ORIGINAL ARTICLE

Bailout Thrombectomy: Its Outcomes in Patients Undergoing Primary Percutaneous Coronary Intervention

MAHBOOB UR REHMAN[1], FARHAN FAISAL[2], AMJAD ABRAR[3], AMJAD ALI SHAH[4], MUHAMMAD SHOAIB[5], MALIK ALI RAZA[6]

[1,2]Assistant Professor, Cardiac Centre Pakistan Institute of Medical Sciences, Islamabad
[3]Associate Professor, Cardiology department, Gomal Medical College Dera Ismail Khan
[4]Senior Medical Officer, Cardiology Department, Saidu Teaching Hospital Swat
[5,6]Registrar Cardiology Department, Pakistan Institute of Medical Sciences, Islamabad
Corresponding Author: Dr Mahboob ur Rehman, Email: drmehboobfcps@yahoo.com, Cell No. 03339229552

ABSTRACT

Aim: To determine the clinical outcomes of patients who received bailout thrombectomy for primary percutaneous coronary intervention.

Study Design: Cross-sectional/observational

Place & Duration: Study was conducted at Cardiac Centre, Cardiology Department, Pakistan Institute of Medical Sciences (PIMS) Islamabad from January 2020 to December 2020 (for one year).

Methods: 200 hundred patients of both genders undergoing primary percutaneous coronary intervention(PPCI)for ST elevation myocardial infarction(STEMI) were analyzed in this study. All patients were divided into two groups. Group A contains 100 patients and received PPCI with bailout thrombectomy and Group B contains 100 patients and received PPCI alone. Informed written consent was taken. Outcomes such as mortality, re-infarction, heart failure, cardiogenic shock, renal impairment, excess bleeding, post procedure stroke and hospital stay were examined and compare between both groups.

Results: In Group A there were 53% males and 47% females with mean age 56.45+10.88 years. In Group B 55% were males and 45% were females with mean age 58.35+9.23 years. In Groups A there were more diabetic patients 45% than Group B 32% (p-value 0.005), Group B had more smokers 60%. There was a significant difference between group A and B regarding family history of coronary artery disease 35% vs 20% (p=0.003). In Group A 3% patients were died and in Group B 2% patients were died with no significant difference. Group A patients had more renal impairment 9% vs 5% and stroke 3% vs 1% than Group B. Hospital stay was high in Group A patients 7.12+2.05 vs 5.34+1.02 days of Group B.

Conclusion: It is concluded that patients received bailout thrombectomy for percutaneous coronary intervention (PCI) had high rate of comorbidities. There was no significant difference in term of mortality between both groups. However, patients with bailout thrombectomy had more renal impairment and post-procedure stroke.

Keywords: ST-segment elevated myocardial infarction, bailout thrombectomy, PPCI, Outcomes

INTRODUCTION

Globally, acute myocardial infarction (AMI) is one of the leading causes of morbidity and mortality in cardiac patients and acute coronary artery thrombosis is the major cause of ST-segment elevated myocardial infarction (STEMI) [1]. In these patients aspiration thrombectomy for primary percutaneous coronary intervention (PPCI) considered a useful management [1-2]. Aspiration thrombectomy is mostly not useful procedure in patients who presented in the early hours after the event occur. Many of studies reported that aspiration thrombectomy had major adverse outcomes in patients presented in early hours [3]. Patients presented late after the event occur the procedure aspiration thrombectomy considered a procedure of choice with better outcomes [3-4].

After the AMI, myocardial blush grade (MBG) and Thrmbolysis In Myocardial Infarction (TIMI) flow is a main predictor of mortality and morbidity. Routine aspiration thrombectomy during PCI in STEMI patients is associated to high rate of stroke [4-6]. Therefore, routine aspiration thrombus is considered not useful procedure in patients with STEMI. [7]. Aspiration thrombus is very effective with very low rate of mortality and cardiovascular morbidity in patients having TIMI thrombus grade>3. Thus, in this condition bailout throbectomyconsideredan effective and useful procedure. Many of studies demonstrated that

bailout thrombectomy for PCI had low mortality rate in patients having thrombus grade>3 [7-9].

