The importance of cardiac biomarkers and echocardiography in the evaluation of heart failure children younger than 3 years

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Introduction. N-terminal pro-hormone brain natriuretic peptide (NT-proBNP) and brain-natriuretic peptide (BNP) are cardiac biomarkers that provide diagnostic information in heart failure (HF) patients. We aim to assess the serum levels of NT-proBNP and BNP in HF children younger than 3 years with heart abnormalities and to evaluate the correlations with NYHA/Ross functional class and the left ventricle ejection fraction (LVEF). Methods. 24 children with HF due to congenital heart diseases and dilated cardiomyopathy were enrolled. Children were analyzed based on NYHA/Ross functional class. We measured the serum levels of NT-proBNP and BNP and LVEF was calculated in all cases. Results. Patients with cyanotic heart diseases recorded the highest values of median NT-proBNP level and median BNP level (248.0 pg/mL and 3000.6 pg/mL, respectively). Both heart biomarkers NT-proBNP and BNP had a negative relationship with LVEF: coefficient of correlation Spearman was -0.165 (95 % CI -0.682 - 0.26), with p = 0.44 for NT-proBNP and -0.066 (95 % CI -0.418 - 0.345), with p = 0.76 for BNP. We found a very good correlation between NT-proBNP and BNP, with a coefficient of correlation Spearman of 0.903 (95 % CI 0.526 - 0.887), and with p <0.001. Conclusions. The cardiac biomarker BNP was found related to the severity of HF in infants and small children younger than 3 years with HF due to congenital heart diseases and dilated cardiomyopathy. The 3 patients with dilated cardiomyopathy proved an association between the highest values of NT-proBNP and BNP with the lower LVEF. The other patients from our study group did not prove this association, data being without statistic significance.