

# A Single Center Study on Demographic Profile of Patients Undergoing Coronary Angiogram

Md. Abdul Kader Akanda<sup>1</sup>, Abeeda Tasnim Reza<sup>2</sup>, Md. Muhtasim Akanda<sup>3</sup>

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## Abstract:

**Background:** The aim of this study was to observe demographic profile of patients undergoing coronary angiogram (CAG) in a single center.

**Method:** The data was derived from a prospective observational study to observe the demographic profile of patients undergoing coronary angiogram for 2 years. A total of 176 patients undergoing coronary angiogram were randomly selected and enrolled from 2018 to 2019 in an urban cardiac hospital of Bangladesh. The study population were divided into two groups with group 1 consisting of patients with normal coronaries (n=45) and group 2 consisting of patients having coronary artery disease (CAD) (n=131). Age, sex, risk factors & investigation findings were noted and compared between two groups.

**Results:** Most of the patients (120) belonged between 41-60 years age group. This age group had the maximum patients with abnormal CAG & normal CAG. Most of the

study populations were male (73.9%). Among the female study population (26.1%), most of them had normal coronaries rather than CAD (52% vs 48%). Most of the study population with abnormal CAGs had normal body mass index (BMI). Those having CAD had higher percentage of risk factors in comparison to those having normal coronaries. Among all the risk factors, there were significant difference in respect of diabetes & smoking between the two groups (p=0.007 & <0.001, respectively). Most of the CAD patients had presence of 2 or more risk factors. Dx: Significant difference was noted among the 2 group in respect of random blood sugar & serum creatinine level. Echo: , TVD, DVD, SVD, LM, Right dominant

**Conclusions:** Higher percentage of patients undergoing coronary angiogram had abnormal coronaries.

**Key words:** demographic profile, coronary angiogram, normal coronaries, coronary artery disease

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## Introduction:

Coronary artery disease (CAD) is the leading cause of death worldwide. Over three quarters of these deaths occur in low and middle income countries<sup>1</sup>. Another data showed that than 4.5 million deaths occurring in the developing world due to CAD<sup>2</sup>. In Bangladesh, according to WHO, the CAD accounted for 75.1 deaths per 100000 populations in the year 2019<sup>3</sup>.

In the recent days, there is a certain shift of demographic profile in patients undergoing coronary angiograms to evaluate coronary arteries. More young age group and

female patients are undergoing CAGs. CAD also tends to occur earlier in patients more cardiovascular risk factors and involve the coronary tree with more aggressive lesions<sup>4</sup>. Differences were observed in clinical presentations, risk factors and angiographic profile of patients with CAD worldwide<sup>5</sup>. The incidence of cardiac disease in patients having chest pain referred to cardiologist, may be as low as 11–27%<sup>6</sup>.

There is lack of data regarding the demographic profile of patients undergoing coronary angiogram in

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1. Professor, President, Heart Failure Research Foundation

2. Associate Consultant, Department of Clinical & Interventional Cardiology, Evercare Hospital Dhaka

3. Intern, Green life Medical College & Hospital

**Address of Correspondence:** Md. Abdul Kader Akanda, Professor, President, Heart Failure Research Foundation, Mobile: 01714445962, E-mail: abeeda.tasnim.rez@gmail.com

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Bangladesh. Thus, this study has been designed to define the regional demographic indicators, main cardiovascular risk factors in Bangladeshi population.

**Methods:**

**Study Population:**

The data was derived from a prospective observational study to observe the demographic profile of patients undergoing coronary angiogram for 2 years. A total of 176 patients undergoing coronary angiogram were randomly selected and enrolled from 2018 to 2019 in an urban cardiac hospital of Bangladesh. The study population were divided into two groups with group 1 consisting of patients with normal (n=45) and group 2 consisting of patients having coronary artery disease (CAD) (n=131). Age, sex, risk factors & investigation findings were noted and compared between two groups.

**Data collection**

Data was collected on patient's demography (age, sex, BMI), risk factors for cardiovascular diseases (CVD) such as diabetes, hypertension, dyslipidemia, family history of IHD & smoking. Clinical diagnosis were recorded. All baseline investigations were done including ECG (Electrocardiogram) & echocardiography following hospital admission. For each study subject, angiographic severity was assessed by number of vessel involvement.

**Patient groups**

The study population were divided into two groups with group 1 consisting of patients with normal (n=45) and group 2 consisting of patients having coronary artery disease (CAD) (n=131). Both groups were compared.

