

Can NT-ProBNP indicate the timing of the defect closure in children with ASD and VSD?

Ozyurt A. (1), Baykan A. (1), Argun M. (1), Pamukcu O. (1), Uzum K. (1), Zararsiz G. (2), Narin F. (3), Narin N. (1)

Erciyes University Medical Faculty, Department of Pediatric Cardiology, Kayseri-Turkey (1); Erciyes University Medical Faculty Biostatistically and Medical Informatics, Kayseri-Turkey (2); Erciyes University Medical Faculty Department of Clinically Biochemistry, Kayseri-Turkey (3)

Objective: The aim of this study was to investigate the potential role of NT-ProBNP in the assessment of shunt severity and invasive hemodynamic parameters in children with ASD/VSD.

Methods: This is prospective, controlled (n=62), double-blind study. NT-ProBNP levels were correlated with various hemodynamic measurements (the ratio of pulmonary blood flow to systemic blood flow (Qp/Qs), pulmonary artery pressure_{mean-peak} (PAP_{mean-peak}), pulmonary vascular resistance (PVR), ratio of pulmonary vascular resistance to systemic vascular resistance (PVR/SVR), the ratio of systemic peak pressure to pulmonary peak pressure (Sp/Pp), left ventricle end-diastolic pressure (LVEDp), right ventricle end-diastolic pressure (RVEDp)) which were obtained during cardiac catheterization of 127 pediatric patients (VSD=64, ASD=63; **Table**). A Qp/Qs ratio of ≥ 1.5 was considered to indicate a significant shunt and the NT-proBNP cut-off points were determined for this Qp/Qs value in both defect types. A ROC analysis was carried out for the cut-off levels of NT-ProBNP.

Results: Statistically significant relationship was found between the mean NT-ProBNP values of the patients with Qp/Qs of ≥ 1.5 in both defect types and that of the control group. A NT-ProBNP level of ≥ 113.5 pg/ml was found to be associated with high specificity and sensitivity in determining VSD patients with a significant shunt. NT-ProBNP cut-off point of 57.9 pg/ml was found to determine a significant shunt in patients with ASD. A significant positive correlation was found between the all of invasive hemodynamic parameters with NT-ProBNP levels in patients with VSD, also a significant positive correlation was found only between mean pulmonary artery pressure, right ventricle end-diastolic pressure and the ratio of systemic pressure to pulmonary pressure with NT-ProBNP levels in patients with ASD.

Conclusion: Our study demonstrated that the NT-ProBNP measurements could be used as a

Variables	Control (n=62)	VSD (n=64)	ASD (n=63)	p
Age (months)	84.0 (24.0-130.0) ^a	12.0 (5.5-56.0) ^b	60.0 (40.0-96.0) ^a	<0.001
Gender(male/female)	33 (53.2)/29 (46.8)	36 (56.2)/28(43.8)	35 (55.6)/28 (44.4)	0.370
BMI (kg/m ²)	17.3 (15.4-18.8)	9.0 (5.7-18.0)	16.6 (15.0-19.5)	0.126
Qp/Qs	-	2.1 (1.5-3.6)	2.0(1.5-2.8)	0.349
Sp (peak, mmHg)	-	96.0 (89.0-103.0)	100.0 (93.0-100.0)	0.457
Sp (mean, mmHg)	-	75.5 (67.0-81.0)	76.0 (68.0-80.0)	0.847
RAp (mean, mmHg)	-	7.0 (6.0-8.0)	8.0 (7.0-9.0)	0.070
PAP (peak, mmHg)	-	33.0 (27.0-51.5)	28.0 (25.0-32.0)	0.001
PAP (mean, mmHg)	-	21.0 (17.5-31.5)	19.0(17.0-23.0)	0.005
PVR (odds)	-	1.1 (0.8-1.8)	0.9 (0.5-1.2)	<0.001
PVR/SVR	-	0.08 (0.05-0.11)	0.07 (0.04-0.09)	0.042
NT-ProBNP(pg/mL)	55.5 (31.6-72.8) ^a	182.5 (77.5-952.0) ^b	109.0 (51.4-201.0) ^c	<0.001
LVEDp (mmHg)	-	8.0 (7.0-9.5)	-	-
RVEDp (mmHg)	-	-	8.0 (6.0-10.0)	-

supporting parameter by clinicians in determining the significance of shunt and the timing of VSD and ASD closure.

Values are expressed as n(%) or median(1st-3rd quartiles). Different superscripts in a column indicate a statistically significant difference between groups. **BMI:** Body mass index, **Sp:** Systemic arterial pressure, **RAp:** Right atrial pressure, **PAP:** Pulmonary arterial pressure, **PVR:** pulmonary vascular resistance, **PVR/SVR:** ratio of pulmonary vascular resistance to systemic vascular resistance, **LVEDp:** Left ventricular end-diastolic pressure, **RVEDp:** Right ventricular end-diastolic pressure.