



Short term follow-up of culprit only revascularization versus total revascularization in primary percutaneous coronary intervention in patients with multivessel disease



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Received 30 June 2014; accepted 18 December 2014
Available online 14 January 2015

KEYWORDS

Myocardial infarction;
Reperfusion;
Primary PCI

Abstract *Background:* Patients with ST-segment elevation myocardial infarction (STEMI) and multivessel coronary artery disease are common. It is unknown whether complete revascularization in these patients is superior.

Objectives: This study evaluated the short term outcome of culprit only revascularization compared to total revascularization in the setting of primary percutaneous coronary intervention in patients with STEMI.

Methods: The study included 40 patients with acute STEMI who were presented within 12 h from onset of symptoms. All patients had multivessel disease on emergency coronary angiography. Primary PCI was performed in all patients. According to study protocol, patients were divided into 2 groups: group A (20 patients) included patients who underwent culprit artery only revascularization, while group B (20 patients) had total revascularization. In-hospital and 30 days outcome (mortality, re-infarction, heart failure, recurrence of angina symptoms, cerebrovascular stroke, need for revascularization) were reported.

Results: All cause mortality was reported in one patient from group B (5%). No re-infarction. Recurrence of ischemic symptoms was reported in 15% of patients (25% versus 5% in groups A and B respectively, $P = 0.2$). Heart failure was evident in 15% of all patients (15% in each group). Composite end point of adverse cardiovascular events was reported in 37.5% of all patients (40% versus 35% in groups A and B respectively, $P = 0.5$). Contrast induced nephropathy was evident in

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Peer review under responsibility of Alexandria University Faculty of Medicine.

<http://dx.doi.org/10.1016/j.ajme.2014.12.006>

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47.5% of patients (10% versus 35% in groups A and B respectively, $P = 0.08$), subacute stent thrombosis occurred in 2 patients (5%), (10% in group B but not in group A, $P = 0.4$).

Conclusion: Both treatment strategies carry equivalent short term outcome among patients with STEMI treated with PPCI.

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1. Introduction

Primary percutaneous coronary intervention (PPCI) is the most effective available method to reestablish coronary perfusion in patients presenting with STEMI. It is associated with greater patency of infarct related artery and lower rates of death, re-infarction and stroke when compared to fibrinolysis.¹ The prevalence of multivessel disease (MVD) in patients presented with STEMI approaches 40%.² The conventional strategy of PPCI in the setting of STEMI usually involves selective intervention of infarct related artery (IRA, culprit only revascularization) with treatment of significant lesions in non-IRA in patients with MVD, to be performed later as staged PCI procedure (staged revascularization).³ Early revascularization of IRA by PPCI is recommended according to recent guidelines. But strategy for treatment of non-IRA lesions in the acute setting remains unclear.⁴

In this prospective, controlled study we compared short term outcome between PPCI to IRA (culprit only revascularization) and that for both infarct related artery and noninfarct related artery (total revascularization) in STEMI patients with MVD.

2. Patients and methods

2.1. Study design

This prospective, controlled, nonrandomized study included 40 patients with STEMI who were admitted to the coronary care unit of cardiology department at the National heart institute, Egypt, during the period from October 2010 to March 2012. All patients signed an informed consent and the study was approved by the local ethics committee. Key inclusion criteria were as follows: 1. STEMI patients presented within 12 h of onset of symptoms. 2. MVD disease on coronary angiography, which are suitable for PCI. MVD was defined as the presence of at least one lesion $\geq 70\%$ diameter stenosis in a major epicardial vessel, or one of its branches other than the infarct related artery (IRA). Key exclusion criteria were as follows: cardiogenic shock, pulmonary edema, severe renal impairment (creatinine > 3.0 mg/dl), any contraindication to anti platelet therapy, left main coronary artery disease, patients in whom non-IRA is < 2.5 mm, or is totally occluded or showing extensive calcification.

2.2. Methods

2.2.1. Baseline evaluation

All patients had review of their medical history on admission to emergency department including the following: analysis of demographic data (age, sex), presence of risk factors of

coronary atherosclerosis, associated comorbidities, general and cardiac examination, 12 leads ECG which was performed immediately on admission and every 6 h during the first 24 h, and once daily until discharge, routine laboratory investigations including the following: cardiac biomarkers (Troponin I & CK-MB), kidney function tests (S. Creatinine), lipid profile including (total cholesterol, low density lipoprotein (LDL) high density lipoprotein (HDL), triglycerides), random blood sugar.

2.2.2. Coronary angiography and PPCI

Aspirin (300 mg loading dose, then 150 mg daily) and clopidogrel (600 mg loading then 150 mg/day maintenance dose) were given on admission. Un-fractionated heparin (UFH) (10,000 units) bolus dose was injected after sheath insertion. The procedure was performed according to the standard technique for coronary angiography and PCI. Femoral approach was used in all patients using 6–7 Fr sheaths. Diagnostic coronary angiography was done to detect the culprit vessel and eligibility to the study. XB guiding catheters were used for left coronary lesions and JR catheters for right coronary lesions. Aspiration devices and glycoprotein inhibitors were used in lesions with heavy thrombus burden and or impaired TIMI flow after PCI. Bare metal stents (BMS) were used in all patients. The operator determined the size and length of the stent. Sheaths were removed 6 h after PCI and compression was done manually.

2.2.3. Study protocol

After diagnostic coronary angiography, patients were subsequently divided into the following:

- Group A: culprit only revascularization (COR).
- Group B: total revascularization (TR).

2.2.4. Study end points

Thirty days combined end point of all cause mortality, re-infarction, heart failure, recurrence of angina symptoms, cerebrovascular stroke, need for revascularization (Repeat PCI or bypass surgery).

2.2.5. Study definitions

1. Contrast induced nephropathy: 25% rise in serum creatinine from baseline within 48–72 h from the procedure.
2. Major bleeding: intracranial bleeding, GIT bleeding, decrease hemoglobin concentration by more than 5 gm/dl.
3. Minor bleeding: puncture site bleeding, decrease hemoglobin concentration by less than 3 gm/dl.
4. Reinfarction: recurrent chest pain associated with new ECG changes such as ST segment re-elevation or new pathological Q waves.

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