The present study was conducted aimed to examine the outcomes of bailout thrombectomy for PPCI in patients presented with acute STEMI and compare the findings with patients who received PCI alone.

METHODS

This cross-sectional study was conducted at Cardiac Centre, Cardiology Department, Pakistan Institute of Medical Sciences (PIMS) Islamabad from January 2020 to December2020(for one year). In this study total 200 patients of both genders with ages above 35 years presented with acute ST-segment elevated myocardial infarction (STEMI) undergoing Primary Percutaneous Coronary Intervention (PPCI) were included. Patients detailed demographic including, age, gender, residence, co-morbidities such as diabetes mellitus, hypertension, smoking history and hypercholesterolemia, history of liver disease and renal disease were examined after taking informed written consent. Patients who were presented late after 24 hours with STEMI, those who required Coronary Artery Bypas Grafting (CABG)and those with no consent were excluded.

All the patients were divided in to two groups. Group A contains 100 patients and received PPCI with bailout

thrombectomy and Group B consist of 100 patients and received primary percutaneous coronary intervention alone. Outcomes such as mortality, re-infarction, heart failure, cardiogenic shock, renal impairment, excess bleeding, post-procedure stroke and hospital stay were examined and compare between both groups.

Data was analyzed by SPSS 20.0. Student t-test and chi-square test was used to compare the outcomes between both groups. Frequencies and percentages were obtained to analyze the values in tabulation form. P-value <0.05 was set as statistically significant.

RESULTS

In Group A there were 53% males and 47% females with mean age 56.45+10.88 years. In Group B 55% were males and 45% were females with mean age 58.35+9.23 years. There were 52% and 45% patients in Group A and B had rural residency while 48% and 55% patients in Group A and B had urban residency. In Group A 45% patients had diabetes mellitus while in Group B 32% had diabetes mellitus. Hypertension found in 35% in Group A and 32% in Group B. Hypercholesterolemia found in 60% and 59% in Group A and B. There were more smokers 60% in Group B than 38% in Group A patients. Liver disease found in 10% and 21% patients in Group A and B. History of renal disease found in 22% and 10% patients in Group A and B. There were no significant difference regarding previous history of coronary artery disease, myocardial infarction and percutaneous coronary intervention (p=>0.05). There was a significant difference between group A and B regarding family history of coronary artery disease 35% vs 20% (p=0.003). (Table 1)

Table No 1. Baseline characteristics of both groups

Characteristics	Group A	Group B	P-value
Mean Age yrs	56.45+10.88	58.35+9.23	0.062
Gender			
Male	53 (53%)	55 (55%)	N/S
Female	47 (47%)	45 (45%)	N/S
Residence			
Rural	52 (52%)	45 (45%)	N/S
Urban	48 (48%)	55 (55%)	N/S
Comorbidities			
Diabetes	45 (45%)	32 (32%)	0.005
Hypertension	35 (35%)	32 (32%)	N/S
Hypercholesterolemia	60 (60%)	59 (59%)	N/S
History of Smoking	38 (38%)	60 (60%)	0.001
History of CLD	10 (10%)	21 (21%)	0.024
History of	22 (22%)	10 (10%)	0.021
Cardiac factors			
History of CAD	8 (8%)	7 (7%)	N/S
History of MI	9 (9%)	8 (8%)	N/S
History of PCI	10 (10%)	11 (11%)	N/S
Family History of CAD			
Yes	35 (35%)	20 (20%)	0.003
No	65 (65%)	80 (80%)	

According to the clinical presentation we found 12% in Group A and 8% patients in Group B had cardiogenic shock. 18% and 15% in Group A and B had Killip class >2 heart failure, 35% patients in Group A had early presentation within 12 hours while 65% patients had late presentation 12 to 24 hours. In Group B 33% patients had early and 67% patients had late presentation. No significant difference between both groups. 54% and 59% patients had anterior myocardial infarction and 36% and 27%

patients had inferior myocardial infarction in Group A and B. (Table 2)

