

Original Research Article

Study on risk factors and angiographic pattern of coronary artery involvement in patients presenting with angina

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ABSTRACT

Background: Coronary artery disease has become a global health problem affecting a significant portion of population in developed as well as the developing countries. The objective of the present endeavor is to study the pattern of coronary artery involvement by coronary angiography in patients with angina and to correlate the risk factors with the pattern of coronary artery involvement.

Methods: This study was done as a cross sectional study on 50 patients with angina, attending the department of Medicine and Cardiology in Aarupadai veedu medical college hospital, Pondicherry from January 2018 to March 2018, who later underwent coronary angiogram. All patients of both sexes aged above 18 years presenting with history of angina both stable and unstable were included in the study, while those with previous history of congestive cardiac failure, malignant diseases, chronic kidney disease, autoimmune disorders were excluded from the study. Study was carried out in all patients fulfilling the inclusion and exclusion criteria. Data with regards to age, sex, diabetes, dyslipidemia were collected and analysed by appropriate statistical methods.

Results: A total of 50 patients with 30 males and 20 females presented with anginal chest pain, of the total 50 patients, 19 were smokers, 9 had family history of coronary artery disease, 31 patients had hypertension, 14 had diabetes and 39 of the study population had dyslipidemia. Coronary angiography showed 48% of the study population had a single vessel disease and 32% with double vessel disease. Left anterior descending artery (LAD) was predominantly involved with 25 (50%) of total cases. Single vessel disease was common among those with hypertension and dyslipidemia.

Conclusions: Coronary artery disease (CAD) is common in young adults. Dyslipidemia, hypertension and smoking are the most important risk factors associated with CAD. Left anterior descending artery is commonly involved in CAD followed by right coronary artery.

Keywords: Angiographic pattern, Coronary artery disease, Dyslipidemia, Hypertension, Risk factors

INTRODUCTION

In an era of cardiovascular disease epidemic, an imminent search for risk factors of cardiovascular morbidity and mortality has always been sought. Coronary artery disease has become a global health problem affecting a significant portion of population in

developed as well as the developing countries¹. It is the leading cause of morbidity and mortality worldwide; over three quarters of these deaths occur in low and middle income countries.¹⁻³ It has been predicted that by the year 2020, the world's population will grow to 7.8 billion and 32% of all deaths will be due to coronary artery disease.⁴The incidence of coronary artery disease in

South Asian countries is among the highest globally and it has been estimated from the global burden of disease study that by the year 2020, South Asian countries will have the most number of population with atherosclerotic coronary artery disease than any other region.^{5,6} The South Asian population have an increased risk of CAD and were found to have an early onset acute myocardial infarction than other parts of the world. There is a recent increase in the incidence of CAD and to be precise acute myocardial infarction among the young population in this region.⁵⁻⁷ This study is an attempt to assess the role of various risk factors and the pattern of involvement of coronary arteries in patients with angina to prevent further cardiovascular disease morbidity and mortality.

METHODS

Data were collected from patients with angina attending the department of medicine/cardiology in Aarupadai Veedu Medical College and Hospital, Puducherry; who later underwent coronary angiogram. Study was done as a cross sectional study from January 2018 to March 2018. It was conducted on 50 patients presenting with angina. After taking written informed consent from patients' data with regards to age, sex, diabetes, dyslipidemia were

collected from patient's profile and the coronary catheterization registry and were analyzed by appropriate statistical methods including SPSS 22 (Statistical Package for the Social Science). Patients aged 18 years and above presenting with history of angina both stable and unstable angina were included in the study. Patients with previous history of congestive cardiac failure, cerebrovascular disease, malignant diseases, severe renal dysfunction including chronic kidney disease, autoimmune disorders were excluded from the study.

RESULTS

A total of 50 patients with 30 males and 20 females presented with anginal chest pain. Out of 50 patients, 5 were aged 40 years or below while 26 between 41 to 60 years and 19 were aged above 60 years. Of the risk factors, 19 were smokers and 31 non-smokers; 9 of them had family history of coronary artery disease. While 31 patients had hypertension and 14 had diabetes. 39 of the study population had dyslipidemia and 17 were obese. Coronary angiography showed 48% of the study population had a single vessel disease (SVD) and 32% with double vessel disease (DVD) while 20% had triple vessel disease (TVD) (Table 1).

Table 1: Distribution of patients according to their gender, age and clinical variables.

