

Evaluation of left atrial ejection force and ascending aorta elasticity in children after repair of coarctation of the aorta.

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Objectives: Coarctation of the aorta is a chronic vascular disease characterized by persistency of myocardial and vascular alterations. What remain obscure in these patients are intrinsic mechanisms of hypertension, and its relationship with elastic properties of aorta and left atrium performance. The aim of present study was to evaluate the elasticity of aorta, left atrium function and myocardial performance collectively at midterm follow-up, in normotensive children who have had successful coarctation surgery or balloon dilatation.

Methods: In this prospective study, nineteen patients (9 boys, 10 girls; mean age: $7,15 \pm 0,9$ years) with native coarctation who underwent surgery or balloon angioplasty and 21 age-sex matched healthy children were included. Left atrial ejection force, aortic wall stiffness index, ascending aorta distensibility, M-mode echocardiography, LVMI, diastolic functions and myocardial performance index were assessed in both groups. Left atrial ejection force (kdyne/m^2) is defined as product of mass and acceleration of blood expelled from the left atrium during the accelerative phase of diastole. Aortic stiffness and distensibility were estimated using ascending and descending aorta diameters obtained by M-mode echocardiography and approximation of pulse pressure in the right arm and leg.

Results: No difference was found in systolic blood pressure at rest between patients and controls. Left atrial ejection force index were found to be higher in study group than in the control group ($12.69 \pm 1.76 \text{ kdynes/m}^2$ versus $4.57 \pm 1.12 \text{ kdynes/m}^2$, $p: 0.001$). Aortic stiffness index in patient group was significantly increased (5.12 ± 1.24 versus 2.57 ± 0.68 , $p: 0.000$). Ascending aorta distensibility was significantly lower in patient group than in the controls (42.13 ± 11.02 versus 78.79 ± 20.49 , $p: 0.000$). Correlation was found between LAEF index and right arm systolic blood pressure, E velocity as well as E/A ratio was found in current study (Table 1).

Conclusions: Augmented left atrial ejection index may be indicative of diastolic abnormalities in children who successfully treated in early childhood. We also found that increased aortic stiffness may be used as a marker for late onset hypertension in in the follow-up of coarctation of the aorta.

Table 1 Relationship between LAEF index and E velocity, E/A ration as well as right arm systolic blood pressure

Variables	LAEF index	
	p value	r coefficient
E velocity	0.019	0.561
E/A ratio	0.013	-0.586
Systolic blood pressure	0.015	-0.572