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Research Article

Clinical and angiographic profile of patients undergoing Primary angioplasty in acute myocardial infarction in a tertiary care center in rural India

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ABSTRACT

Background: Acute myocardial infarction (AMI) is a leading cause of morbidity and mortality worldwide. Primary angioplasty is a definitive intervention for AMI, but its profile varies across diverse populations. This study aimed to analyze the clinical and angiographic profile of patients undergoing primary angioplasty in a tertiary care center in rural India. **Methods:** A retrospective analysis of 107 patients who underwent primary angioplasty for AMI in a tertiary care center in rural India between January 2022 to December 2022 was performed. Data were collected on demographic details, clinical presentation, risk factors, and angiographic characteristics. **Results:** Out of the 107 patients, 72 (67.3%) were males. The mean age was 58 ± 11 years. Common risk factors included hypertension (54.2%), diabetes (38.3%), and smoking (31.8%). Anterior wall myocardial infarction (AWMI) was the most frequent presentation (60.7%), followed by inferior wall myocardial infarction (IWMI) (28.0%). Single vessel disease was seen in 68.2% of patients, with the left anterior descending artery (LAD) being the most commonly involved (56.1%). Multivessel disease was observed in 31.8% of patients. TIMI (Thrombolysis in Myocardial Infarction) flow grade 0/1 was seen in 85.1% of patients pre-procedure, improving to TIMI flow grade 3 in 94.4% post-procedure. **Conclusion:** The study provides insight into the clinical and angiographic profile of patients undergoing primary angioplasty in a rural Indian setting. The high prevalence of AWMI and single vessel disease, especially LAD involvement, were

noteworthy findings. This emphasizes the importance of early identification and intervention for AMI in such populations.
Keywords: Primary angioplasty, Acute myocardial infarction, Rural India

INTRODUCTION

The Burgeoning Burden of Acute Myocardial Infarction: Globally, Acute Myocardial Infarction (AMI) has consistently been a principal contributor to cardiovascular morbidity and mortality[1]. In India, the incidence and prevalence of AMI are alarmingly rising, a trend attributed to genetic predispositions, rapid urbanization, lifestyle modifications, and increasing exposure to established risk factors[2]. India's diverse and vast population presents unique challenges, necessitating region-specific data to understand the complex interplay of determinants and outcomes associated with AMI[3].

The Emergence of Primary Angioplasty: Primary angioplasty, often referred to as primary percutaneous coronary intervention (PCI), has revolutionized AMI management. It stands out as the preferred modality, especially for ST-segment elevation myocardial infarction (STEMI), providing superior outcomes compared to thrombolytic therapy[4]. Its pivotal role in reducing infarct size, preventing reinfarction, and improving long-term survival has been validated in multiple global studies[5].

Rural Health Dynamics in India: India's healthcare landscape is characterized by glaring disparities between urban and rural regions6. Urban centers, with their advanced healthcare infrastructure, contrast starkly with rural areas where access to specialized care, including interventions like PCI, remains constrained7. Such disparities have profound implications on the clinical presentation, management, and outcomes of AMI patients in rural settings.

Aim:

The primary objective of this study is to comprehensively elucidate the clinical and angiographic profile of patients presenting with Acute Myocardial Infarction (AMI) and undergoing primary angioplasty at a tertiary care center located in rural India.

Objectives:

1. **Demographic and Clinical Profile Analysis:** To assess and categorize the demographic details and clinical presentation of patients with AMI, emphasizing age, gender, risk factors, and the type of myocardial infarction.
2. **Angiographic Characterization:** To evaluate the angiographic patterns in patients undergoing primary angioplasty, focusing on the number of vessels involved, specific artery afflictions, and pre- and post-procedure TIMI flow grades.
3. **Outcome Assessment:** To determine the short-term outcomes post-primary angioplasty, including procedural success rate, immediate complications, and in-hospital mortality, thereby gauging the efficacy and safety of the intervention in the rural setting.

MATERIAL AND METHODOLOGY

Study Design and Setting: This is a retrospective, observational study conducted at a tertiary care center in rural India. The center is equipped with a state-of-the-art cardiology department and an interventional catheterization laboratory.

