2D speckle tracking echocardiography as predictor of major adverse cardiac events (MACE) in patients with non ST elevation myocardial infarction and unstable angina

Authors:
MRA Lacanin\textsuperscript{1}, EST Tucay\textsuperscript{1}, \textsuperscript{1}Philippine Heart Center - Quezon - Philippines

Topic(s):
Echocardiography

BACKGROUND: 2D speckle strain echocardiography has been recognized in different studies to provide additional important prognostic information in patients with chronic stable coronary artery disease or acute coronary syndrome (ACS)—more often on (ST elevation myocardial infarction (STEMI) patients.

PURPOSE: This study aimed to determine the clinical utility of 2D speckle tracking echocardiography in predicting major adverse cardiac events (MACE) in patients with non ST elevation – acute coronary syndrome (NSTE-ACS).

METHODOLOGY: This is a prospective cohort study which included 91 patients diagnosed to have NSTE-ACS. Baseline characteristics were collected and echocardiographic evaluations of patients were done within 48 hours of admission. In hospital and 6 months MACE were evaluated in relation to their baseline echocardiographic parameters, 2D speckle strain and strain rate analyses.

RESULTS: Among the conventional echocardiographic parameters, only left ventricular end systolic diameter (LVESD) and wall motion score showed significant difference between those with and without outcomes after 6 months. There were no significant difference among the 2D speckle tracking strain and strain rate parameters between those patients with and without major cardiac events during their in hospital admission. However after 6 months follow-up, there were significantly lower mean left ventricular global longitudinal strain (GLS) (-14.22\% ± 4.45 versus -16.44\% ± 4.19, p-value 0.0261) and strain rate (-0.69 1/sec ± 0.36 versus -0.94 1/sec ± 0.25, p-value 0.009) were observed among patients with MACE compared to those without. Also, incidence of reduced GLS strain and strain rate, were significantly higher in those with MACE after 6 months. The left ventricular global circumferential strain and strain rate, and right ventricular global longitudinal strain did not have significant difference between those with and without but these had a generally lower value among those who had in-hospital and 6 months MACE. In this study, LV GLS sensitivity and specificity were 64.64\% and 61.70\% respectively, at cut-off value of \(<-15.0\%\) for detecting MACE within 6 month follow-up. LV GLS cut-off point \(<-12.0\%\), which detects severe LV dysfunction in previous studies, have sensitivity of 40\% but high specificity of 82.98\% for predicting MACE after 6 months.

CONCLUSION: Both LV GLS strain and strain rate can be used to predict major adverse cardiovascular events after NSTE-ACS.
2D speckle tracking echocardiography as predictor of major adverse cardiac events (MACE) in patients with non ST elevation myocardial infarction and unstable angina

Authors: MRA Lacanin 1, EST Tucay 1

Topic(s): Echocardiography

BACKGROUND: 2D speckle strain echocardiography has been recognized in different studies to provide additional important prognostic information in patients with chronic stable coronary artery disease or acute coronary syndrome (ACS)—more often on (ST elevation myocardial infarction (STEMI) patients.

PURPOSE: This study aimed to determine the clinical utility of 2D speckle tracking echocardiography in predicting major adverse cardiac events (MACE) in patients with non ST elevation – acute coronary syndrome (NSTE-ACS).

METHODOLOGY: This is a prospective cohort study which included 91 patients diagnosed to have NSTE-ACS. Baseline characteristics were collected and echocardiographic evaluations of patients were done within 48 hours of admission. In hospital and 6 months MACE were evaluated in relation to their baseline echocardiographic parameters, 2D speckle strain and strain rate analyses.

RESULTS: Among the conventional echocardiographic parameters, only left ventricular end systolic diameter (LVESD) and wall motion score showed significant difference between those with and without outcomes after 6 months. There were no significant difference among the 2D speckle tracking strain and strain rate parameters between those patients with and without major cardiac events during their in hospital admission. However after 6 months follow-up, there were significantly lower mean left ventricular global longitudinal strain (GLS) ($-14.22\% \pm 4.45$ versus $-16.44\% \pm 4.19$, p-value 0.0261) and strain rate ($-0.69 \text{ 1/sec} \pm 0.36$ versus $-0.94 \text{ 1/sec} \pm 0.25$, p-value 0.009) were observed among patients with MACE compared to those without. Also, incidence of reduced GLS strain and strain rate, were significantly higher in those with MACE after 6 months. The left ventricular global circumferential strain and strain rate, and right ventricular global longitudinal strain did not have significant difference between those with and without but these had a generally lower value among those who had in-hospital and 6 months MACE. In this study, LV GLS sensitivity and specificity were 64.64% and 61.70% respectively, at cut-off value of <15.0% for detecting MACE within 6 month follow-up. LV GLS cut-off point <12.0%, which detects severe LV dysfunction in previous studies, have sensitivity of 40% but high specificity of 82.98% for predicting MACE after 6 months.

CONCLUSION: Both LV GLS strain and strain rate can be used to predict major adverse cardiovascular events after NSTE-ACS.