

**Primary percutaneous coronaries intervention in Al-Hussein
teaching hospital , Samawah , Iraq , 1\1\2020 – 1\11\2021 .**

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ABSTRACT

Aim :We wanted to assess our experience in P-PCI in Samawah coronary catheterization unit regarding success and complications .

Methods : We followed our 317 cases during the period from 1\1\2020 till 1\11\2021 regarding gender , age groups , arteries involved , culprit arterial segment , comorbidities , success rate and mortalities whom were subjected for P-PCI .

Results: From our 317 cases studied male were 74.76% , females were 25,23% . _regarding arteries involved : LAD(54.25%) , LCX (8.5%) , RCA(32.80%) , diagonal(0.31%) , OM(2.83%) , PDA(0.94%) , Ramus(0.31%) . _regarding segment involved LAD : ostial (5.99%) , proximal (17.98%) , mid(29.65%) , distal (0.94%) ,LCX (0.31%) (2.83%) (5.36%) (1.89%) . RCA : 0.63% , 10.0 % , 16.40 % , 5.36% in sequence . OM : proximal (1.57%) , mid (1.26%) , diagonal :ostial (0.31%) , Ramus : proximal (0.3%) , PDA: ostial (0.31%) .

regarding S. cholesterol increased in :81.7% , increased triglyceride in :74.66% , increased LDL :30% , decreased HDL :93.33% , increased mixed cholesterol and triglyceride in 77% , regarding hypertension high systolic BP :92% , high diastolic BP in :58 % , high both in :54% , DM:90% , smoking :56.8% , success rate :99.05% , mortalities: 0.94% .

conclusion : P-PCI is very helpful and highly successful in achieving , complete revascularization of the culprit artery especially if performed very early since the onset of complaint and we can avoid remodeling and late bad sequelae's of acute myocardial infarction .

Key word : P-PCI : primary percutaneous coronary intervention

Background

Primary percutaneous coronary intervention, where available, has become the therapy of choice in myocardial reperfusion during ST-elevation myocardial infarction. However, in a significant proportion of patients, owing to a high thrombus burden, myocardial perfusion is not fully achieved in the epicardial vessel. This phenomenon has been attributed predominantly to the distal embolization of thrombus particles and atherosclerotic plaque debris resulting in an association with poorer short- and long-term outcomes, including heart failure and death. Pharmacological measures, such as adequate antiplatelet therapy, glycoprotein IIb/IIIa antagonists and coronary vasodilators, have been employed with the aim of reducing this phenomenon, with limited success. This clinical need has led to the development of devices dedicated to evacuating or trapping thrombus during intervention to reduce the risk of distal embolization during percutaneous coronary intervention. Controversies regarding the benefits that have been achieved with the use of these devices and additional novel approaches, such as the mesh covered stent, will be discussed in this article. (1)

The superiority of primary percutaneous coronary intervention (PPCI) over conventional thrombolytic treatment for ST-elevation myocardial infarction (STEMI) has been demonstrated in randomized controlled

trials (RCTs). This has resulted in it becoming the treatment of choice when available. (1)

Coronary reperfusion with primary percutaneous coronary intervention (PCI) improves outcomes in patients with acute ST elevation myocardial infarction (MI), an MI with a new or presumably new left bundle branch block, or a true posterior MI if performed in a timely fashion. (2)

Methods

We followed our 317 cases of acute MI during the period from 1\1\2020 till 1\11\2021 whom had been admitted into CCU in Al-Husseini teaching hospital , Samawah \ Iraq whom submitted to primary PCI , regarding gender , age groups , arteries involved , culprit arterial segments , comorbidities , success rates and mortalities .