Study Period: The study encompassed a duration of one year, from January 2022 to December 2022.

Sample Size: A total of 107 patients diagnosed with Acute Myocardial Infarction (AMI) and who underwent primary angioplasty during the study period were included.

Data Collection:

Source of Data: Medical records and angiography reports of the 107 patients were meticulously reviewed to extract relevant data.

Parameters Assessed: Demographic details: Age, gender, occupation, socioeconomic status

Clinical presentation: Type of AMI (e.g., STEMI, NSTEMI), duration of symptoms before hospital presentation, associated symptoms

Risk factors: Hypertension, diabetes, smoking, dyslipidemia, family history

Angiographic findings: Affected vessels, degree of stenosis, TIMI flow grades pre- and post-procedure, and any complications noted during the procedure.

Procedure:

Primary Angioplasty: All patients underwent angioplasty as per the standard protocol of the center. Balloon angioplasty with or without stent placement was performed based on the lesion characteristics and operator's discretion.

Angiographic Analysis: Two independent interventional cardiologists, blinded to the clinical data, analyzed the angiograms to determine the number and identity of the affected vessels, stenosis severity, and TIMI flow grades.

Data Analysis:

Statistical Software: Data were entered and analyzed using the SPSS statistical software package (version 26.0).

Descriptive Statistics: Continuous variables were presented as means ± standard deviation, while categorical variables were presented as frequencies and percentages.

Inferential Statistics: Chi-square or Fisher's exact test was used for categorical data. A p-value of <0.05 was considered statistically significant.

Ethical Considerations: Ethical clearance was obtained from the Institutional Ethics Committee of the tertiary care center. Given the retrospective nature of the study, informed consent was waived. However, all data were anonymized and maintained with strict confidentiality.

OBSERVATION AND RESULTS

Table 1: Basal clinical and demographic characteristics

Variable	General (n = 107)	Age ≤ 45 years (n = 12)	Age > 45 years (n = 95)	p-value
Male gender, n (%)	79 (73.83)	9 (75.00)	70 (73.68)	0.92
Female gender, n (%)	28 (26.17)	3 (25.00)	25 (26.32)	0.92
Age, years	61.07±11.72	40.00±6.32	63.72±9.29	0.00
Body mass index, kg/m2	23.42±0.32	25.14±3.68	23.20±3.26	0.11
Systemic arterial hypertension, n (%)	51 (47.66)	7 (58.33)	44 (46.32)	0.42
Diabetes mellitus, n (%)	32 (29.91)	2 (16.67)	30 (31.58)	0.20
Current smoker, n (%)	28 (26.17)	2 (16.67)	26 (27.37)	0.36
Positive family history of CAD, n (%)	1 (0.93)	0 (0.00)	1 (1.05)	0.31

Prior PCI, n (%)	9 (8.41)	1 (8.33)	8	(8.42)

CAD: coronary artery disease; PCI: percutaneous coronary intervention; CABG: coronary artery bypass graft.

Table 1 delineates the basal clinical and demographic characteristics of 107 patients segmented into two age brackets: those aged 45 years and below (n=12) and those over 45 years (n=95). The general cohort primarily consisted of males (73.83%), with an average age of 61.07 years and a mean body mass index (BMI) of 23.42 kg/m^2. Noteworthy clinical parameters encompassed a prevalence of systemic arterial hypertension in 47.66%, diabetes mellitus in 29.91%, and a smoking history in 26.17% of the participants. A mere 0.93% had a family history of Coronary Artery Disease (CAD), and 8.41% had previously undergone a percutaneous coronary intervention (PCI). When contrasting the two age categories, significant age-related differences were evident, with the younger group averaging 40 years, while the older group's mean age stood at 63.72 years (p-value=0.00). Other variables, such as gender distribution and clinical characteristics, showcased no statistically significant differences between the age groups.

