

BNP and ANP as diagnostic and predictive markers in heart failure with left ventricular systolic dysfunction

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Authors

Menezes Falcão, L., Pinto, F., Ravara, L., & van Zwieten, P. A.

Abstract

Background

The prevalence of chronic heart failure (CHF) with systolic dysfunction is increasing. Plasma natriuretic peptides have been envisaged as diagnostic and predictive markers.

Aims

To investigate the relationship between the levels of B-type natriuretic peptide (BNP) and A-type natriuretic peptide (ANP) and the clinical and functional parameters of CHF in outpatients with CHF at baseline, compared with normal healthy controls; to find out the differences in a randomised controlled trial between patients treated with an angiotensin-converting enzyme (ACE) inhibitor, captopril, or an angiotensin receptor blocker (ARB), irbesartan. These differences were assessed throughout the six-month treatment period and at the sixth month.

Methods

Plasma BNP (pmol/L) and ANP (pmol/L) were determined in 68 hypertensive patients with dilated cardiomyopathy, NYHA class III-IV and ejection fraction (EF) <40%, and in 26 normal controls. Statistical analysis for BNP and ANP was done by Student's t-test. The patient group was randomly subdivided into two subgroups of 34 patients, each treated with either an ARB, irbesartan, or an ACE inhibitor (ACE-I), captopril. BNP and ANP were measured in both subsamples and correlated with clinical, functional and neurohormonal parameters throughout a follow-up period of six months and at the sixth month.

Results

The mean EF in the patient sample was $33.43 \pm 6.52\%$ and in the controls was $61.96 \pm 3.53\%$ ($p=0.000$). The mean BNP (pmol/L) in patients was 44.78 ± 54.36 and in the controls was 7.12 ± 8.28 ($p=0.000$) and the mean ANP (pmol/L) was 30.32 ± 25.97 in patients and 11.18 ± 7.92 in controls ($p=0.000$). A statistically significant difference was found between patients and healthy controls. Significant correlations were found between natriuretic peptides and EF. Between the baseline phase and the sixth month, BNP and ANP decreased significantly in the ARB group. At the sixth month, both BNP and ANP were lower in the ARB group. Evidence of clinical benefit was found with both ARB or ACE-I treatment throughout the six months, with patients moving from classes III and IV to class II NYHA. Improvement of EF was also found, with transition of patients with lower EF (even <30%) to higher values. EF was higher in the ARB group at the sixth month.

Conclusions

BNP and ANP can be useful diagnostic tools in hypertensive CHF patients with moderate-to-severe LV dysfunction. The decrease in BNP and ANP in the ARB group throughout six months, as well as the lower value at the sixth month, suggest a prognostic value of these parameters.

Keywords

A-type natriuretic peptide, B-type natriuretic peptide, ET-1, heart failure, diagnosis, left ventricular dysfunction