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**A novel method of correcting the left ventricular stroke volume by Doppler echocardiography: comparison with multidetector computed tomography**

**Authors:**
C Toriyama, H Abe, H Nishida, M Nakamura, T Ohashi, Y Iida, S Kosugi, T Ozaki, K Shinouchi, T Mishima, M Date, Y Ueda, M Uematsu, Y Koretsune, Osaka National Hospital - Osaka - Japan,

**Topic(s):**
Echocardiography: Systolic and Diastolic Function

**Citation:**

Background: Although transthoracic Doppler echocardiography is widely used for estimating left ventricular stroke volume (SV), accelerated blood flow in the left ventricular (LV) outflow tract may lead to overestimation. SV can be calculated accurately from left ventricular end-systolic and end-diastolic volume determined by multi-detector computed tomography (MDCT). However, radiation exposure as well as the use of contrast medium hampers its routine use.

Purpose: The purpose of this study was to examine whether the correction of SV measured by pulsed wave Doppler echocardiography (SVdop) can accurately predicts SV obtained by MDCT (SVct).

Methods: We enrolled consecutive 61 patients who underwent both MDCT and transthoracic echocardiography. Patients with moderate or severe valvular diseases and valve replacement surgery were excluded. Correction of SV was explored with SVct as a reference.

Results: Univariate analysis showed that SVdop (r=0.42, P=0.0007) and patient age (r=-0.50, P<0.0001) were significantly correlated with SVct. On the other hand, left ventricular ejection fraction calculated by Teicholz method (EFteich) (r=0.19, P=0.14), systolic blood pressure (r=0.07, P=NS), and LV mass index (r=-0.02, P=NS) were not correlated with SVct. Multivariate analysis showed that SVdop, patient age and EFteich were the independent predictive factors for SVct (R2=0.49, P<0.0001). Based on these correlations, we postulated SV as: corrected SV = SVdop × 0.40 + EFteich × 0.46 – age × 0.67 + 44.77. As expected, the correlation between corrected SV and SVct significantly improved (r=0.70, P<0.0001). Bland-Altman plot analysis showed that corrected SV significantly reduced the variation between SVdop and SVct, and diminished the overestimation of SVdop (Figure).

Conclusion: The new correction formula of SVdop may correct the overestimation of SV obtained by pulsed wave Doppler echocardiography, although the formula remains to be validated in a separate cohort of patients.
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