



## DEMOGRAPHIC PROFILE, RISK FACTORS AND ANGIOGRAPHIC PROFILE OF PATIENTS WITH ACUTE CORONARY SYNDROME

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### Abstract

#### Background:

**Aim of the study:** To study the demographic profile, risk factors and angiographic profile of patients with acute coronary syndrome.

**Material and method:** A total of 765 patients with acute coronary syndromes who underwent Coronary Angiography (CAG) from 1<sup>st</sup> April 2022 to 30<sup>th</sup> September 2022 at Krishna Hospital and Medical Research Centre, Karad were analysed. Their demographic profile and coronary risk factors were compared with their angiographic profile.

**Results:** Of total 765 patients with acute coronary syndrome, 461 (60.3%) were males and 304 (39.7%) were females and the mean age of the study population was 58.99 ( $\pm$  12.09) years. A majority of 235 (31.1%) subjects were aged between 51-60 years. Hypertension (41.7%) followed by tobacco chewing (35.6%) were the most common coronary risk factors. A majority of 349 (45.6%) patients had non-ST elevation myocardial infarction followed by 161 (21%) patients with unstable angina. Of the 255 (33.4%) patients with ST-elevation myocardial infarction, 88 (11.5%) patients had anterior wall myocardial infarction followed by 72 (9.4%) patients with inferior wall myocardial infarction. Single vessel disease (27.2%) was the most common angiographic profile observed, followed by double vessel disease (21.6%) and triple vessel disease (19.7%). The month of September had the highest number of patients admitted with acute coronary syndromes, with the majority of 49 (27.8%) having single vessel disease and the month of July saw the lowest number of patients (14%). The left anterior descending artery (LAD) was the most involved vessel, seen in 400 (52.3%) patients, followed by the right coronary artery (RCA), seen in 289 (37.8%) patients. The most common site of obstruction was the mid LAD (34.5%). **Conclusion:** Present study depicted the frequent occurrence of acute coronary syndromes in men in their fifth decade with hypertension and tobacco chewing being the most frequent coronary risk factors. Non-ST elevation myocardial infarction was the most common acute coronary syndrome. Single vessel disease, with LAD was the most diseased coronary artery on CAG.

**Keywords:** Coronary artery disease, coronary risk factors, angiographic profile, acute coronary syndrome, ST-elevation myocardial infarction

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## 1. Introduction

One-fourth of deaths in India are because of cardiovascular disease (CVD). Ischemic heart disease and stroke are responsible for >80% of this burden, with coronary artery disease being the major cause.<sup>[1]</sup> India is fast becoming the 'global capital' of coronary artery disease (CAD), contributing to 60% of the global burden of CAD, and the prevalence is rising.<sup>[1]</sup> The genetic predisposition and rapid acquisition of cardiovascular risk factors secondary to urbanization seem to be the major contributors to this rising prevalence.<sup>[2]</sup> The population of young patients with CAD is predominantly male, rural, and characterized by a low socio-economic status. The etiology of CAD in this patient group differs significantly from that in older patients and it is often associated with an unhealthy lifestyle related to rapid civilization changes. The rates of CAD risk factors in young adults are high and the most important risk factors are dyslipidemia, smoking, and overweight/obesity.<sup>[3]</sup> Coronary risk factor profiles and angiographic features were compared between STEMI and non-ST elevation myocardial infarction (NSTEMI)/unstable angina (UA) patients. Of all cases of acute Coronary syndrome, about one in ten cases were reported at a younger age. Comparative analysis of young patients with STEMI and NSTEMI/UA revealed that single vessel disease was predominantly involved in the STEMI group, whereas triple-vessel disease was predominant in NSTEMI/UA group. LAD was the most commonly involved coronary artery in both groups. Affected patients were predominantly male and showed a high prevalence of smoking/tobacco consumption.<sup>[4]</sup> There is scanty literature about coronary artery disease and angiographic profile in rural India, hence the present study was conducted.

## 2. Material and Methods

**Aim:** To study the demographic profile, risk factors and angiographic profile of patients with acute coronary syndrome. **Objectives:** To study the demographic profile and risk factors in patients with acute coronary syndrome. To study the angiographic profile [Normal angiography, Single vessel disease (SVD), Double vessel disease (DVD), Triple vessel disease (TVD)] of patients

## 3. Results

**Demographic profile and risk factors:** The current study included 765 patients with acute

with acute coronary syndrome and to find the relation between demographic profile, risk factors and the angiographic profile in the patients with ACS. **Study design:** Retrospective observational data analysis study. **IEC approval:** The study is approved by Institutional Ethics Committee (IEC) KIMS, Deemed to be university, Karad (Protocol Number: 180/2022-2023). **Study setting:** The present study is a single centre, hospital-based data analysis study conducted on the data of patients with acute coronary syndrome who underwent Coronary Angiography (CAG) from 1<sup>st</sup> April 2022 to 30<sup>th</sup> September 2022. **Inclusion criteria:** All patients aged > 18 years with coronary artery disease who underwent Coronary Angiography (CAG). **Exclusion criteria:** Pregnancy and patients with a previous history of allergy to radiographic contrast or severe renal insufficiency (eGFR <30 ml/min) were excluded. **Sample size:** The patients who fulfilled the inclusion criteria were considered samples. The study was time bound and conducted on patients who underwent Coronary Angiography (CAG) from 1<sup>st</sup> April 2022 to 30<sup>th</sup> September 2022 (6 months). All patients with coronary artery disease diagnosed based on clinical history, 12 lead electrocardiogram (ECG) findings, biochemical markers, echocardiography, and undergoing CAG were enrolled in this study and were classified into ST-segment elevation MI (STEMI), non-STEMI (NSTEMI) and unstable angina (UA). CAD was defined as a 70% lesion in one of the three major epicardial arteries [left anterior descending (LAD), left circumflex (LCX), or right coronary artery (RCA)] or one of their major branches, or a 50% luminal narrowing of the left main coronary artery (LMCA). As a result, patients were classified as having single-vessel (SVD), double-vessel (DVD), or triple-vessel disease (TVD). Any lesion or stenosis other than this was classified as mild disease and non-obstructive coronaries were classified as normal. Atherosclerotic lesions complexity was further categorized according to the Joint American College of Cardiology/American Heart Association (ACC/AHA) task force classification system.<sup>[5]</sup> **Statistical Analysis:** This data was collected and analyzed using SPSS 21.0 trial version. Age was expressed as the mean standard deviation. The 'p' < 0.05 was considered statistically significant. T-test was used to study the difference between continuous variables groups.