Results

Regarding gender , age groups , arteries involved we studied 317 cases :

Table 1

Male : 237 (74.76%)				Female : 80 (25.23%)			
Thrombotic lesions 208 (65.61%)				Non thrombotic lesions 109 (34.38%)			
Arteries involved	LAD	LCX	RCA	Diagonal	OM	PDA	RAMUS
	172 (54.25%)	27 (8.5%)	104 (32.80%)	1 (0.31%)	9 (2.83%)	3 (0.94%)	1 (0.31%)
Age	20-30	31-40	41-50	51-60	61-70	71-80 ys	

groups	ys	ys	ys	ys	ys	
	7 (2.20%))	15 (4.73))	78 (24.60))	124 (39.11))	83 (26.18))	17 (5.36%)

Arterial segments involved (table 2)

	Ostial	Proximal	mid	distal
LAD	19 (5.99%)	57(17.98%)	94 (29.65%)	3 (0.94%)
LCX	1 (0.31%)	9 (2.83%)	17 (5.36%)	6 (1.89%)
RCA	11 (0.63%)	23 (10.09%)	52 (16.40%)	17 (5.36%)
OM		5 (1.57%)	4(1.26%)	
diagonal	1 (0.31%)			
Ramus		1 (0.31%)		

Comorbidities table 3

Lipids	↑ cholesterol	↑ Triglyceride	↑ LDL	↓ HDL	↑ Cholesterol & triglyceride
	81.7 %	74.66%	30%	93.33%	77%
Hypertension	↑ Systolic BP		↑ Diastolic BP	↑ Both	
	92%		58%	34%	
Diabetes mellitus	90%				
Family history	Positive in 38%				
Smoking	Positive in 56.8 %				

Success and mortalities table 4

success	314 (99.05%)
mortalities	3 (0.94%)

Discussion

During the period between 1\1\2020 – 1\11\2021 we performed 317 cases of P-PCI in Samawah center for cath. Lab. We will discuss the results and in comparison with other studies accounted in other places .

We performed almost our cases of P-PCI through Rt.F.A approach and there were problems regarding sheath and dilater insertion we reverted to radial approach although it was stated in one study that Bleeding complications are common in patients with ST elevation myocardial infarction (STEMI) and they predict a worse prognosis . Many of these major bleeds occur in relation to the access site for percutaneous coronary intervention (PCI), particularly when the femoral artery is used. (2)

We had no facilities to perform intravascular ultrasound (IVUS) and optical coherence tomography (OCT) whereas it is accounted that the role of adjunctive intravascular imaging techniques, such as intravascular ultrasound (IVUS) and optical coherence tomography (OCT), has not been established in patients with primary PCI. Several registries have found discordant results. In the ADAPT-DES study in which 813 STEMI patients were enrolled, IVUS use was associated with improved outcomes in STEMI patients .In the CREDO-Kyoto AMI Registry, 3028 patients with STEMI underwent PCI with or without IVUS. Following risk adjustment, there was no difference in target vessel failure between the groups (adjusted hazard ratio =1.14; CI 0.86-1.51) .However, the risk of stent thrombosis was lower with IVUS guidance. Likewise, a randomized, multicenter trial of angiographic compared with OCT-guided drug-eluting stent placement found that OCT-guidance did not reduce the incidence of major adverse cardiac events. OCT guidance led to post-PCI stent optimization in 29 percent of patients . (2)

All our patients whom dealt with P-PCI had not been given thrombolytic therapy before PCI as a policy of a pharmaco-invasive strategy and in this aspect it was mention that In the recent Strategic Reperfusion Early After Myocardial Infarction (STREAM) trial, a pharmaco-invasive strategy with tenecteplase (half dose in the elderly), clopidogrel, and enoxaparin,

and including angiography between 6 and 24 hours or rescue PCI, was compared with standard primary PCI in almost 1900 early presenting patients who could not undergo primary PCI within 1 hour. Patients were randomly assigned in the ambulance or the emergency department of a community hospital. At 30 days, the pharmaco-invasive approach was associated with a 2% lower incidence of death, shock, congestive heart failure, or reinfarction when compared with primary PCI, which was not statistically significant. At 1-year follow-up, total and cardiac mortality rates were very similar. (3)

