

## Diagnostic accuracy of left ventricular diastolic transverse strain imaging by speckle tracking echocardiography for diagnosing chest pain in diabetic patients

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**Background:** Two-dimensional speckle tracking echocardiography (2D-STE) has been reported to be useful for the diagnosis of myocardial ischemia by detecting delayed relaxation (diastolic stunning) after an episode of angina. 2D-longitudinal strain is not specific besides ischemia such as diastolic dysfunction, and diabetes have been associated with abnormal longitudinal fibers. The aim is to evaluate the diagnostic accuracy of Left ventricular (LV) diastolic transverse strain imaging by STE to detect the presence of acute coronary syndrome (ACS) in diabetic patients with acute chest pain.

**Methods:** 385 consecutive patients with acute chest pain and without wall motion abnormality, who were admitted to an emergency department (ED) at 1 of 12 clinical sites in Japan, were enrolled and underwent 2D-STE at ED. Left ventricular (LV) transverse strain values at aortic valve closure (A) and one-third of diastole duration (B) were measured. The strain imaging diastolic index (SI-DI) value was determined as:  $(A - B)/A \times 100\%$  to assess the LV diastolic strain imaging and was used to identify the regional LV delayed relaxation. All patients underwent coronary CT or coronary angiography to establish the diagnosis of ACS. Clinicians were blinded to the 2D-STE results.

**Results:** Out of 385 patients, 2D-STE analysis was possible in 365 patients (94%). 76 patients were diabetic (DM+), and 289 patients were non-diabetic (DM-). With assessment of coronary CT or coronary angiography, ACS was diagnosed in 125 patients (34%). 2D-STE was obtained at a mean of 5.3 hours after chest pain episode. Transverse SI-DI of ischemic segments were significantly lower than those of non-ischemic segments (p value <0.001) in both diabetic and non-diabetic patients, and transverse SI-DI of both diabetic and non-diabetic patients demonstrated high area under curve (AUC) for detection of myocardial ischemia (Figure: RCA; right coronary artery, LAD; left anterior descending artery, LCX; left circumferential artery). In diabetic patients, sensitivity, specificity, and negative predictive value for ACS of transverse SI-DI are 100%, 95%, 100% in RCA (a cut-off value of 36.2), and 86.4%, 95%, 93% in LAD (a cut-off value of 50.2), and 75%, 85%, 94% in LCX (a cut-off value of 52), respectively.

**Conclusion:** LV diastolic transverse strain imaging by 2D-STE at ED increase the sensitivity, specificity and accuracy to predict the presence of ACS in diabetic patients with chest pain, as well as non-diabetic patients. (UMIN00013859).

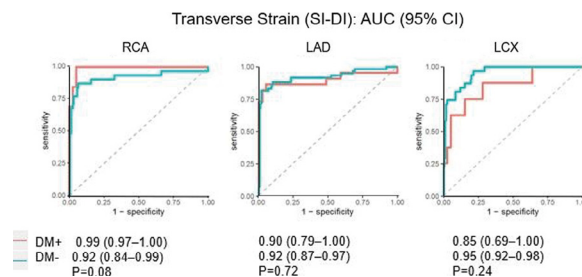


Figure 1. Transverse Strain (SI-DI): AUC (95% CI)