coronary syndrome, of which the male gender was predominating, with 461 (60.3%) patients being males and 304 (39.7%) being females, for a male-to-female ratio of 1.5:1. The mean age of the study

population was 58.99 ( $\pm$  12.09) years, and mean age among the male and female was 58.42 ( $\pm$  12.53) and 59.86 ( $\pm$  11.36) respectively ('p' value = 0.106). A majority of 235 (31.1%) subjects were aged between 51-60 years. The minimum and maximum age in the study population was 19 and 97 years respectively. (Table 1, Figure 1) Among the risk factors for acute coronary syndrome, hypertension and tobacco chewing were the most

common, which were present in 41.7% and 35.6% of patients respectively. Diabetes mellitus, dyslipidemia, obesity, alcohol consumption, family history and smoking, were present in 35.2%, 20%, 16.6%, 10.8%, 3.8% and 3.1% respectively. Alcohol consumption was more in males (80.7%) than females (19.3%) ('p' value <0.001). (Table 1, Figure 2)

Figure 1: Frequency distribution for age of the study population

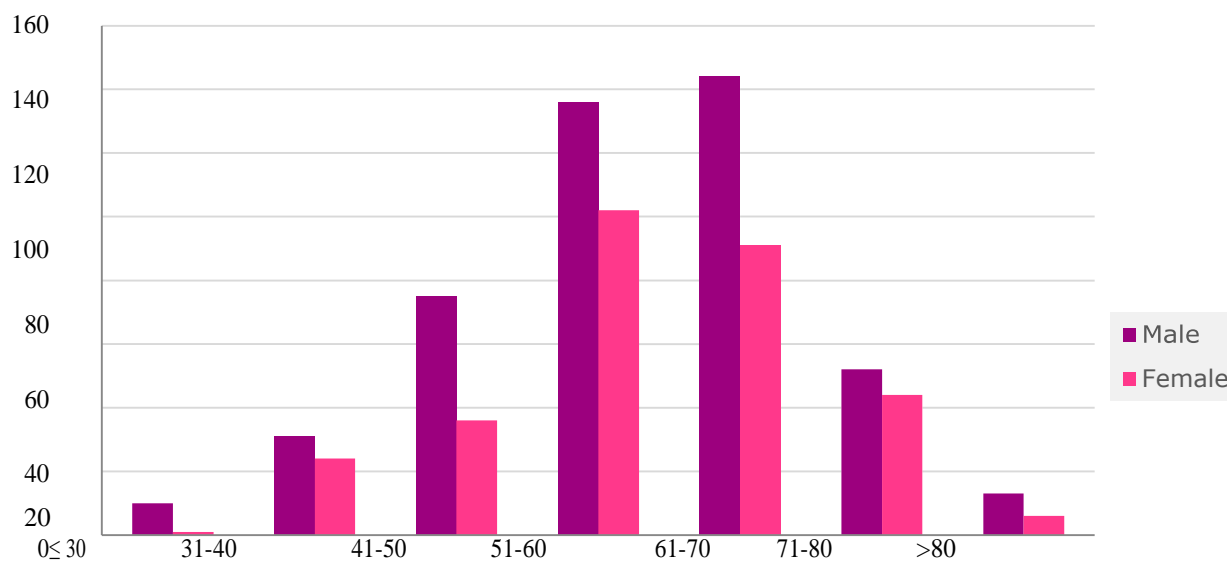


Figure 2: Coronary risk factors

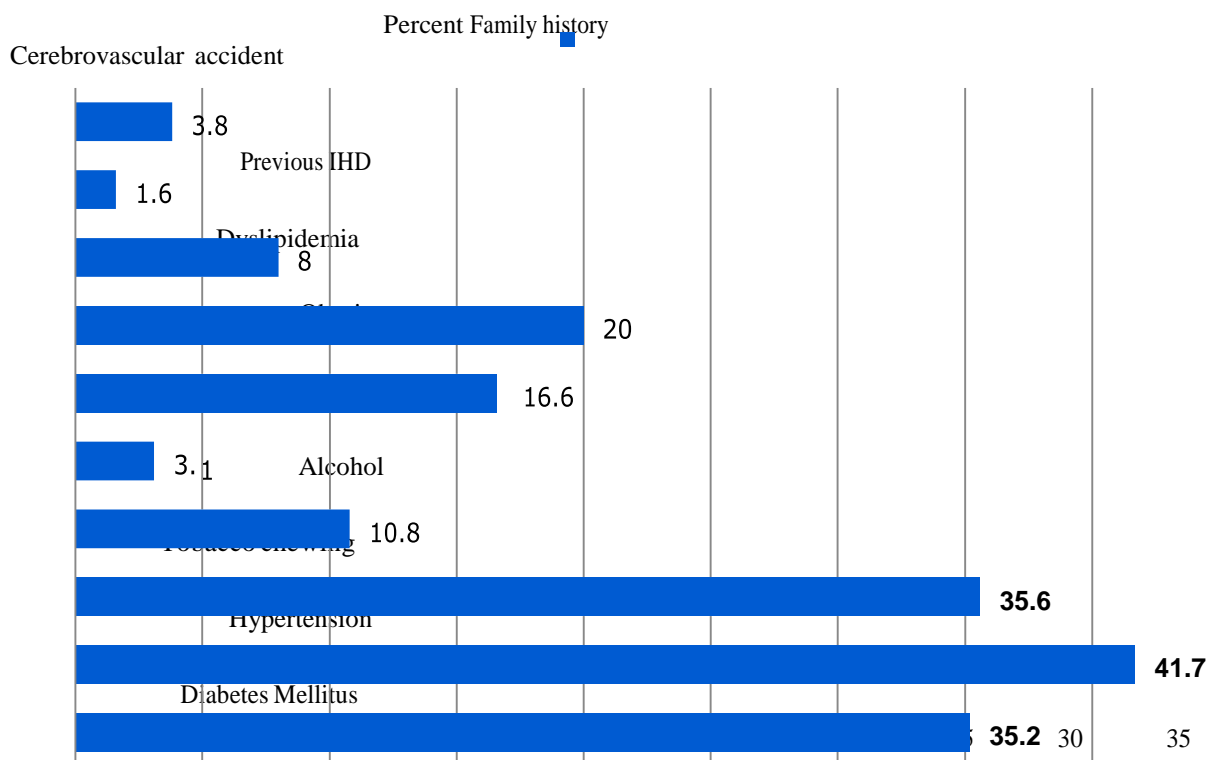


Table 1: Demographic profile and risk factors

Frequency distribution of age(Years)	Male(n=461)	Female(n=304)	Total(n=765)
≤ 30	10 (90.9%)	1 (9.1%)	11 (1.4%)
31-40	31 (56.4%)	24 (43.6%)	55 (7.2%)
41-50	75 (67.6%)	36 (32.4%)	111 (14.5%)
51-60	136 (29.5%)	102 (33.6%)	238 (31.1%)
61-70	144 (61.3%)	91 (38.7%)	235 (30.7%)
71-80	52 (54.2%)	44 (45.8%)	96 (12.5%)
>80	13 (68.4%)	6 (31.6%)	19 (2.5%)
Total	461 (60.3%)	304 (39.7%)	765 (100%)
Chi- Square = 10.223; DF =6; 'p' value = 0.116			
Mean Age in years	Male	Female	'p' value
58.99 (± 12.09)	58.42 (± 12.53)	59.86 (± 11.36)	0.106
Risk factors	Males	Females	Total
Diabetes Mellitus	174 (64.7%)	95 (35.3%)	269 (35.2%)
Hypertension	185 (58%)	134 (42%)	319 (41.7%)
Tobacco chewing	166 (61.5%)	104 (38.5%)	272 (35.6%)
Alcohol	67 (80.7%)	16 (19.3%)	83 (10.8%)
Smoking	12 (50%)	12 (50%)	24 (3.1%)
Obesity	76 (59.8%)	51 (40.2%)	127 (16.6%)