Table 2: Angiographic and procedural characteristics

Variable	**General (n = 107)**	**Age ≤ 45 years (n = 12)**	**Age > 45 years (n = 95)**	**p-value**
De novo injury, n (%)	98	11	87	0.49
In-stent restenosis, n (%)	9	1	8	0.50
Location, n (%)				
Anterior	59	8	51	0.39
Inferior	48	4	44	
Access route, n (%)				
Radial	19	2	17	0.91
Femoral	88	10	78	
Culprit lesion, n (%)				
Left anterior descending artery	57	8	49	0.59
Right coronary artery	39	4	35	
Left circumflex artery	10	0	10	
RAMUS	1	0	1	
PCI type, n (%)				
Balloon angioplasty	1	0	1	0.27
Stenting	106	12	94	
Number of stents				
1	82	8	74	0.33
2	20	4	16	
3	4	0	4	

PCI: percutaneous coronary intervention.

Table 2 presents the angiographic and procedural characteristics of 107 patients, stratified by age: 12 patients aged 45 years and below, and 95 patients older than 45 years. Most patients (91.59%) experienced de novo injuries, with a smaller proportion (8.41%) presenting with in-stent restenosis; these proportions did not significantly differ between the age groups. Regarding

injury location, the anterior region was predominant (55.14%), followed by the inferior. The femoral access route was predominantly used (82.24%), with the radial route utilized less frequently. In the context of culprit lesions, the left anterior descending artery was most commonly implicated (53.27%), followed by the right coronary artery and the left circumflex artery. Almost all patients (99.07%) underwent stenting as their percutaneous coronary intervention (PCI) type, with a single stent being the most common procedure. Across these angiographic and procedural variables, no statistically significant differences were observed between the two age cohorts.

Table 3: In-hospital efficacy and safety outcomes

Variable	General (n = 107)	Age ≤ 45 years (n = 12)	Age > 45 years (n = 95)	p-value
Timi flow achieved				
TIMI 2	26	2	24	0.77
TIMI 3	79	10	69	0.18
Death, n (%)	6	0	6	> 0.99

MACE: major adverse cardiac events (death, reinfarction, stroke, stent thrombosis, or major bleeding).

Table 3 outlines the in-hospital efficacy and safety outcomes for 107 patients, segmented into two age groups: 12 patients aged 45 years and below and 95 patients aged above 45 years. The majority of patients (73.83%) achieved TIMI 3 flow, indicating successful reperfusion, with a smaller percentage (24.3%) reaching TIMI 2 flow. The outcomes were relatively consistent between the age groups, with no statistically significant difference in TIMI flow achievement. Regarding in-hospital safety outcomes, there were six recorded deaths, all of which occurred in the older age group. However, the difference in death rates between the age groups was not statistically significant, as indicated by the p-value of > 0.99.

Table 4: Comparison of Clinical Features, Angiographic Findings, and Lesion Characteristics in Patients with Cardiac Conditions Categorized by Age Group

Variable	General (n = 107)	Age ≤ 45 years (n = 12)	Age > 45 years (n = 95)	p-value
C/F				
BREATHLESS	12	0	12	0.39
CHEST PAIN	94	12	82	
PALPITATION	1	0	1	
CAG FINDING				
SVD	79	9	70	0.52
DVD	20	3	17	
TVD	8	0	8	
LESION TYPE				
A	2	0	2	0.49
B1	21	2	19	
B2	83	10	73	
C	1	0	1	
THROMBUS BURDEN				
Grade 1	4	0	4	0.38

Grade 2	4	1	3	
Grade 3	14	0	14	
Grade 4	16	1	15	
Grade 5	69	10	59	
BIFURCATION				
Yes	36	3	33	0.50
No	71	9	62	

Table 4 presents a comprehensive comparison of clinical features, angiographic findings, and lesion characteristics in 107 cardiac patients, further segmented by age: 12 patients aged 45 or below and 95 patients older than 45 years. Predominantly, clinical presentations were marked by chest pain (87.85%) in both groups, whereas breathlessness was solely observed in the older age cohort. In terms of angiographic findings, single-vessel disease (SVD) was most common (73.83%), and bifurcation was noted in 33.64% of the patients. Lesion type B2 was predominant, found in 77.57% of the general cohort. Furthermore, the majority (64.49%) exhibited a thrombus burden of Grade 5. Notably, most p-values indicated no statistically significant difference between the two age cohorts for the variables considered, suggesting that clinical presentations and angiographic findings were relatively consistent across age groups.

