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Original Article

Outcome of primary PCI – An Indian tertiary care center experience

Vijayakumar Subban [a], *Anitha Lakshmanan* [b], *Suma M. Victor* [a], *Balaji Pakshirajan* [a], *Kalaichelvan Udayakumaran* [a], *Anand Gnanaraj* [a], *Ramkumar Solirajaram* [a], *Jaishankar Krishnamoorthy* [c], *Ezhilan Janakiraman* [c], *Ulhas M. Pandurangi* [c], *Latchumanadhas Kalidoss* [c], *Ajit Sankardas Mullasari* [d,*]

[a] *Consultant, Department of Cardiology, Institute of Cardio-Vascular Diseases, Madras Medical Mission, Chennai, India*

[b] *Physician Assistant, Department of Cardiology, Institute of Cardio-Vascular Diseases, Madras Medical Mission, Chennai, India*

[c] *Senior Consultant, Department of Cardiology, Institute of Cardio-Vascular Diseases, Madras Medical Mission, Chennai, India*

[d] *Director, Department of Cardiology, Institute of Cardiovascular Diseases, Madras Medical Mission, 4A, JJ Nagar, Mogappair, Chennai 600 037, India*

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ABSTRACT

Objective: To assess the feasibility and outcomes of primary percutaneous coronary intervention (PPCI) for ST-segment elevation myocardial infarction (STEMI) in Indian Scenario.
Methods: Between January 2005 and December 2012, consecutive STEMI patients who underwent PPCI within 12 h of onset of chest pain were prospectively enrolled in a PPCI registry. Patient demographics, risk factors, procedural characteristics, time variables and in-hospital and 30 day major adverse cardiovascular events (MACE) [death, reinfarction, bleeding, urgent coronary artery bypass surgery (CABG) and stroke] were assessed.
Results: A total of 672 patients underwent PPCI during this period. The mean age was 52 ± 13.4 years and 583 (86.7%) were males, 275 (40.9%) were hypertensives and 336 (50%) were diabetics. Thirty one (4.6%) patients had cardiogenic shock (CS). Anterior myocardial infarction was diagnosed in 398 (59.2%) patients. The median chest pain onset to hospital arrival time, door-to-balloon time and total ischemic times were 200 (10–720), 65 (20–300), and 275 (55–785) minutes respectively. In-hospital adverse events occurred in 54 (8.0%) patients [death 28 (4.2%), reinfarction 8 (1.2%), major bleeding 9 (1.3%), urgent CABG 4 (0.6%) and stroke 1 (0.14%)]. Nineteen patients with CS died (mortality rate – (61.3%)). At the end of 30 days, 64 (9.5%) patients had MACE [death 35 (5.2%), reinfarction 10 (2.1%), major bleeding 10 (1.5%), urgent CABG 4 (0.6%) and stroke 1 (0.1%)].

* *Corresponding author*. Tel.: +91 44 26565953; fax: +91 44 26565859.
E-mail address: icvddoctors@mmm.org.in (A.S. Mullasari).

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Conclusion: Our study has shown that PPCI is feasible with good outcomes in Indian scenario. Even though the recommended door-to-balloon time can be achieved, the total ischemic time remained long. CS in the setting of STEMI was associated with poor outcomes.

1. Introduction

Coronary artery disease (CAD) is the most common non-infectious disease in India and by 2015, it is estimated to affect over 65 million of its population. Acute ST-segment elevation myocardial infarction (STEMI) is the most dramatic manifestation of CAD with high morbidity and mortality and timely reperfusion therapy has undoubtedly proved to reduce these adverse events.[1] Primary percutaneous coronary intervention (PPCI) is the most effective therapy for STEMI and achieves rapid and more consistent reperfusion with low complication rate when compared to thrombolysis.[2] This prospective, observational study evaluates the feasibility and outcome of PPCI in Indian scenario.