Dyslipidaemia	88 (57.5%)	65 (42.5%)	153 (20%)
Family history	15 (51.7%)	14 (48.3%)	29 (3.8%)

**Clinical diagnosis:** Of total 765 patients with acute coronary syndrome, 255 (33.4%) patients had ST-elevation myocardial infarction, with 88 (11.5%) having anterior wall myocardial infarction and 72 (9.4%) having inferior wall myocardial infarction. Antero-lateral wall myocardial infarction, inferio-posterior wall myocardial infarction, antero-septal wall myocardial infarction, posterior wall myocardial infarction, and Q right bundle branch myocardial infarction were found in 4.7%, 4.6%, 1.6%, 1.2% and 0.4%

patients respectively. Of the 765 patients, a majority of 349 (45.6%) patients had non-ST elevation myocardial infarction followed by 161 (21%) patients with unstable angina. All the acute coronary syndromes were more common in males except posterior wall myocardial infarction, antero-septal wall myocardial infarction and Q right bundle branch myocardial infarction which was found to be more in females. ('p' value = 0.003) (Table 2)

Table 2: Clinical diagnosis of the study population

Clinical diagnosis		Male (n=461)	Female (n=304)	Total (n=765)
Unstable angina		83 (51.6%)	78 (48.4%)	161 (21%)
NSTEMI		206 (59%)	143 (41%)	349 (45.6%)
STEMI	AWMI	69 (78.4%)	19 (21.6%)	88 (11.5%)
	ALWMI	23 (63.9%)	13 (36.1%)	36 (4.7%)

IWMI	49 (68.1%)	23 (31.9%)	72 (9.4%)	255 (33.4%)
PWMI	4 (44.4%)	5 (55.6%)	9 (1.2%)	
IPWMI	21 (60%)	14 (40%)	35 (4.6%)	
ASWMI	5 (41.7%)	7 (58.3%)	12 (1.6%)	
QRBB MI	1 (33.3%)	2 (66.7%)	3 (0.4%)	
Total	461 (60.3%)	304 (39.7%)	765 (100%)	
CHI- SQUIRE = 23.03 DF =8; 'p' value = 0.003				
NSTEMI: non-ST elevation myocardial infarction; STEMI: ST-elevation myocardial infarction; AAMI: anterior wall myocardial infarction; ALWMI: anterolateral wall myocardial infarction; IWMI: inferior wall myocardial infarction; PWMI: posterior wall myocardial infarction; IPWMI: inferio-posterior wall myocardial infarction; ASWMI: antero-septal wall myocardial infarction; QRBB MI: Q right bundle branch myocardial infarction.				

