Myocardial sympathetic innervation, function, and oxidative metabolism in non-infarcted myocardium in patients with prior myocardial infarction.

Abstract: The purpose of this study was to investigate the relationship between sympathetic innervation, contractile function, and the oxidative metabolism of the non-infarcted myocardium in patients with prior myocardial infarction. In 19 patients (14 men, 5 women, 65 ± 9 years) after prior myocardial infarction, sympathetic innervation was assessed by (11)C-hydroxyephedrine (HED) positron emission tomography (PET). Oxidative metabolism was quantified using (11)C-acetate PET. Left ventricular systolic function was measured by echocardiography with speckle tracking technique. The (11)C-HED retention was positively correlated with left ventricular ejection fraction (LVEF) (r = 0.566, P41 mL) was associated with reduced (11)C-HED retention and peak longitudinal strain in systole, whereas Kmono was similar between the groups. This study indicates that remodeled LV after myocardial infarction is associated with impaired sympathetic innervation and function even in the non-infarcted myocardial tissue. Furthermore, oxidative metabolism in the non-infarcted myocardium seems to be operated by normal regulatory mechanisms rather than pre-synaptic sympathetic neuronal function.