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ORIGINAL ARTICLE

Effect of trimetazidine on myocardial salvage index in patients with acute ST segment elevation myocardial infarction undergoing primary PCI

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KEYWORDS

Trimetazidine;
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Abstract *Introduction:* Acute STEMI is the most serious presentation of CAD. Restoration of the coronary flow facilitates cardiomyocyte salvage and decreases cardiac morbidity and mortality. However, reperfusion may result in paradoxical cardiomyocyte dysfunction, a phenomenon termed reperfusion injury. Trimetazidine is a metabolic anti-ischemic drug which is beneficial in reducing periprocedural myocardial reperfusion injury.

The aim of the work is to study the effect of trimetazidine on myocardial salvage index in patients with acute STEMI who underwent primary PCI.

Methods: Forty patients presented with acute STEMI, underwent primary PCI with injection of an intravenous dose of Tc-99m labeled Sestamibi before primary PCI then first set of SPECT images were taken within 6 h from injection time to assess the initial size of the perfusion defect. Prior to discharge the patients received another dose of Tc-99m labeled Sestamibi and follow up SPECT images were taken to assess the final perfusion defect and to calculate myocardial salvage and myocardial salvage index.

Twenty patients of them received trimetazidine before primary PCI (study group) and the other twenty patients did not receive trimetazidine (control group).

Results: (1) Patients with acute STEMI undergoing primary PCI who received trimetazidine before primary PCI had better myocardial salvage index, however it was statistically non significant. (2) Statistically significant better myocardial salvage index with post procedural TIMI 3 flow than with post procedural TIMI 2 flow among patients who received trimetazidine before primary PCI.

Conclusion: In the presence of post procedural TIMI3 flow trimetazidine is beneficial in improving myocardial salvage index in patients presented with acute STEMI who underwent primary PCI.

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1. Introduction

ST segment elevation myocardial infarction (STEMI) is the most serious presentation of atherosclerotic coronary artery disease carrying the most hazardous consequences and it is caused by occlusion of major coronary artery.[1] Primary

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percutaneous coronary intervention (PCI) is the preferred reperfusion strategy especially when performed by an experienced team within the shortest possible time from first medical contact.[2]

One of the main aims of all treatment modalities in STEMI is mortality reduction, and since the use of mortality as an end point in randomized trials of reperfusion therapy requires increasingly large sample sizes, there has been a growing interest in assessment of infarct size by technetium (Tc)-99m Sestamibi single photon emission computed tomography (SPECT) imaging as a surrogate end point for both early and late mortality.[3] On the basis of the available scientific evidence, SPECT imaging with Tc-99m Sestamibi is the best available measurement tool for infarct size in clinical medicine. Tc-99m Sestamibi scintigraphy is considered a reliable method to assess myocardial salvage (difference between the actual and potential infarct size) achieved by reperfusion therapy.[3] Trimetazidine is a metabolic anti-ischemic drug that exerts its beneficial effects without altering hemodynamic function of the heart.

It acts by optimizing cardiac metabolism by reducing fatty acid oxidation through selective inhibition of mitochondrial 3-ketoacyl coenzyme A thiolase so it decreases ischemic stress and improves cardiac performance and also it showed cytoprotective effect in several models of myocardial infarction.[4] Also trimetazidine is beneficial in reducing peri-procedural myocardial reperfusion injury in elective PCI.[5]

2. Aim of the work

To assess the effect of trimetazidine on myocardial salvage index in patients with STEMI undergoing primary PCI.

3. Patients and methods

This study was conducted on forty patients admitted to the Ain Shams University Hospital by acute STEMI eligible for reperfusion within the period between September 2010 and July 2011.

3.1. Patients

3.1.1. Inclusion criteria

All patients were presented with typical rise and/or fall of cardiac biomarkers of myocardial necrosis with at least one of the following:

(1) New ST segment elevation at the J point in two contiguous leads with cut off points: 0.2 mV in men and 0.15 mV in women in leads V2 and V3 and/or 0.1 mV in other leads.
(2) Any ischemic symptoms such as chest pain, palpitation or dyspnea.[6] Reperfusion therapy was indicated in patients who sought medical advice within 12 h of onset of continuous symptoms, also persistence of ischemic symptoms after 12 h was considered as an indication of reperfusion.

3.1.2. Exclusion criteria

Patients who had one or more of the following were excluded from the study:

(1) Previous AMI.
(2) Patients with contraindication for primary PCI such as high risk bleeding as intracranial hemorrhage.
(3) Patients who were hemodynamically unstable or clinically unfit to be transferred to myocardial perfusion scan laboratory.
(4) Previous CABG surgery.
(5) Re-infarction during CCU admission before acquiring second SPECT image.

Patients were classified into two groups, **group 1** included twenty patients who received 70 mg of **trimetazidine** loading before primary PCI and continued on 70 mg/day in two divided doses till the second SPECT image (study group) and **group 2** included twenty patients who did not receive **trimetazidine** (control group).

3.2. Methods

All patients were subjected to:

3.2.1. Thorough history taking

Full history was taken from all cases as regards:

1- *Personal history*: Age, sex, and detailed risk profile as regards diabetes mellitus, hypertension, dyslipidemia and smoking status.
2- *Past history*: Including past history of AMI or prior history of anginal symptoms or renal impairment.
3- *Family history*: As regards family history of premature CAD (men <55 years of age or women <65 years of age) or occurrence of sudden cardiac death.
4- *Presenting complaint*: Chest pain was analyzed as regards duration prior to admission, associated symptoms, and presence of angina equivalents.

3.2.2. Full clinical examination

Each patient was thoroughly examined

1- *General examination:* With special emphasis on vital data especially arterial blood pressure and heart rate.
2- *Local cardiac examination:* All patients were subjected to full cardiac examination stressing on the presence of mechanical complications and signs of heart failure as: mitral regurgitation, ventricular septal defects, S3 gallop and basal rales.

3.2.3. Twelve lead surface ECG

ECG was done to all patients on admission, immediately post procedure, 90 min after primary PCI and serially every 8 h for the next 24 h, then daily till discharge. ECG machine was used to record standard 12-lead ECGs.

3.2.4. Full Labs

Full labs were carried out for all patients on admission and followed up thereafter with special emphasis on cardiac enzymes (CK and CK-MB), renal profile (serum creatinine, sodium, and potassium) and complete blood count (hemoglobin and platelet count).

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