**Study ethics**

The study protocol was reviewed and approved by ethical review committee. Informed written consent was obtained from each patient.

**Statistical analysis**

All data were analyzed with SPSS statistical software version 16.0 (Chicago, Illinois, USA). Continuous variables (age, blood pressure data, and heart rate) were expressed as mean ± standard deviation. The comparison of continuous variables between two groups was performed using the t-test. Categorical variables were expressed as number (n) with regard to percentage (%). The comparison of categorical variables between group 1 & 2 was performed using the chi-square test. p < 0.05 was considered statistically significant.

**Results:**

*Demographic & Clinical profile:*

In Table I, clinical characteristics of study population with normal & abnormal coronaries are shown. Patients with CAD were older than the normal coronary group. Most of the study populations were male (73.9%). Among the female study population (26.1%), most of them had normal coronaries rather than CAD (52% vs 48%). Most of the study population with abnormal CAGs had normal body mass index (BMI). Those having CAD had higher percentage of risk factors in comparison to those having normal coronaries (Table II, Figure 1). Among all the risk factors, there were significant difference in respect of diabetes & smoking between the two groups (p=0.007 & <0.001, respectively). Most of the CAD patients had presence of 2 or more risk factors (Table III). ). Most of the normal & abnormal CAG groups were diagnosed as stable coronary artery disease (Table IV). In CAD patients, next higher percentage belonged to Non ST-ACS patients. Significant difference was noted among the 2 group in respect of random blood sugar & serum creatinine level (Table V). Most of the population of both groups had normal LV systolic function (Table VI).

**Angiographic Findings:**

Table 7 shows angiographic findings. Most of the patient had right dominance. Among the CAD group, most

**Table-I**  
*Demographic profile of patients undergoing coronary angiogram (n=176)*

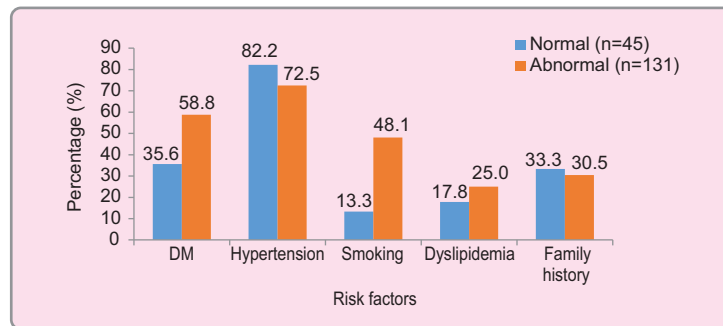
Variables	Coronary angiogram			p-value
	Normal (n=45) No. (%)	Abnormal (n=131) No. (%)	Total (n=176) No. (%)	
Age group (years)				
20-40	7(15.6%)	14(10.7%)	21(11.9%)	
41-60	36(80.0%)	84(64.1%)	120(68.2%)	
61-80	2(4.4%)	33(25.2%)	35(19.9%)	
Mean±SD	48.27±8.43	54.21±9.96	52.69±9.92	<0.001*
Range (min-max)	(30-70)	(29-76)	(29-76)	
Sex				
Female	24(53.3%)	22(16.8%)	46(26.1%)	<0.001*
Male	21(46.7%)	109(83.2%)	130(73.9%)	
BMI (kg/m <sup>2</sup> )				
Underweight (<18.5)	0(0.0%)	4(3.1%)	4(2.3%)	0.075
Normal (18.5-24.9)	17(37.8%)	71(54.2%)	88(50.0%)	
Overweight (25.0-29.9)	24(53.3%)	43(32.8%)	67(38.1%)	
Obese (>30.0)	4(8.9%)	13(9.9%)	17(9.7%)	

**Table-II**  
*Association of risk factors between normal and abnormal coronary angiogram findings (n=176)*

Variables	Coronary angiogram		Total (n=176)	p-value
	Normal findings (n=45) No. (%)	Abnormal findings (n=131) No. (%)		
DM	16(35.6%)	77(58.8%)	93(52.8%)	0.007*
Hypertension	37(82.2%)	95(72.5%)	132(75.0%)	0.195
Smoking	6(13.3%)	63(48.1%)	69(39.2%)	<0.001*
Dyslipidemia	8(17.8%)	34(26.0%)	42(23.9%)	0.267
Family history	15(33.3%)	40(30.5%)	55(31.3%)	0.727

patients had LAD involvement, followed by RCA & then LCX/OM (Figure 2). 14 patients had LM involvement. Most

of the patients had double vessel disease, followed by TVD & then SVD (Figure 3).