Variable	Subgroup	Males		Females		Total		P Value
		N (30)	%	N (20)	%	N	%	
Age (years)	≤40	3	10	2	10	5	10	0.615
	41-60	14	46.7	12	60	26	52	
	>60	13	43.3	6	30	19	38	
Smoking	Yes	19	63.3	0	0	19	38	<0.001*
	No	11	36.7	20	100	31	62	
Family history	Present	6	20	3	15	9	18	0.652
	Absent	24	80	17	85	41	82	
Hypertension	Present	19	63.3	12	60	31	62	0.812
	Absent	11	36.7	8	40	19	38	
Diabetes mellitus	Present	8	26.7	6	30	14	28	0.797
	Absent	22	73.3	14	70	36	72	
Dyslipidemia	Present	24	80	15	75	39	78	0.676
	Absent	6	20	5	25	11	22	
Obesity	Present	9	30	8	40	17	34	0.465
	Absent	21	70	12	60	33	66	
Angiographic profile	SVD	15	50	9	45	24	48	0.771
	DVD	10	33.3	6	30	16	32	
	TVD	5	16.7	5	25	10	20	

*- Significant

Angiographic coronary artery disease was found to be more among patients aged over 40 years. A total of 45 cases aged over 40 years were found to have one or more coronary vessel disease and 26 of those were between the age group of 41-60 years and 19 cases were aged above

60 years. Double vessel disease was found to be more when compared to single or triple vessel disease with a total of 20 cases and most of those were in males (Table 2).

Left anterior descending artery (LAD) was predominantly involved followed by right coronary artery (RCA) with 25 (50% of total cases) and 14 (28% of total cases) cases respectively. While left main coronary artery (LMCA) was found to be involved in only 3 cases and left circumflex artery (LCX) in 8 cases (Table 3).

Among risk factors dyslipidemia and hypertension were found to be significantly associated with coronary artery

disease with 39 and 31 cases respectively. Single vessel disease was common among those with hypertension and dyslipidemia. In the study, a major coronary risk factor smoking was found to be associated with 19 cases of coronary artery disease out of 30 smokers. Other risk factors like positive family history and obesity were not significantly associated though, yet 17 cases were obese with BMI $\geq 30\text{kg/m}^2$ and 9 patients had family history of coronary artery disease (Table 4).

Table 2: Distribution of patients according to their gender and angiographic profile.

Angiographic profile	Male (age in years)			Total	Female (age in years)			Total	P value
	≤ 40	41-60	>60		≤ 40	41-60	>60		
SVD	1	5	4	10	0	3	2	5	0.755
DVD	2	6	5	13	1	5	1	7	0.492
TVD	0	3	4	7	1	4	3	8	0.542
Total	3	14	13	30	2	12	6	20	0.615

Table 3: Distribution of patients according to gender with respect to the vessel involved.

Vessel involved	Males		Females		Total		P value
	N (30)	%	N (20)	%	N	%	
LMCA	2	6.7	1	5	3	6	
LAD	15	50	10	50	25	50	
LCX	5	16.7	3	15	8	16	0.989
RCA	8	26.6	6	30	14	28	

Table 4: Distribution with respect to the angiographic profile and the risk factors.

Risk factors	Angiographic profile				P value	
	SVD	DVD	TVD	Total		
Smoking	Yes	10	6	3	19	0.815
	No	14	10	7	31	
Hypertension	Present	15	9	7	31	0.779
	Absent	9	7	3	19	
Diabetes mellitus	Present	4	6	6	14	0.04
	Absent	20	10	4	36	
Obesity	Present	10	3	4	17	0.294
	Absent	14	13	6	33	
Family history	Present	3	4	2	9	0.592
	Absent	21	12	8	41	
Dyslipidemia	Present	21	14	4	39	0.005*
	Absent	3	2	6	11	
Total		24	16	10	50	

*- Significant

DISCUSSION

Majority of them were males. After angiographic evaluations, left anterior descending artery (LAD) was found to be the most commonly involved artery among all the cases followed by right coronary artery (RCA)8. Among the risk factors dyslipidemia, hypertension and

smoking were more prevalent in patients with coronary artery disease. Majority of smokers had one or more coronary artery disease. Earlier studies also showed coronary artery disease including acute myocardial infarction (AMI) occurs commonly in males and smoking was the most common risk factor.⁸ In present study, dyslipidemia is associated with CAD which was statically

significant similar to previous study done by Saha et al, and a good control of dyslipidemia will prevent CAD.^{9,10} Hypertension was found to be an important risk factor for CAD in present study similar to previous study done by Aykan et al.¹¹ In present study single vessel disease was more common than double and triple vessel disease as noted by Jegavanthan et al, in their study.¹² In another study, it was reported that acute coronary syndrome (ACS) occurs more among males than females in younger age groups.¹³

CONCLUSION

Coronary artery disease (CAD) is common in young adults. Dyslipidemia, hypertension and smoking are the most important risk factors associated with CAD. Left anterior descending artery is commonly involved in CAD. Coronary angiography must be considered for all adults with angina irrespective of age and sex. Early detection of CAD will significantly improve patient's outcome and reduce the CAD associated morbidity and mortality.

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