

Poster presentation

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Pro-B-Type natriuretic peptide: a novel, specific biomarker for detection of left ventricular dysfunction in the general community

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Background

Pro-B-Type Natriuretic Peptide (ProBNP), from which biologically active BNP and inactive amino-terminal BNP (NT-proBNP) are processed, has recently been reported to be elevated in patients with heart failure (HF). It remains to be shown in a large cohort study whether ProBNP circulates in normals, what factors influence ProBNP, and whether or not it is a sensitive biomarker for left ventricular (LV) dysfunction.

We test whether a novel assay (BioRad) for ProBNP will be specific for ProBNP and not cross react with other forms of BNP. Furthermore, we hypothesize that ProBNP levels will be most determined by age and gender and that ProBNP will be a sensitive and specific biomarker for LV dysfunction in the general community.

Methods

We used a large community cohort (n = 2009; age => 45) from Olmsted County, MN. All subjects had detailed echocardiography, clinical phenotyping, and assessment of comorbidities. ProBNP was measured using BioRad assay. Univariable and multivariable analysis were used to determine which clinical factors best determine ProBNP levels in all subjects. ROC curves were generated by comparing ProBNP to 2-D Doppler Echocardiography in detecting LV dysfunction. Assay specificity was assessed by

adding 8 different forms of BNP to normal human plasma.

Results

ProBNP was present in normals (median male = 10 pg/ml, female = 20; p < .001) and elevated in those with EF<40% (median male = 195, female = 188; n = 36). Gender and age (Spearman > .3, p < .01) were strong predictors of Pro-BNP. ProBNP was a sensitive and specific marker for LV dysfunction based on ROC curves (AUC=.86). Finally, the BioRad assay did not cross react with any BNP forms that we added to normal human plasma.

Conclusion

Using a novel ProBNP assay, we are the first to establish normal ProBNP levels in a large general adult population, suggesting that the normal human heart secretes ProBNP. We conclude that age and gender should be considered in interpretation of ProBNP values, similar to BNP and NT-proBNP. Importantly, in the entire population of randomly selected adults in the general community, ProBNP was a sensitive and specific biomarker for the detection of LV dysfunction. Thus, these studies establish the utility of ProBNP as a biomarker for HF, and we suggest further studies to better establish the biologic and pathophysiologic significance of ProBNP in humans.