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The Determination of Hypertension Persistence in Children Whose Aortic Coarctation Were Treated with CP Stent

Baykan A. , Demiraldi A., Narin N., Uzun K., Pamukcu O
Erciyes University Medical Faculty, Pediatric Cardiology Dept. Kayseri, Turkey

Objective: The aim of this study is to address presence of persistent hypertension in Aortic Coarctation (CoA) patients who were treated with endovascular stent, by using ambulatory blood pressure monitorization (ABPM), echocardiography, and biochemical evaluations.

Material and method: 20 patients (mean age: 14.2±3.9 years) with CoA and 20 age- and sex-matched healthy controls were included and all results were compared between groups. Physical examination findings and blood pressures were recorded. Structure and functions of left ventricle, elastic functions of aorta, aortic diameters and carotid-intima media thickness (CIMT) were measured by echocardiography. Patients were assessed for hypertension by using ABPM. As indirect marker of arterial stiffness, pulse wave velocity (PWV) and augmentation index (aix@75) parameters were recorded.

Findings: Systolic and diastolic interventricular septum (IVSs, IVSd), diastolic left ventricular posterior wall (LVPWd), systolic left ventricular posterior wall (LVPWs) thicknesses, left ventricular mass (LVMass) and left ventricular mass index (LVMI; g/m^{2.7}) values were found to be significantly higher in patient group. ABPM revealed, systolic pressure, daytime systolic pressure, mean arterial pressure and daytime mean arterial pressure values were found to be significantly higher in the patient group when compared to controls. Based on percentile values, 15% and 5% of the patients were pre-hypertensive and hypertensive, respectively in study group. PWV and cardiac output (CO) values were found to be significantly higher in the patient group. Based on PWV percentiles, PWV values were found to be above 95 percentile in 30% of the patients. No significant difference was found in aix@75 values and aortic stiffness, distensibility and strain values between groups. CIMT was found to be significantly higher in the patient group. No significant correlation was detected among CIMT, LVMI, aix@75 and PWV values (summarized in table).

Conclusions: It was shown that hypertension incidence, CIMT and PWV were greater than those in healthy population even CoA was corrected. This suggests that CoA is a part of generalized vasculopathy rather than being a localized narrowing. The use of new measurements in follow-up of patients with CoA can be helpful to predict risks. Further prospective studies are needed on this issue.

Parameters	Study Group	CONTROL	P
IVSd (cm)*	1,06 ± 0,24	0,8 ± 0,14	0,014
IVSs (cm)*	1,41 ± 0,26	1,14 ± 0,9	0,011
LVPWd (cm)**	0,94(0,78-1,02)	0,71(066-0,88)	0,009
LVPWs (cm)*	1,38 ± 0,23	1,10 ± 0,9	0
LVMI (g/m ^{2.7})*	46 ± 10	32,3 ± 7,4	0
24 Hour SBP (mmHg)**	116,5 (106,5-126)	107,5 (105-111)	0,017
24 hour MAP (mmHg)**	88,5 (81-96)	83 (80-86)	0,043
Daytime SBP (mmHg)**	119,5 (108,2-130,2)	110,5 (106-114)	0,013
Daytime MAP (mmHg)**	91 (84-99)	84 (81-88)	0,021
CO (l/min)*	5,12 ± 0,43	4,8 ± 0,39	0,019
PWV (m/sc)**	4,8 (4,43-5,1)	4,45 (4,4-4,6)	0,009
CIMT (cm)**	0,40 (0,37-0,47)	0,34(0,31-0,41)	0,013

*mean ± standart deviation (SD), ** median (25p-75p)