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Demographic and Clinical Status of Patients with Coronary Artery Disease Treated in a Tertiary Care Hospital in Bangladesh

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Abstract

Background: Coronary artery disease (CAD) affects heart vessels and is more common in men, although women's risk increases post-menopause. Understanding these patterns informs better prevention and treatment strategies. This study aimed to examine the demographic and clinical status of coronary artery disease (CAD) patients.

Methods: This prospective observational study was conducted in the Department of Cardiology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh from June 2022 to May 2023. For this study, a total of 77 patients with confirmed coronary artery disease (CAD) were enrolled using a convenient purposive sampling technique. The data were analyzed using MS Office tools.

Results: The mean age and BMI of the patients were 46.56 ± 10.68 years and 27.22 ± 2.17 kg/m² respectively. Male-female ratio was 2:1. The mean ±SD waist circumference, hip circumference, fasting blood sugar, HbA1C, total cholesterol, LDL, HDL, and triglycerides were 90.31 ± 9.22 cm, 107.12 ± 28.43 cm, 6.92 ± 0.66 mmol/l, 7.14 ± 0.55%, 176.97 ± 42.32 mg/dl, 113.13 ± 14.13 mg/dl, 36.8 ± 6.41 mg/dl, 189.54 ± 31.31 mg/dl respectively. More prevalent risk factors were hypertension (31.5%), smoking and tobacco use (26.0%), obesity (20.8%), diabetes (13.0%), and ischemic heart disease (11.7%).

Conclusion: Middle-aged male individuals are mainly prone to coronary artery disease diseases in Bangladesh. Routine health checkups among the middle-aged population are necessary for managing such cases. Early diagnosis can reduce morbidities and mortalities of CAD in any age group of patients.

Keywords: CAD, Clinical status, Cholesterol, Coronary artery disease, ECG, Single vessel disease

Introduction

Coronary artery disease (CAD), caused by the narrowing or blockage of coronary arteries, is a leading cause of illness and mortality worldwide. In the field of cardiovascular medicine, exploring the demographic and clinical profiles of coronary artery disease patients is crucial for research [1]. Cardiovascular diseases lead the way among non-communicable diseases, responsible for 17.7 million deaths annually worldwide, with the majority occurring in low and middle-income countries [2]. Coronary artery disease (CAD) is the primary cause of cardiovascular-related deaths globally, causing over 4.5 million deaths in the developing world [3]. Cardiovascular disease is the leading cause of disease-related mortality in many countries [4,5]. There

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is a growing concern in developing countries, including Bangladesh, regarding the increasing incidence of CAD in younger populations. Furthermore, CAD tends to manifest earlier in individuals with clusters of cardiovascular risk factors, and it involves the coronary arteries with more severe lesions [6,7]. While developed countries have experienced a recent drop in CAD mortality, developing countries face a rapid increase in CAD death rates and risk factors [8]. In these regions, a higher prevalence of CAD has been linked to higher socioeconomic status [9]. For instance, in Delhi's urban population, the prevalence of CAD among higher socioeconomic groups was 61% in males and 30% in females, compared to 20% in males and 9% in females within lower socioeconomic groups [10]. A study in Bangladesh indicated an alarming frequency of coronary artery disease among males. The research identified abnormalities in waist or hip circumferences, total cholesterol levels, serum creatinine, and erythrocyte sedimentation rate (ESR) as potential indicators for coronary artery disease in these patients [11].

Given the increasing burden of coronary artery disease (CAD) in developing countries like Bangladesh, it is essential to explore the specific demographic and clinical patterns associated with the disease in local populations [11]. Bangladesh has witnessed a rapid shift in disease burden from communicable to non-communicable diseases, with CAD emerging as a significant contributor to morbidity and mortality. Despite global advancements in cardiovascular care, early detection and risk factor management remain challenging in resource-limited settings [3, 4]. Lifestyle changes, urbanization, poor dietary habits, lack of physical activity, smoking, and increasing rates of obesity and diabetes are fueling the prevalence of CAD in younger and middle-aged individuals [7]. Moreover, inadequate access to routine health screenings and awareness further complicates timely diagnosis and intervention. In this context, studying the demographic and clinical status of CAD patients at a tertiary care hospital can help identify prevalent risk factors, clinical profiles, and the extent of disease progression. Such information is vital for tailoring public health strategies, guiding clinical decision-making, and implementing targeted interventions for high-risk populations [5]. The objective of this study was to assess the demographic and clinical status of patients with coronary artery disease.

Methodology

This prospective observational study was done in the Department of Cardiology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh June 2022 to May 2023 Using a purposive sampling technique, the study enrolled 77 confirmed coronary artery disease (CAD) patients. Written consent was obtained from all patients before data collection. The inclusion criteria specified that only conservative CAD treatment patients were included in the study. The exclusion criteria for this study ruled out patients who had undergone surgical procedures, or angioplasty, suffered from valvular heart disease and cardiomyopathy, or were admitted to the intensive care unit (ICU). All demographic and clinical information of the patients was recorded, and data analysis was conducted using MS Office tools.

