
**Background:** Unlike echocardiography (echo), optimal methods and imaging parameters of aortic valve area (AVA) calculation by cardiac MRI (CMR) have not yet been standardized. The continuity equation (LVOT area * LVOT-VTI/ Ao-VTI) and planimetry are commonly used echo methods. Data are limited comparing CMR techniques with each other and to these echo methods. Using an MRI flow quantification sequence, we obtained AVA measurements by the continuity equation and by planimetry of the AV orifice and compared both CMR techniques to standard echo methods. **Methods:** 17 symptomatic and asymptomatic subjects referred for valvular assessment were studied. CMR images were obtained using a flow-quantification sequence perpendicular to the AV leaflet tips (Ao) and in the left ventricular outflow tract (LVOT) below the valve annulus. Regions of interest were traced along the margins of increased signal intensity (maximal velocity) at both the AV and LVOT and velocity time integrals (VTI) were determined. LVOT area was determined by planimetry. These values and the continuity equation were used to determine the AVA. CMR planimetry of the AVA was also measured at the same slice position. **Results:** The peak velocities for CMR (3.2±0.6 m/s, range 2.1 to 4.4 m/s) correlated well with echo (3.7±0.7 m/s, range 2.4 to 4.5 m/s; r=0.7) Peak velocities by echo were greater by 0.5±0.5 cm/s (p=0.002). The mean AVA by CMR continuity equation (1.3+/− 0.6 cm²) and planimetry (1.2±0.5 cm²) were not significantly different than that by echo continuity equation (1.1±0.5 cm²; p=0.08; p=0.07). There was excellent correlation between the three different methods (CMR planimetry to CMR continuity, r=0.94; CMR planimetry to echo continuity, r=0.93; CMR continuity to echo continuity, r=0.92). Bland-Altman analysis showed bias and limits of agreement (2 standard deviations) between CMR planimetry and CMR continuity were 0.10 (-0.31, 0.50) cm², between CMR planimetry and echo continuity were 0.10 (-0.39, 0.63) cm², and between CMR continuity and echo continuity were 0.20 (-0.26, 0.68) cm². **Conclusion:** AVA is easily determined by CMR using planimetry and continuity methods. These CMR methods correlate strongly with each other and with AVA measurements by echo.