**Figure 1:** Bar diagram showing the association of risk factors between normal and abnormal coronary angiogram findings (n=176)

**Table-III**  
*Number of risk factors relation with normal and abnormal coronary angiogram findings (n=176)*

Number of risk factors	Coronary angiogram		Total (n=176) No. (%)	p-value
	Normal findings (n=45) No. (%)	Abnormal findings (n=131) No. (%)		
0	0(0.0%)	6(4.6%)	6(3.4%)	0.004*
1	18(40.0%)	22(16.8%)	40(22.7%)	
2	17(37.8%)	50(38.2%)	67(38.1%)	
3	10(22.2%)	28(21.4%)	38(21.6%)	
4	0(0.0%)	21(16.0%)	21(11.9%)	
5	0(0.0%)	4(3.1%)	4(2.3%)	
Total	45(100.0%)	131(100.0%)	176(100.0%)	

**Table-IV**  
*Comparison of Clinical Diagnosis between normal and abnormal coronary angiogram findings (n=176)*

Variables	Coronary angiogram	
	Normal findings (n=45)	Abnormal findings (n=131)
Stable Coronary Artery Disease	35 (77.77%)	61(46.6%)
Old MI	0	22(16.8%)
Acute & Recent MI	0	14(10.7%)
Non ST-ACS	7(15.55%)	34(25.9%)
HCM	2(4.44%)	0
DCM	1(2.24%)	0

**Table-V**

*Comparison of laboratory investigations between normal and abnormal coronary angiogram findings (n=176)*

Variables	Coronary angiogram		p-value
	Normal findings (n=45) Mean±SD	Abnormal findings (n=131) Mean±SD	
Hb	12.66±1.62	13.20±1.68	0.061
RBS	6.77±2.27	8.46±3.87	0.006*
Serum creatinine	91.26±19.05	105.32±31.40	0.005*
Uric acid	280.98±128.30	272.16±113.19	0.749
SGPT	45.03±45.18	42.34±24.94	0.668
TC	165.21±35.04	171.69±52.51	0.502
HDL	40.27±7.43	38.58±9.98	0.370
LDL	96.73±38.87	94.92±39.87	0.819
TG	186.61±83.72	202.62±140.54	0.536

**Table-VI**

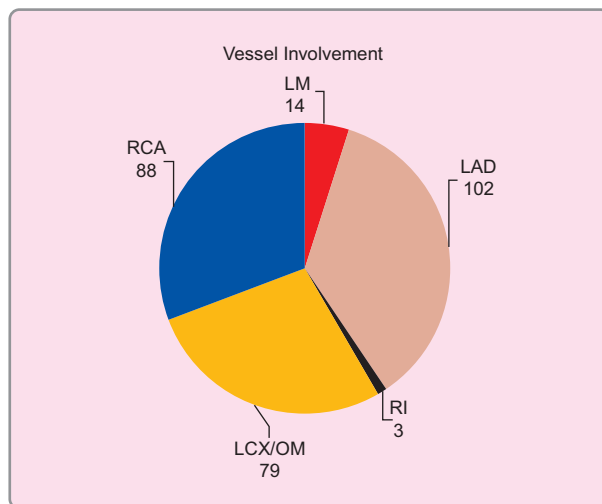
*Comparison of Left ventricular Function on Echocardiography between normal and abnormal coronary angiogram findings (n=176)*

Variables	Coronary angiogram	
	Normal findings (n=45)	Abnormal findings (n=131)
LVEF >50%	42(93.3%)	84(64.1%)
LVEF ≤50%	3(6.7%)	47(35.9%)