Results

In this study, the baseline characteristics of the patients showed a mean age of 46.56 ± 10.68 years and a BMI of 27.22 ± 2.17 kg/m². Nearly two-thirds of the patients (66%) were male. More than half of the patients were from rural areas. Regarding educational status, the majority had completed secondary education. The clinical findings of our patients were as follows: The mean ±SD waist circumference was 90.31 ± 9.22 cm, hip circumference was 107.12 ± 28.43 cm, fasting blood sugar (FBS) was 6.92 ± 0.66 mmol/l, HbA1C was 7.14 ± 0.55%, total cholesterol was 176.97 ± 42.32 mg/dl, LDL was 113.13 ± 14.13 mg/dl, HDL was 36.8 ± 6.41 mg/dl, triglycerides (TG) were 189.54 ± 31.31 mg/dl, serum creatinine was 1.7 ± 0.06 mg/dl, and erythrocyte sedimentation rate (ESR) was 27.35 ± 6.27 mm in the first hour. In this study, the major risk factors identified among patients were hypertension (31.5%), smoking and tobacco use (26.0%), obesity (20.8%), diabetes (13.0%), and ischemic heart disease (11.7%). In the ECG findings, 35% of patients had anterior Q waves and 19% had inferior Q waves. A left bundle branch block was present in 14%, while 10% had a right bundle branch block. Only 5% showed a normal ECG pattern. Poor R wave progression occurred in 26% of subjects. Arrhythmias were observed in 16%, with atrial flutter in 4%. Premature ventricular contractions were present in 13% of cases. The mean QRS duration was 124.17 ms, with a standard deviation of 18.31. According to the angiographic findings, 11.30% of patients had non-significant lesions, 24.10% had single vessel disease, 14.30% had double vessel disease, and 21.20% had triple vessel disease.

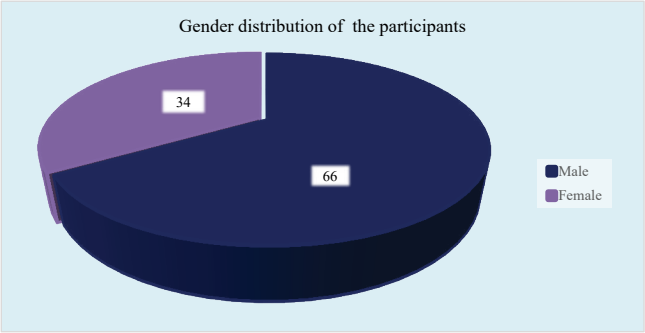

Figure I: Pie chart showed gender wise patients distribution (N=77)

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Table 1: Baseline characteristics of patients (N=77)

Characteristics	Mean ±SD/n (%)	
Age of the patients		
Mean age (Years)	46.56±10.68	
Gender distribution		
Male	51	66%
Female	26	34%
BMI distribution		
BMI (Kg/m2)	27.22± 2.17	
Residential status		
Urban	31	40%
Rural	46	60%
Educational status		
Illiterate	15	19%
Secondary	33	43%
Higher Secondary	22	29%
Graduation and above	7	9%

Table 2: Clinical findings (N=77)

Characteristics	Mean ±SD
Waist circumference	90.31±9.22
Hip circumference	107.12±28.43
FBS (mmol/l)	6.92±0.66
HbA1C	7.14±0.55
Total cholesterol (mg/dl) (%)	176.97±42.32
LDL (mg/dl)	113.13±14.13
HDL (mg/dl)	36.8±6.41
TG (mg/dl)	189.54±31.31
S creatinine (mg/dl)	1.7±0.06
ESR (mm in 1st hour)	27.35±6.27

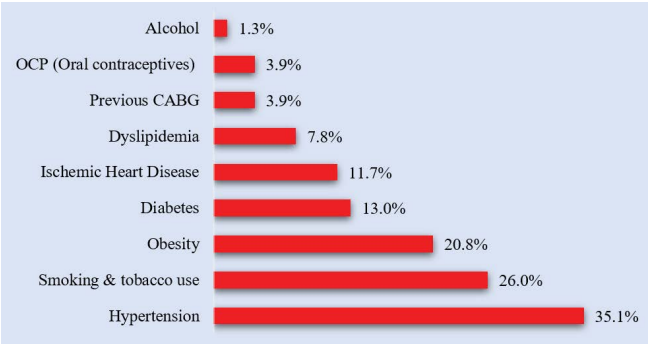

Figure II: Bar chart showed risk factor wise patients distribution (N=77)

Table 3: ECG findings (N=77)

Characteristics	Mean ±SD/n (%)	
Ant. Q	27	35.00%
Inf. Q	15	19.00%
Left bundle branch block	11	14.00%
Normal	4	5.00%
Poor R	20	26.00%
Right bundle branch block	9	10.00%
Arrhythmias	12	16.00%
Atrial Flutter (AF/AFL)	3	4.00%
PVC	10	13.00%
QRS duration (ms)	124.17 ± 18.31	

