ORIGINAL ARTICLE

EARLY OUTCOME OF CORONARY ARTERY BYPASS GRAFTING IN PATIENTS WITH UNSTABLE ANGINA

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Background: Unstable angina is a common cause of admission to hospitals. There is conflicting evidence on the need and success of urgent coronary revascularization in such cases. This study was conducted to evaluate the early post-operative morbidity and mortality of Coronary Artery Bypass Grafting (CABG) in patients with unstable angina. **Methods:** This cross sectional descriptive study was conducted at Choudry Pervaiz Elahi Institute of Cardiology, Multan. The data of the all the patients who had undergone CABG for unstable angina, between February 2009 and March 2010, was collected and analysed. **Results:** Total 35 patients of unstable angina had undergone CABG (M=29, F=6). Mean age was 58.25±9.62. Sixty five percent of the patients were from New York Heart Association (NYHA) class-IV. Regarding pre-operative risk factors, 35% had diabetes mellitus (DM), 22% had previous Myocardial infarction (MI), 3% had pulmonary Hypertension, 3% had uncontrolled hyperlipidemia, 40% had positive history of smoking, 17% had positive family history of IHD and 82% had triple vessel disease. None of the patients died. Mild ionotropic support was required in 48% of the patients. Two patients had acute confusional state; none of the patients had stroke or renal failure requiring dialysis. However 4 patients had disturbed renal profile. Pulmonary complications occurred in one patient. **Conclusion:** Coronary artery bypass surgery in patients with unstable angina has comparable morbidity and mortality in our setup and should be performed where indicated

Keywords: Unstable angina, CABG, IHD, outcome

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INTRODUCTION

Clinically, recent change in the severity, character, or trigger threshold of chronic stable angina or new-onset angina is labelled as unstable angina. The patho-physiological mechanisms in unstable angina include plaque rupture, platelet aggregation and thrombus formation, causing coronary artery obstruction and myocardial infraction (MI). Unstable angina is further classified depending upon frequency of the pain (I to III) and type of the triggering stimulus (A–C).[1] It is grouped, with non Q wave MI and post infarction angina, as non ST elevation MI (NSTEMI).

The patients with NSTEMI are initially stabilised with drugs and then risk stratification is done which is based on clinical, demographic, electrocardiographic and laboratory findings. If the patient is found to have intermediate or high risk then angiography is done. Some previous randomized trials[2,3] have shown that in patients with unstable angina morbidity and mortality is very high even if these patients undergo Coronary Artery Bypass Grafting (CABG). But many recent randomized controlled trials have shown the benefits of revascularization in high risk patients.[4–8] American Heart Association (AHA) guidelines also recommend CABG in patients with NSTEMI.[9]

Recently there are reports that the mortality and morbidity has decreased significantly because of substantial advances in peri-operative care.[10]

We want to report the morbidity and mortality experienced in our set up, in patients with unstable angina who have undergone CABG.

MATERIAL AND METHODS

This descriptive cross-sectional study was conducted at Choudry Pervaiz Elahi Institute of Cardiology (CPEIC) Multan, a tertiary care hospital for cardiac patients. The data of the all the patients who had undergone CABG for unstable angina, between February 2009 and March 2010, was retrieved from the hospital record and electronic database. A structures *pro forma* was used to collect data.

The data recorded included pre-operative, intra-operative and post-operative variables. Pre-operative variables included age, weight, height, NYHA class, duration of angina, previous history of MI, history of smoking, history of diabetes Mellitus (DM), presence of hypercholesteremia, family history of ischemic heart disease (IHD), body mass index (BMI), blood Sugar, haemoglobin levels, serum creatinine levels, extent of disease, findings of echo, ejection fraction and risk stratification scores. The operative variables included type of CABG, associated procedure, aortic clamp time, intraoperative balloon pump requirement, hypothermia, bypass time, number of grafts and any arrhythmias after aortic unclamping. The post-operative variables included inotropic and mechanical support needed, weaning time, total drainage, the number of blood and

the blood products used post operatively, the neurological status, maximum CK-MB in 24 hours, ICU stay, neurological and renal status of the patient, the pulmonary complication, re-opening and death. Statistical analysis was done by using SPSS-15.

In our setup, all operations are carried out by a team led by a consultant surgeon in our institution. Under general anaesthesia, medial sternotomy is done. Simultaneously, the greater saphenous vein from one of the patient's legs was "harvested" to be used for the bypass procedure. Depending upon the situation, we perform both on pump and off pump CABG. In, on pump CABG, the standard cardiopulmonary bypass (CPB) was established with aortic and 2 stage right atrial cannulae. The local cooling was done with ice slush. Cold blood cardioplegia was given through cardioplegia cannula in the ascending aorta and was repeated every 20 minutes. The grafts were applied using different blood vessels like great saphenous veins and Internal Mammary Arteries (IMA). Depending on the numbers and location of the obstruction grafts were applied. When the grafting is completed aortic cross clamp is removed and top ends of venous grafts are applied on ascending aorta .The heart resumes its activity with re-warming and when effect of cardioplegia is over. Once the heart beats normally the patient is removed from the heart-lung machine and the chest was closed after placing chest drains with controlled suction upon it. The sternum was stabilized with stainless steel wire suture, and the chest and leg wounds were closed with sutures or clips. Patient was shifted to ICU. During ICU stay all patients had invasive and non-invasive hemodynamic monitoring. When they were extubated and hemodynamically stable, they were shifted to high dependency unit on next day.

