



IMAGING AND DIAGNOSTIC TESTING

RELATIONSHIP BETWEEN AORTIC STIFFNESS AND LEFT VENTRICULAR SYSTOLIC FUNCTION IN PATIENTS WITH NORMAL EJECTION FRACTION: A STUDY BY TISSUE DOPPLER AND STRAIN IMAGING

ACC Poster Contributions

Georgia World Congress Center, Hall B5

Monday, March 15, 2010, 3:30 p.m.-4:30 p.m.

Session Title: General Echocardiography: Cardiac Function, Mass, and Resistance by Echocardiography

Abstract Category: General Echocardiography: TTE

Presentation Number: 1201-215

Authors: *Cesare Russo, Yasuyoshi Takei, Takuya Hasegawa, Shun Koshaka, Shunichi Homma, Mitchell S.V. Elkind, Ralph L. Sacco, Marco R. Di Tullio, Columbia University, New York, NY, University of Miami, Miami, FL*

Background: Increased arterial stiffness has been observed in heart failure patients. However, the association of arterial stiffness with preclinical changes in left ventricular (LV) systolic function is controversial.

Methods: Subjects from the Cardiovascular Abnormalities and Brain Lesions (CABL) study underwent echocardiography and applanation tonometry of the radial artery to derive the aortic waveform. Participants with coronary artery disease, left ventricular ejection fraction (LVEF) <50% or LV wall motion abnormalities were excluded. Aortic augmentation index (Alx) and LV wasted energy index (WEi), an indicator of added systolic effort due to wave reflection, were used as indicators of aortic stiffness. Systolic function parameters included LVEF, stroke volume index (SVi), tissue Doppler-derived septal mitral annulus systolic velocity (S'), peak longitudinal strain and strain rate.

Results: The study population consisted of 301 subjects (mean age 68.3±10.2 years, 64% women). Age, blood pressure, heart rate and LV mass showed significant correlations with aortic stiffness. In multivariate analysis, only tissue Doppler parameters were significantly correlated to Alx and WEi (Table). LVEF and SVi did not show significant correlations with arterial stiffness.

	Alx Beta* (p value)	WEi Beta* (p value)
SVi	-0.07 (0.24)	-0.07 (0.13)
LVEF	-0.03 (0.54)	0.003 (0.93)
S'	-0.19 (<0.001)	-0.13 (0.001)
Peak longitudinal strain	0.11 (0.02)	0.07 (0.04)
Peak longitudinal strain rate	0.13 (0.006)	0.10 (0.008)
*Covariates: age, SBP, DBP, heart rate and LV mass		

Conclusions: In subjects without cardiac disease, arterial stiffness is inversely associated with LV systolic function assessed by tissue Doppler and strain imaging but not by traditional echocardiographic methods.