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Postsystolic shortening yields novel and independent prognostic information on cardiovascular events and mortality in patients with type 2 diabetes

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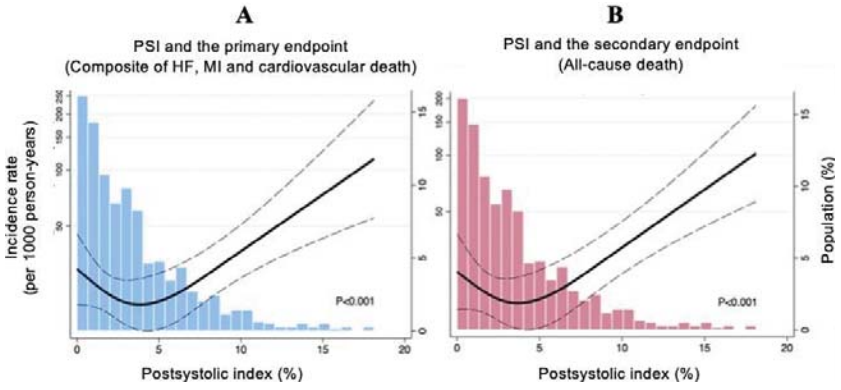
Background: Cardiovascular disease is the leading cause of death and disability in patients with type 2 diabetes. We aimed to evaluate if postsystolic shortening, a marker of impaired myocardial function, may provide prognostic information on cardiovascular events and mortality in patients with type 2 diabetes.

Method: We prospectively studied 783 patients with diabetes type 2 (63% male, age 65 [58, 70] years; HbA1c 54 [48, 65] mmol/mol; diabetes duration 11 [6, 17] years) who underwent speckle tracking echocardiography. Patients with left bundle branch block, atrial fibrillation and a history of heart failure and myocardial infarction were excluded. The primary endpoint was the composite of incident heart failure, myocardial infarction and cardiovascular death. The secondary endpoint was all-cause death. We defined the postsystolic index (PSI) as: [100x (maximum strain in cardiac cycle – peak systolic strain)/ (maximum strain in cardiac cycle)].

Results: During the median follow-up of 4.9 years [4.2, 5.3], 87 patients (11%) reached the primary endpoint and 80 (10%) died from any cause. Each 1% increase in the PSI was associated with the primary (HR 1.07 95% CI 1.02–1.13, P<0.001, Fig A) and secondary endpoint (HR 1.09 95% CI 1.04–1.14, P<0.001, Fig B). After adjusting for age, sex, hypertension, smoking, duration of diabetes, cholesterol, eGFR, left ventricular ejection fraction and mass index, E/A-ratio, deceleration time and left atrial volume index, the PSI remained an independent predictor of both endpoints; primary (HR 1.07 per 1% increase 95% CI 1.01–1.14, P=0.028) and secondary endpoint (HR 1.07 per 1% increase, 95% CI 1.01–1.14, P=0.022).

Conclusion: In patients with type 2 diabetes, assessment of PSI yields novel and independent prognostic information on cardiovascular events and mortality. Hence, PSI may offer guidance on risk stratification in patients with type 2 diabetes.



PSI and the endpoints