Progression Rate of Aortic Jet Velocity in Patients with Aortic Stenosis and Its Association with Left Ventricular Hypertrophic Patterns

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Abstract

Purpose: This study aimed to investigate the progression and natural course of aortic stenosis (AS), including aortic valve sclerosis and mild AS, and its relationship with the morphology of left ventricular hypertrophy.

Subjects and Method: We included 501 patients with aortic valve sclerosis and AS, including those classified as mild to severe, along with patients who had undergone >3 transthoracic echocardiography recordings. According to the maximum AS jet velocity (Vmax) at the first examination, all patients were classified into the following four groups: group A (Vmax <2 m/s), group B (2≤ Vmax <3 m/s), group C (3≤ Vmax <4 m/s), and group D (Vmax ≥4 m/s). The left ventricular (LV) morphology was classified into four groups based on the relative wall thickness and LV mass index. We then evaluated the relationship between LV morphology and AS progression.

Results and Discussion: Intergroup (A–D) progression rates differed significantly; furthermore, significantly more number of patients presenting with a progression of >0.3 m/s/year being allocated in the more severe category. A logistic regression analysis demonstrated that a higher AS severity was associated with a higher the risk of progression in the following three groups: group B (odds ratio 2.08, p=0.021), group C (odds ratio 3.79, p<0.001), and group D (odds ratio 6.41, p<0.001). The LV concentric hypertrophic pattern was also considered a significant factor (odds ratio 2.12, p=0.001). In addition, the AS progression was divided into three groups based on the tertiles, and the fastest progressing group (≥0.2 m/s/year) had a significantly higher percentage of patients with LV concentric hypertrophy than that in the other two groups.

Conclusion: These results suggest that AS may progress more rapidly in patients with severe AS and in those with LV concentric hypertrophy.

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