



## **ACUTE CORONARY SYNDROME: PREVALENCE AND MANAGEMENT IN A TERTIARY CARE HOSPITAL IN PALAKKAD**

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### **ABSTRACT**

**Background and aim:** The prevalence of acute coronary syndrome (ACS) among Coronary Artery Disease patients (CAD) are not well studied in Kerala. The study was aimed to access the prevalence and management of ACS among CAD patients in a tertiary care hospital in Palakkad. **Methods:** A hospital based prospective study was conducted in Rajeev Gandhi Cooperative Multispecialty hospital in Palakkad from July 2022 to January 2023, 90 patients with Acute Coronary Syndrome were included. Details regarding socio-demographic characters, diagnosis, treatment and class of drugs prescribed were noted. **Results:** 150 Coronary Artery Disease (CAD) patients were included in the study, of which 90 were diagnosed with Acute Coronary Syndrome (ACS) among which 19 (21%) patients were diagnosed with unstable angina, 46 (51%) with ST Elevation Myocardial Infarction (STEMI) and 25 (28%) with Non ST Elevation Myocardial Infarction (NSTEMI). Single vessel disease was the most commonly observed condition 57 (63%) and most commonly involved artery was left anterior descending artery 57 (63%). Drugs prescribed for management of ACS are antiplatelet, antihypertensive, hypoglycemic, statins and antianginal drugs. **Conclusion:** Recent epidemiological trend of ACS is progressing and it constitutes an important challenge for both patient and treating physician. Patients with ACS are mainly males and SVD is more common and commonly prescribed drug is antiplatelet.

**Keywords:** Acute Coronary Syndrome (ACS), Coronary artery disease (CAD), Non-ST-segment elevation myocardial infarction (NSTEMI), ST-segment elevation myocardial infarction (STEMI), Unstable Angina (UA).

### **INTRODUCTION**

Coronary artery disease (CAD) is the most common type of heart disease which is the leading cause of morbidity and mortality worldwide [1]. Approximately 12 million people die from cardiovascular disease and its complications every year in the Indian subcontinent [2]. The coronary arteries in people with CAD develop atherosclerotic plaque, which reduces blood flow and, as a result, the supply of oxygen to the heart. CAD can lead to Acute coronary syndrome (ACS), which is a disorder characterized by signs and symptoms of abrupt myocardial ischemia—a sudden decrease in blood supply to the heart. The signs and symptoms of ACS range in severity from unstable angina (UA) to non-ST-segment elevation myocardial infarction (NSTEMI) to ST-segment elevation myocardial infarction (STEMI). A totally occluded coronary artery causes STEMI, whereas UA and NSTEMI

typically originate from a partly or sporadically blocked coronary artery [3]. It is well-known that CAD is a chronic condition that starts in a person's early years and progresses gradually over their lifetime [4]. The goal of this study is to offer information on the prevalence and treatment of ACS at the hospital under investigation.

### **METHODS**

A hospital based prospective study was conducted in the cardiology department of Rajiv Gandhi co-operative multispecialty hospital, Palakkad, for a period of 6 months duration from July 2022 to January 2023. The study was approved by the Ethical committee of the institution and an official consent was also provided by the authority of hospital for conducting the study.

On the basis of inclusion and exclusion criteria, the subjects were chosen. The study population taken was patients with coronary artery disease belonging to both sex with or without comorbidities and aged greater than or equal to 18 years. Patients with serious non-cardiovascular disease or conditions interfering with life expectancy, patients with impaired cognitive functions and not willing to give consent are excluded from the study.

A data collection form was developed in order to enter necessary information relevant to the study. Data collected included following variables: patient's demographics, reason for admission, final diagnosis, comorbidities, family history, social habits, ECG findings, relevant laboratory investigation data, use of medications and use of invasive cardiac procedures and interventions. Prevalence of ACS among the CAD patients admitted in the hospital was accessed using basic prevalence calculation.

An abrupt drop in blood flow in the coronary arteries causes ACS, which causes a portion of the heart muscle to become dysfunctional or die. According to the length of the symptoms, the existence of ECG alterations, and the findings of the blood tests, ACS is categorized into three scenarios: STEMI, NSTEMI and unstable angina. Unstable angina is diagnosed when symptoms last less than 30 minutes. If symptoms persist for more than 30 minutes, an acute myocardial infarction is the likely the diagnosis. A fresh left bundle branch block or ST-segment elevation on an initial electrocardiogram (ECG) as well as increased cardiac markers are necessary for the definition of STEMI. NSTEMI was diagnosed according to symptoms or ECG changes appropriate to ACS or both and in presence of elevated cardiac markers, but criteria for STEMI were not met. The presence of normal cardiac markers, symptoms, or ECG alterations consistent with ACS, or both, was required for the diagnosis of UA.