**Angiography profile:** Of total 765 patients undergoing CAG, 212 (27.2%) patients had single vessel disease (SVD), which was the most common angiographic profile observed, followed by double vessel disease (DVD) in 165 (21.6%) patients and triple vessel disease (TVD) in 151 (19.7%) patients. Mild disease was observed in 109 (14.2%) patients, while normal angiograms were observed in 128 (16.7%). When compared to normal angiograms and mild disease, the prevalence of SVD, DVD, and TVD was higher in males. (The 'p' value is < 0.0001). In the present study, there was no statistically significant difference in the type of vessel involved in CAD on CAG among the genders. ('p' value=0.818). (Table 3, Figure 3) The month of September had the highest number of patients admitted with acute coronary syndromes, with the majority of 49 (27.8%) having single vessel disease and 39 (22.2%) having double vessel disease. The month of July saw the lowest number of patients (14%). There was no statistical significance between the different types of vessels involved and the months. ('p' value = 0.187) (Table 4) The left anterior descending artery (LAD) was the most commonly involved vessel, seen in 400 (52.3%) patients, followed by the right coronary artery (RCA), seen in 289 (37.8%) patients. The left main coronary artery (LMCA) was the least likely to be involved (2.7%). The LAD was more commonly involved in TVD (35.8%) than SVD (32.3%) and DVD (32%) ('value is <0.001). (Table 5, Table 6, Figure 4) The most common site of obstruction was the mid LAD (34.5%) followed by proximal LAD (29.4%). The least common site was proximal LMCA (1.3%). More than 70% of stenosis was seen in mid LAD (26.8%). (Table 7)

Table 3: Angiographic profile of the study population

Angiography	Male (n=461)	Female (n=304)	Total (n=765)
Normal angiography	61 (47.7%)	67 (52.3%)	128 (16.7%)
Mild disease	53 (48.6%)	56 (51.4%)	109 (14.2%)
SVD	137 (64.6%)	75 (35.4%)	212 (27.2%)
DVD	109 (66.1%)	56 (33.9%)	165 (21.6%)
TVD	101 (66.9%)	50 (33.1%)	151 (19.7%)
Total	461 (60.3%)	304 (39.7%)	765 (100%)
CHI- SQUIRE = 21.42; DF =4; 'p' value < 0.0001			
SVD: Single vessel disease; DVD: double vessel disease; TVD: triple vessel disease			

Table 3: Angiographic profile of the study population

Angiography	Male (n=461)	Female (n=304)	Total (n=765)
Normal angiography	61 (47.7%)	67 (52.3%)	128 (16.7%)
Mild disease	53 (48.6%)	56 (51.4%)	109 (14.2%)
SVD	137 (64.6%)	75 (35.4%)	212 (27.2%)
DVD	109 (66.1%)	56 (33.9%)	165 (21.6%)
TVD	101 (66.9%)	50 (33.1%)	151 (19.7%)
Total	461 (60.3%)	304 (39.7%)	765 (100%)

CHI-SQUARE = 21.42; DF =4; 'p' value < 0.0001

SVD: Single vessel disease; DVD: double vessel disease; TVD: triple vessel disease