2. Materials and methods

Between January 2005 and December 2012, consecutive STEMI patients who underwent percutaneous coronary intervention (PCI) within 12 h of onset of chest pain were prospectively enrolled in a PPCI registry. This includes all patients admitted directly to coronary care unit (CCU) and those transferred from nearby referral hospitals. Patients with cardiogenic shock (CS) were also included in the registry. Patients who underwent rescue PCI were excluded. The protocol was cleared by institutional ethics committee.

Once a patient was received in the CCU and the diagnosis of STEMI was confirmed, the in-house catheterization laboratory team was notified. All patients underwent brief history taking to rule out any contraindication to dual antiplatelet treatment and a focused clinical examination to assess the need for mechanical ventilation or circulatory support. A screening echocardiography was done to exclude any mechanical complications. After obtaining informed consent, all patients were loaded with 325 mg of aspirin, 300–600 mg of clopidogrel and 40–80 mg of atorvastatin and transferred to the catheterization laboratory as early as possible.

Procedure was performed either through radial or femoral route. Elective intra-aortic balloon pump was inserted in patients with CS. Non-infarct related artery was imaged first with a diagnostic catheter to rule out any critical lesions with compromised blood flow. Then, 70–100 U/kg heparin was administered intra arterially through the sheath to maintain the activated clotting time (ACT) between 250 and 300 s. Infarct related artery (IRA) was engaged with an appropriate sized guiding catheter and the culprit lesion was crossed with non-hydrophilic soft 0.014″ guide wire. After lesion crossing, the TIMI flow and thrombus burden were assessed. If TIMI flow was grade III and thrombus burden was low (TIMI grade 1 or 2), the lesion was stented directly. Conversely, when there was large thrombus burden, aspiration thrombectomy was done using Export aspiration catheter (Medtronic, Minneapolis, Minnesota) and balloon dilatation was done if the lesion was too tight to allow the passage of the stent or when it was difficult to assess the size of the distal vessel. Intracoronary (IC) nitroglycerine was administered when the hemodynamics permitted to exclude any epicardial coronary spasm. IC anti no-reflow medications and GP IIb-IIIa inhibitors were given according to the need. As per the hospital protocol, bare metal stents (BMS) were used in most of the patients and drug-eluting stents (DES) were used when the patient or lesion characteristics were at high risk for restenosis. In case of multi-vessel disease, PCI is limited to IRA unless patient had significant stenosis with less than TIMI III flow in a non-IRA or patient was in cardiogenic shock. Time from pain onset to hospital arrival, door-to-balloon time and total ischemic time were recorded.

Patients were transferred back to CCU post-procedure and arterial sheath was removed when ACT was less than 150 s. Hemodynamically stable patients were transferred to the wards after 24 h and discharged on the third day. At the time of discharge, all the patients were continued on dual antiplatelets, statin, beta-blocker and ACE inhibitor if not contraindicated. In hospital adverse events (death, reinfarction, urgent CABG, bleeding and stroke) were noted and they were followed up for 30 days. At 30 days all patients were reviewed clinically in the out patient department and medications were optimized. Those who did not come to the OPD were contacted through telephone. Patient with multi-vessel disease underwent follow up angiogram between 6 and 8 weeks and had either angioplasty or surgery according to the coronary anatomy.

3. Definitions

STEMI: Angina or anginal equivalent lasting for >20 min and ST-segment elevation of ≥1 mm in ≥2 contiguous leads, or new left bundle branch block, or true posterior MI with ST depression of ≥1 mm in ≥2 contiguous anterior leads.

Cardiogenic shock: Sustained hypotension with systolic blood pressure less than 90 mmHg for at least 30 min, unresponsive to fluid administration and associated with features of tissue hypoperfusion.

Diabetes mellitus: Fasting glucose > 126 mg/dL or on treatment.

Systemic hypertension: Systolic blood pressure >140 mmHg and or Diastolic pressure >90 mmHg, or on treatment.

Dyslipidemia: Fasting cholesterol >200 mg/dL or on treatment.

Multivessel disease: Presence of >50% stenosis in ≥2 epicardial vessels.