

Left atrial systolic force: comparison between two methods for the noninvasive assessment of left atrial systolic function.

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Abstract

BACKGROUND: Left atrial systolic force (LASF) is a measure of atrial systolic function applied both in patients with systemic arterial hypertension and aortic valve disease.

DESIGN AND METHODS: The method used for assessing LASF was described by Manning in 1993. It assumes a constant circular area for estimating the mitral orifice and measures peak atrial velocity of transmitral flow. Using this approach, several authors showed a positive association between LASF and left ventricular hypertrophy and diastolic dysfunction. Recently, we proposed another approach measuring atrial velocity at the level of the mitral orifice and calculating mitral orifice area by continuity equation with Doppler technique. LASF estimated by this method predicted a higher risk for cardiovascular events in hypertensive patients. In this study we compared these for calculating LASF.

RESULTS: Fifty-six hypertensive patients and 31 healthy controls underwent measurement of LASF with the two methods. Correlation coefficient between the two methods was 0.74 ($P < 0.00001$) in the whole population, 0.70 in hypertensive patients and 0.80 in the controls, 0.73 and 0.67 in the subgroups with and without left ventricular hypertrophy, respectively. Mean LASF was 10.4 +/- 5.6 and 8.0 +/- 3.9 Kdynes when calculated in the whole population by Manning's or continuity equation method, respectively ($P = 0.003$). LASF was constantly and significantly higher with Manning's than the continuity equation method. The following equation corrects the differences: LASF (continuity equation method) = 2.6 + 0.55* Manning's method.

CONCLUSION: The Manning's method is closely related to the continuity equation method, though LASF results are constantly higher. Conversion is possible by application of a simple formula.

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