## The prognostic value of myocardial deformational patterns is reduced in patients with heart failure

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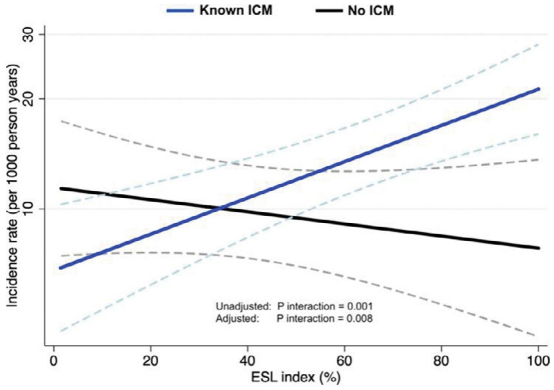
**Background:** Early systolic lengthening (ESL) and postsystolic shortening are considered highly specific for myocardial ischemia. We aimed to investigate the prognostic potential of both deformational patterns in patients with heart failure (HF) and to determine if a history of ischemic heart disease modified this relationship.

**Method:** A total of 884 patients with systolic HF (66±12 years, male 73%, mean ejection fraction 28±9%) underwent speckle tracking echocardiography. Of these, 61% suffered from ischemic cardiomyopathy (ICM). Patients were followed for all-cause mortality. We assessed the ESL index: [–100x (peak positive strain/maximal strain)] and the postsystolic index (PSI): [100x (postsystolic strain/maximal strain)]. Both parameters were averaged across 18 myocardial segments.

**Results:** During a median follow-up of 3.4 years [interquartile range 1.9 to 4.8], 132 patients (15%) died. In multivariable survival analyses adjusted for potential confounders (age, sex, BMI, mean arterial pressure, cholesterol, heart rate, CABG/PCI, left ventricular ejection fraction and mass index, left atrial volume index, tricuspid annular plane systolic excursion, E-wave, E/e', deceleration time, and global longitudinal strain) neither the ESL index (HR 1.02 per 1% increase [0.97 to 1.08], P=0.40) nor PSI (HR 1.00 per 1% increase [0.98 to 1.01], P=0.69) were associated with all-cause mortality. ICM modified the relationship (P interaction unadjusted/adjusted=0.001/0.008; Figure) such that per 1% increase in ESL index in patients with ICM was significantly associated with all-cause mortality (unadjusted: HR 1.09 [1.04 to 1.15], P<0.001 and adjusted: HR 1.06 [1.00 to 1.13], P=0.045) but not in those without (unadjusted: HR 1.02 [1.01 to 1.03], P=0.002 and adjusted: HR 0.99 [0.90 to 1.09], P=0.086). ICM did not modify the relationship between PSI and all-cause mortality (P interaction unadjusted/adjusted=0.15/0.13).

**Conclusion:** Our results indicate that in this cohort of undifferentiated HF patients with reduced ejection fraction the prognostic value of deformational patterns was reduced. However, the ESL index may provide some information on prognosis in patients with ICM.




ESL and interaction with ICM