Figure 3: Angiographic profile of the study population

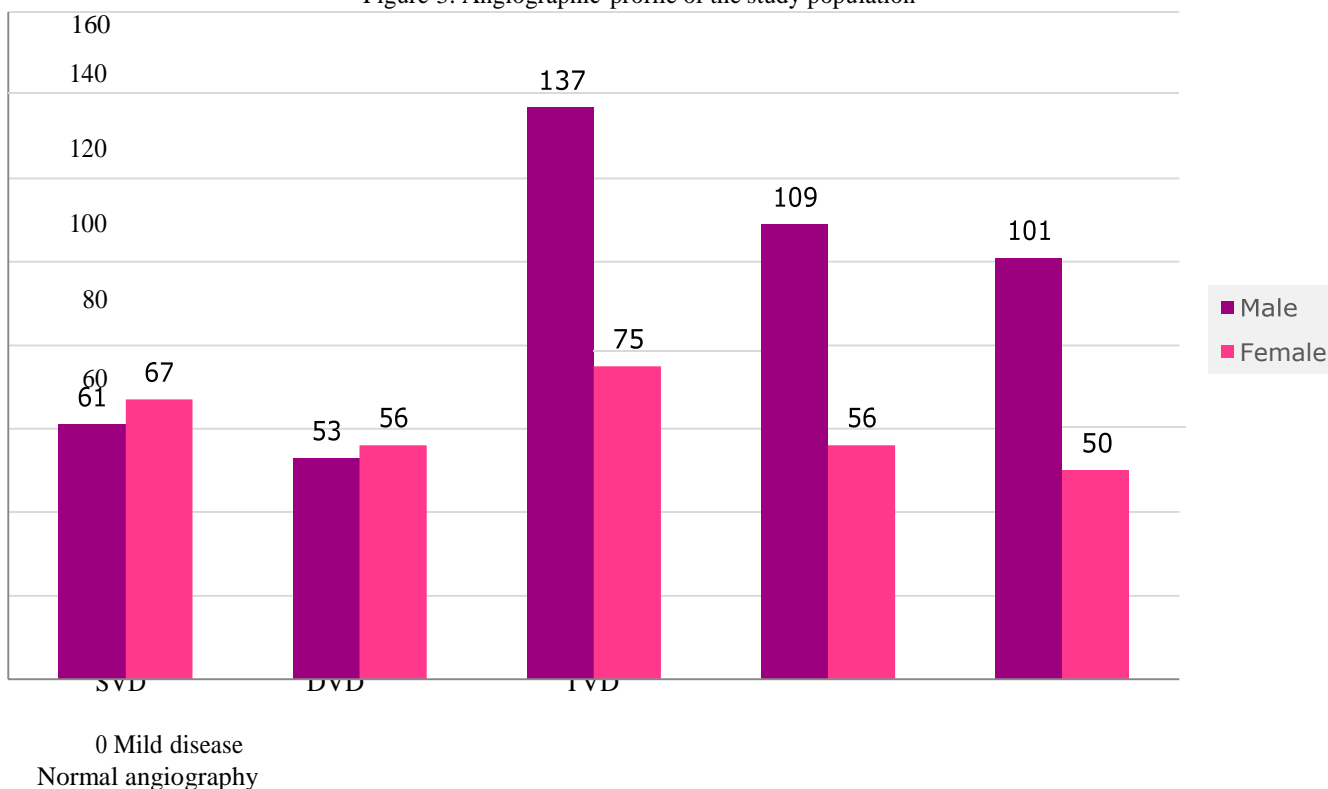


Table 4: Month-wise angiographic profile of the study population

Month	Angiography profile					Total
	Normal	Mild disease	SVD	DVD	TVD	
April	32(27.4%)	2(1.7%)	40(34.2%)	19(16.2%)	24(20.5%)	117(15.3%)
May	20(15.6%)	20(15.6%)	33(25.8%)	34(26.6%)	21(16.4%)	128(16.7%)
June	18(16.2%)	16(14.4%)	31(27.9%)	16(14.4%)	30(27%)	111(14.5%)
July	18(16.8%)	17(15.9%)	27(25.2%)	27(25.2%)	18(16.8%)	107(14%)
August	16(12.7%)	27(21.4%)	32(25.4%)	30(23.8%)	21(16.7%)	126(16.5%)
September	24(13.6%)	27(15.3%)	49(27.8%)	39(22.2%)	37(21%)	176(23%)

Total	128(16.7%)	212(14.2%)	165(27.7%)	151(21.6%)	109(19.7%)	765(100%)
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Table 5: Angiography profile and the involved artery

Artery	Stenosis (%)	Angiography profile					Total	‘p’ value
		Normal	Mild disease	SVD	DVD	TVD		
LMCA	≥50%	0	0	4(19%)	4(19%)	13(61.9%)	21(2.7%)	<0.001
	<50%	128(17.2%)	109(14.7%)	208(28%)	161(21.6%)	138(18.5%)	744(97.3%)	
LAD	≥50%	0	0	129(32.3%)	128(32%)	143(35.8%)	400(52.3%)	<0.001
	<50%	128(35.1%)	109(29.9%)	83(22.7%)	37(10.1%)	8(2.2%)	365(47.7%)	
LCX	≥50%	0	0	31(12.6%)	79(32.1%)	136(55.3%)	246(32.2%)	<0.001
	<50%	128(24.7%)	109(21%)	181(34.9%)	86(16.6%)	15(2.9%)	519(67.8%)	
RCA	≥50%	0	0	47(16.3%)	99(34.3%)	143(49.5%)	289(37.8%)	<0.001
	<50%	128(26.9%)	109(22.9%)	165(34.7%)	66(13.9%)	8(1.7%)	476(62.2%)	

LMCA: left main coronary artery; LAD: left anterior descending artery; LCX: left circumflex artery; RCA: right coronary artery

Table 6: CAD and the involved artery

Coronary artery	Stenosis (%)	Angiography profile			Total	‘p’ value
		SV D	DV D	TV D		
LMCA	≥50%	4	4	13	21	<0.001
LAD	≥50%	129	128	143	400	
LCX	≥50%	31	79	136	246	
RCA	≥50%	47	99	143	289	

