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The relationship of plasma BNP, ANP, TNF-α and IL-6 levels to cardiac function in patients with congestive heart failure

Li Xia, Kang Weiqiang
Shandong University School of Medicine

Objectives: To study the relationship of the plasma brain natriuretic peptide (BNP), atria natriuretic peptide (ANP), tumor necrosis factor-α (TNF-α) and Interleukin-6 (IL-6) concentration with the severity of heart failure, the underlying heart disease and the left ventricular function in patients with congestive heart failure (CHF).

Methods: Method 80 patients with CHF were recruited and divided into 3 subgroups of NYHA II-IV, and 30 healthy persons were enlisted as control group. The blood samples were obtained from all the subjects in fasting condition in the morning. The levels of plasma BNP, ANP, TNF-α and IL-6 were determined by radioimmunoassay. Left ventricular ejective fraction (LVEF) was measured by echocardiography.

Results: The plasma BNP, ANP, TNF-α and IL-6 concentrations were significantly higher in CHF groups than those in control group (P<0.01). They also increased according to the severity of heart failure classified by NYHA's classification (P<0.01). The plasma BNP level was significantly higher in MI group than those in VHD, HHD and DCM group (P<0.01). The levels of ANP, TNF-α and IL-6 were not related to the primary disease of CHF (P>0.05). The plasma levels BNP, ANP, TNF-α and IL-6 had significantly negative correlation to LVEF (r=-0.72, -0.65, -0.54 and -0.58, P<0.01, 0.01, 0.05, 0.05). There were positive correlations among the levels of TNF-α and those of BNP, ANP, and IL-6 (r=0.51, 0.45, 0.62, P<0.01, 0.01, 0.001).

Conclusions: (1) BNP, ANP, TNF-α and IL-6 serving as neurocrines and cytokines are involved in the pathophysiology of CHF. They also increased according to the severity of heart failure. (2) The plasma BNP concentrations is elevated more markedly in CHF patients caused by myocardial infarction. (3) The plasma BNP concentration evaluates the left ventricular function better. (4) Neurocrines and cytokines relate each other and both play important roles in the diagnosis and the risk of patients with CHF.

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The correlation of plasma Gal-3 and NT-ProBNP level with the left ventricular structure and function

Zhao Cuiping, Zhu Xuefeng, Sun Rong, Lv Xin, Zhou Wenbo
The First Hospital of Harbin University

Objectives: Heart failure (HF) is a complex disorder in which a number of pathophysiologic mechanisms participate, including inflammation, tissue remodeling, neurohormonal and endocrine signaling, and interactions with the renal and nervous systems. Recently, it has been suggested that NT-ProBNP and galectin-3 (Gal-3) play a role in the pathogenesis of HF and Gal-3 is associated with an impaired outcome after short-term follow-up in HF patients. However, the correlation between Gal-3 and NT-ProBNP in HF is unknown. Therefore, we examined the levels of plasma Gal-3 and NT-ProBNP to mark for tissue remodeling and systolic function in patients with chronic HF and compared correlation between them with heart failure degree.

Methods: We recruited 45 HF patients (thirty and three men and twelve women with New York Heart Association (NYHA) Class II and III-IV who had been hospitalized for HF and were followed for twelve months. The levels of plasma Gal-three and NT-proBNP were developed by enzyme-linked immuno-sorbent assay.

Results: The level of Gal-3 and NT-ProBNP were significantly higher in NYHA functional class II and III compared with that in control (P<0.05 and P<0.01, respectively). Multivariate linear regression analyses revealed that the levels of plasma Gal-3 and NT-proBNP were positively correlated with LVEDD (r=0.478, P<0.01; r=0.452, P<0.01), but negatively correlated with LVEF (r=-0.409, P<0.01; r=-0.516, P<0.01). There were no significant effects of medications on Gal-3 levels during a week (P>0.05), whereas significantly lower levels of NT-proBNP (P<0.05) were seen compared with prior treatment, meanwhile left ventricular end-diastolic diameter (LVEDD) has no obvious change, but the ejection fraction decreased obviously.

Conclusions: Our results suggested that Gal-3 is associated with the left ventricular structure and function, and nearly have no effect with the treatment, indicating that Gal-3 may have been involved in the process of CHF remodeling, and the measurement of Gal-3 provided additional prognostic information compared with NT-proBNP.