

P-195

B-type natriuretic peptide according to magnetic resonance imaging findings in surgically repaired tetralogy of Fallot

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Objective: B-type natriuretic peptide (BNP) is an established diagnostic marker in congestive heart failure and left ventricular dysfunction. Recent reports suggest a role for BNP to detect right ventricular dysfunction, too. In patients with surgically repaired tetralogy of Fallot (TOF) we found a correlation between BNP and echocardiographic parameters reflecting right ventricular volume load (Int J Cardiol 2010;143:130-4). The aim of this study was to evaluate the association of plasma BNP and magnetic resonance imaging (MRI) findings in this patient group.

Methods: Plasma BNP concentration was measured (Triage BNP assay, Alere®) in all patients with repaired TOF who underwent cardiac MRI evaluation in our hospital. BNP levels were compared with age and gender-specific normal values, and additionally with evaluated MRI parameters.

Results: 27 Patients (16 males, 11 females; aged 8.2 to 39.7 years) were evaluated at a median age of 15.6 years (interquartile range [IQR] 12.5–19.0 years) and 13.5 (median; IQR 10.0–15.0) years after surgically repair of TOF. Plasma BNP levels were between 5 and 57pg/ml (median 16pg/ml; IQR 8-26pg/ml). According to age and gender, BNP was normal in 14/27 and slightly increased in 13/27 patients (BNP standard deviation score median 2.0; IQR 0.6-3.6). There was no correlation between BNP and age at corrective surgery, but BNP increases with space of time from surgical repair to MRI assessment. BNP was significantly correlated ($r=0.47$, $p=0.01$) with right ventricular end diastolic volume (144ml/m²; IQR 121-166ml/m²), but neither with right ventricular ejection fraction nor pulmonary regurgitation fraction.

Conclusion: In the half of patients with surgically repaired TOF BNP plasma concentration was slightly increased. There was a significant correlation between BNP and end diastolic right ventricular volume assessed by MRI. Therefore, MRI data support our previous echocardiographic data that elevated or increasing plasma BNP levels can indicate right ventricular volume load. However, a normal BNP level does not exclude right ventricular dilatation.