



## A STUDY TO EVALUATE CLINICAL PROFILE OF THE PATIENTS WITH RECANALIZED CORONARY ARTERIES

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**ABSTRACT** **Background & Objective:** Recanalized coronary artery includes non obstructive coronary artery disease, luminal irregularities and slow flow after thrombolytic therapy.

This study is aimed to analyze the clinical profile of patients who had complete recanalization of coronary artery found by coronary angiogram.  
**Material :** A Retrospective Study conducted in the Cardiology department of Government Rajaji hospital madurai.100 patients with STEMI who underwent coronary angiogram were included.

**Results:** In our study 85% patients were males Smoking was the prevalent risk factor in our study .90% of the patients presented within 6 hours. coronary angiogram showed non obstructive lesions in 62% of the patients , luminal irregularity in 16% of the patients

**Conclusion:** Risk factors like advancing age, dyslipidemia, diabetes, hypertension decrease the chances of complete recanalization. The chance of recanalization was more when the patient reached hospital within 4-6 hours .

**KEYWORDS :** Coronary artery disease, recanalized coronary arteries

### INTRODUCTION :

The incidence of CAD in the young has been reported to be 12%–16% in Indians<sup>1,2</sup> Half of the CVD-related deaths (ie, 52% of CVDs) in India occur below the age of 50 years, and about 25% of acute myocardial infarction (MI) in India occurs under the age of 40 years.

The main goal in the treatment of Acute myocardial infarction is early restoration of complete infarct artery perfusion. Thrombolytic therapy lyses infarct artery thrombi and enhance reperfusion, thereby reducing infarct size, preserving left ventricular function, and improving survival. In less than 50% of patients only, the most effective thrombolytic regimens achieve angiographic epicardial infarct related artery patency within 90 minutes<sup>(9)</sup>.

Recanalized coronary artery is defined as the lesion which is not significant and it includes non obstructive coronary artery disease, luminal irregularities and slow flow after thrombolytic therapy.

Thrombolytic therapy plays a major role in the management of acute myocardial infarction (AMI).Primary Percutaneous intervention is the class 1 indication in STEMI , but studies now focusing pharmaco invasive strategy as most centers in India doesn't have PCI This study is aimed to analyze the clinical profile of patients who had complete or near complete recanalization of infarct related coronary artery found by coronary angiogram

### OBJECTIVES:

To analyze the clinical profile of patients who had recanalization of infarct related coronary artery , found by coronary angiogram,

### MATERIALS AND METHODS:

**Study design:** A Retrospective Study conducted in the Cardiology department, Government rajaji Hospital , Madurai

**Sample size:** 100 patients.

### Inclusion criteria:

1. Patients with acute ST elevation Myocardial Infarction(STEMI) who underwent coronary angiogram and reported as recanalized coronary artery.
2. Typical rise of cardiac biomarkers either in the form of Creatine Kinase-MB (CKMB) or Troponin.

### Exclusion criteria:

1. Non STEMI

2. History of previous revascularization
3. DCM

### DATA COLLECTION:

Baseline characteristics like age, sex, clinical history, conventional risk factors, duration of symptoms, type of thrombolytic agent used and coronary angiogram results were analyzed in detail.

### STUDY PROTOCOL

#### DESIGN OF STUDY:

Prospective analytical study.

#### PERIOD OF STUDY

August 2018 TO July 2019

#### COLLABORATING DEPARTMENTS:

Department of Cardiology. Government Rajaji Hospital, Madurai

#### ETHICAL CLEARANCE:

Obtained Individual written and informed consent.

#### ANALYSIS: STATISTICAL ANALYSIS

The information collected regarding all the selected cases were recorded in a master chart. Data analysis was done with the help of computer by using SPSS 16 software and Sigma Stat 3.5 version (2012). Using this software mean, standard deviation and 'p' value were calculated through Student 't'test, One way ANOVA, Chi square test and correlation coefficient from Pearson correlation and P value of < 0.05 was taken as significant.

#### CONFLICT OF INTEREST: NIL

#### FINANCIAL SUPPORT: NIL

#### PARTICIPANTS:

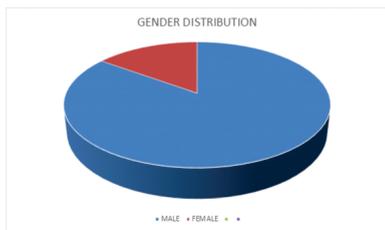
Patients of acute STEMI who were admitted in our ICCU and coronary angiogram done were included in this study

#### GENDER DISTRIBUTION OF PATIENTS IN OUR STUDY

**Table 1**

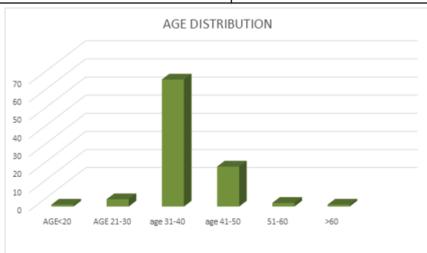
Sex	No of patients	%
MALE	85	85%
Female	15	15%
Total	100	100%

In our study there were 85% male patients and 15% were female patients.



