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OUTCOMES OF PRIMARY PERCUTANEOUS CORONARY INTERVENTION WITH AND WITHOUT POST DILATATION IN PATIENTS WITH ST SEGMENT ELEVATION MYOCARDIAL INFARCTION.

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ABSTRACT

Introduction: It is debatable how SPD (stent post-dilatation) work during PPCI (primary percutaneous intervention). It is up to the operator to decide when to execute stent after dilatation because there are currently no definitive rules or general agreement on the subject. **Objective:** To assess the results of PPCI (primary percutaneous coronary intervention) in participants having ST segment elevation myocardial infarction with as well as without post-dilatation. **Methodology:** This retrospective analysis research was performed in Hayatabad medical complex, Peshawar, Pakistan after the approval from the institutional and ethical review board. The study included 180 patients, both sexes, ages 18 to 70 years, who received primary percutaneous coronary intervention due to STEMI. The patients' various characteristics, such as DM, HTN (hypertension), CKD (chronic kidney disease), BMI, smoking history, the location of the MI, blood pressure, the type of artery, and the TIMI flow before and after the procedure, were recorded in an excel sheet. **Results:** Regarding the culprit artery, there wasn't a scientifically significant distinction between the two categories; group 1's left anterior descending artery (LAD) was observed in 50 (55.5%) cases & in group 2 in 49(54.4%) cases. Right coronary artery (RCA) in group 1 in 31(34.4%) and 27(30%) in group 2. Left circumflex artery (LCX) in group 1 was noted in 17(18.9%) and 19(21.1%) in group 2. The use of thrombus aspiration catheters was greater in group 2 than in group 1, with 24 (26.7%) compared to 15 (16.7%). GP IIb/IIIa inhibitors were given to 20 (22.2%) individuals in group 2 compared to 18 (20%) patients in group 1. Patients in groups 1 and 2 had substantially larger pre-stenting balloon dilatation, 44 (48.9%) and 11 (12.2%), respectively. In both groups, every patient got DES (drug-eluting stents). **Conclusion:** In patients with STEMI, selective postdilation enhanced some angiographic and clinical outcomes, and it could not be discouraged from being used in the primary percutaneous coronary intervention.

Key words: PPCI, SPD, LAD, LCX, TIMI

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INTRODUCTION

The use of coronary stents in people having STEMI (ST segment elevation myocardial infarction) has grown into a reliable & popular initial option..[1,2] After primary percutaneous coronary intervention, improper post-dilatation may increase the risk of both short and long-term complications such as stent thrombosis and re-stenosis.[3,4] About two thirds of patients still have difficulty achieving optimum myocardial perfusion even after the culprit vessel has been opened.[5] Micro-vascular malfunction post percutaneous coronary intervention is improved by post dilatation with a non-compliant balloon, which may lower the happening of no re-flow proceedings.

No re-flow is a frequent occurrence in ill patients following PPCI (primary percutaneous coronary intervention), which may cause more cellular damage to the heart and affect the prognosis over the lengthy period.[6,7] suggestions for Post-primary percutaneous coronary intervention post-dilatation is still unclear.[8] Post-dilatation following percutaneous coronary intervention may lessen both short-term and long-term problems, according to research7. However, if post dilatation is performed at very high pressure, it may potentially enhance myocardial damage and have unfavorable effects on the outcome.[9,10]

It is still debatable how post dilatation should be used after PPCI (primary percutaneous coronary intervention) in patients with STEMI. While some research predict positive results, others advise against performing it. In our population, post dilatation is typically not done. Therefore, we will undertake post dilatation in this study's cohort and track its results, as in our setup especially in Peshawar, no similar study has been conducted over the past couple of years.

Materials and Methods

This retrospective analysis study will be performed in Hayatabad medical complex, Peshawar, Pakistan after the approval from the institutional and ethical review board. The study included 180 patients, both sexes, ages 18 to 70 years, who received primary percutaneous coronary intervention due to STEMI. The patients' various characteristics, such as DM, HTN (hypertension), CKD (chronic kidney disease), BMI, smoking history, the location of the MI, blood pressure, the type of artery, and the TIMI flow before and after the procedure, were recorded in an excel sheet. The study comprised all STEMI patients who underwent primary percutaneous coronary intervention and had successful stent insertion. Bifurcation stenting, fibrinolytic therapy, no stent placement, and cardiogenic shock patients were excluded from the study.

