

Valve Area Versus Pressure Gradient in Aortic Stenosis with Preserved Left Ventricular Function

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Background: Recent studies have shown a high frequency of discordance between aortic valve area (AVA) and trans-valvular pressure gradients (PG) in patients (pts) with severe aortic stenosis (AS) and preserved left ventricular ejection fraction (LVEF).

Methods: Consecutive pts with moderate or severe AS (AVA ≤ 1.5 cm²) and preserved LVEF ($\geq 50\%$) were identified and the relationship between AVA and mean PG was examined. The characteristics of pts with severe AS (AVA < 1.0 cm²) and low PG (< 40 mmHg) were compared to those of pts with severe AS and high PG (≥ 40 mmHg).

Results: During 3 years 619 pts fulfilled the inclusion criteria (age 76 ± 11 yr, 40% male). Among 265 pts with severe AS, 193 had high PG (73%) and 72 had low PG (27%) (Figure). Among 354 pts with moderate AS (AVA 1.0-1.5 cm²), 303 had low PG (86%) and 51 had high PG (14%). AVA and PG were concordant (high PG in pts with severe AS and low PG in pts with moderate AS) in 496 (80%) pts; concordance was similar (77%) when AVA was indexed to body surface area (severe AS = AVA < 0.6 cm²/m²). <IMAGE03>

Pts with severe AS and low PG were older (80 ± 10 vs. 76 ± 11 yr), had a higher frequency of atrial fibrillation (21% vs. 9%), had larger AVA (0.86 ± 0.12 vs. 0.74 ± 0.15 cm²) and indexed AVA (0.51 ± 0.08 vs. 0.42 ± 0.09 cm²/m²) and smaller stroke volume (77 ± 14 vs. 90 ± 19 ml) and relative wall thickness (0.41 ± 0.09 vs. 0.49 ± 0.09), compared to pts with high PG (all P values < 0.05). There were no differences in gender, body size, heart rate, LVEF, left ventricular (LV) mass, LV outflow tract diameter, severe right ventricular dysfunction, or severe valve regurgitation (aortic, mitral or tricuspid).

Conclusions: The concordance between AVA and PG in pts with moderate or severe AS is higher than previously reported. The discordance between AVA and PG in pts with severe AS is partial explained by differences in age, heart rhythm, AS severity (less severe AS in pts with low PG), stroke volume (lower stroke volume in pts with low PG), and LV remodeling.