



## SIX MONTH FOLLOW UP OF ST SEGMENT ELEVATION MYOCARDIAL INFARCTION WITH TOTAL OCCLUSION OF INFARCT RELATED ARTERY WITH OPTIMUM MEDICAL THERAPY

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**ABSTRACT** **Background:** Delayed PCI of a totally occluded infarct artery 24 hours after STEMI should not be undertaken in clinically stable patients without evidence of severe ischemia. Some study shows that PCI in occluded artery after MI in stable patients did not reduce the occurrence of death, reinfarction, or heart failure. In addition, there was an excess reinfarction in the PCI arm. **Methods:** Study conducted in a tertiary hospital in eastern India, patients who are admitted in cardiology ward, who met the inclusion and exclusion criteria were put on optimal medical therapy at their maximum tolerable doses unless contraindicated. Patients and follow up for 6 months with clinical and echocardiography measurements. Data will be analyzed by standard statistical method by applying SPSS-19 software. **Result:** Total 105 patients were enrolled. During visit at 6 months 46% patients were asymptomatic and rest presented with Shortness of breath. Among this 46% of patients 20% had NYHA class II and 34% had class III symptoms. 46% had mild, 11% had moderate RWMA and 43% had severe RWMA. 27% had no MR, 41 had grade 1 and rest 32% had grade 2 MR. During the period of 6 months follow up readmission due to cardiovascular reason in 2nd visit was in 9 patients (9%) and non fatal MI occurs in 4 patients (4%). **Conclusions:** Early and timely revascularization is beneficial for the patient till myocardium is viable. But delayed revascularization is of questionable benefit. In spite of optimum medical therapy patients with total occlusion of IRA and non viable myocardium developed progressive remodeling. Shortness of breath was predominant symptoms in follow up.

**KEYWORDS :** St Segment Elevation Myocardial Infarction, total Occlusion Of Infarct Related Artery, optimal Medical Therapy

### INTRODUCTION

2013 ACCF/AHA Guideline for the Management of ST-Elevation Myocardial Infarction the benefits of routine PCI of an angiographically significant stenosis in a patent infarct artery 24 hours after STEMI are less well established. Delayed PCI of a totally occluded infarct artery 24 hours after STEMI should not be undertaken in clinically stable patients without evidence of severe ischemia. (1) In several observational studies, a patent infarct-related artery during hospital discharge was associated with improved clinical outcomes. (2),(3),(4) Several randomized trials compared percutaneous coronary intervention (PCI) versus medical therapy (MED) for total occlusion late after MI. (5),(6). Although not definitive, potential improvements in left ventricular function and clinical events suggested that late opening of occluded arteries should be seriously considered. However, in Occluded Artery Trial (OAT), the PCI carried out in stable patients 3 to 28 days after MI did not reduce the occurrence of death, reinfarction, or heart failure. In addition, there was an excess reinfarction in the PCI arm during follow-up. (7) The Total Occlusion Study of Canada 2 (TOSCA-2) sub study of OAT also found no benefit of the PCI strategy in terms of left ventricular function. (8)

### AIMS AND OBJECTIVES:

Follow up of patients who are asymptomatic following MI, electrically and haemodynamically stable regarding their clinical status, LV function, change of coronary anatomy. Specific objectives: Clinical outcome in the form of death, myocardial infarction, heart failure NYHA class III or IV, Remodeling and Functional outcome like Left ventricular ejection function, Right ventricular ejection function, Chamber dimensions, diastolic function.

### MATERIALS AND METHODS:

Study conducted in a tertiary hospital in eastern India patient who are admitted in cardiology ward, Patients included if coronary angiography performed 3 to 28 days after STEMI, showed total occlusion of the infarct-related artery. The qualifying period of 3 to 28 days was based on calendar days; day 1 was the day of the onset of symptoms. Patients with NYHA class III or IV heart failure, dynamic ST changes, deranged renal function, cardiogenic shock, angio-

graphically significant LMCA and triple vessel disease, significant angina are excluded from this study. Patients who met the inclusion and exclusion criteria were put on optimal medical therapy including aspirin, clopidogrel, anticoagulation (Warfarin) if indicated, angiotensin-converting-enzyme inhibitor (Ramipril), beta blocker (metoprolol succinate), and lipid-lowering therapy (atorvastatin), at their maximum tolerable doses unless contraindicated. Patients are included in the study for 1 year and follow up for 6 months with clinical and echocardiography measurements. Data will be analyzed by standard statistical method by applying SPSS-19 software

### RESULTS AND ANALYSIS:

This study was done in Department of Cardiology and followed up for six months. Total 105 patients were enrolled. 5 patients could not be traced after discharge following first admission with STEMI. Rest 100 patients were extensively followed up. Coronary angiography was done to all patients and discharged with optimum medical therapy. Every patient was evaluated at 6 months clinically and echocardiographically

Among 100 patients 78 were male (78%) and 22 (22%) were female, 32 (32%) were below 50 years, 34 (34%) were between 51 to 60 years and 34 (34%) were above 60 years. 54 (54%) were anterior wall myocardial infarction (AWMI), 35 (35%) were inferior wall MI (IWMI) and rest (11%) were IWMI with Right ventricular involvement. 46 (46%) patients received thrombolysis with streptokinase, rest were non thrombolysed either due to late presentation or presence of absolute contraindication. During time of 1st admission 57 (57%) patients had moderate regional wall motion abnormality (RWMA) and rest (43%) had severe RWMA. Among 100 patients of STEMI and among 46 patients of IWMI (including RVMI) 23 patients showed poor RV function on Echocardiography. On angiography, LAD remained the IRA infarct related artery in 54%, RCA in 35% and Left circumflex in rest of the cases. During visit at 6 months 46% patients were asymptomatic and rest presented with Shortness of breath, none of them presented with significant chest pain. Among this 46% of patients 20% had NYHA class II and 34% had

class III symptoms. About RWMA 46% had mild RWMA, 11% had moderate RWMA and 43% had severe RWMA. Regarding mitral regurgitation at 6 months 27% had no MR, 41 had grade 1 MR and rest 32% had grade 2 MR. Out of 100 patients at 6 months 66 patients survived from development of NYHA class III/IV heart failure symptoms.

