Prevalence and Importance of Renal Dysfunction in Hospitalized Heart Failure Patients

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Background: Renal dysfunction is an adverse prognostic marker in heart failure (HF). Although serum creatinine concentration is the usual method for assessing renal dysfunction, the accuracy of this test in HF is uncertain. Consequently, the true prevalence of renal dysfunction in unselected HF patients is unknown.

Methods: Index emergency admissions with HF to one University hospital during the year 2000 were studied. Hematological and biochemical (from the initial blood samples taken on the day of admission) data were obtained from hospital electronic records.

Results: 528 consecutive, first-admissions, with HF were included in this study. The median follow-up was 693 days (range 1 - 978 days). Mean serum creatinine (standard deviation [SD]) concentration on admission was 1.50(0.9) mg/dL and 51% of patients had an elevated creatinine (>1.3 mg/dL) concentration. Glomerular filtration rate (GFR) was calculated using the Modified Diet in Renal Disease equation. Mean GFR was 51(22) mL/min/1.73m2. Mean GFR of men was greater than that of women (56(23) vs 48(20); P=0.0001). 436(96%) patients had a reduced GFR (<60 mL/min/1.73m2 ). 66%, 16%, and 3% had a GFR less than 60, 30 and 15 mL/min/1.73m2, respectively. 199(21%) patients with a normal creatinine had a low GFR. On multiple regression analysis, age (coefficient of variation [95% confidence interval] -0.6 (-0.7, -0.4); P<0.0001), male sex (11 (6, 16); P=0.001), ACE inhibitor therapy (6 (10, 9, 11); P=0.02), Hb (1.6(0.4, 2.8) and plasma CRP (0.6(-0.1, 0.02) were independent predictors of GFR.

Conclusions: Measurement of serum creatinine fails to detect impaired renal function in a high proportion of hospitalized HF patients. Normal renal function on admission is rare in these patients, and GFR is an independent predictor of long-term outcomes. In addition to established predictors of renal function, we found that ACE-I therapy and plasma CRP concentrations are also predictors.

Prognostic Impact of Catabolic/Anabolic Imbalance in Chronic Heart Failure

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Background: Chronic heart failure (CHF) is characterised by a catabolic/anabolic imbalance. The cortisol/DHEA ratio (C/D) reflects this disequilibrium. Its prognostic utility is unknown.

Method & Results: Survival and CDR were analysed in 102 stable male CHF patients (age 62±11y, NYHA class 2.6±0.7, CDR 50±5, urate 468±136 µMol/L, creatinine 124±43 µMol/L, body mass index 26.1±4.4 kg/m², left ventricular ejection fraction 26±11 %, peak oxygen consumption(VO2) 18.1±5.8 mL/kg/min, ventilation/carbon dioxide production (age 62±11y, NYHA class 2.6±0.7, CDR 50±5, urate 468±136 µMol/L, creatinine 124±43 µMol/L). 83% of patients with a normal cortisol had a low C/D. On multiple regression analysis, age (coefficient of variation [95% confidence interval] -0.6 (-0.7, -0.4); P<0.0001), male sex (11 (6, 16); P=0.001), ACE inhibitor therapy (6 (10, 9, 11); P=0.02) and death or HF readmission (0.8 (0.7,1.0; P=0.03) were independent predictors of survival. Cox survival analysis, CDR (SD) was an independent predictor of mortality (odds ratio [95% confidence interval] odds ratio [95% confidence interval] 0.89 [0.78,1.0]; P<0.08), HF readmission (0.8 (0.6,1.1; P=0.02) and death or HF readmission (0.8 [0.7,1.0]; P=0.03).

Conclusions: Measurement of serum creatinine fails to detect impaired renal function in a high proportion of hospitalized HF patients. Normal renal function on admission is rare in these patients, and GFR is an independent predictor of long-term outcomes. In addition to established predictors of renal function, we found that ACE-I therapy and plasma CRP concentrations are also predictors.

