CLINICAL PROFILE, ANGIOGRAPHIC PROFILE AND OUTCOME IN ACUTE CORONARY SYNDROME PATIENTS IN A TERTIARY CARE HOSPITAL

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■ ABSTRACT

Objective: To represents the demographic profile, clinical characteristics, frequency of risk factors and distribution of lesions and findings on coronary angiogram in acute coronary syndrome (ACS) patients.

Methodology: This retrospective cross sectional study was conducted from January 2020 to December 2021 at the Department of Cardiology, Lady Reading Hospital, Peshawar. Clinical profile, risk factors and angiographic finding were collected from the history ans medical record of patients and entered on proforma. The study comprised of all patients presenting with ACS to tertiary care set up. Inclusion criteria was patients presenting with chest pain suggestive of angina presenting to the ER of the hospital

Results: Of the total 800 patients, 62.50 % were male. Mean age of the study population was 55.58±11.16. Majority had normal BMI. Overall, 33.75% of the patients were smoker. Hypertension was present in 48 % of the patients. Diabetes mellitus and dyslipidemia was observed in 38.8% and 31.2% respectively. Most common presenting complaint was chest pain. Myocardial infarction was observed in 33.25% of the patients. Angiographic distribution of lesion showed that 20.38% had SVCAD. About 30% had DVCAD and 27.50% had TVCAD. On the other hand, 22.25% patient had normal coronary vessel. PCI was performed in 350(43.75%) of the patients where CABG was recommended in 16.13%. Right dominance was observed in 705(88.12%) of the individuals.

Conclusion: Single vessel coronary artery disease is the most common finding and most common treatment option is PCI. Hypertension and smoking were the most common risk factors in patients presenting as ACS.

Keywords: Angina; Acute Coronary Syndrome; Angiographic Findings

■ INTRODUCTION

Atherosclerosis is a chronic immune-mediated inflammatory disease of the arteries caused by lipid accumulation in the vessel intima.[1] A disparity in oxygen supply and demand to the myocardium is the primary mechanism in the pathophysiology of acute coronary syndrome. A thrombus formation over an already existing atherosclerotic plaque that has eroded is the most common cause of acute coronary syndrome. Unstable plaques with an increased activity of inflammatory mediators inside the plaque have a large lipid core with a thin fibrous cap and are at risk of disruption and thrombus formation. The plaque's erosion exposes the subendothelial cells, allowing platelets to adhere to them and form a thrombus.[2] Alternatively, the fibrous cap tears, exposing the highly thrombogenic lipid core to the blood, resulting in significant platelet aggregation and thrombus formation, which is ultimately mediated by the GP IIb/IIIa receptors. The intra-arterial partial-ly occludes the lumen and some blood flow remains intact in Unstable Angina and non-ST Elevation Myocardial Infarction (NSTEMI). Activated platelets on the surface of an intraluminal thrombus and constituents of the disturbed plaque, on the other hand, may be swept downstream into the distal myocardial vascular bed. These micro emboli can cause microscopic foci of myocardial necrosis and are thought to be the primary cause of biomarker release in patients with NSTEMI.[3]

Coronary artery disease is the leading cause of death worldwide [4] and will be one of the leading causes of disability globally.[5] Although mortality rates in Western countries have decreased over the last three decades, mortality rates in Asian populations have increased. The prevalence of coronary artery disease has risen in tandem with the rate of urbanization, as has the consumption of energy-dense processed foods.[6] Coronary artery disease in Asians is more common in younger people, with extensive angiographic involvement, and

is caused by genetic, metabolic, traditional, and nontraditional risk factors.[7-9] The gender angiographic profile of younger patients with ACS differs from that of the relatively older population, as demonstrated by Deshmukh et al in their study of very young patients with anterior wall myocardial infarction, in which 95% of their study population was male and only 61% had obstructive coronary disease, with 7.3% having normal coronaries.[10]

The rationale for this study is that, despite the numerous treatment options available, cardiovascular diseases remain the leading cause of death, and understanding the angiographic profile and the various outcomes after treatment is critical to understanding the expected outcome in patients with acute coronary syndrome.

■ METHODOLOGY

This retrospective cross-sectional study was conducted by the Cardiology Department at Lady Reading Hospital between January 2020 and December 2021. A purposive convenient sampling technique was used to include the first 800 patients diagnosed with Acute Coronary Syndrome. The sample size of 800 was determined based on a prevalence of 7.3% of normal coronaries, as reported by Deshmukh et al.[10], using an OpenEpi calculator with a 95% confidence interval and 5.5 margin of error. The department is equipped with state-of-the-art facilities, and staffed by experienced cardiologists and trained residents providing intervention cardiology services. Clinical profiles, risk factors and angiographic data were collected using a structured questionnaire from medical charts after obtaining informed consent from the patients. Participants with cardiac disease, unstable angina, or stable angina who had a significant ECG or ETT underwent coronary angiography. Visible stenosis of more than 25% in at least single epicardial coronary region was used to identify coronary artery disease. Depending on how

many vessels had stenosis, patients were categorised as having mild (50%), intermediate (50-69%), or extreme (>70%) single vascular disease, double vessel disease, or triple vessel disease. SPSS21 software was used to analyse the data, and the Kolmogorov-Smirnov test was employed to ensure that the data was distributed normally. They utilized the Chi-square or Fisher's exact analysis to detect group relationships, and the Mann-Whitney test to contrast median value due to non-normal distribution of data. The study's significance level was $p<0.05$.