Figure 4: CAD And The Involved Artery

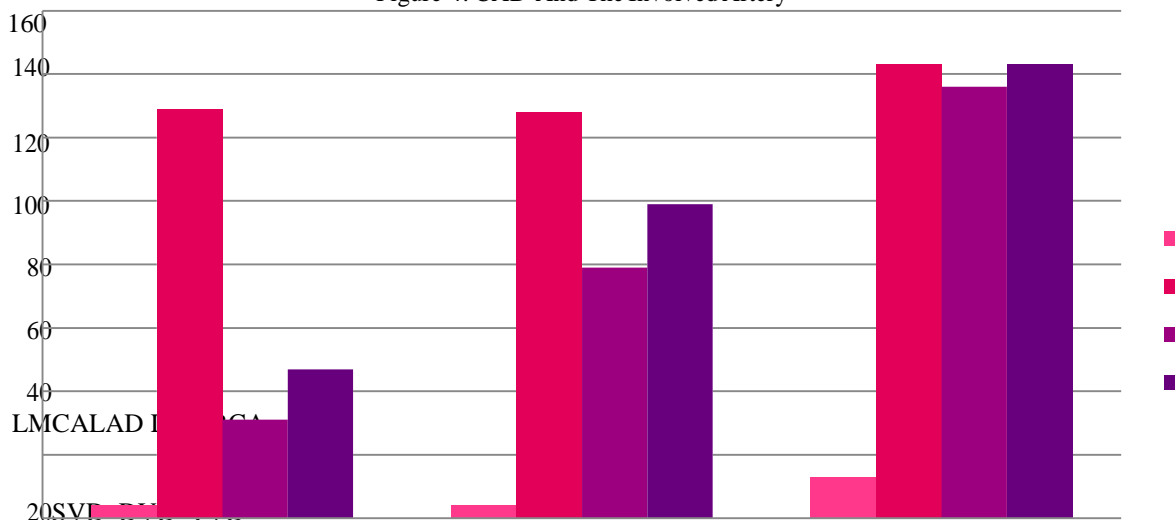


Table 7: Coronary angiographic profile and site of stenosis

Artery	Stenosis (%)	Site of stenosis						
		Proximal	Distal					
LMCA	0%	743(97.1%)	730(95.4%)					
	<50%	12(1.6%)	18(2.4%)					
	50-70%	1(0.1%)	10(1.3%)					
	>70%	9(1.2%)	7(0.9%)					
Total involved		10 (1.3%)	17(2.2%)					
LAD		Proximal	Mid	Distal	D1	D2	D3	
	0%	381(49.8%)	393(51.4%)	656(85.8%)	688(89.9%)	700(91.5%)	736(96.2%)	
	<50%	159(20.8%)	108(14.1%)	55(7.2%)	23(3%)	13(1.7%)	14(1.8%)	
	50-70%	56(7.3%)	59(7.7%)	12(1.6%)	14(1.8%)	16(2.1%)	6(0.8%)	
	>70%	169(22.1%)	205(26.8%)	42(5.5%)	40(5.2%)	36(4.7%)	9(1.2%)	
Total involved		225(29.4%)	264(34.5%)	54(7.1%)	54(7%)	52(6.8%)	15(2%)	
LCX		Proximal	Mid	Distal	OM1	OM2	LPDA	LPLVB
	0%	522(68.2%)	726(94.9%)	705(92.2%)	690(90.2%)	670(87.6%)	726(94.9%)	738(96.5%)
	<50%	97(12.7%)	14(1.8%)	17(2.2%)	21(2.7%)	29(3.8%)	11(1.4%)	12(1.6%)
	50-70%	37(4.8%)	4(0.5%)	9(1.2%)	10(1.3%)	17(2.2%)	8(1%)	3(0.4%)
	>70%	109(14.2%)	21(2.7%)	34(4.4%)	44(5.8%)	49(6.4%)	20(2.6%)	12(1.6%)
Total involved		146(19%)	25(3.2%)	43(5.6%)	54(7.1%)	66(8.6%)	28(3.6%)	15(2%)
RCA		Proximal	Mid	Distal	PDA	PLVB		
	0%	507(66.3%)	506(66.1%)	640(83.7%)	711(92.9%)	725(94.8%)		
	<50%	108(14.1%)	86(11.2%)	50(6.5%)	23(3%)	11(1.4%)		
	50-70%	30(3.9%)	32(4.2%)	21(2.7%)	14(1.8%)	13(1.7%)		
	>70%	120(15.7%)	141(18.4%)	54(7.1%)	17(2.2%)	16(2.1%)		
Total involved		150(19.6%)	173(22.6%)	75(9.8%)	31(4%)	29(3.8%)		

#### 4. Discussion

In the present retrospective study, it was protuberant that, of the 765 patients with acute coronary syndromes, the males had a higher prevalence (60.3%) than females (39.7%). This was similar to the studies conducted by J.R. Beig et al, Pruthvi C et al, Sharma et al and Rauniyar et al with 54.8%, 92%, 79.5% and 91.65 % male predominance respectively, which was justified by the fact that according to age standardised death and disability rates of Cardiovascular disease in

India, death due to Ischemic heart disease is more in males than females.<sup>[6,7,8,9,11]</sup> The study conducted by Mohammed AM et al reported female predominance (51.66%).<sup>[10]</sup> The mean age of the study population was 58.99 (±12.09) years with a majority of 235 (31.1%) subjects aged between 51-60 years. The minimum and maximum age in the study population was 19 and 97 years respectively. This was similar to the studies conducted by J.R. Beig et al, Sharma et al and Mohammed AM et al.<sup>[6,8,10]</sup> Pruthvi C et al and Rauniyar et al conducted studies on young patients less than 40



years and the mean age was 35.5 ( $\pm$  4.7) and 38.55 ( $\pm$  1.90) years respectively.<sup>[7,9]</sup> The most common risk factor for acute coronary syndrome in present study was hypertension (41.7%) followed by Tobacco chewing (35.6%), diabetes mellitus (35.2%), dyslipidemia (20%), obesity (16.6%), alcohol consumption (10.8%), family history (3.8%) and smoking (3.1%). This was similar to the study conducted by Mohammed AM et al with Hypertension being the most common risk factor.<sup>[10]</sup> About 1/3<sup>rd</sup> of adult Indians are estimated to have hypertension (34% in urban areas and 28% in rural areas).<sup>[12]</sup> The number of hypertensive people is expected to double from 118 million in 2000 to 213.5 million by 2025.<sup>[13]</sup> The average blood pressure in India has risen in the last two decades, while it has fallen in the majority of Western countries.<sup>[14]</sup> But other studies conducted showed that cigarette smoking was the main risk factor for acute coronary syndromes.<sup>[6,7,8,4,9]</sup> Tobacco was consumed mainly by chewing (35.6%) than smoking (3.1%) in rural areas. Tobacco use is increasing rapidly among young people in India (20-35 years old),<sup>[15]</sup> with a faster rate of increase among those with less education.<sup>[16]</sup> Evidence also suggests that tobacco experimentation begins relatively early among children in India.<sup>[17]</sup> All these risk factors were found to be more in males than females in our study. ('p' value <0.001). The angiography profile of 765 patients revealed that 349 (45.6%) patients had non-ST elevation myocardial infarction, 161 (21%) patients had unstable angina and 255 (33.4%) patients had ST elevation myocardial infarction of which anterior wall myocardial infarction (11.5%) was most common followed by inferior wall myocardial infarction (9.4%). The most common clinical diagnosis in this study was non-ST elevation myocardial infarction (45.6%). These findings were different from the studies conducted by J.R. Beig et al, Pruthvi C et al, Sharma et al and Surender Deora et al where the most common clinical diagnosis is AAMI (32.1%), STEMI (82%), STEMI (63.7%) and STEMI (74.5%) respectively.<sup>[6,7,8,4]</sup> These figures differed from previous Indian studies, reiterating the fact that the majority of the PCIs in our country are performed in the setting of acute coronary syndromes.<sup>[18,19]</sup> These findings vary with those reported from Western countries, where chronic stable angina is the initial manifestation of CAD in roughly half of patients and accounts for up to two-