Regarding stent thrombosis after P-PCI we faced 3 cases (0.94%) . one of them the patient stopped his treatment the day after the procedure and presented with re-infection after 6 days the second patient stopped his treatment for 16 days and presented with re-infection , and on repeated the PCI it was very difficult to open culprit lesion successfully as if the clot had been organized since along time . the 3ed case the patient presented with extensive anterior MI and P-PCI had been done and during the procedure it was found that his previous RCA stent which had been deployed before 3 months also through P-PCI had been thrombosed because he was reluctant to continue on his DAP therapy , and in this aspect it was said in one article that . Primary percutaneous coronary intervention (PCI) is the preferred treatment for patients with ST-segment elevation myocardial infarction (STEMI) owing to improved vessel patency, decreased infarct size, lower rates of reinfarction, and improved survival compared with pharmacological reperfusion. However, stent thrombosis (ST) remains a major concern among STEMI patients with an excess 3- to 4-fold increased risk compared with PCI in an elective setting. (4)

We performed 317 cases of P-PCI and the success rate was (99.05%) so it was said that Primary percutaneous coronary intervention (p-PCI) has become the dominant reperfusion treatment for ST-elevation acute myocardial infarction (STEMI). (5)

Also it was added in the same article that During the last three years (2003-5) primary percutaneous coronary intervention (p-PCI) has become the dominant reperfusion treatment for ST-elevation acute myocardial infarction (STEMI) in most European countries. With this change in the organization of acute coronary care many practical questions arise. (5)

We had not practiced a policy of a (lytic facilitated PCI) and in one study it was established that Thrombolytics are not indicated in this setting. The concept of "lytics-facilitated PCI" has been proved to be inferior compared to simple primary PCI strategy by several randomized trials (LIMI, PRAGUE, ASSENT-4 PCI). The explanation is complex: more strokes and more reinfarctions (stent thrombosis) after "facilitated PCI", rather short "ECG - PCI" time delays in primary PCI patients (short delay makes additional benefit from lytics unlikely), etc. (5)

During the procedure of P-PCI we used UFH and in comparison it was stated that Low molecular weight heparins have no evidence to support their use over UFH for PCI in STEMI. (5)

At one occasion of PCI we faced a patient with extensive anterior MI presented with 3 episodes of VF and his C.A. revealed total proximal occlusion . we tried to use different sized balloons but we got no more than TIMI (1) and the patient got dyspneic so we abounded the procedure and sent him to CCU . we put him on Aspirin 300 mg , Ticagrelor 180 mg

+ enoxaparin 6000 I.U *2 \daily for 7 days and after that the C.A repeated which showed completely normal study . we had not used intra coronary lytic therapy . in this aspect it is account in one study that We specifically warn against the "bailout" use of thrombolytics in the catheterization -lab in efforts to recanalized the infarct arteries when primary PCI fails. The success rate of primary PCI in achieving TIMI 2-3 flow in the infarct vessel is 90-95%. In those few patients in whom primary PCI fails to open the vessel, there is a very small likelihood that thrombolytics will be successful. The opposite is true: the unsuccessful PCI is frequently associated with vessel dissection or even guide wire penetration outside the vessel. This usually has no clinical consequences unless lytics are used. When lytics are given to a patient with failed primary PCI, cardiac tamponade may be the final result of this effort . (5)

