

**Mild extension of left ventricle engages with elevation of brain natriuretic peptide in patients with atrial septal defect**

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Background: When patients with atrial septal defects (ASD) are candidate for surgery, dimension of LV becomes small. The levels of BNP sometimes increase in response to left ventricular dysfunction early after surgery of ASD. We predicted BNP was also excreted from small LV before repair. The present study investigated whether LV influenced the elevation of BNP in patients with ASD. Methods: The medical records of 87 patients with ASD were reviewed. They underwent cardiac catheterization with operation in view. Blood test and chest X-p were performed at the same point in time. Levels of BNP ranged from 3.9 to 313pg/ml. The patients with levels of BNP in the top quartile ( $BNP \geq 55.6$ pg/ml) were defined as the group of BNP elevation. Relation BNP elevation and factors were assessed which were obtained from catheterization and radiograph. Results: Patients ranged in age from 5 months to 17 years (mean 4.1years). In the univariate analysis two factors were related to BNP elevation significantly on left-sided heart: expansion of end-diastolic volume of LV (LVEDV); increased cardiac index. Four factors were related to BNP elevation on right-sided: extension of EDV of right ventricle (RVEDV); extension of end-systolic volume of RV; elevated end-diastolic pressure of RV (RVEDP); increased cardio-thoracic ratio (CTR). Multiple logistic regression analysis revealed that four factors had independent relationship with high levels of BNP: mild enlargement of LVEDV ( $\geq 107\%$ ); increased RVEDV ( $\geq 280\%$ ); elevation of RVEDP ( $\geq 10$ mmHg) ; enlargement of CTR ( $>60\%$ ). These four factors explained 63% of high levels of BNP. Conclusion: Same as previous reports burden to right ventricle were associated with BNP elevation in patients with ASD. Our study also showed mild expansion of LV was related to high-elevated BNP before operation. There were no reports that BNP levels got elevated preoperatively in patients with ASD. Small left ventricle of ASD might be weak against little load. We should attend left ventricular dysfunction in ASD patients with elevated BNP, if right-sided load was not so intensive.