Original Article

Primary Percutaneous Coronary Intervention (PPCI) in Acute Myocardial Infarction Complicated by Cardiogenic Shock in a Newly Emerging Cardiac Centre in Nepal

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Abstract

Background: Acute myocardial infarction (AMI) is complicate[illegible]enic shock in [illegible]% of patients. Mortality rate is exceedingly high and reaches 70-80% in those [illegible]ted co[illegible]ively. Large thrombolytic trials demonstrate 60% mortality with most effective thrombolytic agent. In betwe[illegible]ember 2005 to August 2008 total PCI in Shahid gangalal National Heart Centre (SGN[illegible]epal was 452. a[illegible]hem primary PCI (PPCI) in AMI with cardilgenic shock was done in only 16 pati[illegible]rdiogenic shock wh[illegible]derwent PPCI, 6 patients are in out of 50% (n=8) patients with cardiogenic sh[illegible]ho underwent PPCI, 6 patients are in routine follow up over 12 months and 2 were doing well in subsequent [illegible]nths but lost in[illegible]low up afterwards. Primary PCI in AMI complicated by cardiogenic shock has lower mortality[illegible]improved out[illegible]. High cost, high in-hospital mortality, need for trained manpower are the major limitations.

Keywords : Primary Percutaneo[illegible]nary interven[illegible]myocardial infarction, cardio genic shock, SGNHC (Shahid Gangalal National [illegible]

INTRODUCTION

Cardiogenic shock is the com[illegible]st c[illegible]of death[illegible] patients with acute myocardial [illegible]ction (A[illegible] who reac[illegible] hospital alive. Cardilgenic sho[illegible]MI occ[illegible]m 40% o[illegible] more of the left ventricle is dest[illegible]. It[illegible]s of onset of infarction d[illegible]massiv[illegible]nia and infarction. . A relataively small [illegible]ction superi[illegible]ted on extenxive previous damage [illegible]cipitate cardi[illegible] shock. Acute myocardial inf[illegible]mplicated by c[illegible]genic shock in 7-10 % o[illegible]ients. [illegible]lity rate is exceedingly high and reach[illegible]70-80% in th[illegible]ated conservatively. Large thromb[illegible] trials demonstra[illegible]% mortality with most effec[illegible]hrombolytic agent. Com[illegible]son of 30 day mortality in[illegible]ogenic s[illegible]with AMI between Reteplase or Alteplase, [illegible]f pati[illegible]reated with Repteplase and 58% treated with Alt[illegible] within 30[illegible] (p=0.59).

A[illegible]ng trend[illegible] been to go for more aggressive [illegible]herapeu[illegible]erve[illegible]s early in patients who have cardiogenic [illegible]ock follo[illegible]te myocardial infarction. In the recent [illegible]idelines of t[illegible]European Society and American College of [illegible]diology (ACC) and the American Heart Association (AHA) [illegible]early mechanical revascularization for cardiogenic shock for patients younger than 75 years with ST-elevation AMI or left bundle-branch block.

Invasive strategy in developing country like Nepal is not [illegible]ly costly but also technically demanding. No study has been done till date with aggressive invasive strategy in poor developing country like Nepal and hence its usefulness, justification and feasibility is not known. The purpose of this study was to evaluate the in-hospital mortality rate in a cohort of unselected consecutive patients with AMI complicated by cardiogenic shock treated with PPCI in SGNHC, the only national heart centre which offers this facility in Nepal.

METHODS

Sixteen consecutive patients who presented to SGNHC with ST elevation MI complicated by cardiogenic shock were studied. Those patients who presented with ST elevation MI with cardiogenic shock and mechanical complications like papillary muscle rupture, ventricular septal defect and free wall rupture in echocardiography were not considered for PPCI due to surgical indication. We do not have exact data of the whole incidence of cardiogenic shock in ST elevation MI. however, it is estimated to be approximately 5-7%. Diagnosis of acute ST elevation with cardiogenic shock was defined as evidence of hypo-perfusion (cold clammy skin, cerebral obtundation), systolic blood pressure <90 mm Hg, pulse >100 bpm and evidence of acute STEMI or neew onset LBBB (ischemic chest pain and ST elevation in ECG).

This is a retrospective study between September 2005 to August 2008. Total PCI in SGNHC was done in 452 patients. Among them PPCI in AMI with cardiogenic shock was done in only 16 patients (3.5%).

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RESULTS

Clinical characteristics of the patients included in this study are shown in table 1. the interval between AMI to Cardiogenic shock PPCI was 6-30 hours. The age range was between 21-77 yrs (mean 48.5+/16.52 yrs). There were 12 male and 4 female patients. The risk factors distribution showed diabetes in 4, smoking in 7, hypertension in 4 and strong family history in 2 patients. The baseline left ventricular ejection fraction (LVEF) by echocardiography was 30-41% (35.57 +/ 3.92). the culprit vessels were 7 right coronary arteries (RCA), 6 left anterior descending arteries (LAD), 2 left circumflex (LCX) and 1 left main vessel (LM). Thrombolysis in myocardial infarction (TIMI) flow among 16 patients showed pre procedure TIMI flow 0 in 14 patients ad TIMI flow 1 in 2 patients. Post procedural TIMI flow 3 was achieved in 13 patients. Intraaortic balloon pump (IABP) was used in 7 patients.