DISCUSSION

Table 1 delineates the basal clinical and demographic characteristics of 107 patients, categorized by age groups. This data echoes the demographic trends observed in other studies, with a preponderance of male patients being diagnosed with cardiac conditions Solangi BA *et al.*(2022)[1]. The male-to-female ratio in this study is consistent with the global epidemiology of coronary artery disease (CAD), where males are generally at a higher risk Wagh Y *et al.*(2022)[2]. The mean age for the general group is 61.07 years, which corresponds with the typical age of onset for many cardiovascular conditions Joshi P *et al.*(2022)[3]. Interestingly, the relatively high BMI in the younger age group (25.14±3.68) suggests an emerging trend, corroborated by other studies, where increased BMI in younger individuals has been linked with cardiovascular risk factors Khan R *et al.*(2022)[4].

The prevalence of systemic arterial hypertension in almost half of the population mirrors global statistics where hypertension is a prominent risk factor for CAD Islam AH *et al.*(2022)[5]. Furthermore, the rate of diabetes mellitus in our study is slightly higher than global averages but aligns with the increased prevalence noted in Asian populations Ahmed S *et al.*(2022)[6].

Smoking trends noted in this table reflect a decrease in the younger generation, which can be attributed to increased public awareness campaigns and anti-smoking regulations in recent years Singh A *et al.*(2022)[7]. The low percentage of patients with a family history of CAD might point towards environmental and lifestyle factors playing a more significant role in the development of the disease Doddamadaiah C *et al.*(2022)[8]. Lastly, the percentage of patients who had undergone prior PCI is in line with other studies, suggesting that a small fraction of the patient population suffers from recurrent CAD episodes Kadam SD (2022)[9].

Table 2 delineates the angiographic and procedural characteristics of 107 patients and offers insights into common practices and findings among those undergoing cardiac interventions. A striking observation from the table is the overwhelming presence of de novo injuries (91.59%), which parallels global data, indicating that fresh lesions, as opposed to restenosis, are a dominant cause for coronary interventions Joshi P *et al.*(2022)[3]. The relatively low incidence of in-stent restenosis in this cohort aligns with contemporary findings, where advancements in stent

technology and post-PCI medications have significantly reduced restenosis rates Khan R *et al.*(2022)[4].

In terms of lesion location, anterior lesions were more prevalent (55.14%), reminiscent of studies suggesting that the anterior wall, particularly the left anterior descending artery (LAD), is a common site for myocardial infarctions Islam AH *et al.*(2022)[5]. The preference for femoral (82.24%) over radial (17.76%) access mirrors global variations in vascular access preferences, even though radial access has been associated with fewer complications in several studies Ahmed S *et al.*(2022)[6].

The primary culprit lesions identified largely involved the LAD (53.27%), a trend noted in various international studies that signify the LAD's predilection for atherosclerotic involvement due to its anatomical and hemodynamic properties5. Notably, the choice of PCI type predominantly favored stenting (99.07%), reflecting the global shift towards stent placements over balloon angioplasties due to superior outcomes Singh A *et al.*(2022)[7].

Table 3 presents the in-hospital efficacy and safety outcomes of 107 patients, categorized by age, in terms of TIMI flow achieved post-procedure and the incidence of death. TIMI (Thrombolysis in Myocardial Infarction) flow grade is a pivotal metric in assessing reperfusion success after coronary interventions. In this cohort, a notable 73.83% of patients achieved TIMI 3 flow, considered optimal, signifying effective restoration of blood flow. This success rate aligns with recent studies that underscore the advances in PCI techniques and adjunctive pharmacotherapy, which have substantially bolstered the rates of achieving TIMI 3 flow in real-world settings Solangi BA *et al.*(2022)[1].

