

Effect of Trimetazidine on Myocardial Salvage Index in Patients with Acute ST Segment Elevation Myocardial Infarction Undergoing Primary PCI

Thesis

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تأثير عقار ترايميتازيدين على معامل إنقاذ عضلة القلب
في مرضي إحتشاء عضلة القلب المصحوب بارتفاع في
قطعة س- ت في رسم القلب الكهربى والذين تمت إعادة
التروية لهم عن طريق القسطرة التداخلية الأولية

رسالة

مقدمة توطئة للحصول على درجة الماجستير
فى أمراض القلب و الأوعية الدموية

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Summary

Acute STEMI is the most serious presentation of CAD carrying the most hazardous consequences and it is caused by occlusion of major coronary artery with primary goal in the management to start reperfusion therapy as early as possible.

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 peri-procedural 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.

This study was conducted on forty patients presented to Ain Shams university hospital by acute STEMI eligible for reperfusion therapy within the period between September 2010 and July 2011.

All patients underwent primary PCI after diagnostic coronary angiography, the IRA was identified and treated using bare metal stents $\pm$ pre-dilatation by balloons according to discretion of treating physician.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿وَمَا أُوتِيتُمْ مِنَ الْعِلْمِ إِلَّا قَلِيلًا﴾

صدق الله العظيم

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List of Abbreviations

AIVR	: Accelerated idioventricular rhythm
AMI	: Acute myocardial infarction
ATP	: Adenosine tri-phosphate
ATPase	: Adenosine tri-phosphatase
CABG	: Coronary artery bypass grafting
CAD	: Coronary artery disease
CCU	: Coronary care unit
CD	: Cluster of differentiation
CK	: Creatine kinase
CK-MB	: Creatine kinase myocardial band
cTFC	: Corrected TIMI frame count
cTnI	: Cardiac troponin I
cTnT	: Cardiac troponin T
ECG	: Electrocardiographic, Electrocardiogram
ESC	: European Society of Cardiology
FDA	: Food and drug administration
FMC	: First medical contact
GP	: Glycoprotein
HLA	: Horizontal long axis
IRA	: Infarct related artery
IU	: International unit
Kev	: Kilo electron volt
LAD	: Left anterior descending artery
LBBB	: Left bundle branch block
LCX	: Left circumflex artery
LV	: Left ventricle, left ventricular
MAC	: Membrane attack complex
MBG	: Myocardial blush grade
MCE	: Myocardial Contrast echocardiography
mCi	: Milli Curie
mg	: Milligram
mm	: Millimeter
MPI	: Myocardial perfusion imaging

mv	: Millivolt
NAD	: Nicotine amide adenine dinucleotide
PCI	: Percutaneous coronary intervention
PDH	: Pyruvate dehydrogenase
pH	: Power of hydrogen
PIS	: Pre-infarction syndrome
PMNs	: Polymorph nuclear leukocytes
PTCA	: Percutaneous transluminal coronary angioplasty
PTP	: Permeability transition pore
RCA	: Right coronary artery
RISK	: Reperfusion injury salvage kinase
r-PA	: Reteplase
S	: Second
SD	: Standard deviation
SK	: Streptokinase
SPECT	: Single photon emission computed tomography
STEMI	: ST segment elevation myocardial infarction
Tc	: Technetium
TIMI	: Thrombolysis in myocardial infarction
TNF	: Tumor necrosis factor
TNK-tPA	: Tenecteplase
tPA	: Tissue plasminogen activator
VLA	: Vertical long axis
Vs.	: Versus

Introduction

Acute myocardial infarction (AMI) remains a leading cause of morbidity and mortality worldwide. Myocardial infarction occurs when irreversible myocardial cell damage or death occurs.

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

Primary 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 (FMC) ⁽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⁾.

Trimetazidine is beneficial in reducing peri-procedural myocardial reperfusion injury in elective PCI ⁽⁵⁾.

Aim of the work

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