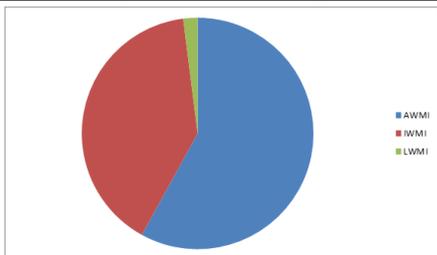
**2. AGE:**  
**Table 2**

Age	No of patients
< 20 years	1
20-30 years	4
31-40	70
41-50	22
51-60	2
>60	1



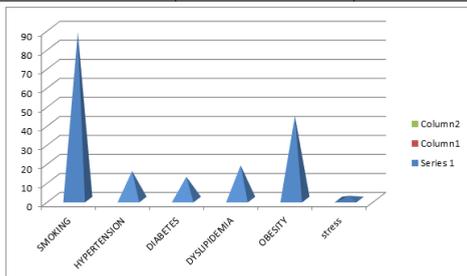
**Table no: 3**  
**TYPE OF MI**

TYPE OF MI	PATIENTS	%
AWMI	58	58%
IWMI	40	40%
LWMI	2	2%



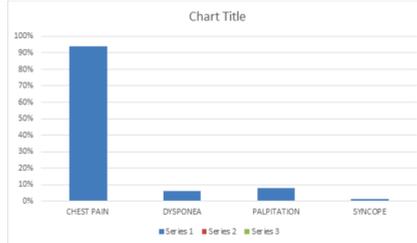
**4. Type 4: risk factors**

RISK FACTOR	PATIENTS	%
SMOKING	88	88%
HYPERTENSION	15	15%
DIABETES MELLITUS	12	12%
DYSLIPIDEMIA	18	18%
OBESITY (BMI> 30%)	44	44%
STRESS	2	2%



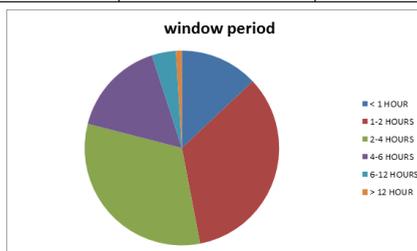
**5. PRESENTING SYMPTOMS**

PRESENTING SYMPTOMS	PATIENTS	%
CHEST PAIN	94	94%
DYSPONEA	6	6%
PALPITATION	8	8%
SYNCOPE	1	1%



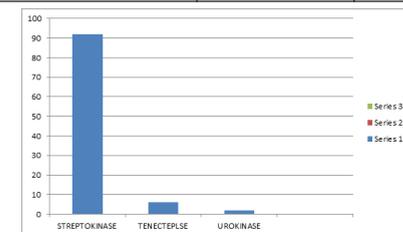
**6. WINDOW PERIOD**

WINDOW PERIOD	PATIENTS	%
< 1 HOUR	13	13%
1-2 HOUR	34	34%
2-4 HOURS	32	32%
4-6 HOURS	16	16%
6-12 HOURS	4	4%
> 12 HOURS	1	1%



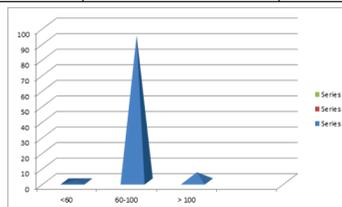
**7. THROMBOLYTIC**

THROMBOLYTIC AGENTS	PATIENTS	%
STREPTOKINASE	92	92%
TENECTEPLASE	6	6%
UROKINASE	2	2%



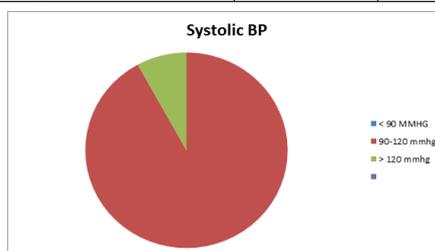
**8. PULSE AT ADMISSION TIME**

PULSE	PATIENTS	%
< 60	1	1%
60-100	94	94%
>100	6	6%



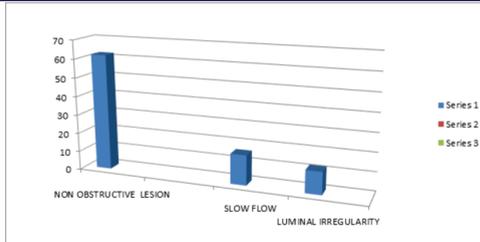
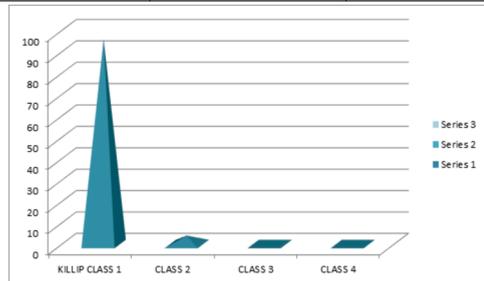
**9. SYSTOLIC BLOOD PRESSURE AT ADMISSION TIME**