Table No 2. Clinical findings between both groups

Variables	Group A	Group B	P-value
Cardiogenic Shock	12 (12%)	8 (8%)	0.031
Class>2 HF	18 (18%)	15 (15%)	0.049
Early Presentation	35 (35%)	33 (33%)	N/S
Late Presentation	65 (65%)	67 (67%)	N/S
Myocardial Infarction			
Anterior	54 (54%)	59 (59%)	0.046
Inferior	36 (36%)	27 (27%)	0.033

In Group A 3% patients were died and in Group B 2% patients were died with no significant difference. Group A patients had more renal impairment 9% vs 5% and stroke 3% vs 1% than Group B. In Group A and B 5% and 4% patients had NYHA class IV heart failure. In Group A 3% patients found to have excess bleeding and in Group B 2% patients had excess bleeding. Re-infarction found in 4% and 2% patients in Group A and B. Hospital stay was high in Group A patients 7.12+2.05 vs 5.34+1.02 days. (Table 3)

Table No 3. Outcomes of procedure between both groups

Variables	Group A	Group B	P-value
Died	3 (3%)	2 (2%)	N/S
Renal Imp	9 (9%)	5 (5%)	0.04
Stroke	3 (3%)	1 (1%)	0.048
HF	5 (5%)	4 (4%)	N/S
Excess Bleeding	3 (3%)	2 (2%)	N/S
Re-infarction	4 (4%)	2 (2%)	0.049
Hospital stay (days)	7.12+2.05	5.34+1.02	0.02

DISCUSSION

Acute myocardial infarction (AMI) is one of the most common cardiac disorders. In USA about 0.6 million people found to have myocardial infarction categorized as ST elevation myocardial infarction (STEMI)[10]. Every year 0.12 million people have undergo percutaneous coronary intervention [11]. Present study was conducted aimed to examine the outcomes of primary percutaneous coronary intervention (PPCI) with bailout thrombectomy in patients presented with STEMI. In this study we analyzed 200 patients whom were undergoing PPCI. We divided patients into two groups Group A and B. Group A consist of those patients who received bailout thrombectomy for PCI and Group B received PCI alone. We found that There were no significant difference regarding gender and age wise distribution between both groups. These results were similar to some other studies [12-13].

In present study we found that in Group A 45% patients had diabetes mellitus while in Group B 32% had diabetes mellitus. Hypertension found in 35% in Group A and 32% in Group B. Hypercholesterolemia found in 60% and 59% in Group A and B. There were more smokers 60% in Group B than 38% in Group A patients. These results were comparable to some other studies [14-15]. In this study we found a significant difference between group A and B regarding family history of coronary artery disease 35% vs 20% (p=0.003). A study conducted by Mona A alsaidy [16] reported no difference in term of family history of coronary artery disease.

In present study Group A patients had more cardiogenic shock and killip class >2 heart failure than the patients treated PCI alone. These results were similar to

other study in which patients who received bailout thrombectomy for PPCI had increase rate of cardiogenic shock [17].

In our study we found In Group A 3% patients were died and in Group B 2% patients were died with no significant difference. These results were similar to some other studies in which no major difference was found in term of mortality between patients who received aspiration thrombectome and patients who received PCI alone [18]. We found that group A patients had more renal impairment 9% vs 5% and stroke 3% vs 1% than Group B. In Group A and B 5% and 4% patients had NYHA class IV heart failure. In Group A 3% patients found to have excess bleeding and in Group B 2% patients had excess bleeding. Re-infarction found in 4% and 2% patients in Group A and B. Hospital stay was high in Group A patients 7.12+2.05 vs 5.34+1.02 days. These results were comparable to some other studies [19-20].

CONCLUSION

We concluded that patients received bailout thrombectomy for percutaneous coronary intervention had high rate of comorbidities. There was no significant difference in term of mortality between both groups. However, patients with bailout thrombectomy had more renal impairment and post-procedure stroke. More patients had major bleeding and length of hospital stay was also high in patients who received bailout thrombectomy.

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