Diastolic Dysfunction in Aortic Stenosis and Arterial Stiffness

I read with interest the recent paper (1) describing increased mortality in asymptomatic patients with at least moderate aortic stenosis (AS) who have an increased valvuloarterial impedance ($Z_{va}$) (total left ventricular [LV] afterload including arterial pressure). Total LV afterload explains 2 common scenarios often encountered in clinical practice, that of severe AS associated with low aortic valve gradient and normal LV systolic function as well as that of symptoms in some patients with moderate AS. The article implies that the phenomenon of low cardiac output is related to increased LV afterload from both AS and systemic arterial hypertension. I would propose another variable that contributes to low cardiac output as well as heart failure symptoms in this cohort, that of ventricular stiffening and diastolic dysfunction. Arterial stiffness is associated with diastolic LV dysfunction (2). Aside from LV afterload, LV pre-load and diastolic filling parameters may contribute significantly to the reduced stroke volume and cardiac output. Enlarged left atrial volume index as well as grade II or greater diastolic dysfunction, indicating compliance abnormality and elevated LV end diastolic pressure may be indicators of diastolic dysfunction in this group. A review of Table 1 in their data (1) shows that diastolic dysfunction prevalence was comparable in patients with the 3 categories of $Z_{va}$ <3.5, 3.5 to 4.5, and >4.5 mm Hg/ml. However, the grade of diastolic dysfunction was not quantified or presented. Diastolic dysfunction is expected in this cohort of patients with AS, increased LV mass, hypertension, and mean age of 66 years. However, it is the grade of diastolic dysfunction that may help to determine its potential role in causing reduced LV diastolic volume as well as potentially increased pulmonary venous congestion and elevated pulmonary artery pressure, and in turn, heart failure symptoms. The data on pulmonary artery pressure also are not presented in their report.

REFERENCE


Usefulness of Valvuloarterial Impedance to Predict Adverse Outcomes in Patients With Asymptomatic Aortic Stenosis

Hachicha et al. (1) have proposed the use of valvuloarterial impedance ($Z_{va}$) to improve risk stratification and clinical decision making in patients with asymptomatic severe aortic stenosis (AS). However, some questions remain unanswered.

The first critical task in the management of AS is accurate assessment of its severity and overall clinical impact. Because $Z_{va}$ does not separate relative contributions of AS and the associated hypertension, high resistance, and low arterial compliance of the

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