Frequency Distribution of Hospitalized Heart Failure Patients: Data From The Adjudication Committee of Val-HeFT

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Background: Categorization of hospitalization data, particularly by adjudication committees, has been rare in heart failure (HF) trials which have commonly targeted HF events.In ValHeFT, we examined the adjudicated hospitalization database, 49.7% of which categorized non HF hospitalizations.

Methods: The independent endpoints committee (EC) of Val-HeFT adjudicated every non-elective hospitalization up to and including the first of each primary event. All hospitalizations were categorized as HF or non-HF (and cardiovascular (CV) or non-CV). For CV hospitalizations, CV systems were classified using the MEDDRA dictionary if an EC assignment was not made. Multiple hospitalizations occurred for some patients.

Results: For 5010 patients randomized, 5962 hospitalizations were investigator-assessed for 2509 patients, and 2962 hospitalizations were EC- adjudicated for 1834 patients. Of the patients with adjudicated hospitalizations, 83.0% (5320) had at least one hospitalization classified as CV-related, approximately 34% (618) as non-CV. 44.3% (812) as HF-related, and 71.8% (1316) as non-HF (including CV-related). Among CV reasons other than HF, unstable angina (249, 13.6%) and invasive cardiac procedures (159, 8.7%) were common, while myocardial infarction (MI) (59, 3.2%) and stroke (61, 2.8%) were not. Leading non-CV causes were infection (197, 10.7%), general disorders (e.g., chest pain NEC, malaise) (136, 7.4%), and pulmonary (83, 4.5%). Among the 812 patients with HF hospitalizations, 718 (88.4%) met criteria by IV use or oral medication addition, 87 (10.7%) with pulmonary edema, and 16 (2.0%) with shock.

Conclusions: Non-HF hospitalizations appear commonly in HF patients. Among non HF CV admissions, unstable angina and invasive cardiac procedures were common and irreversible CV endpoints (MI and stroke) were infrequent. Future HF trials may consider these proportions of hospitalizations in designing composite endpoints and in further assessing the importance of non-HF morbidity in the disease.

Predictors of Mortality in Patients Hospitalized With Worsening Heart Failure: Insights From the ACTIV in CHF Trial

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Background: Patients hospitalized for worsening heart failure have a high post-discharge mortality and readmission rate. Limited information, however, exists for risk stratification in this population.

Methods: The Acute and Chronic Therapeutic Impact of a Vasopressin Antagonist in Chronic Heart Failure (ACTIV in CHF) trial randomized 319 patients admitted to the hospital for worsening heart failure to tolvaptan or placebo, in addition to standard therapy. Cox proportional hazards analysis was used to explore the relation between baseline characteristics and mortality within 60-day post-discharge, adjusted for treatment. Baseline variables examined included demographics, history, renal function, and clinical laboratory values.

Results: The overall unadjusted 60-day mortality was 5.8% and the 60-day mortality/trachealization rate was 26.7%. The two most important baseline independent predictors of mortality were elevated BUN (BUN > 29 mg/dL; HR = 5.54, 95% CI 2.17 - 14.17, p < 0.0004) and hyponatremia (serum Na < 136 mEq/L; HR = 3.12, 95% CI 1.47 - 6.61, p < 0.0004). Hyponatremia (serum Na < 136 mEq/L; HR = 3.12, 95% CI 1.47 - 6.61, p < 0.0004). Renal (Hemoglobin < 13 for men and < 12 for women; HR 1.59; 95% CI 0.72 - 3.52, p = 0.26) and low systolic blood pressure (systolic blood pressure < 90 mm Hg; HR = 1.94, 95% CI 0.49 - 7.68, p = 0.34), trended toward statistical significance.

Conclusions: In patients discharged after hospitalization for worsening heart failure, elevated BUN and hyponatremia are strong predictors of 60-day mortality. Clinical decision-making processes and further research efforts should target these two factors.