

### **Evaluation of the cardiovascular changes in the children with bicuspid aortic valves**

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**Introduction:** Bicuspid aortic valve is the most commonly seen malformation but its cardiovascular effects during childhood have not been well studied. In this study, markers predicting cardiovascular changes and the relationship between progression of the disease and valvular dysfunction were evaluated in children with isolated bicuspid aortic valve and compared with the evaluations of children with tricuspid aortic valve.

**Methods:** The study was a prospective study. 41 children with bicuspid aortic valve was study group and 25 with tricuspid aortic valve was control group. The age was ranging between 5-15y. Blood lipids, endothelin, homocysteine, hsC-reactive protein, myeloperoxidase activity, glutathione peroxidase, matrix metalloproteinase 9, tissue metalloproteinase inhibitor levels were studied to evaluate cardiovascular risk and changes. By transthoracic echocardiography, aortic valve structure, left ventricle, and ascending aorta were evaluated. The carotid artery intima-media thickness were measured. The data were compared with the control group's data.

**Results:** There was no relation between the type of bicuspid aortic valve and aortic insufficiency and stenosis. Left ventricular hypertrophy could be seen in patients with minimally dysfunctioning bicuspid aortic valve so they should be followed very closely for the occurrence of diastolic dysfunction. Biochemical markers showing endothelial dysfunction and carotid artery intima-media thickness were not changed in patients with bicuspid aortic valve. Tei index was significantly high in the study group. Patients with normal or mildly affected cardiac function had influences of global functions of left ventricle that can not be detected with M-mode echocardiography. Aortic diameters of the patient group were increased significantly at the level of aortic sinotubular junction and ascending aorta. The increase in the aortic valve insufficiency was due to the increase in the diameter of the aorta. Contrary to adults with bicuspid aorta, increased aortic flexibility was associated with the non-occurrence of atherosclerosis yet. There was no relation between aortic elasticity and aortic stenosis and insufficiency level.

**Conclusions:** This study points out that atherosclerosis do not develop in early ages of patients with bicuspid aorta with mild aortic stenosis and insufficiency. The detected pathological effects of bicuspid aortic valve were left ventricular dysfunction, aortic diameter and aortic elasticity increase.