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The role of NTproBNP in predicting prognosis and cardiovascular events in patients with heart failure

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Background: The role of Nterminal-proBtype natriuretic peptide (NTproBNP) to stratify risk in patients with heart failure (HF) has been analyzed. NT-proBNP levels are increased in HF, and well correlate with ventricular wall stress and severity of HF. Repeated measurements of this marker through blood sampling, give accuracy of risk stratification.

Purpose: The purpose of this study is to assess the prognostic value of NTproBNP levels and the risk of short-term death in patients with HF.

Method: We studied 235 patients with an average age of 74,123 years, with clinical and echocardiographic signs of HF. 161 have HFrEF (EF≤45%) while 74 have HFpEF (EF>45%). NTproBNP was evaluated at the hospitalization and at discharge and in 76 patients it was furthermore checked after 30 days from discharge. The median follow-up was 8 months. We noticed the relationship between percentage NTproBNP increase from baseline to admission, and the percentage NTproBNP reduction from admission to discharge, that it is related with therapy during the hospitalization. Moreover, we considered different parameters that may alter basic values NT-proBNP, such as chronic renal failure, physical activities and the use of certain drugs, overcoming these thresholds.

Results: NT-proBNP values above 1100 pg/mL are prognostically meaningful in chronic HF, and a rising pattern is predictive of impending adverse outcome. Moreover, drugs used for chronic HF (such as, vasodilators, aldosterone blockers and β-blockers) tend to lower the values of NT-proBNP. NTproBNP at discharge gives an important prognostic index for mortality (HFrEF 28.9% deceased: CIndex 0.84 P<0.0001; HFpEF 13.6% deceased: CIndex 0.76 P=0.0004). In multivariate Cox analysis, which is a stronger and independent prognostic factor showed HFrEF all P≤0.02; HFpEF all P≤0.03. The percentage changes stratify the risk only for mortality (χ^2 13.68 P=0.001) conversely, categorical risk stratification shows a prognostic role for all outcomes (all logrank P<0.0001) and provides independent prognostic information when threshold values are specific for HFrEF or HFpEF compared to titrations. Among these patients HF, the median NT-proBNP levels were higher in those patients dying in 45 days median of follow-up (9450 pg/mL) when compared with those surviving (2017 pg/mL, P<0.001 for difference).

Conclusions: The determination of levels of NTproBNP in patients with heart failure is important for prediction of cardiovascular events: Increased levels of this biomarker indicate the severity of myocardial dysfunction and severity of chronic heart failure. High levels of NT-proBNP are related with decreasing expectation of life and worse quality of daily living.

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