SYSTOLIC BLOOD PRESSURE	PATIENTS	%
< 90 mmhg	0	0
90-120 hg	94	94
>120 mmhg	6	6



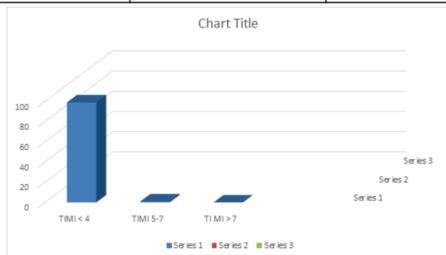
**10. KILLIP CLASS AT ADMISSION TIME**

KILLIP CLASS	PATIENTS	%
1	96	96%
2	4	4%
3	0	0%
4	0	0%



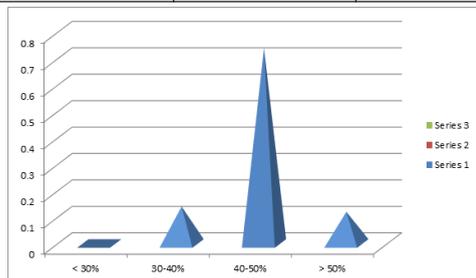
**11. TIMI SCORE AT ADMISSION TIME**

TIMI SCORE	PATIENTS	%
< 4	99	99%
4-7	1	1%
>7	0	0%



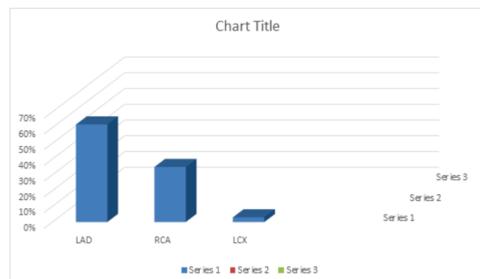
**12. EJECTION FRACTION AT THE ADMISSION TIME**

EJECTION FRACTION	PATIENTS	%
< 30%	0	0%
30-40%	14	14%
40-50%	74	74%
>50%	12	12%



**FIGURE NO : 12 EJECTION FRACTION OF PATIENTS IN OUR STUDY**

**FIGURE NO 13 : CORONARY ARTERY INVOLVEMENT IN OUR STUDY**



**14. CORONARY ANGIOGRAM PROFILE**

CORONARY ANGIOGRAM	PATIENTS
< 20% LESION	62
LUMINAL IRREGULARITY	12
SLOW FLOW	16

**RESULTS :**

In our study 85% patients were males and 15% patients were females indicating high prevalence of recanalized coronary arteries in men (Table & Figure no 1) . 75% of the patients age were less than 40 indicating high prevalence of recanalized coronaries in young patients (Table no 2 & figure no 2). Smoking was the prevalent risk factor in our (Table & figure no 3) study . We believe that dominance of smoking is a significant threat for young adults. Since it is a preventable risk factor, we recommend that healthy life styles should be encouraged and new precautions about smoking/tobacco consumption must be undertaken to combat high incidence of CAD. In our study, we also observed that hypertension and diabetes were less common ( $\leq 10\%$ ) among patients with recanalized profile. AAMI is seen in 74% of the patients (Table no 4 & figure no 4) . chest pain was the predominant symptom and atypical symptoms were very less (Table no 5 & figure no 5) . In our study 47% patients presented within two hours (Table & figure no 6) and 90% of the patients presented within 6 hours indicating Time is crucial in deciding recanalization . Streptokinase was the predominant drug used for thrombolysis (Figure & Table no 7) as its cost is very less . In our study most patients had stable vitals indicating recanalization of coronaries making the myocardium viable and less prone for arrhythmias .95% patients had normal Pulse rate between 60-100 bpm (Table & Figure no 8) and 94% patients had normal systolic blood pressure (Table & Figure no 9). 88% patients had KILLIP class 1 (Table & Figure no 10) and none of the patients had KILLIP class 4 . 92% patients had TIMI score less than 4 , 8 patients had TIMI score between 4-7 (Table & Figure no 11) . Most patients (74% ) Table & Figure no 12) had ejection fraction between 40-50% . LAD was the most common artery involved (Table & Figure no 13) .coronary angiogram showed non obstructive lesions in 62% of the patients , luminal irregularity in 16% of the patients , slow flow was present in 16% of the patients (Table & Figure no 14) .

