Section: Cardiology

Original Research Article

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

Received : 10/01/2025
Received in revised form : 11/03/2025
Accepted : 27/03/2025

Keywords:
Clinical Profile, Recanalized Coronary Arteries.

Corresponding Author:
Dr. V. Vivek,
Email: vivek.oct5@gmail.com

DOI: 10.47009/jamp.2025.7.2.181

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2025; 7 (2); 894-898

D.Manikandan[1], J.Nambirajan[2], D.Chakkravarthy[1], J.Jegadeesh[1], A.N.Senthil[1], K.Sathish Kumar[1], V.Vivek[3]

[1]Assistant Professor, Department of Cardiology, Coimbatore Medical College and hospital, Tamil Nadu, India
[2]Professor, Department of Cardiology, Coimbatore Medical College and hospital, Tamil Nadu, India
[3]DM Cardiology Resident, Coimbatore Medical College and hospital, Tamil Nadu, India

Abstract

Background: Coronary arteries are said to be recanalized if there is less than 70% obstruction in lumenogram or irregularities in coronary lumen or slow flow after fibrinolytic therapy. The aim of this study is to analyse the clinical profile of patients who had complete recanalization of coronary artery found by coronary angiogram. **Materials and Methods:** A Retrospective Cross Sectional Study conducted in the Cardiology Department of Coimbatore Medical College and Hospital. 100 patients with STEMI who underwent coronary angiogram were included. **Result:** 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, dyslipidaemia, diabetes, hypertension decrease the chances of complete recanalization. The chance of recanalization was more when the patient reached hospital within4-6 hours.

INTRODUCTION

The incidence of CAD in the young has been reported to be 12%–16% in Indians.[1,2] Half of the CVD-related deaths (i.e. 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.[3]

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 centres in India doesn't have PCI. This study is aimed to analyse the clinical profile of patients who had complete or near complete recanalization of infarct related coronary artery found by coronary angiogram.

Objectives: To analyse the clinical profile of patients who had recanalization of infarct related coronary artery, found by coronary angiogram.

MATERIALS AND METHODS

Study Design: A Retrospective Cross-sectional Study conducted in the Cardiology department, Coimbatore Medical College and Hospital, Coimbatore.

Sample Size: 100 patients.

Inclusion Criteria

Patients with acute ST elevation Myocardial Infarction (STEMI) who underwent coronary angiogram and reported as recanalized coronary artery.

Exclusion Criteria

1. NSTEMI
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 analysed in detail.

Study Protocol Design of Study: Prospective analytical study.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Period of Study: August 2018 TO July 2019
Collaborating Departments: Department of Cardiology. Coimbatore Medical College and Hospital, Coimbatore.
Ethical Clearance: Obtained
Consent: 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.

RESULTS

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

Table 1: gender distribution of patients in our study.

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.

Table 2: Age

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

Table 3: Type of MI

Type of MI	Patients	%
AWMI	58	58%
IWMI	40	40%
LWMI	2	2%

Table 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%

Table 5: Presenting Symptoms

Presenting symptoms	Patients	%
Chest pain	94	94%
Dysponea	6	6%
Palpitation	8	8%
Syncope	1	1%

Table 6: Window Period

Window Period	Patients	%
< I 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%

Table 7: Thrombolytic

Thrombolytic Agents	Patients	%
Streptokinase	92	92%
Tenecteplase	6	6%
Urokinase	2	2%

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Table 8: Pulse atadmission time

Pulse	Patients	%
< 60	1	1%
60-100	94	94%
>100	6	6%

Table 9: Systolic blood pressure atadmission time

Systolic blood pressure	Patients	%
< 90 mmhg	0	0
90-120 hg	94	94
>120 mmhg	6	6

Table 10: Killip class atadmission time

Killip class	Patients	%
1	96	96%
2	4	4%
3	0	0%
4	0	0%

Table 11: TIMI score atadmission time

Timi Score	Patients	%
< 4	99	99%
4-7	1	1%
>7	0	0

Table 12: Ejection fraction at the admission time

Ejection fraction	Patients	%
< 30%	0	0
30-40%	14	14%
40-50%	74	74%
>50%	12	12%

Table 13: Coronaryangiogram profile

Coronary Angiogram	Patients
< 20% Lesion	62
Luminal Irregularity	12
Slow Flow	16

In our study 85% patients were males and 15% patients were females indicating high prevalence of recanalized coronary arteries in men [Table 1]. 75% of the patients age were less than 40 indicating high prevalence of recanalized coronaries in young patients [Table 2]. Smoking was the prevalent risk factor in our study [Table 3]. We believe that dominance of smoking is a significant threat for young adults. Since it is a preventable risk factor, we recommend that healthy lifestyles 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 (≤10%) among patients with recanalized profile. AWMI is seen in 74% of the patients [Table 4]. Chest pain was the predominant symptoms, and atypical symptoms were very less [Table 5]. In our study 47% patients presented within two hours [Table 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 [Table 7] as it's 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 8] and 94% patients had normal systolic blood pressure [Table 9]. 88% patients had KILLIP class-1 [Table 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 11]. Most patients (74%) [Table 12] had ejection fraction between 40-50%. LAD was the most common artery involved. 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 13].

DISCUSSION

Rupture of the plaque with subsequent thrombosis is the leading cause of myocardial infarction in patients with Coronary Artery Disease.[4-7] It has been recognized that 1 to 12% of patients may suffer from a myocardial infarction with angiographically normal coronary arteries (MINCA).[8] Young people are more likely to suffer an MINC than older people.[9,10] Our study also clearly showed the incidence is more common inpatients less than 40 years and also 18% patients were less than 30 years.

