

Impact of Arteriovenous Fistula on Flow States in the Evaluation of Aortic Stenosis among ESKD Patients on Dialysis

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Abstract

Introduction An arteriovenous fistula (AVF) in patients with end-stage kidney disease (ESKD) can influence flow states. We sought to evaluate if assessment of aortic stenosis (AS) by transthoracic echocardiographic (TTE) differs in the presence of AVF compared to other dialysis accesses in patients on dialysis. **Methods** We identified consecutive ESKD patients on dialysis and concomitant AS from a single center between January 2000 and March 2021. We analyzed TTE parameters of AS severity (velocities, gradients, aortic valve area [AVA]) and hemodynamics (cardiac output [CO], valvuloarterial impedance [Zva]) and compared AS parameters in patients with AVF versus other dialysis access. **Results** The cohort included 94 patients with co-prevalent ESKD and AS; mean age 66 years, 71% male; 43% Black, 24% severe AS. Dialysis access: 53% AVF, 47% others. In the overall cohort, no significant differences were noted between AVF vs. non-AVF in AVA/CO/Zva, but with notable subgroup differences. In mild AS, CO was significantly higher in AVF vs. non-AVF (6.3 vs. 5.2 L/min; $p=0.04$). In severe AS, Zva was higher in the AVF vs. non-AVF (4.6 vs. 3.6 mmHg/ml/m²). With increasing AS severity in the AVF group, CO decreased, coupled with increase in Zva, likely counterbalancing the net hemodynamic impact of the AVF. **Conclusion** Among ESKD patients with AS, TTE parameters of flow states and AS severity differed in those with AVF versus other dialysis accesses and varied with progression in severity of AS. Future longitudinal assessment of hemodynamic parameters in a larger cohort of co-prevalent ESRD and AS would be valuable.

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