Subjects were distributed equally between two groups. Group 1: Consisting of 90 STEMI patients they experienced PPCI (primary percutaneous coronary intervention) with stent post dilatation (SPD). Group 2: Consists of 90 STEMI patients who had PPCI without having post-dilatation. Typical chest pain that is unresponsive to nitroglycerin, ST-segment elevation of at least 1 millimeter in two consecutive precordial leads, 2 millimeters in two consecutive limb leads, or the appearance of a new left bundle branch

block are all signs of a STEMI. And over 70percent non-left main coronary artery stenosis and 50percent left main coronary artery stenosis are considered an important coronary artery illness.

The definition of in-hospital mortality is death due to cardiovascular causes following a main percutaneous coronary intervention operation. If the left ventricle ejection fraction was less than 40% or if the ejection fraction was preserved but there were echocardiographic, laboratory, and clinical signs of heart failure, the patient would be regarded to have heart failure. GFR less than 60 ml/min/1.73 m2 was deemed chronic renal failure. A rise in serum creatinine of at least 0.5 mg/dl or at least 25% from baseline within the first 48 to 72 hours following contrast delivery was considered contrast-induced nephropathy. After that, the data will be exported to SPSS. For categorical variables, the chi square will be used, whereas the unpaired t-test will be used for continuous variables. Statistics will be considered significant if the P value is <0.05.

RESULTS

In group 1 single vessel disease was found in 55(61.1%) and multi-vessel disease in 35(38.9%), while in group 2 single and multi-vessel disease were noted in 63(70%) & 27(30%) respectively.

Regarding the culprit artery, there wasn't a statistically substantial distinction among the two groups; group 1's left anterior descending artery (LAD) was observed in 50 (55.5%) cases & in group 2 in 49(54.4%) cases. Right coronary artery (RCA) in group 1 in 31(34.4%) and 27(30%) in group 2. Left circumflex artery (LCX) in group 1 was noted in 17(18.9%) and 19(21.1%) in group 2. The use of thrombus aspiration catheters was greater in group 2 than in group 1, with 24 (26.7%) compared to 15 (16.7%). GP IIb/IIIa inhibitors were given to 20 (22.2%) individuals in group 2 compared to 18 (20%) patients in group 1. Patients in groups 1 and 2 had substantially larger pre-stenting balloon dilatation, 44 (48.9%) and 11 (12.2%), respectively. Across both categories, every patient had drug-eluting stents (DES).Table-1

Table-1: Characteristics of the study population

Characteristics	Group 1		Group 2		P value
Single vessel disease	55	61.1%	63	70%	0.071
Multi vessel disease	35	38.9%	27	30%	0.063
LAD	50	55.5%	49	54.4%	0.911
RCA	31	34.4%	27	30%	0.065
LCX	17	18.9%	19	21.1%	0.062
Thrombus aspiration	15	16.7%	24	26.7%	0.066
GPIIb/IIIa	18	20%	20	22.2%	0.091
Pre stenting balloon dilatation	44	48.9%	11	12.2%	0.003

Higher incidence of no-reflow was noted in group 1 than in group 2, 14(15.6%) Vs 8(8.9%). Group 1 in 1 (1.1%) had thrombolysis in myocardial infarction (TIMI) flow 0 in the culprit artery at the conclusion of the operation and 2(2.2%) in group 2, TIMI flow I in 5(5.5%) in group 1 and 4(4.4%) in group2, TIMI flow II in group 1 in 23(25.5%) and 25(27.8%) in group 2, TIMI flow III in 43(47.8%) in group 1 and 19(21.1%) in group 2 respectively.