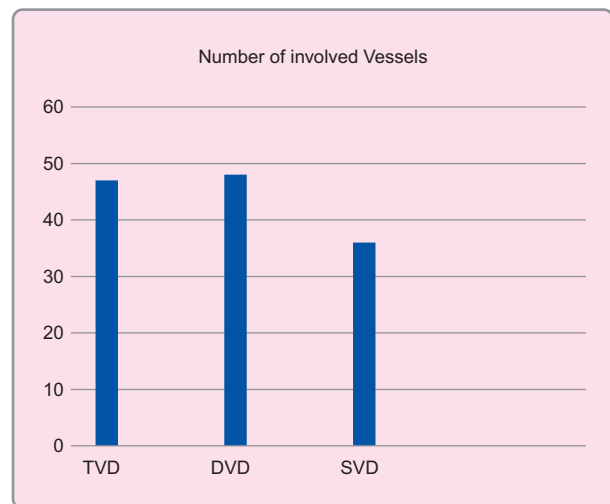
**Table-VII**

*Comparison of coronary dominance between normal and abnormal coronary angiogram findings (n=176)*

Variables	Coronary angiogram	
	Normal findings (n=45)	Abnormal findings (n=131)
Right Dominant	37(82.2%)	116(88.5%)
Left Dominant	7(15.6%)	14(10.7%)
Co Dominant	1(2.2%)	1(0.8%)



**Figure 2:** Pie Diagram of involvement of vessels in abnormal coronary angiogram group (n=131)



**Figure 3:** Bar Diagram of involvement of number of involved vessels in abnormal coronary angiogram group (n=131)

### Discussion:

In this study, we compared demographic, clinical & angiographic characteristics of patients undergoing coronary angiogram to evaluate coronaries.

The percentage of normal coronaries & abnormal coronaries were 25.6% & 74.4% respectively. This findings are consistent with other similar study<sup>7</sup>.

The mean age was 48.27±8.43 vs 54.21±9.96 years in normal coronary vs abnormal coronary group indicating elderly people had more occurrence of CAD (Mean age 52.69±9.92). The age of the most patients were 41 years or more. A similar study showed that most of the study population were 33-83 years with a mean (SD) of 55.5 ± 10.4 years which was similar to our study<sup>7</sup>.

Majority of the patients were male (73.9% vs 26.18%) respectively indicating a male to female preponderance. This is consistent with other studies done in south-east regions<sup>8, 9</sup>. In the normal coronary group, most were female (53.3% vs 46.7%).

Most of the study population with abnormal CAGs had normal body mass index (BMI), whereas those with normal CAGs were overweight. Studies have shown that obesity had been shown as an independent risk factor for the early incidence of CAD<sup>10</sup>.

The most prevalent risk factor among the study population was HTN (82.2% vs 72.5%). Diabetes was the second most prevalent risk factor, followed by smoking, positive family history of CAD & Dyslipidemia. Among all the risk factors, there were significant difference in respect of diabetes & smoking between the two groups (p=0.007 & <0.001, respectively). Most of the CAD patients had presence of 2 or more risk factors (Table 3). A similar study revealed that the highest prevalence was that of hypertension (55.3%), followed by dyslipidemia (42.7%) and T2DM (29%). All comparisons proved statistically significant. *P*-value *d*" 0.005<sup>7</sup>.

Most of the normal & abnormal CAG groups were diagnosed as stable coronary artery disease (77.77% vs 46.6%). In CAD patients, next higher percentage belonged to Non ST-ACS patients, followed by old MI & acute/Recent MI.

Significant difference was noted among the 2 group in respect of random blood sugar & serum creatinine level. Most of the population of both groups had normal LV systolic function. 3(6.7%) patients with LV systolic dysfunction had normal findings in CAG.

Most of the patient had right dominance. Among the CAD group, most patients had LAD involvement (77.9%),

followed by RCA (67.17%) & then LCX/OM (60.3%). 14 patients (10.7%) had LM involvement. Most of the patients had double vessel disease (36.64%), followed by TVD (35.88%) & then SVD (27.48%). In a study done in India showed that SVD was the most common angiographic pattern (50.3%); LAD was the most common vessel involved (65.9%); and majority of the lesions were proximally located (35.8%)<sup>9</sup>. LMCA disease was seen in 4.2% patients, all of whom had multi vessel CAD. This picture indicates more severe CAD is prevalent in Bangladeshi population in comparison to Srinagar, India.

### Study limitations:

The major limitation of the study is that this is a single center study with a relatively small number of patients; a multicenter study with larger study cohort may be required to give a better estimate of study parameters.

### Conclusions:

The demographic, clinical & angiographic variables were compared in a study population undergoing coronary angiogram. This study showed that CAD is prevalent among older age group, male sex & those having 2 or more coronary risk factors. The angiographic findings also suggest that severity of CAD with multiple vessel involvement was more in the study population having abnormal coronaries.

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