During the period of 6 months follow up readmission due to cardiovascular reason in 2nd visit was in 9 patients (9%) and non fatal MI occurs in 4 patients (4%).

One sample t test were done among progression of change of ejection fraction (EF), LVIDd, LVIDs,  $e'$  and  $E/e'$  in successive follow up. All of the parameter shows statistically significant correlation ( $p < 0.05$ ). Mean LVIDd in AWMI in follow up visit  $51 \pm 1.68$  and  $64.71 \pm 6.41$ , in IWMI  $47.35 \pm 0.95$ ,  $49 \pm 2.37$ , in IWMI + RVMI

$44 \pm 1.46$ ,  $5 \pm 2.87$ . These changes are found to statistically significant ( $p < 0.05$ ). Mean LVIDs in AWMI in follow up visit  $36.53 \pm 1.01$  and  $50.95 \pm 8.24$ , in IWMI  $32 \pm 1.66$ ,  $35.6 \pm 1.22$ , in IWMI + RVMI  $34 \pm 1$ ,  $33.22 \pm 2.87$ . Mean  $e'$  in AWMI in follow up visit  $8.4 \pm 4$  and  $6 \pm 4$ , in IWMI  $12 \pm 9.5$

$12 \pm 3.7$ , in IWMI + RVMI  $12 \pm 1.12$ ,  $2 \pm 2.87$ . Mean  $E/e'$  in AWMI in follow up visit  $16 \pm 1.6$  and  $28 \pm 1.4$ , in IWMI  $10 \pm 0.95$ ,  $12 \pm 0.37$ , in IWMI + RVMI  $12 \pm 1.02$ ,  $12 \pm 1.87$ . Similarly the changes in LVIDs,  $E/e'$  and  $e'$  all found to be statistically significant ( $p < 0.05$ ).

#### DISCUSSION:

Pfeffer MA, Braunwald E<sup>(9)</sup> In their study the 100 patients who were stable haemodynamically and electrically at the time of recruitment developed left ventricular remodeling, deterioration of systolic dysfunction with gradual diminution of ejection fraction as well as diastolic dysfunction on further visit which were found to be statistically significant. OAT study<sup>(7)</sup> showed maximum ventricular remodeling was found to be in AWMI patient, maximum left ventricular dilatation, maximum left atrial dilatation, maximum deterioration of  $e'$  as well as elevation of  $E/e'$  were found in AWMI patient. OAT study<sup>(7)</sup> also demonstrated that occurrence of angina declined gradually. Horie et al<sup>(10)</sup> showed 10 times more episode of heart failure in comparison to PCI group. AUTayebjee MH, Lip GY, MacFadyen RJ<sup>(11)</sup> said Occlusive coronary disease is an important cause of global morbidity and mortality. Judith S. Hochman et al.<sup>(7)</sup> showed 2166 patients with no reduction in major cardiovascular events during a mean follow-up of 3 years. There was a trend toward excess nonfatal reinfarction when routine PCI was performed in stable patients who were found to have occlusion of the infarct-related artery 3 to 28 days after myocardial infarction. In this study in conservative management there was less trend of non fatal infarct (4%). John P.A. Ioannidis et al.<sup>(12)</sup> showed percutaneous coronary intervention does not seem to confer any benefits when used for late revascularization of occluded arteries after MI in stable patients.

#### SUMMARY AND CONCLUSION:

According to late open artery hypothesis mechanical opening of a persistently occluded infarct related artery at the time too late for myocardial salvage should improve the long term outcome. But latest ACC/AHA guideline of STEMI management opined for conservative management of these group of patients. This study was a 6 month follow up study of this group of 100 patients. There was no mortality found during this period of study. There was 9% incidence of readmission and 4% incidence of non fatal MI only, there was no complaint of chest pain on subsequent visit. The patients of IWMI who had RV involvement also during admission did well with conservative management. There was no further evidence of RV (right ventricle) systolic dysfunction on follow up visit. On follow up visit the patient gradually developed features of LV remodeling and LA (left atrium) enlargement. LV remodeling has been indicated by progressive dilatation of LV (progressive increment of LVIDd and LVIDs) and diminution of EF. LV diastolic parameters were also deranged. Tissue Doppler  $e'$  gradually decreased and  $E/e'$  gradually increased. These alterations more pronounced with AWMI. Regarding symptoms of the patient patients more with AWMI developed predominantly heart failure symptoms. Following conclusions could be made from this study:

1. Early and timely revascularization is beneficial for the patient till myocardium is viable. But delayed revascularization is of questionable benefit.

2. In spite of optimum medical therapy patients with total occlusion of IRA and non viable myocardium developed progressive remodeling.
3. Remodeling causes gradually progressive HF symptoms.
4. If the patient has not developed new coronary lesion patients usually didn't present with chest pain, shortness of breath was predominant symptoms in follow up in this group of patients.

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