Table 4: Angiographic findings (N=77)

Coronary findings	n	%
Normal findings	59	29.10%
Non-significant lesions	23	11.30%
Single vessel disease	49	24.10%
Double vessel disease	29	14.30%
Triple vessel disease	43	21.20%

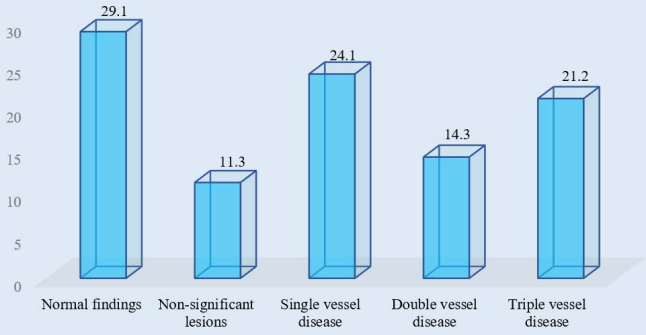

Figure III: Column chart showed angiographic findings of the patient's distribution (N=77)

Discussion

In the current study, the baseline characteristics of the patients showed a mean age of 46.56 ± 10.68 years and a BMI of 27.22 ± 2.17 kg/m². The mean age was comparable to 52 ± 10 years reported in a study conducted in Pakistan [12]. Regarding residential status, more than half (60%) of the patients were from rural areas, which aligns with findings from another study [13]. Additionally, the majority of patients in our study were male. Such male predominance was also observed in many studies [14,15]. The clinical findings of our patients included the following mean ± SD values: waist circumference was 90.31 ± 9.22 cm, hip circumference was 107.12 ± 28.43 cm, fasting blood sugar (FBS) was 6.92 ± 0.66 mmol/l, HbA1C was 7.14 ± 0.55%, total cholesterol

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was 176.97 ± 42.32 mg/dl, LDL was 113.13 ± 14.13 mg/dl, HDL was 36.8 ± 6.41 mg/dl, triglycerides (TG) were 189.54 ± 31.31 mg/dl, serum creatinine was 1.7 ± 0.06 mg/dl, and erythrocyte sedimentation rate (ESR) was 27.35 ± 6.27 mm in the first hour. These findings were comparable with the reports of some other studies [7,16]. In this study, the major risk factors identified among patients were hypertension (31.5%), smoking and tobacco use (26.0%), obesity (20.8%), diabetes (13.0%), and ischemic heart disease (11.7%). In some other studies [17,18] we found some similarities in risk factor distribution. In our study, the ECG findings revealed that 35% of patients had anterior Q waves and 19% had inferior Q waves. Additionally, a left bundle branch block was present in 14% of the patients, while 10% had a right bundle branch block. Only 5% of the patients exhibited a normal ECG pattern, and poor R wave progression was noted in 26% of subjects. Similar findings were observed in a separate study [19]. The angiographic findings indicated that 11.30% of our patients had non-significant lesions, while 24.10% had single vessel disease, 14.30% had double vessel disease, and 21.20% had triple vessel disease. These findings were aligned with another recent study [20]. The findings from this study could be beneficial for future research in similar areas.

Our study highlights critical demographic and clinical trends in coronary artery disease (CAD) among patients treated conservatively at a tertiary care center in Bangladesh. The relatively young mean age of patients, combined with a high prevalence of modifiable risk factors such as hypertension, obesity, and tobacco use, emphasizes the shifting burden of CAD towards younger populations. These findings are especially important in the context of developing countries, where healthcare access and preventive strategies are still evolving [9, 13]. The predominance of rural residents in our study may reflect limited access to early diagnosis and lifestyle counseling in those regions, underlining the need for targeted outreach and community-based interventions. Moreover, the presence of triple vessel disease in a significant proportion of patients, despite conservative management, raises concerns about delays in seeking care or underestimation of disease severity [12]. The abnormal biochemical markers and ECG changes observed also suggest that many patients present with advanced disease stages, reinforcing the importance of early detection [19]. These insights can guide policymakers and clinicians in refining national strategies for CAD prevention and management. Future studies with larger samples and longitudinal follow-up are warranted to explore outcomes and guide evidence-based improvements in cardiac care delivery.

Limitation of the Study

This was a single-centered study with a small sample size, and it faced a limitation due to the mid-study dropout of severe patients. Additionally, the study was conducted over a very short period. As a result, the findings may not fully represent the situation across the entire country.

Conclusion & Recommendation

In Bangladesh, middle-aged males are particularly susceptible to coronary artery disease (CAD), highlighting the need for routine health checkups within this demographic. Regular screenings and health assessments can facilitate early diagnosis, playing a critical role in reducing both the morbidity and mortality associated with CAD across different age groups. By detecting and addressing risk factors early, healthcare providers can implement appropriate interventions, potentially slowing disease progression and improving quality of life. Emphasizing preventive measures and public health awareness is essential for managing CAD effectively and improving cardiovascular health outcomes on a broader scale.

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Conflicts of interest

There are no conflicts of interest.

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