Longitudinal strain in patients with STEMI using speckle tracking echocardiography. Correlation with peak infarction mass and ejection fraction.

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Abstract

Background:

As an index of myocardial infarct size (IS), left ventricular (LV) function is a key determinant of the prognosis after an acute myocardial infarction (STEMI). Traditionally, LV function is assessed by the volume-fraction expelled during systole, i.e. ejection fraction (LVEF), or alternatively by semiquantitative visual grading of LV wall dynamics, i.e. wall motion score index (WMSI). Both methods are subject to observer- and expert-dependence; so in search of a less observer-dependent method, two-dimensional deformation imaging by speckle tracking has been proposed.

Aim:

Assessment of the global longitudinal peak systolic strain (GLPSS) by speckle tracking echocardiography in patients with STEMI in first 24hrs after primary PCI and its correlation with LV infarction size and ejection fraction.

Materials And Methods:

A total of 30 patients with STEMI (mean age 58±8, 25 men) were studied, All patients underwent 1ry PCI. Conventional 2D echocardiography to assese left ventricular ejection fraction (LVEF), wall motion score index (WMSI), and end systolic volume index (ESVI) and speckle tracking echocardiography to assese LV GLPSS was done within 24hr of 1ry PCI. Infarction size was estimated by myocardial perfusion imaging before hospital discharge.

Results:

All patients with STEMI had low LV GLPSS (mean -10.57±2.67%). Significant correlation was observed between LV GLPSS and IS (P=0.03 r=0.39), The cut-off point for GLPSS that defined large myocardial infarction size (≥ 30% of LV mass) was -11.5% with 93% sensitivity and 67% specificity (area under the curve=0.8), Significant correlation was observed between LV GLPSS and EF (P=0.01, r =0.35), and WMSI (P=0.04, r=0.5). WMSI showed the most

significant correlation to IS (P=00, r= 0.64). Significant correlation was observed between IS and EF (P=0.04, r= 0.37). No significant correlation was found between ESVI and IS (P= P=0.4, r= 0.2) nor GLPSS (P= 0.08, r= 0.33).

Conclusion:

Assessment of IS by echocardiography on day 1 after 1ry PCI in patients with STEMI was superior with GLS and WMSI compared with LVEF and ESVI with cut-off point for GLPSS that defined large myocardial infarction size (≥ 30% of LV mass) was -11.5% with 93% sensitivity and 67% specificity. Since global strain is an inexpensive test, these data may be of health economic interest.

Key words: Longtudinal strain – Speckle tracking echocardiography – STEMI – Infarction size