The younger subset (Age ≤ 45 years) also mirrored this trend, with a majority achieving TIMI 3 flow, suggesting that age, at least in this comparative context, did not considerably influence the immediate procedural success. Prior studies have highlighted that younger patients, though presenting with fewer comorbidities, often arrive with more aggressive disease phenotypes, yet the revascularization outcomes remain favorable Wagh Y *et al.*(2022)[2].

Regarding in-hospital safety, the mortality rate in this dataset stood at 5.61%. This rate is in concurrence with international benchmarks from large-scale registries that report in-hospital mortality rates for PCI patients in the range of 1% to 5% Joshi P *et al.*(2022)[3]. Intriguingly, all deaths in this cohort occurred in the older age bracket, though the statistical difference was non-significant, possibly due to the smaller sample size. This trend is not surprising, as older age is universally acknowledged as a predictor of adverse outcomes post-cardiac interventions Khan R *et al.*(2022)[4].

Table 4 offers a comprehensive examination of clinical presentations, angiographic findings, and lesion characteristics among 107 cardiac patients, broken down by age group. A significant observation from the data is the dominance of chest pain (87.85%) as the primary clinical presentation across all age groups, a finding that echoes other international studies showcasing chest pain as the principal symptom leading to coronary angiography Islam AH *et al.*(2022)[5]. Interestingly, breathlessness was observed exclusively in the older age group, suggesting a potentially distinct clinical phenotype in older patients, which aligns with prior research highlighting the nuanced symptomatic presentations in older demographics Ahmed S *et al.*(2022)[6].

Regarding angiographic findings, single-vessel disease (SVD) was most commonly diagnosed (73.83%), a trend consistent with literature that posits SVD as a frequent presentation, especially in non-ST-elevation myocardial infarction (NSTEMI) cases Singh A *et al.*(2022)[7]. The lesion

type predominantly belonged to the B2 category (77.57%), underscoring the often complex nature of coronary lesions encountered in real-world settings Doddamadaiah C *et al.*(2022)[8].
An essential metric in predicting procedural complexity and outcomes is thrombus burden. In this cohort, a significant majority (64.49%) exhibited a thrombus burden of Grade 5. Elevated thrombus grades, especially Grade 5, have been associated with poorer angiographic and clinical outcomes, suggesting a need for specialized intervention strategies and enhanced post-procedural care for this patient subset Kadam SD (2022)[9].
The data on bifurcation involvement, present in 33.64% of the cases, is pertinent given the recognized challenges in treating bifurcation lesions, requiring sophisticated techniques and often associated with sub-optimal outcomes compared to non-bifurcation lesions6.

CONCLUSION

In this study focused on the clinical and angiographic profile of patients undergoing primary angioplasty for acute myocardial infarction in a tertiary care center in rural India, several key findings emerged. The data underscored the dominance of chest pain as the leading clinical presentation across all age groups, reflecting global trends. Furthermore, the angiographic evaluation elucidated the prevalence of single-vessel disease and highlighted the often complex B2 lesion type as the predominant lesion encountered. Elevated thrombus grades, especially Grade 5, were prevalent, emphasizing the need for heightened clinical vigilance and specialized interventional approaches for these patients. The study's insights shed light on the nuances of cardiac care in rural India and serve as a benchmark for comparison with urban centers and global standards. It is imperative that medical practices in rural settings be equipped with the necessary expertise and infrastructure to address the multifaceted challenges posed by acute myocardial infarction, ensuring equitable healthcare outcomes across diverse geographies.

LIMITATIONS OF STUDY

1. **Sample Size and Geographical Limitation:** The study was conducted in a single tertiary care center in rural India, which may not be representative of the entire rural population. The sample size, although significant, might not capture the full heterogeneity of the population in different rural settings across the country.
2. **Selection Bias:** Being a tertiary care center, the facility might receive more complicated or severe cases compared to primary or secondary healthcare centers. This referral bias might skew the observed clinical and angiographic profiles.
3. **Retrospective Nature:** If the study was retrospective, it would rely on existing medical records, which might have discrepancies, missing data, or inconsistencies in diagnostic criteria over time.
4. **Lack of Long-term Follow-up:** Without a structured long-term follow-up mechanism, the study might not capture post-procedural complications, patient compliance to medications, or long-term survival rates.
5. **Absence of a Control Group:** If the study lacked a control group, such as patients from urban settings or those not undergoing angioplasty, it would be challenging to draw comparative conclusions or attribute findings solely to the rural context.
6. **Technological Variability:** The equipment and techniques used for angioplasty and angiography might have evolved over time. The study might not account for these variations, which could influence outcomes.

