

Arterial stiffness and myocardial functions in children with isolated bicuspid aortic valve.

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Objectives: Due to the deficiency of nitrite oxide synthase, patients with bicuspid aortic valve are at risk for endothelial dysfunction and atherosclerosis as well as valve dysfunction and proximal aortic dilatation. In this study, we aimed to investigate the presence of arterial stiffness and early atherosclerotic changes in children with bicuspid aortic valve.

Methods: Forty five children with isolated BAV and 34 healthy controls with TAV matched by gender, age and body surface area were studied. Patients with aortic valve velocity > 1.7 m/s and more than mild aortic regurgitation (AR) were excluded. Aortic valve morphology, aortic root and ascending aorta dimensions were detected with two-dimensional echocardiography. Left ventricular myocardial functions examined with M-mode and tissue Doppler echocardiography. Bilateral carotis intima media thickness were measured with liner prob. Aortic blood pressure, augmentation index (Alx) and pulse wave velocity (PWV) measured with ambulatory oscillometric device (Mobil-O-Graph, IEM, Germany).

Results: There were no differences in lipid profile and blood glucose. Echocardiographic parameters were also similar except aortic diameters at four levels (annulus, valsalva sinuses, sinotubular junction, ascending aorta) which were larger in BAV patients (18.4 ± 2.9 mm v.s 16.4 ± 2.1 mm, $p < 0.001$, 24.8 ± 4.2 v.s 23.1 ± 2.7 , $p < 0.001$, 21.2 ± 4.3 v.s 18.1 ± 1.9 , $p < 0.001$, 25.6 ± 5.2 v.s 20.7 ± 2.6 , $p = 0.04$, respectively). Compared to controls, the E/Em ratio and tissue Doppler derived myocardial performance index were higher in BAV patients (8.9 ± 2.5 v.s 7.8 ± 1.4 , $p = 0.02$, 0.39 ± 0.005 v.s 0.33 ± 0.04 , $p < 0.001$, respectively). There were no differences in terms of carotid intima media thickness and central blood pressure values. Although there was a statistically insignificant decrease in terms of pwv, Alx was detected lower in BAV patients.

Conclusions: Although there were findings associated with aortopathy and myocardial dysfunction in patients with well function bicuspid aortic valve even in childhood, no evidence of endothelial dysfunction were detected.