■ RESULTS

A total of 800 people participated in the research, of whom 62.50% were men and 68.10% were between the ages of 31 and 60, or 55.58 ± 11.16. Most of them had BMIs that were within WHO guidelines. About 48% of individuals had hypertension, and

33.75 percent of patients smoked. Dyslipidemia was 31.2% and diabetes was 38.8%. Angina affects most patients. 33.25% had MI. Details are shown in Table 1. SVCAD was present in 20.38% of angiographic lesions. 27.50% TVCAD and 30% DVCAD. The coronary vessels of 22.25% were healthy. Left main stem (LMS) angiograms were normal in about 92% of the individuals, but narrowed in 38.46% of them (between 50 and 80%) and 65.25% of patients had LAD, 49.55% had RCA, and 43% had LCX. RCA in 67.58% and LAD (65.13%) was narrowed by 50-80%. 705 (88.12) of the population favoured the right. Patients with single- and multiple-vessel coronary disease were divided. Multi-vessel coronary artery disease was seen in 57.37%. Patients with multi-vessel disease were older (57.00 vs. 53.00, $p=0.018$) than those with single vascular illness. Patients with single 119 (73.01%) and multiple 302 (65.80%) vascular involvement

Table 1: Demographic and clinical characteristics of the patients

Characteristics		N	%
Age(years) Mean(SD) Median (IQR) 55.00(15.00)		55.58	11.16
Age groups	≤ 30	20	2.50
	31-60	545	68.10
	>61	235	29.40
Sex	Male	500	62.50
	Female	300	37.50
Body Mass Index	Normal (18.5–24.9 kg/m2)	450	56.25
	Overweight (25.0–29.9 kg/m2)	300	37.50
	Underweight (<18.5 kg/m2)	50	6.25
Smoking	Smoker	270	33.75
	Non smoker	530	66.25
Hypertension	Yes	384	48.00
	No	416	52.00
Diabetes Mellitus	Yes	311	38.88
	No	489	61.13
Dyslipidemia	Present	250	31.25
	Absent	550	68.75
Family History of CAD	Positive	100	12.50
	Negative	700	87.50
Angina	Yes	544	68.00
	No	256	32.00
MI	Yes	266	33.25
	No	534	66.75

Table 2: Coronary artery angiographic findings of the patients

Vessels involvement		N	%
Left Main Stem (LMS) Disease	No	735	91.88
	Yes	65	8.13
LMS Disease	<50%	38	58.46
	50-80%	25	38.46
	>80%	2	3.08
Left Artery Descending (LAD)	No	278	34.75
	Yes	522	65.25
LAD Disease	<50%	93	17.82
	50-80%	340	65.13
	>80%	89	17.05
Left Circumflex Artery (LCX)	No	456	57.00
	Yes	344	43.00
LCX Diseases	<50%	66	19.19
	50-80%	207	60.17
	>80%	71	20.64
Right Coronary Artery (RCA)	No	402	50.25
	Yes	398	49.75
RCA Disease	<50%	71	17.84
	50-80%	269	67.59
	>80%	58	14.57
Dominance	Right	705	88.12
	Left	64	8.00
	Co	31	3.88

Table: 3: Background or Demographic characteristics stratified by the number of vessels involved

Variables		Vessel's Involvement		
		Single n=163	Multiple n= 459	p-value
Age (years) Median (IQR)		53 (14)	57 (15)	0.018
Age groups	≤ 30	5 (3.07)	12 (2.61)	0.182
	31-60	119 (73.01)	302 (65.80)	
	>61	39 (23.93)	145 (31.59)	
Sex	Male	104 (63.80)	290 (63.18)	0.925
	Female	59 (36.20)	169 (36.82)	
BMI	Normal weight (18.5–24.9 kg/m2)	87 (53.37)	259 (56.43)	0.586
	Overweight (25.0–29.9 kg/m2)	67 (41.10)	169 (36.82)	
	Underweight (<18.5 kg/m2)	9 (5.52)	31 (6.75)	
Smoking	Smoker	56 (34.36)	154 (33.55)	0.848
	Non-Smoker	107 (65.64)	305 (66.45)	
Hypertension	Yes	77 (47.24)	244 (53.16)	0.203
	No	86 (52.76)	215 (46.84)	
DM	Yes	66 (40.49)	197 (42.92)	0.645
	No	97 (59.51)	262 (57.08)	