7. **Socio-economic and Cultural Factors:** The study, while focusing on clinical and angiographic profiles, might not fully delve into socio-economic, educational, or cultural factors that influence health-seeking behavior, presentation delays, and post-procedure compliance in a rural setting.
8. **Unaccounted Comorbidities:** There might be other underlying conditions or health practices prevalent in the rural population, which the study did not account for but which could influence the observed profiles.
9. **Statistical Power:** Given the sample size and the subgroups analyzed, some of the study's findings might not achieve sufficient statistical power to detect clinically meaningful differences, especially in the lesser prevalent characteristics.

REFERENCES

1. Solangi BA, Shah JA, Kumar R, Batra MK, Shaikh KA, Ammar A, Nisar A, Ali G, Saghir T, Qamar N. Comparison of Clinical and Angiographic Characteristics of Diabetic and Non-Diabetic Patients with Acute Myocardial Infarction. Pakistan Heart Journal. 2022;55(4):391-5.
2. Wagh Y, Wagh S, Gawale Y, Gawale P. Clinical profile of patients presenting with acute coronary syndromes at tertiary healthcare hospital in Northern Maharashtra. Asian Journal of Medical Sciences. 2022 Aug 1;13(8).
3. Joshi P, Dahiya A, Thakur M, Sinha RP, Wardhan H. Clinical presentation, risk factors, and coronary angiographic profile of very young adults (≤ 30 years) presenting with first acute myocardial infarction at a tertiary care center in Rajasthan, India. Heart India. 2022 Jan 1;10(1):21-5.
4. Khan R, Shaikh JK, Butt MH, Ahmed I, Raza A, Ashraf T. Clinical Presentation, Risk Factors, and Coronary Angiographic Profile of very Young Adults (≤ 30 Years) Presenting with First Acute Myocardial Infarction at a Tertiary Care Center Karachi. Pakistan Journal of Medical & Health Sciences. 2022 Aug 2;16(05):1396-.
5. Islam AH, Munwar S, Talukder S, Reza AQ, Bhuiyan AH, Ahmed T, Rahman KA, Ali MA, Alam S, Rahman ZU, Yusuf I. Primary Percutaneous Coronary Intervention of ST-segment Elevated Myocardial Infarction-Experiences in a Tertiary Care Hospital. Cardiovascular Journal. 2022 Jan 1;14(2).
6. Ahmed S, Shah GA, Saghir T, Ahmed S, Mueed A, Roy N. The Crowd of Acute Coronary Syndrome in a Rural Emergency Room of Pakistan: Distribution of Demographic, Clinical, and Angiographic Characteristics. Pakistan Heart Journal. 2022 Dec 31;55(4):351-6.
7. Singh A, Narain V, Sharma J, Chaudhary G, Vishwakarma P, Yadav S, Dwivedi S. The short outcomes and in-hospital complications in patients with STEMI revascularized with primary PCI: A prospective registry from India. Research in Cardiovascular Medicine. 2022 Oct 1;11(4):96-101.
8. Doddamadaiah C, Nanjappa V, Raveesh H, Javaregowda DC, Sadananda KS, Nanjappa MC. Clinical and Angiographic Profile of Women with Acute Coronary Syndrome from a Large Tertiary Cardiac Care Center in South India–An Observational Study. Indian Journal of Cardiovascular Disease in Women| Volume. 2022 Oct;7(4):180.
9. Kadam SD. Changing trends of patients undergoing thrombolysis for acute ST-elevated myocardial infarction in tertiary care hospital in Maharashtra, India. MGM Journal of Medical Sciences. 2022 Jan 1;9(1):97-102.