

Predictive Value of Tissue Doppler Imaging For Left Ventricular Ejection Fraction And Infarct Size Versus Myocardial Perfusion Imaging After Primary Percutaneous Coronary Intervention For Acute Myocardial Infarction

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BACKGROUND

The main goal in the management of acute myocardial infarction (MI) is an early restoration of coronary artery flow in order to preserve viable myocardium, primary percutaneous coronary intervention (PCI) has been proven to be superior to other reperfusion strategies in terms of mortality reduction and preservation of left ventricular (LV) function. (Zilstra F et al., 1999). Decreased LVEF and LV remodelling are associated with adverse prognosis. Therefore, early identification of high-risk patients is crucial. (Joost P et al., 2010).

OBJECTIVE

This study was designed to evaluate the predictive value of TDI for left ventricular ejection fraction measured by conventional Echocardiography in ST-elevation myocardial infarction patients who underwent primary PCI in reference to ejection fraction and infarct size measured by technetium Tc99m sestamibi single photon emission computed tomography.

MATERIALS AND METHODS

All the patients included in the study were subjected to Electrocardio- graphic analysis and cardiac biomarkers sampling and primary percutaneous coronary intervention. Echocardiographic studies were performed within 24 hr and 3 month of the acute infarction. Technetium Tc 99m sestamibi were performed 3 months after primary PCI. All patients of the study group were subdivided into 2 subgroups: Group (I): included 39 patients with positive invasive and non invasive reperfusion criteria. Group (II): included 11 patients with negative invasive and non invasive reperfusion criteria.

RESULTS

The studied groups were compared at baseline study and 3 months later, there was significant difference in favor of group (1) regarding all echocardiographic parameters, Tissue Doppler data was statistically significant difference in the (Sm) and (Em) wave values with more improvement at follow-up, while the mean value of Am wave velocity showed

significant difference between group (I) (6.856 ± 0.654) in favor of group (II) (8.222 ± 0.481). The mean Sm wave velocity had cutoff value of 4.5cm/sec or more for prediction of recovery of global systolic function with a sensitivity and specificity of 97.4% and 90.9% respectively while the Em wave velocity had a cutoff value of 4.7cm/sec or more for prediction of recovery of diastolic function after myocardial infarction treated with primary PCI with a sensitivity and specificity of 94.9 % and 90.9% respectively. The mean LVEF in patients under study increased from $44.78 \pm 7.07\%$ to 50.26 ± 8.02 and in Group (I) patients, the mean LV EF of the group population increased from $46.87 \pm 6.38\%$ to $53.36 \pm 6.22\%$ (mean 6.49%, P- value 0.001) between the first and the second echocardiography evaluation, while in group (II), the mean LV EF increased but less than 5%. Regarding septal\lateral wall dyssynchrony: Our data detected statistical significant difference between early and follow up (3 months) after primary PCI between both groups as regard septal\lateral wall dyssynchrony p-value<0.001. Regarding technetium Tc 99m sestamibi parameters; our study showed a significant positive correlation between EF% measured by Echo and EF% measured by technetium Tc 99m sestamibi ($r=0.965$, $P<0.001$) & significant positive correlation between PTD average systolic and diastolic myocardial velocity (Sm6), (Em6) and EF% measured by technetium tc 99 sestamibi ($r=0.711$, $p<0.001$) ($r=0.739$, $p<0.001$) respectively.

CONCLUSION

EF measured by conventional Echo (by Simpson's method) is as sensitive as and specific for evaluation of left ventricular function in the setting of post primary PCI as TDI parameters in reference to the technetium 99m sestamibi single photon emission computed tomography. This study demonstrated a significant relationship between systolic and diastolic PTD parameters and infarct size measured by technetium 99m sestamibi 3

months after primary PCI therefore infarct size be useful as an endpoint in clinical trials and as important prognostic measure when caring for patients with STEMI. Also this study has demonstrated a significant relationship between

systolic and diastolic PTD parameters and both invasive and noninvasive markers of reperfusion in patients with acute STEMI undergoing primary PCI.