86 (80.4%) were male and 69 (64.5%) had dilated cardiomyopathy. The mean VO_2 was 16 ± 4.7 ml/kg/min; left ventricular ejection fraction was 26 ± 9%; mean blood pressure was 99 ± 13 mmHg; resting heart rate was 80.7 + 13.9 bpm; serum Na was 140 ± 3 mEq/l. HFSS was 9.03 ± 0.97 (range 6.42–11.43) which classified patients into three strata: 2 patients (1.8%) were classified as at high risk, 18 (16.8%) at medium risk and 87 (81.3%) at low risk. All patients had a clinical follow-up at 1 year. Event-free survival (urgent transplant in inotrope-dependent patients or pre-transplant death) was determined by the Kaplan-Meier method and compared by the log rank test. At the end of follow-up 7 events (6.5%) were recorded: 3 (2.8%) deaths and 4 (3.7%) inotrope-dependent transplant. Event-free survival at 1 year was 68 ± 14% for the combined medium and high risk strata vs. 96 ± 2% for the low risk stratum (p = 0.0005).

Conclusion: The HFSS is a reliable and generalizable model to predict one year mortality and transplantation in patients referred for evaluation in a HT center different from the one where the score was developed. Event-free survival for patients in the high and medium risk strata is poor, and these patients should be listed for HT. HT listing can be safely deferred for low risk stratum patients.

P101/10407 ANP & BNP are potent markers for left ventricular dimensions, mass and function in patients with chronic heart failure

B.A. Groenning, J.C. Nilsson, L. Sondergaard, A. Kjaer[1], T. Fritz-Hansen, H.B.W. Larsson, P.R. Hildebrandt[2]. *Dep. of MR, Sect. 340, H:S Hvidovre University Hospital, [1]Dept. of Medical Physiology, University of Copenhagen, Copenhagen; [2]Dep. of Cardiology and Endocrinology E H:S, Frederiksberg University Hospital, Copenhagen, Denmark*

The aim of the study was to evaluate neurohormonal plasma levels as markers for left ventricular dimensions, muscle mass and function as measured by magnetic resonance imaging (MRI) in patients with chronic heart failure.

Methods: In a substudy to the Metoprolol CR/XL Randomised Intervention Trial in Heart Failure (MERIT-HF), 48 patients with symptomatic heart failure in New York Heart Association functional classes II–IV (II: 51%, III: 46%, IV: 3%), left ventricular ejection fraction (LVEF) < 35% (mean LVEF 31% (by echocardiography) [95% confidence interval (CI) 27–34]) and age between 40 and 80 years (mean age 66 years [95% CI 63–69]) were examined with MRI prior to randomisation assessing left ventricular dimensions (left ventricular end-diastolic (LVEDVI) and end-systolic (LVESVI) volume indices), muscle mass (left ventricular mass index (LVmassI)) and function (left ventricular ejection fraction (LVEF)). Prior to the MRI examination, plasma levels of epinephrine (EPI), norepinephrine (NEPI), atrial natriuretic peptide (ANP), brain natriuretic peptide (BNP), plasma renin activity (PRA), aldosterone (ALDO) and arginine-vasopressin (AVP) were measured.

Results: Mean LVEDVI, LVESVI and LVmassI exceeded normal values (154 ± 66 vs 66 ± 12 ml/m^2 [mean ± standard deviation], P < 0.001; 111 ± 62 vs 21 ± 10 ml/m^2, P < 0.001; 178 ± 51 vs 87 ± 12 g/m^2, P < 0.001) and mean LVEF was below normal value (31 ± 12 vs 67 ± 5%, P < 0.001). Elevated plasma levels of ANP and BNP were powerful markers for high values of LVEDVI (ANP: r = 0.74, P = 4×10^{-9}; BNP: r = 0.61, P = 1×10^{-5}) and LVESVI (ANP: r = 0.73, P = 1×10^{-8}; BNP: r = 0.65, P = 2×10^{-6}) as well as for an increased LVmassI (ANP: r = 0.64, P = 2×10^{-6}; BNP: r = 0.60, P = 2×10^{-5}). A low LVEF was associated with elevated plasma levels of ANP (r = −0.35, P = 0.02); BNP (r = −0.48, P = 0.0009) and PRA (r = −0.37, P = 0.01). Plasma levels of EPI, NEPI, ALDO and AVP were not associated with any hemodynamic variables.

Conclusion: The present study is the first to demonstrate that ANP and BNP are valid markers for left ventricular volumes and myocardial mass in patients with chronic heart failure and holds the potential for introduction of these surrogate measurements into clinical practice.