Table 1. Patient Characteristics

Characteristics	n=16
Mean Age (years)	48.5 ± 16.5
Male Sex	12 (75%)
Anterior MI	7 (44%)
Non anterior MI	9 (56%)
Diabetes Mellitus	4 (25%)
Hypertension	4 (25%)
Current Smoking	7 (44%)
Hyperlipidemia	3(19%)
IABP usage	7 (44%)
LVEF	35.6 ± 3.9%

Among those 16 patients with a ST e ion MI complicated by cardiogenic shock underwe PPCI, 8 patients died in-hospital and 8 sur nd w Of 8 deaths, culprit vessel co not 1 died due to pre existing failure patients died despite opening the culp ssel due to on ischemia. Of the 8 patients who a are in routine up over 12 months and 2 follow up for sequent 6 months.

DISCUSSION

Me alysis o large randomized trial have shown that ary PCI uperior to thrombolysis for immediate treatm f MI due t more effective restoration of coronary y, less re nt myocardial ischemia, less nary R ion, i oved residual LV function and clinical luding stroke.

e mortality s study with 16 patients showed to be 5 The causes of mortality were pre-existing renal failure, d delayed procedural time.

The mark Shock trial showed that early revascularization is better than medical management in AMI h cardiogenic shock. Thirty day survival was 54% and one urvival was 50%. Thirty day survival after successful PCI wa 65% and after unsuccessful PCI was 20%. Mortality was related to TIMI flow. Mortality with TIMI grade flow showed TIMI 3 flow (mortality 98%) TIMI 2 flow (mortality 55%) and TIMI 1 or 0 flow (mortality 100%). The independent predictors of mortality in shock trial was increasing age, lower systolic blood pressure, increasing age, lower systolic blood pressure, increasing time of randomization, lower post PCI TIMI flow 0/1, and multivessel PCI.

In a prospective randomized trial, 1333 patients at 80 centres in Germany between 1994 - 2001 in ALKK PCI registry 14.2% patients with AMI presented with cardio shock. The in-hospital mortality was 46.1%. predicto hospital mortality was ppost procedural TIMI flo anced age (75 years or more) and time-interval betwe ptom-onset and start of PCI.

In retrospective study between 1994 - in Fra 5 patients presenting with AMI and card ic shock th hospital mortality was reported to b 6. Inde ndent ri factors for increased mortality we sence of I 3 flow, smoking, need of mechanical ve on. T ndependent predictors of impaired lon m o ere LVE triple vessel disease.

In REO - SHOCK 30 day morta s 6. the national registry of ial infarction, 5 -May 2004 in 775 US pita ved in hospita ortality of 47.9%. patients randomized rtic counterpulsation had significantly less reocclusion infarct-related artery during f compared with patients (8% versus 21%, 3). in addition, there was a gnificantly lower event rate tients assigned to aortic counterpulsation in terms of a co site clinical en t (death, stroke, reinfarction, need for e ency revascu ation with angioplasty or bypass surger recurrent i mia: 13% versus 24%, p<.04). in a prospe al study of 293, 633 patients from National re yocardial infarction, Jan 1995 - may 775 US hospitals: cardiogenic shock was present in %) of patients. There was increase in PPCI rate f 54.5%. The in-hospital mortality in 1995 was % which was reduced in 2004 to 47.9%.

The in-hospital mortality of AMI complicated by cardiogenic shock in this study is high (50%). However, this is lower compared to historical thrombolytic therapy in AMI with cardiogenic shock. Our present study shows that invasive strategy can be alternative mode of treatment compared to thrombolytic therapy despite high mortality even in developing country like Nepal in highly selected patients.

STUDY LIMITATION

This is the only national heart centre in Nepal to start PCI service, hence in th initial phase the total number of routine PCI and primary PCI in cardiogenic shock is small. As this is a retrospective study of a single centre with small number of highly selective patients there is no direct control group with thrombolytic therapy. However, the number of patients admitted with AMI in hospital is small in number and among those only very small number of patientscomplicated by cardiogenic shock are admitted in hospital.

CONCLUSION

In-hospital mortality in patients with acute myocardial infarction complicated by cardiogenic shock remains high, even with early interventional therapy. Every effort should be made to reduce the incidence of cardiogenic shock. Primary PCI in AMI complicated by cardiogenic shock has lower mortality and improved outcome. High cost, high in-hospitalmortality, need for trained manpower are the major limitations.

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