The incidence of re-infarction occurred in 11(12.2%) of group 1and 15(16.7%) in group 2. Target vessel revascularization (TVR) were significantly higher in patients of group 2 as compared to group 1, 13(14.4%) and 9(10%). There was no significant difference between the two groups regarding the incidence cerebrovascular stroke 6(6.7%) & 4(4.4%), heart failure, 8(8.9%) and 7(7.8%) or cardiac death 1(1.1%) and 1(1.1%) respectively. Table-2

Table-2: Outcome of the study

Outcome	Group 1		Group 2		P value
	Frequency	%age	Frequency	%age	
TIMI flow0	1	1.1%	2	2.2%	0.073
TIMI flowI	5	5.5%	4	4.4%	0.091
TIMI flowII	23	25.5%	25	27.8%	0.962
TIMI flowIII	43	47.8%	19	21.1%	0.001
No reflow	8	8.9%	14	15.6%	0.001
Re-infarction	11	12.2%	15	16.7%	0.05
TVR	9	10%	13	14.4%	0.05
Cerebrovascular stroke	6	6.7%	4	4.4%	0.710
Heart failure	8	8.9%	7	7.8%	0.800
Cardiac death	1	1.1%	1	1.1%	0.991

DISCUSSION

After primary percutaneous intervention, proper stent placement has been shown to predict superior short- and long-term outcomes.[11] Percutaneous intervention with stent post-dilatation (SPD) In the era of drug-eluting stents (DES), offers complete stent expansion, preventing mal-opposition, the primary cause of stent thrombosis and restenosis.[12-13]

Regarding when to do post dilatation, there are currently no definitive rules or basic consensus, so it is up to the operator. Although post-dilatation has the obvious advantages of lowering the incidence of in-stent restenosis and stent thrombosis, it has also been linked to significant adverse events as edge dissection and perforation.[14] The risk of distal embolization and, consequently, the likelihood of no reflow phenomenon after primary percutaneous coronary intervention are both increased by post dilatation, according to prior studies.[15]

The justification for this investigation was that earlier studies had shown conflicting data about the advantages of post-dilatation, and those earlier studies had omitted patients who had STEMI. We therefore set out to assess the short- and long-term effects of stent post-dilatation following primary percutaneous coronary intervention in this research.

In our study, group 2 had a considerably

greater incidence of no reflow than group 1 (15.6% vs. 8.9%, p=0.001). The use of intracoronary vasodilatation resulted in transitory impairment of TIMI flow after post dilatation, but there was no obvious difference between the two groups in terms of the ultimate TIMI flow. In contrast to our findings, Yamaji et al found a higher prevalence of no reflow following post-dilatation, and they hypothesized that stent overexpansion, fissure, or dissection were the most likely causes of this occurrence.[16] Additionally, a prior study by Karamasis G demonstrated that stent overexpansion is linked to a higher risk of mortality.[17] Soyiu K[18] et al noted that stent post dilatation after primary percutaneous coronary intervention did not increase the rate of no reflow, which is similar to our results.

Our study's key findings were that patients in group 2 had a significantly higher incidence of re-infarction than those in group 2 (16.7% vs. 12.2%, p=0.05), as well as a significantly higher need for TVR (14.4% vs. 10%, p0.05), while there was no significant difference between the two groups in terms of cardiac death, heart failure, or stroke. These findings are in line with the majority of research that have examined the effects of primary percutaneous coronary intervention stent post-dilatation. They came to the conclusion that, except from a higher incidence of TVR, there were no notable changes in the clinical outcomes between the two patient groups.[19-20]

LIMITATION

The current study had a few limitations. First off, this was an non-randomized trial study in which the choice of whether to perform a stent after dilatation was left up to the discretion of the operator. In addition, only a small percentage of patients who experienced a new event or severe symptoms were recommended for follow-up coronary angiography, and finally, the sample size was rather small. Additional randomized studies are required, with a larger sample size and longer follow-up.

CONCLUSION

In patients with STEMI, selective postdilation enhanced some angiographic and clinical outcomes, and it could not be discouraged from being used in the primary percutaneous coronary intervention.

Ethics approval: The ERC gave ethical review approval

Consent to participate: written and verbal consent was taken from subjects and next of kin

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