According to the number of major epicardial coronary arteries (left anterior descending artery [LAD], left circumflex artery (LCx), and right coronary artery (RCA) involved), the patients were divided into three groups: single vessel disease (SVD), double vessel disease (DVD), and triple vessel disease (TVD). The presence of normal cardiac markers, symptoms, or ECG alterations consistent with ACS, or both, was required for the diagnosis of UA. According to the number of major epicardial coronary arteries (left anterior descending artery [LAD], left circumflex artery (LCx), and right coronary artery (RCA) involved), the patients were divided into three groups: single vessel disease (SVD), double vessel disease (DVD), and triple vessel disease (TVD). The collected cases will be entered in MS Excel 2007 for calculating the percentage of various parameters.

## RESULTS

150 patients with CAD were included in the study, of which 90 were diagnosed with ACS. Among the

90 ACS patients, 73(81%) patients were male and 17(19%) were female. ACS was more common among those aged greater than or equal to 60(44.4%) followed by 35 patients(38.8%) in the age group of 50-60, 11 patients(12.2%) in the age group of 40-50 and 4 patients(4.4%) in the age group of 30-40. 52 patients (57.14%) had received only primary education and 26 patients (28.57%) were employed. Among the study population majority of patients 89(98.8%) were married and 1 patient (1.2%) was unmarried. Most of the patients 59 (65.71%) lack family history of CAD and paternal family history was found to be higher (21.42%) compared to maternal family history (12.85%). Co-morbidities present in the study were defined as those conditions that were previously diagnosed and recorded in the case sheet and confirmed by laboratory tests. In the study population 26 patients (28.8%) were affected with Hypertension+ Hyperlipidemia, followed by 22(24.4%) patients was affected with Hypertension+ DM + Hyperlipidemia and 18 patients (20%) with Hypertension+ DM. There were 4.4% of patients with hypertension alone, 3.3% of patients with diabetes alone, 3.3% of patients with Hyperlipidemia alone and 2.2% patients with hypothyroidism alone.

From the total 150 CAD patients admitted in the cardiac department, 90 of them were diagnosed with ACS, so the prevalence of ACS among the study population is 60%. Among the 90 ACS cases, 19 patients (21.1%) were diagnosed with Unstable Angina (UA), 46 patients (51.1%) with STEMI and 25 patients (27.8%) with NSTEMI. Based on angiographic data single vessel disease was found to be more prevalent with 57 patients (62.85%), compared to 28(31.42%) double vessel disease patients and 5(5.71%) triple vessel disease patients. The coronary artery involved was the left anterior descending artery, the left circumflex artery, right coronary artery and the left main coronary artery in 57 (62.85), 25 (31.42%), 17 (18.57%) and 5 (5.71%), respectively. Cardiac procedures and drug therapy used were evaluated to study the treatment pattern. Percutaneous Trans luminal coronary angioplasty (PTCA) was mostly done in patients with ACS (61.1%), followed by medication therapy (35.5%) and PTCA+ Percutaneous Old Balloon Angioplasty (POBA) in 3.33 % of patients.

The pattern of drug therapy received by patients was categorized according to the classes of drugs. Antiplatelet was the most commonly prescribed drug (100%). Aspirin, Clopidogrel and Ticagrelor were the antiplatelet prescribed to the patients. Statins were prescribed to 90% of the patients and the statins prescribed to the patients were Atorvastatin and Rosuvastatin. 86% of patients were prescribed with hypoglycemic agents and these includes Glimepiride, metformin and their combination, dipeptidylpeptidase -4 inhibitors-Tenagliptin and insulin. Antihypertensive were prescribed to 85% of patients and it includes beta-blockers (bisoprolol, metoprolol, atenolol), alpha+betablockers(carvedilol), calciumchannelblockers (benidipine, amlodipine), diuretics (furosemide, furosemide+spir

onolactone), angiotensin receptor blockers (losartan, telmisartan). Antianginal drugs were prescribed to 27.7% of the patients and the drug used is Trimaetazidine. Drugs were

also prescribed for supportive therapy and are summarized in table no 6.