Primary objective of this study was to evaluate the early postoperative morbidity and mortality of CABG in patients with unstable angina.

RESULTS

Total 35 patients of unstable angina had undergone CABG. Out of them 29 (82.5%) were male and 6 (17.5%) were female. Mean age was 58.25±9.62. Sixty five percent of the patients were from NYHA class-IV. Regarding pre-operative risk factors, 3% had DM, 22% had previous MI, 3% had pulmonary Hypertension, 3% had uncontrolled hyperlipidemia, 40% had positive history of smoking, 17% had positive family history of IHD and 82 % had triple vessel disease.

The results of pre-operative work up and different scoring systems have been shown in table-1. Table-2 shows the findings of the angiography and details of the surgery. Analysis of different intra-operative and post-operative variables showed that the average duration was; CPB time 115±38 minutes, Cxt time 71±29 minutes, ventilation time ±3 hours and ionotropic support time 15±5 hours. Average drainage was 780±438 ml. ICU stay was 4±20 hours while average hospital stay was 7.9±3.1 days. Number of patients who required ionotropic support and the frequency of postoperative complications noted have been shown in table-3 and 4 respectively.

Table-1: Pre-operative work up

Pre-operative Workup	Mean	SD
Hb	15.4314	1.6
CKMB	30.03	3.49
S-Cr	0.97	0.29
Echo findings		
LVEDP	15.39	1.7
LVIDD	49.7	5.0
LVIDS	33.36	7.07
EF-echo	49.06	12.01
Risk stratification		
Par sonnet	6.2	0.86
Add-Euro Score	2.05	0.27
Log-Euro Score	3.02	0.68

Table-2: Variables related with indication of surgery and type of surgery

Variable	Findings	Frequency
LV Function (angio)	Good (>50 %)	15
	Moderate (30–50%)	11
	Poor (<30%)	9
	Unknown	7
Extent of Disease	2- Vessel Dis	6
	3- Vessel Dis	29
Priority	Elective	24
	Emergency	2
	Salvage	0
	Urgent	9
CABG	CABG (Conventional)	33
	CABG (On-pump beating)	1
	OPCAB	1
Valve surgery	CABG Alone	33
	Mitral	2
IABP	Not Required	32
	Pre-op	1 (2.8)
	Per-op	1 (2.8)

Table-3: Need for inotropic support

Inotropic support needed	Number of patients	Percentage
Not required	2	6%
Low dose	17	48%
Intermediate dose	15	43%
High dose	1	3%

Table-4: Post-operative complications

Post-operative complications	Number of patients	Percentage
Pulmonary	1	3%
Neurological	2	6%
Renal complications	4	11%
None	28	80%

DISCUSSION

Because of advancement in percutaneous coronary intervention, the indications of the CABG for acute coronary syndrome have become limited. In 1976 Bertolasi *et al* compared the outcome of the patients with unstable angina with medical and surgical therapy and reported better outcome of surgical intervention[11]. Similar findings were reported by Luchi RJ *et al* in 1987.[12] Anderson *et al* claimed superior results with

thrombolysis in terms of improved survival, lower rates of recurrent angina and fewer recurrent hospitalizations.[13] Nevertheless better outcome has been reported by many other authors' recently.[4-8]

The reported combined morbidity of CABG (Adverse cardiac events) for other indications, is 18.8%[14] while CABG for unstable angina carries morbidity of 5.3% as reported by Caqqeqi *et al* in a recent study.[15] In our study the combined morbidity was bit higher i.e., 19%. Li *et al* has reported incidence of renal morbidity as 28% in overall CABG patients.[16] He has proposed that hypertension; number of grafts and duration of mechanic ventilation are independent risk factors of acute renal injury. In our series the incidence of acute renal injury was 11%. The reported incidence of early reversible neurological complication after CABG is 3.9%[17] while in our study it was 6%. However the incidence of the stroke or the permanent neurological damage was 0%.

The reported mortality after CABG for any other indication is in the range of 7-14% as reported by Oliveira.[18] The reported mortality of CABG in unstable angina, in different series, varies like 11% by Bertolasi *et al*[11], 4.1% by Luchi *et al*[12], 12.2% by Anderson[13] and 7.7% by Boden *et al*[18] and in our series it was 0%.

CONCLUSION

Coronary artery bypass surgery in patients with unstable angina has comparable morbidity and mortality in our setup and should be performed where indicated.

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