Many patient refusing P-PCI and asking for alternative so we performed a thrombolytic therapy but the fibrinolytic lyses the clot and not achieve total recanalization of the culprit lesion . I comparison one study accounted that Primary percutaneous coronary intervention (PPCI) with stenting has become the standard reperfusion strategy for the treatment of ST-segment-elevation myocardial infarction (STEMI) and it achieves superior outcomes compared to thrombolysis or balloon PCI alone. Yet, thrombolysis remains an effective reperfusion strategy, especially in the many parts of the world where PPCI is not available or geographical limitations prohibit timely access to it. (6) . in the same study it is declared that). Primary PCI is effective in securing and maintaining coronary artery patency and avoids some of the bleeding risks of fibrinolysis. The advantages of primary PCI over fibrinolysis

include lower rates of early death, reinfarction, and intracranial hemorrhage . (6)

We preferred direct stenting in our cases if the situations permit and in case of stenting we used only DAS . we used Ticagrelor nearly in most of our cases for one year in addition of Aspirin for a life as DAP therapy , and in comparison it is stated in the same study that The use of stent over balloon angioplasty alone (Pinto et al., 2011; Steg et al., 2012) should be preferred because it reduces the incidence of restenosis and the rate of reintervention. For the same reason, stents coated with medication (drug-eluting stents) should be preferred to bare-metal stents. However, since drug-eluting stents carry a high risk of intracoronary acute thrombosis, prolonged DAPT is mandatory in all patients receiving drug-eluting stents. Thus, drug-eluting stents should be preferred over bare-metal stents if the patient has no contraindications to prolonged DAPT . (6)

We used aspiration thrombectomy in 12 out of our 317 cases of P-PCI and it is stated in the above article that During PCI, it can be reasonable to perform aspiration thrombectomy; but routine thrombectomy does not reduce mortality, recurrent myocardial infarction, heart failure, or cardiogenic shock, and might increase the risk of stroke within 30 days . (6)

Our total mortality was (0.94%) 3 death out of 317 cases of P-PCI performed while in one study and for comparison it was accounted (7) that Total all cause in hospital mortality was 12.9% (48 deaths).

We faced no complications regarding vascular access and in the same study above (7) it was declared that Complications related to vascular access were infrequent with only 2.7% having local hematomas. All of

them were managed conservatively and none required transfusion or re intervention for the same. There were no pseudoaneurysm or AV fistulas.

Re-infection had not been recorded in our cases during the index hospital stay while in the above article (7) it was said that Two patients had re-infarctions in the same territory during the index hospital stay and were caused by subacute stent thrombosis. Both were managed successfully with balloon angioplasty.

Conclusion

Primary PCI is very helpful and highly successful in achieving a complete revascularization of the culprit artery especially if performed very early since the onset of complaint and we can avoid remodeling and late bad sequelae's of acute myocardial infarction .

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References

- 1 : Tatyana Weitsman; David Meerkin , Primary Percutaneous Coronary Intervention , Interv Cardiol. 2013;5(3):289-300.
- 2 : C Michael Gibson, Joseph P Carrozza , Roger J Laham, Primary percutaneous coronary intervention in acute ST elevation myocardial infarction: Periprocedural management , Oct 2021.
- 3 : peter R. Sinnaeve , Frans Van de Werf , Primary Percutaneous Coronary Intervention Not Always the Best Reperfusion Strategy? , 2014;129:1623–1625 .

4 : Lorenz Räber , Stephan Windecker , Primary Percutaneous Coronary Intervention and Risk of Stent Thrombosis , 2011;123:1709–1712 .

5 : Prof. P. Widimsky , Primary PCI in the treatment of acute ST elevation myocardial infarction , Vol. 4, N° 18 - 18 Jan 2006 .

6 : Konstantinos Toutouzas, Dimitris Tousoulis , Primary Percutaneous Coronary Intervention , Journal of the American College of Cardiology 2018 .

7 : Gajendra Dubey ,Sunil Kumar Verma, Vinay Kumar Bahl , Primary percutaneous coronary intervention for acute ST elevation myocardial infarction: Outcomes and determinants of outcomes: A tertiary care center study from North India , online 2016 Nov 30. doi: [10.1016/j.ihj.2016.11.322](https://doi.org/10.1016/j.ihj.2016.11.322) .