<b>Table 1. Socio-demographic profile of the ACS patients</b>		
<b>Characteristics</b>	<b>Number of patients (n=90)</b>	<b>Percentage of patients (%)</b>
<b>Gender</b>		
Male	73	81.42
Female	17	18.57
<b>Age group (years)</b>		
30-40	4	4.4
40-50	11	12.2
50-60	35	38.8
≥60	40	44.4
<b>Education</b>		
Uneducated	5	5.71
Primary education	52	57.14
Secondary education	23	25.71
Bachelor's degree and above	10	11.42
<b>Occupation</b>		
Unemployed	18	20
Employed	26	28.57
Retired	12	12.85
Entrepreneurs	24	27.14
Farmers	10	11.42
<b>Marital status</b>		
Married	89	98.8
Unmarried	1	1.2
<b>Family history</b>		
Mother	12	12.85
Father	19	21.42
Nil	59	65.71

<b>Co morbidities</b>	<b>Number of patients (n=90)</b>	<b>Percentage of patients (%)</b>
Hypertension (HTN)	4	4.44
Diabetes (DM)	3	3.33
Hyperlipidemia	3	3.3
Hypothyroidism	2	2.2
HTN+DM	18	20
HTN + Hyperlipidemia	26	28.8
DM+ Hyperlipidemia	12	13.3
HTN + DM+ Hyperlipidemia	22	24.4

<b>Characteristics</b>	<b>Number of patients (n=90)</b>	<b>Percentage of patients (%)</b>
<b>Diagnosis</b>		
Unstable angina	19	21.1
STEMI	46	51.1
NSTEMI	25	27.8
<b>Number of vessels narrowed</b>		
Single vessel disease	57	62.85
Double vessel disease	28	31.42
Triple vessel disease	5	5.71

<b>Characteristics</b>	<b>Number of patients (n=90)</b>	<b>Percentage of patients (%)</b>
<b>Type of branch block present</b>		
Left anterior descending artery	57	62.85
Left circumflex artery	28	31.42
Left main coronary artery	5	5.71
Right coronary artery	17	18.57
Obtuse marginal	4	4.28
<b>Treatment plan</b>		
Medication therapy	32	35.5
PTCA	55	61.1
POBA+PTCA	3	3.33

<b>Class of drugs</b>	<b>Number of patients (n=90)</b>	<b>Percentage of patients (%)</b>
Antiplatelet	90	100
Antihypertensive	77	85
Hypoglycaemic	77	86
Statins	81	90
Antianginal	25	27.7

<b>Class of drugs</b>	<b>Number of patients (n=90)</b>	<b>Percentage of patients (%)</b>
Proton pump inhibitors	90	100
Antibiotics	10	11.1
Vitamins	81	90
Laxative	9	10
Mucolytic	8	8.3
Anti-allergic	9	9
Thyroid hormone	3	5

## DISCUSSION

In this prospective study, it was found that most of the patients (44.4%) belonged to the 60+ age group, that male (81.42%) outnumbered women (18.57%), and 98.8% of patients were married. The reason behind this trend maybe because of adoption adverse lifestyle habits due to unawareness as most of them had received only primary education. According to a survey by Homeira khoddam, the most common age group is 60 and older, men outnumber women, and the majority of them were married. Genetics play a key influence in the development of coronary artery disease; however, the significance of favorable family history as an independent risk factor is hotly debated. The majority of patients in this study (65.71%) did not have a positive family history of coronary artery disease, but paternal family history was found to be more prevalent than maternal family history [6]. A study done by Kianoosh Hoseini, shows that majority of study population lacks a positive family history of CAD but, acute coronary syndrome was significantly more frequent in male patients with positive family history of coronary disease in their mothers. In this study, among the 90 ACS

patients, STEMI was observed to be more common (51.1%), followed by NSTEMI (27.8%) and lastly unstable angina (21.1%). A similar pattern was discovered in the investigation carried out in Senegal by Moctar MA [7]. Based on angiographic data, it was reported that single vessel disease was more common than double and triple vessel disease. The LAD is the most frequently narrowed artery, and the majority of patients undergone PTCA for the management of ACS compared to medical management. According to a study by Michinari in Japan, the LAD is the artery that is most commonly constricted [8]. According to studies carried out by Farhin Iqbal in Guwahati, India [9], STEMI patients have a marginally lower ejection fraction and a significantly higher incidence of single vessel disease than NSTEMI/UA patients, whereas NSTEMI/UA patients have a greater increase in incidence of normal coronaries and a greater increase in triple vessel disease. The classes of medications prescribed for the management of ACS included antiplatelets, antihypertensive agents, hypoglycaemics, statins, and antianginals. Some classes of drugs were also prescribed as supportive therapy. Antiplatelet were prescribed to all the patients, followed by other classes of drugs. Similar result

was seen in a study conducted by Chandrasekhar dilip in Kerala [3].

## CONCLUSION

From the study we can conclude that ACS is more prevalent for those aged greater than or equal to 60 years and male were predominant than female. STEMI was the commonly observed ACS and single vessel disease was the common condition with most commonly narrowed artery is Left anterior descending artery. Treatment plan mainly

undertaken was PTCA with stenting and commonly prescribed drug was antiplatelet.

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