thirds of patients undergoing percutaneous coronary revascularization.<sup>[20,21]</sup> These different findings could be attributed to either under diagnosis of stable CAD in our healthcare system or a more malignant presentation of CAD in our population. Single vessel disease (SVD) was the most common angiographic profile observed in 212 (27.2%) patients, followed by double vessel disease (DVD) in 165 (21.6%) patients and triple vessel disease (TVD) in 151 (19.7%) patients. Mild disease was found in 109 (14.2%) of the patients, with normal angiograms found in 128 (16.7%). SVD was also found to be most common in studies conducted by J.R. Beig et al (50.3%), Pruthvi C et al (53%), Sharma et al, Surender Deora et al and Rauniyar et al (30.27%).<sup>[6,7,8,4,9]</sup> The study conducted by Mohammed AM et al had normal angiography as the most common presentation (29.3%).<sup>[10]</sup> The most commonly involved vessel was the left anterior descending artery (LAD), which was seen in 400 (52.3%) patients, followed by the right coronary artery (RCA), which was seen in 289 (37.8%) patients. The left main coronary artery (LMCA) had the lowest risk of involvement (2.7%), which was very much similar to other studies. The mid LAD (34.5%) was the most commonly obstructed, followed by the proximal LAD (29.4%). Proximal LMCA (1.3%) was the least commonly involved.

Table 8: Comparison with other studies

Author	Type of study	(n)	Me an age	Ris k fact or	Clinic al diagno sis	CAD	Co nc lus io n
J.R. Beig et al (2017) <sup>[6]</sup>	Prospective Observational	624	59.30 (±11.1)	Smoking (79.8%)	AWMI (32.1%)	SVD (50.3%)	With smoking as the most common risk factor, majority had AWMI with SVD with LAD as most common artery
Pruthi et al (2020) <sup>[7]</sup>	Prospective Interventional	182	35.5 (±4.7)	Smoking (56%)	STEMI (82%)	SVD (53%)	The majority of the patients had single-vessel disease, and there was a significant delay in first medical contact and revascularization
Sharma et al (2014) <sup>[8]</sup>	Prospective Observational	1562	54.71 (±19.9)	Smoking (49.3%)	STEMI (63.7%)	SVD	Smoking was most prevalent risk factor. Diabetic patients had more of multi-vessel disease. Complications and in hospital mortality were higher in females and elderly population.
Surender Deora et al (2016) <sup>[4]</sup>	Retrospective	820	-	Smoking (65%)	STEMI (74.5%)	SVD	Significant differences were observed in coronary risk factor profile and angiographic features between young patients with STEMI and NSTEMI/UA, but larger studies will be required
Rauniyar et al (2020) <sup>[9]</sup>	Retrospective	109	38.55 (±1.9)	Smoking (29.3%)	-	SVD (30.2%)	Single vessel disease (SVD) was most prevalent in young patients with significant CAD. LAD is the most involved coronary artery followed by Right coronary artery (RCA) and Left Circumflex (LCX).
Mohammed AM et al (2021) <sup>[10]</sup>	Prospective Cross-sectional	300	55 (±10.4)	HTN (55.3%)	-	Normal (29.3%)	CAD tends to occur earlier in the population. Although cardiovascular risk factors were clustered among women, older men showed more aggressive coronary angiographic lesions
Present study	Retrospective	765	58.99 (±12.0)	HTN (41.7%)	NSTEMI (45.6%)	SVD (27.2%)	Acute coronary syndromes are more common in men in 5 <sup>th</sup> decade. Hypertension and tobacco chewing were the most frequent coronary artery disease risk factors. Non-ST-elevation myocardial infarction was the most common ACS. The most common coronary angiography finding was single vessel disease, with the LAD being the most common artery involved and the mid-Lad being the most common site of stenosis.

## 5. Conclusion

Atherosclerotic cardiovascular disease (ASCVD) is common in the general population, affecting the majority of adults past the age

of 60 years. This study revealed that acute coronary syndromes are more common in men in their fifth decade and onwards with hypertension and tobacco consumption being the most common coronary risk factors. Non-ST elevation myocardial infarction was the most common acute coronary syndrome, and anterior wall myocardial infarction was the most common ST-elevation myocardial infarction. Single vessel disease was prevalent, with LAD being the most frequent coronary artery involved and the mid-LAD being the most common site of stenosis. The study reveals the burden of cardiovascular atherosclerotic disease (ASCVD) in the study population of CAD. There is a pressing need for aggressive management of modifiable risk factors for the prevention of cardiovascular atherosclerotic disease.

