Alexandria Journal of Medicine (2015) **51**, 261–270

HOSTED BY

ELSEVIER

Alexandria University Faculty of Medicine

Alexandria Journal of Medicine

http://www.elsevier.com/locate/ajme

Value of dobutamine stress tissue Doppler in evaluation of LV functional improvement after elective PCI

Shaimaa Ahmed Mostafa *, Osama Sanad Arafa, Hesham Mohamed Abo-El-Einin, Saad Mahmoud Amaar, Shereen Mohamed Khaled

Benha Faculty of Medicine, Benha University, Egypt

Received 28 June 2014; accepted 27 October 2014
Available online 12 December 2014

KEYWORDS

Dobutamine stress echo;
Tissue doppler image;
PCI;
Functional recovery

Abstract *Aim:* To clarify the value of dobutamine stress tissue Doppler in the evaluation of LV functional improvement after elective PCI.
Methods: The study included 60 patients with hibernating viable myocardium proved by DSE referred for an evaluation of myocardial viability prior to revascularization. Hemodynamic and echocardiographic variables (LVEF, WMSI and TDI Sm) were assessed at rest and during stress. 1 month after PCI follow up echocardiography and TDI were done. Patients were divided into 2 groups: (Group I): 18 patients (30%) with no global functional recovery and (Group II): 42 patients (70%) with global functional recovery.
Results: SBP, DPB, HR, EF, WMSI and (Sm) increased significantly at stress $P = 0.001$. After 1 month patients were divided into 2 groups according to functional recovery. There were no statistically significant differences between two groups neither as regards age, sex, risk factors ($P > 0.05$) nor as regards SBP, DBP, HR, rate/pressure product, EF and WMSI during stress but Sm increased during stress and after1 month follow up in Group II ($P = 0.001$). Univariate regression showed that (Sm) is the only predictor for global functional recovery. ROC curve statistical analysis shows that (Sm) is more sensitive and accurate than (WMSI) in the detection of viable myocardium which predicts improvement after revascularization (sensitivity 100%, 50% and accuracy 93.3%, 83.3% respectively).

Abbreviations: ACS, acute coronary syndrome; CAD, coronary artery disease; DBP, diastolic blood pressure; DM, diabetes mellitus; DSE, dobutamine stress echo; HR, heart rate; IHD, ischemic heart disease; LDDSE, low dose dobutamine stress echo; LV, left ventricle; LVEF, left ventricular ejection fraction; NVP, negative predictive value; PCI, percutaneous coronary intervention; PPV, positive predictive value; SBP, systolic blood pressure; TDI, tissue Doppler image; WMSI, wall motion score index

* Corresponding author. Tel.: +20 01229122843.
E-mail addresses: shaimaamustafa2011@gmail.com, shaimaa.desouky@fmed.bu.edu.eg (S.A. Mostafa).
URLs: http://www.Bu.edu.eg, http://www.fac.bu.edu.eg (S.A. Mostafa).

Peer review under responsibility of Alexandria University Faculty of Medicine.

http://dx.doi.org/10.1016/j.ajme.2014.10.004
2090-5068 © 2014 The Authors. Alexandria University Faculty of Medicine. Production and hosting by Elsevier B.V.
This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/3.0/).

Conclusion: Stress TDI provides a feasible and quantitative technique that improves reproducibility of DSE. Sm during stress showed better accuracy than WMSI for the prediction of functional recovery following revascularization and was simple, sensitive and accurate for the detection of subtle myocardial systolic velocity changes.

© 2014 The Authors. Alexandria University Faculty of Medicine. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/3.0/).

1. Introduction

Coronary artery disease (CAD) remains a principal cause of morbidity and mortality worldwide. Many subjects with coronary artery disease have viable but dysfunctional myocardium, where a kinetic or severely hypokinetic myocardium keeps the ability to contract if perfusion improves.[1]

Dobutamine stress echocardiography (DSE) and myocardial perfusion imaging are commonly used to detect viable but dysfunctional myocardium. In studies that evaluated the improvement of function on the segmental basis, SPECT and PET demonstrate excellent sensitivity, whereas echocardiography with dobutamine stress has superior specificity and positive predictive value.[2]

Tissue Doppler imaging (TDI) is evolving as a useful echocardiographic tool for quantitative assessment of left ventricular (LV) systolic and diastolic function.[3]

Systolic tissue velocity imaging and post systolic shortening during acute coronary occlusion were correlated to the recovery of LV systolic function measured early and late after reperfusion. These results suggested that tissue velocity imaging may be related to an active process reflecting myocardial viability.[4]

Several studies demonstrated the potential role of tissue Doppler imaging during dobutamine stress echocardiography to quantify myocardial velocity and deformation, instead of or in addition to traditional evaluation of the wall motion score index (WMSI).[5] However, its application during stress echocardiography remains controversial since no clear advantage in terms of both test interpretation and objective quantification has been demonstrated.[6] Other studies concerning TDI proved its diagnostic value for the detection of myocardial viability during DSE and subsequent recovery after successful revascularization.[7]

2. Aim of the work

The aim of the work was to clarify the value of dobutamine stress tissue Doppler in the evaluation of LV functional improvement after elective PCI.

3. Patients and methods

This study included 60 patients with IHD who were referred to the Benha university hospital, Cardiology department for evaluation of viability prior to revascularization during the period from March 2012 to March 2014.

Exclusion criteria:

- Recent myocardial infarction or ACS.
- AF or any Ventricular arrhythmias.
- Previous pace maker implantation.
- Dilated cardiomyopathy.
- RHD.
- Prosthetic valve disease.
- Complicated PCI.
- LVEF less than 45%.
- Patients whose viability studies showed no significant viable myocardium or scar tissue.

Patients will undergo the following:

1) Detailed history – Age, sex, typical ischemic symptoms and presence of risk factors (DM, HTN, smoking, dyslipidemia and positive FH of IHD).
2) Thorough physical examination – for assessment of the severity of IHD or HF symptoms (clinically S3 gallop, mitral regurge murmur or bilateral fine basal crepitation).
3) Laboratory routine investigations – Complete blood count, random blood sugar, liver function test, kidney function test and coagulation profile.
4) ECG.
5) Echocardiography.

3.1. The conventional echocardiography study

Patients were imaged in the left lateral decubitus position using a commercially available system (Vivid 7, General Electric Vingmed). Images were obtained with simultaneous ECG-signals.

3.1.1. 2D echo

Images were acquired during breath hold and saved in cine-loop format, from the three 2 consecutive beats. The biplane Simpson's technique was used to calculate LV end systolic volumes (LVESVs), LV end diastolic volumes (LVEDVs) and LVEF.

3.1.2. M-mode echo

Measurement of LV dimensions in systole and diastole (LVIDs, LVIDd), interventricular septum (IVSd, IVSs), posterior wall thickening (PWTd) and LVEF% was carried out.

3.1.3. Pulsed wave Doppler echo

Pulsed-wave Doppler of the mitral valve was obtained by placing the Doppler sample volume between the tips of the

Download English Version:

https://daneshyari.com/en/article/3431556

Download Persian Version:

https://daneshyari.com/article/3431556

Daneshyari.com