The aetiology of this disease is not clearly known. The proposed mechanisms include coronary spasm,[9] thrombosis and platelet dysfunction.[10] Coronary

ISSN (O): 2687-5365; ISSN (P): 2753-6556

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.[11]

The present study showed most of the 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.[12-16] It has been shown that there is increased platelet consumption in young smokers without clinical evidence of Coronary Artery Disease. This relation is presumably related to the mechanism of enhanced platelet aggregation and adhesion seen after smoking cigarettes.[17,18] 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.[19] It is well known that such vulnerable plaques can be present in vessels that appear angiographically normal.[20] 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.[21] This mechanism of thrombosis is more common in younger patients and in women.[22]

The angiographic definition of normal coronary arteries relies on axial contrast angiograms of the vessel lumen. This can underestimate the amount of atherosclerotic plaque.[23] 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 Saradha study.[24]

Kozieradzka A et al,[25] 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.

REFERENCES

1. MammiMVI, Pavithran P, Rahman PA, et al. 1991. Acute MI in North Kerala. A 20-year hospital based study. Indian Heart J, 43:93–6.
2. Negus BH, WilliardJE, GlamannDB, et al. 1994. Coronary anatomy and prognosis of young asymptomatic survivors of myocardial infarction. Am J Med, 96:354–8.
3. Thrombolysis forAcute Myocardial Infarction. Circulation 1998;97: 1632-1646.
4. Fuster V, Stein B, Ambrose JA. Atherosclerotic plaque rupture and thrombosis: evolving concepts. Circulation 1990; 82: 47-59.
5. Kawai, C. Pathogenesis of acute myocardial infarction: novel regulatory systems of bioactive substances in the vessel wall. Circulation 1994;90:1033-1043
6. Alpert, JS. The pathophysiology of acute myocardial infarction.1989; Cardiology 76: 85-95.
7. Santamore WP, Yelton BW, Ogilby JD. Dynamics of coronary occlusion in the pathogenesis of myocardial infarction. JAm Coll Cardiol .1991;18: 1397-1405.
8. Alpert, JS. Myocardial infarction with angiographically normal coronary arteries. Arch Intern Med.1994;154: 265-269.
9. Conti, CR. Coronary artery spasm and myocardial infarction. N Engl J Med.1983; 309:238-239.
10. Raymond,R, Lynch,J,Underwood,D, et al. Myocardial infarction and normal coronary arteriography: a 10 year clinical and risk analysis of 74 patients. J Am Coll Cardiol. 1988; 11:471-477.
11. Khan AH,Haywood LJ. Myocardial infarction in nine patients with radiologicallypatent coronary arteries. NEnglJ Med .1974; 291:427-431.
12. Dr. Sunil Sharma1, Dr. C.BMeena1,DrManish Ruhela1 Acute coronary syndrome in young patients.1 Department of cardiology, SMS Medical College & Hospital, Jaipur,Rajasthan,India
13. 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 VarmaAcute myocardial infarction in very young adults: A clinical presentation, risk factors, hospital outcome index, and their angiographic characteristics inNorth India-AMIYA Study
14. McKenna WJ,Chew CY,Oakley CM.Myocardial infarction with normal coronary angiogram.Possible mechanism of smoking risk in coronary artery disease.Br Heart J. 1980;43:493-498.
15. Raymond R,Lynch J,Underwood D,Leatherman J,Razavi M. Myocardial infarction and normal coronary arteriography: a 10 year clinical and risk analysis of74 patients. JAm Coll Cardiol.1988; 11:471-477.
16. Fuster V,Chesebro JH,FryeRL,Elveback LR. Platelet survival and the development of coronary artery disease in the young adult: effects of cigarette smoking, strong family history and medical therapy. Circulation 1981; 63:546-551.
17. Levine PH. An acute effect of cigarette smoking on platelet function. A possible link between smoking and arterial thrombosis. Circulation 1973; 48:619-623.
18. Pittilo RM,Clarke JM,Harris D,Mackie IJ,Rowles PM,Machin SJ,et al. Cigarette smoking and platelet adhesion. Br J Haematol.1984;58:627-632.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

19. Davies MJ. Stability and instability: two faces of coronary atherosclerosis.Circulation 1996;94:2013-2020.
20. Mann JM,Davies MJ. Vulnerable plaque. Relation of characteristics to degree of stenosis in human coronary arteries. Circulation 1996; 94:928-931.
21. Burke AP,FarbA,Malcom GT,Liang YH,Smialek J,Virmani R. Coronary risk factors and plaque morphology in men with coronary disease who died suddenly. N Engl J Med.1997; 336:1276-1282.
22. FarbA,Burke AP,Tang AL,Liang TY,Mannan P,Smialek J,et al. Coronary plaque erosion without rupture into a lipid core. A frequent cause of coronary thrombosis in sudden coronary death. Circulation 1996;93:1354-1363.
23. Arnett EN,Isner JM,Redwood DR,Kent KM,Baker WP,Ackerstein H,et al. Coronary artery narrowing in coronary heart disease: comparison of cineangiographic and necropsy findings. Ann Intern Med.1979; 91:350-356.
24. M.Chokkalingam, S.Saradha, Pradeep.G.Nayar, L.Tamil selvi. Clinical profile of patients with recanalised infarct related coronary artery after thrombolytic therapy Kerala Heart J 2016; 6(2)
25. Kozieradzka A1, Kamiński K, Dobrzycki S, Nowak K, Musiał W.TIMI Risk Score accurately predicts risk of death in 30-day and one-year follow-up in STEMI patients treated with primary percutaneous coronary interventions .Kardiol Pol. 2007 Jul;65(7):788-95; discussion 796-7.

ISSN (O): 2687-5365; ISSN (P): 2753-6556