ABSTRACT

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

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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 via the HealthCall 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.