Abbreviations: CAD: coronary artery disease, CAG: coronary angiography, ACS: acute coronary syndrome, LAD: Left anterior descending artery, LCX: left circumflex artery, RCA: right coronary artery, LMCA: left main coronary artery, STEMI: ST elevation myocardial infarction NSTEMI: non-ST elevation myocardial infarction, SVD: single vessel disease, DVD: double vessel disease, TVD: triple vessel disease, AAMI: anterior wall myocardial infarction, ALWMI: antero-lateral wall myocardial infarction, IWMI: inferior wall myocardial infarction, PWMI: posterior wall

## 6. References

- T. Alexander, S. Mehta, A. Mulasari, B.K. Nallamothe Systems of care for ST-elevation myocardial infarction in India Heart, 98 (2012), pp. 15-17.
- Deedwania P, Singh V. Coronary artery disease in South Asians: evolving strategies for treatment and prevention. Indian Heart J. 2005;57:617-631.
- Maroszyńska-Dmoch EM, Woźakowska-Kapłon B. Clinical and angiographic characteristics of coronary artery disease in young adults: a single centre study. Kardiol Pol. 2016;74(4):314-21.
- Deora S, Kumar T, Ramalingam R, Nanjappa Manjunath C. Demographic and angiographic profile in premature cases of acute coronary syndrome: analysis of 820 young patients from South India. Cardiovasc Diagn Ther. 2016;6(3):193-198.
- Kastrati A, Schömig A, Elezi S, et al. Prognostic value of the modified American College of Cardiology/American Heart Association stenosis morphology classification for long-term angiographic and clinical outcome after coronary stent placement. Circulation. 1999;100:1285-1290.
- Jahangir Rashid Beig, Tariq R. Shah, Imran Hafeez. Clinico-angiographic profile and procedural outcomes in patients undergoing percutaneous coronary interventions: The Srinagar registry. Indian Heart Journal 69 (2017) 589-596.
- Pruthvi C. Revaiah, Krishna Santosh Vemuri, Rajesh Vijayvergiya. Epidemiological and clinical profile, management and outcomes of young patients ( $\leq 40$  years) with acute coronary syndrome: A single tertiary care center study. Indian Heart Journal. 73 (2021) 295e300.
- Rajni Sharma, Shivkumar Bhairappa, SR Prasad Sharma R, Bhairappa S, Prasad SR, Manjunath CN. Clinical characteristics, angiographic profile and in hospital mortality in acute coronary syndrome patients in south Indian population. Heart India 2014;2:65-9.
- Binay Kumar Rauniyar, Arun Kadel, Kiran Prasad Acharya. Angiographic profile of young patients ( $\leq 40$  years) in a tertiary care center of Nepal. Asian Journal of Medical Sciences. 2020;11(6).
- Ameen M Mohammad, Hindreen H Rashad, Qayser S Habeeb. Demographic, clinical and angiographic profile of coronary artery disease in kurdistan region of Iraq. Am J Cardiovasc Dis 2021;11(1):39-45.
- Dorairaj Prabhakaran. Cardiovascular Diseases in India. AHA Journals. Circulation. 2016;133:1605-1620.
- Anchala R, Kannuri NK, Pant H, Khan H, Franco OH, Di Angelantonio E, Prabhakaran D. Hypertension in India: a systematic review and meta-analysis of prevalence, awareness, and control of hypertension. J Hypertens. 2014;32:1170-1177. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton

- PK, He J. Global burden of hypertension: analysis of worldwide data. *Lancet*. 2005;365:217–223.
- Danaei G, Finucane MM, Lin JK, Singh GM, Paciorek CJ, Cowan MJ, Farzadfar F, Stevens GA, Lim SS, Riley LM, Ezzati M; Global Burden of Metabolic Risk Factors of Chronic Diseases Collaborating Group (Blood Pressure). National, regional, and global trends in systolic blood pressure since 1980: systematic analysis of health examination surveys and epidemiological studies with 786 country-years and 5.4 million participants. *Lancet*. 2011;377:568–577.
- Bhan N, Srivastava S, Agrawal S, Subramanyam M, Millett C, Selvaraj S, Subramanian SV. Are socioeconomic disparities in tobacco consumption increasing in India? A repeated cross-sectional multilevel analysis. *BMJ Open*. 2012;2.
- Gupta R, Gupta VP, Sarna M, Prakash H, Rastogi S, Gupta KD. Serial epidemiological surveys in an urban Indian population demonstrate increasing coronary risk factors among the lower socioeconomic strata. *J Assoc Physicians India*. 2003;51:470–477.
- Reddy KS, Perry CL, Stigler MH, Arora M. Differences in tobacco use among young people in urban India by sex, socioeconomic status, age, and school grade: assessment of baseline survey data. *Lancet*. 2006;367:589–594.
- Ramakrishnan S, Mishra S, Chakraborty R, Chandra KS, Mardikar HM. The report on the Indian coronary intervention data for the year 2011–National Interventional Council. *Indian Heart J*. 2013;65:518–521.
- Sharma R, Bhairappa S, Prasad SR, Manjunath CN. Clinical characteristics, angiographic profile and in hospital mortality in acute coronary syndrome patients in south Indian population. *Heart India*. 2014;2:65.
- Schömig A, Mehilli J, Holle H, et al. Statin treatment following coronary artery stenting and one-year survival. *J Am Coll Cardiol*. 2002;40:854–861.
- Agema WR, Monraats PS, Zwinderman AH, et al. Current PTCA practice and clinical outcomes in The Netherlands: the real world in the pre-drug-eluting stent era. *Eur Heart J*. 2004;25:1163–1170.
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