ORIGINAL ARTICLE

Outcome of Primary Percutaneous Coronary Intervention in Octogenarians with Acute Myocardial Infarction

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Background/Purpose: Acute myocardial infarction (AMI) results in more complications and increased mortality in octogenarians compared to patients in younger age groups. This study investigated the short- and long-term outcomes in octogenarians after primary percutaneous coronary intervention (PCI).

Methods: During the study period from May 1997 to August 2004, 54 patients ≥ 80 years old with ST-elevation myocardial infarction (STEMI) were eligible for primary PCI. Data collected included baseline clinical characteristics and usage of cardiovascular medications. Diagnostic coronary angiography and revascularization procedures were performed using standard practices. During hospitalization, the clinical course including serial changes in cardiac enzymes, adverse events associated with myocardial infarction or treatment, and inhospital or long-term mortality of patients were recorded.

Results: The mean age of the 54 patients (35 men, 19 women) was 82.8 ± 2.5 years (range, 80–89 years). Among them, 27 (50%) had anterior infarction, six (11%) had anterolateral infarction, and 21 (39%) had inferior infarction, inclusive of three patients with accompanying right ventricular infarction. Among them, 20 (37%) patients were in Killip class I, nine (17%) were in class II, two (4%) in class III, and 23 (43%) in class IV. The mean delay from onset of symptoms to arrival in hospital was 220 ± 167 minutes, and 189 ± 169 minutes from hospital arrival to reperfusion. Diagnostic coronary angiography revealed that 48 (89%) patients had multivessel disease. Inhospital death occurred in 23 (43%) patients, with the leading causes of death being profound cardiogenic shock (61%), and free wall rupture (26%).

Conclusion: Octogenarian patients who developed STEMI tended to have multivessel disease. These patients had a high inhospital mortality rate that was most likely to be due to cardiogenic shock. [*J Formos Med Assoc* 2006;105(6):451–458]

Key Words: acute myocardial infarction, octogenarian, primary percutaneous coronary intervention

There is a high prevalence of coronary artery disease in octogenarians (≥ 80 years old),[1] and they are also the fastest growing segment of the population. In the United States, over 50% of acute myocardial infarctions (AMIs) occur in people older than 65 years, and 80% of those who die from AMI are more than 65 years old.[2] A population-based study conducted between 1975 and 1995 found that patients aged 75–84 and ≥ 85 years had 7.8 and 10.2 times greater risk of dying from AMI during hospitalization than patients younger than 55 years.[3] Age is a strong independent predictor of outcomes, including inhospital and post-hospital mortality rates, in patients with AMI[4,5] because of its association with increased severity of coronary atherosclerosis, reduced car-

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diac reserve and multiple comorbidities.[6,7] Early reperfusion via primary percutaneous coronary intervention (PCI) or thrombolytic therapy is the cornerstone of effective treatment for patients with ST-elevation myocardial infarction (STEMI).[8] However, there are many limitations to thrombolytic therapy in the older population, and some studies have suggested that primary PCI is superior to thrombolytic therapy and leads to a lower rate of hemorrhagic stroke[9] and greater reduction in the rates of mortality and reinfarction.[10,11]

There are limited data on the efficacy and safety of primary angioplasty in octogenarians. This study analyzed the short-term and long-term outcomes, including disease severity, complications, inhospital and follow-up mortality rates, in 54 octogenarian patients with STEMI who received primary PCI at National Taiwan University Hospital (NTUH) between May 1997 and August 2004.

Methods

Patients

All octogenarian patients identified from the NTUH catheterization laboratory database who met the eligibility criteria were included. Patients had acute STEMI, defined as at least 30 minutes but < 12 hours of symptoms, and the presence of ST-segment elevation ≥ 1 mm in at least two contiguous leads or presumed new bundle-branch block on the presenting 12-lead electrocardiogram. Right ventricular infarction was diagnosed based on the finding of ST-elevation in lead V4R. Patients who had suspected STEMI but couldn't be referred for urgent coronary angiography due to prolonged resuscitation or any other causes were excluded.

Coronary angiography and primary angioplasty

After obtaining informed consent, coronary angiography was performed initially via the femoral artery according to standard clinical practice. Diseased coronary artery was defined as ≥ 50% diameter stenosis, and the left main coronary artery was classified as having two-vessel disease if the left coronary artery was non-dominant, and as having three-vessel disease if it was dominant. Multivessel disease was defined as ≥ 50% diameter stenosis in two or more major epicardial coronary arteries. The flow of the infarct-related artery (IRA) was categorized from grade 0 to grade 3 according to the Thrombolysis In Myocardial Infarction (TIMI) grading system. After diagnostic coronary angiography, the revascularization procedure was tailored to the individual patient and selected solely by the physicians. However, the family could choose conservative treatment if emergency coronary artery bypass graft (CABG) was suggested. Procedural success was defined as a reduction to residual stenosis of < 40% by balloon angioplasty or successful stent deployment at the desired position with a residual stenosis < 20% followed by TIMI grade 2 or 3 flow in the IRA.

Concomitant medical therapy

All patients were treated with aspirin 300 mg orally as the loading dosage and then 100 mg daily. Unfractionated heparin 5000 IU was given intravenously before the procedure, and then infused continuously for 48 hours. Ticlopidine 250 mg twice a day or clopidogrel 300 mg loading dose, followed by 75 mg per day was administered after stent placement for at least 1 month.

Data collection, follow-up and study endpoint

Detailed inhospital and follow-up data were collected, including serum creatine level, white blood cell (WBC) count, Killip score on hospital admission, reperfusion time, peak cardiac enzyme level and its timing, and inhospital adverse events such as sepsis, atrial or ventricular arrhythmia, and MI-related cardiac rupture or acute mitral regurgitation documented by echocardiography. Cardiogenic shock was defined as sustained hypotension with systolic blood pressure < 80 mmHg unresponsive to intravenous fluids, requiring vasopressors or intra-aortic balloon pump. Major bleeding was defined as significant blood loss from any site not caused by trauma and requiring transfusion. Left ventricular ejection fraction (LVEF) was measured after primary PCI or before discharge by the area–length method using a Sonos 4500 or 5500