ranged in age from 31 to 60. Most males with normal BMIs and no family history of CAD showed vascular involvement. In both single and multiple vascular involvements, non-smokers, non-diabetics, angina patients without MI, and angina patients without dyslipidemia were more prevalent. Hypertensive patients comprised 244 (53.16%) of the multi-vessel patients and 86 (52.76%) of the patients with a single vessel. Both groups shared unimportant characteristics (p>0.05). The left main stem (LMS) was normal in both the groups with single and multiple vascular involvement (95.71% vs. 87.80%, p=0.004). Those with multi-vessel disease had more 50% lesions overall. Similar numbers of patients were in both groups. A total of 210 patients (45.75%) had multiple vessel LAD lesions ranging from 50 to 80%. The incidence of LAD illness varies greatly between populations. About 287 (62.53%) of the single vessel participation had LCX, compared to 123 (75.46%) without it. Significant statistically (p 0.001). 68.2% of the multivessel group's RCA narrowed by 50% to 80%. Table 4 provides specifics. 350 patients received PCI, while 16.13% underwent CABG. Patient utilisation of contrast was 70% and 246 people (70.29%) utilised DES, while 84 (24%) used DES + BMS. Just 4 individuals had ventricular imaging (LV gram) done.

DISCUSSION

The findings of current study indicated that patients with multiple vessel disease tended to be older than those with single vessel disease, and a family history of CAD was not commonly reported among patients with coronary artery disease. We observed that smokers were more likely to have multiple vessel disease compared to non-smokers, with 34.36% of smokers having single vessel disease and 33.55% having multiple vessel disease. In the non-smoker group, 65.64% had single vessel disease and 66.45% had multiple vessel disease. Galluc-

Dyslipidaemia	Present	51 (31.29)	146 (31.81)	0.748
	Absent	112 (68.71)	313 (68.19)	
Family history	Present	19 (11.66)	58 (12.64)	0.922
	Absent	144 (88.34)	401 (87.36)	
Angina	Yes	109 (66.87)	304 (66.23)	0.923
	No	54 (33.13)	155 (33.77)	
MI	Yes	50 (30.67)	137 (29.85)	0.843
	No	113 (69.33)	322 (70.15)	

ci et al. noted the significant role of smoking in cardiovascular disease, both primary and secondhand smoking, with smoking exposure accounting for more than 30% of coronary heart disease. However, cessation before the age of 40 can lead to a reduction in this excessive risk.[11]

In this study, it was found that 85.9% of ACS patients were male, which is consistent with a research by Akanda et al. on 637 individuals. Their average patient age was 50.158.8 years, which is significantly younger than ours is at 55.511.1 years. Consistent with our findings, 259 (40.66%) individuals had triple vessel disease and only 3 (0.47%) had isolated left main disease; the most significant risk variables for multiple vascular disease were dyslipidemia (60%) and smoking (60%).[12]

In a study by Kadam et al., 100 patients with acute coronary syndrome were examined, and it was discovered that CAD was slightly more common in male patients (77%) than in female patients (23%), which was higher than the results of our study, which showed that 62.5% of male and 37.50% of female patients had CAD. In accordance with our findings, the study also revealed that 43.7% of all patients had successful PTCA and were released on the proper medication. In contrast, only 16.13% of the patients in our research received the coronary artery bypass grafting recommendation, while 15% and 24% were given rigorous medical therapy. Also, the majority of those participating in our research had multivessel disease, whereas the majority of patients in Kadam et

alstudy .'s had single-vessel coronary artery disease (44%).[13]

Abelonian et al conducted a retrospective study in ACS patients managed by Optical coherence tomography and found that the majority of their patients were male (86%) and that 79% of those included in the study were active smokers. Plaque rupture was found to be the most common mechanism of acute coronary syndrome, with 67% of the patients having plaque rupture. These findings are similar to our study, which also identified smoking as a significant risk factor for ACS.[14] In a study conducted by Khan et al. in 2021, the researchers analyzed and investigated the profiles of patients with heart disease who were 35 years old or younger. In 2021, 1742 people with ACS who sought medical attention in hospitals between August and September were recruited in a research. There were 108 patients (6.2%) who were 35 or younger, with men making up the vast majority. The study indicated that anterior STEMI was the most common site for ST Elevation Myocardial Infarction (91%) in young individuals with ACS. Eighty-three percent of patients diagnosed with ACS reported using tobacco in some form, whether it be smoking or chewing.[15]

A study conducted by Pruthvi et al. in 2016 analyzed cases of ACS in patients aged between 36-42, with a precise age limit of 35.5 ± 4.7 years. The study identified smoking and hypertension as the most prevalent risk factors among the study population. STEMI was the cause of the vast majority of cases, while the LAD was the most

commonly involved artery.[16]

Smoking, hypertension, and dyslipidemia were the most frequent risk factors in large retrospective Nepali research. The previous study only revealed 31% of individuals with dyslipidemia in single and multiple vessel coronary artery disease, and hypertension was the most frequent risk factor.[17]

■ CONCLUSION

The study found that single vessel coronary artery disease was the most frequently observed finding, and the most common treatment option was PCI. Among patients presenting with ACS, hypertension and smoking were the most prevalent risk factors.

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Author's Contribution

Conflict of Interest

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