**DISCUSSION :**

Rupture of the plaque with subsequent thrombosis is the leading cause of myocardial infarction in patients with coronary artery disease<sup>(4,5,6,7)</sup>. It has been recognized that 1 to 12% of patients may suffer from a myocardial infarction with angiographically normal coronary arteries (MINCA)<sup>3)</sup>. Young people are more likely to suffer an MINCA than older people<sup>9,10)</sup>. Our study also clearly showed the incidence is more common in patients less than 40 years and also 18% patients were less than 30 years.

The etiology of this disease is not clearly known. The proposed mechanisms include coronary spasm<sup>9)</sup> and thrombosis,<sup>10)</sup> platelet dysfunction.

Coronary vasospasm can produce myocardial ischaemia, but it is not certain that arterial spasm alone can cause myocardial necrosis. Syndrome X is angina with normal coronary arteries on angiography. Although dysfunction of vascular endothelium is thought to be a mechanism in both syndrome X and MINCA, there are important differences between the two groups. Most patients with MINCA do not have angina. Syndrome X patients tend to be young women. Syndrome X involves the coronary microvasculature, whereas MINCA is associated with epicardial vessels.<sup>(11)</sup>

The present study showed most of the young patients were male and smokers. In Santosh Kumar Sinha, Vinay Krishna s AMIYA study<sup>13</sup> and Dr. Sunil Sharma<sup>12)</sup>, study also most young patients were male and smokers. Traditional risk factors like diabetes mellitus and hypertension were very less in our study.

Cigarette smoking is a major risk factor in young patients with normal coronary arteries suffering myocardial infarction<sup>(14,15,16)</sup>. It has been shown that there is increased platelet consumption in young smokers without clinical evidence of coronary artery disease<sup>(18)</sup>. This relation is presumably related to the mechanism of enhanced platelet aggregation

and adhesion seen after smoking cigarettes<sup>(17,18)</sup> that would be expected to increase the thrombotic risk in smokers with normal coronary arteries. Our study also showed that nearly 40% of patients are smokers.

The most common mechanism of acute myocardial infarction is a plaque rupture with a thin fibrous cap overlying a large lipid core<sup>(19)</sup>. It is well known that such vulnerable plaques can be present in vessels that appear angiographically normal<sup>(20)</sup>. Another proposed mechanism of acute thrombosis is erosion and denudation of endothelial cells over the surface of plaques rich in proteoglycans, and smooth muscle cells<sup>(21)</sup>. This mechanism of thrombosis is more common in younger patients and in women<sup>(22)</sup>.

The angiographic definition of normal coronary arteries relies on axial contrast angiograms of the vessel lumen. This can underestimate the amount of atherosclerotic plaque<sup>(23)</sup>. Atherosclerosis is associated with medial atrophy and vessel wall dilatation resulting in diffusely diseased arteries appearing to have an angiographically normal lumen. So there is limited information about the true prevalence of plaques in patients with myocardial infarction and normal coronary arteries. Intravascular ultrasound and Optical coherence tomography can overcome the limitations of angiography with tomography images and can provide accurate plaque burden.

In our study most patients had stable vitals indicating timely achieving reperfusion effectively stabilize the myocardium as in saratha study<sup>24</sup>

Kozieradzka A<sup>1</sup>, Kamiński K, Dobrzycki S, Nowak K, Musiał W. study<sup>25</sup> also they find TIMI score accurately predicts risk of death in 30 day and one year

Fibrinolytic therapy is an effective treatment in ST-segment elevation myocardial infarction (STEMI) for which American Heart Association/American College of Cardiology has clear cut guidelines regarding eligibility of patients.

## CONCLUSION:

To summarize male sex was predominant in the study population. Majority of patients preferred thrombolysis with Streptokinase. Risk factors like advancing age, dyslipidemia, diabetes, hypertension decrease the chances of complete recanalization. The chance of recanalization was more when the patient reached hospital within 4-6 hours.

FUNDING: No funding resources

Conflict of Interest: None declared

Ethical approval : This study was approved by Institutional Ethics Committee

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- Santosh Kumar Sinha,1 Vinay Krishna,1 Ramesh Thakur,2 Ashutosh Kumar,3 Vikas Mishra,3 Mukesh Jitendra Jha,3 Karandeep Singh,3 Mohit Sachan,3 Rupesh Sinha,3 Mohammad Asif,3 Nasar Afdaali,3 and Chandra Mohan Varma Acute myocardial infarction in very young adults: A clinical presentation, risk factors, hospital outcome index, and their angiographic characteristics in North India-AMIYA Study
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