Criteria for aortic dilatation diagnosis in adolescents with Bicuspid Aortic valve


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Objectives: Establish the threshold to define aortic root and ascending aorta dilatation in adolescents with bicuspid aortic valve. Specifically in those adolescents with adult body surface area (BSA).

Methods: From the Spanish registry for children (≤18 years) with bicuspid aortic valve (REVAB), under the Spanish Society of Pediatric Cardiology and Congenital Heart Diseases (SECPCC), patients ≥10years were analyzed (N=464). The aortic root and the ascending aortic measures were compared in absolute value, value indexed by BSA and z-score, with the threshold of 40mm, 27.5mm/m² and +2/+3 respectively according to AHA guidelines. A second analysis was performed comparing patients ≥10 years with BSA <1.5m² and BSA ≥1.5m².

Results: Overall, adolescents had a higher z-score of the ascending aorta than <10 years: 1.82±1.8SD vs 0.92±2.1SD, p 0.02 (see figure); while there was no difference for the aortic root: 0.40±1.3SD vs 0.16±1.4SD. When analyzing patients ≥10 years, a total of 214 patients (46.1%) had a z-score of the ascending aorta ≥2 and 126 patients (27.1%) had a z-score ≥3 while only 7 (1.5%) had an indexed value ≥27.5mm/m² (p=0.003 and p=0.002 respectively) and 2 had an absolute value ≥40mm (p=0.195 and p=0.067 respectively). For the aortic root, 51 patients (10.9%) had a z-score ≥2 and 13 (2.8%) a z-score ≥3 while 1 patient had an indexed value ≥27.5mm/m² (p=1 for both) and 1 patient had an absolute value ≥40mm (p=0.105 and p=0.027 respectively). Almost half of the adolescents had a BSA ≥1.5m² (231, 47.7%), of those, 109 (47.2%) had an ascending aorta z-score ≥2, 67 (29%) had a z-score ≥3, none had an indexed value ≥27.5mm/m², and 2 had an absolute value ≥40mm (0.9%). For the aortic root, 20 (8.7%) had a z-score ≥2, 4 (1.7%) had a z-score ≥3, none had an indexed value ≥27.5mm/m², and 1 had an absolute value ≥40mm (0.4%).

Conclusions: There are a considerable number of patients who, depending on the dilatation criteria used, can be considered patients with a normal or dilated aorta, especially regarding the ascending aorta. This discrepancy is clinically significant, especially in the adolescent population when recommendations for lifestyle, follow-up and prognosis must be made.

Figure: Relationship between ascending aorta diameter and BSA. Dashed lines represent mean ±2 standard deviation of expected size. Continuous line represent mean of our series size.