Change in Brain Natriuretic Peptide Predicts Risk for Hospitalization in Patients with Heart Failure

Patrick Dunn, Miguel Gambetta, Dawn Nelson, Bobbi Herron Community Health Care System, Munster and Hobart Indiana and Ross Arena, Virginia Commonwealth University, Richmond, VA.

Introduction: Numerous studies have demonstrated the prognostic significance of brain natriuretic peptide (BNP). These investigations have focused on the value of a single assessment of BNP. The purpose of the present investigation is to examine the prognostic value of the short-term change in BNP in a group of patients with heart failure (HF).

Methods: One hundred and twenty five subjects (75 male/50 female) were included in this analysis. Mean age and left ventricular ejection fraction were 76.8 (±8.6 years) and 32.8 (±16.9%), respectively. All subjects were followed by an out-patient HF program consisting of patient education, close monitoring of signs, symptoms, medication and compliance and a telemanagement program. An advanced practice nurse under the direction of a cardiologist managed this program. Two BNP measures were taken 3-5 weeks apart and the difference was calculated. Subjects were tracked for hospitalization for 30 days after the second BNP measurement.

Results: Baseline BNP (931.8 ±1010.7 pg/ml) was significantly less (p=0.02) than BNP at follow-up (1102.3 ±1171.4 pg/ml). The mean change in BNP from baseline to follow-up was 170.6 ±745.1 pg/ml (range: -1838.0 to 4010.0 pg/ml) Fifty four subjects were hospitalized with 30 days of the follow-up BNP measurement. The mean change in BNP from baseline to follow-up in the subjects who were event free and the subjects who were hospitalized was 4.37 ±498.5 pg/ml and 389.1 ±940.8 pg/ml, respectively (p=0.008). The percent of subjects with no change or a decrease in BNP at follow-up in the event free and hospitalized group was 58.3% and 33.3%, respectively (p<0.001). Receiver operating characteristic curve analysis revealed the change in BNP prognostic classification scheme was statistically significant (Area under the curve: 0.66, 95% CI: 0.56-0.76, p=0.002). The optimal prognostic threshold value for change in BNP was </≥ 34.5 pg/ml. Logistic regression analysis revealed subjects with a change in BNP ≥ 34.5 pg/ml were 3.3 (95% CI: 1.6-6.8) times more likely to be hospitalized within 30 days compared to those subjects with a change in BNP <34.5 pg/ml (p=0.002).

Discussion: The results of the present study indicate serial measures of BNP provide valuable prognostic information. Tracking change in BNP in out-patient HF clinics may help to identify those individuals at higher risk for in-patient admissions to manage their heart condition.

Presented at Heart Failure Society of America Meeting, Seattle, WA, 2006.