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ORIGINAL ARTICLE

Profiles of Coronary Artery Disease Patients Treated in a Tertiary Care Hospital of Bangladesh

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Abstract

Background: *Coronary artery disease (CAD) is a leading cause of morbidity and mortality in Bangladesh. Rapid urbanization, sedentary lifestyles, and rising cardiovascular risk factors have increased disease burden. Profiling patients in tertiary hospitals helps understand patterns and guide effective prevention and management strategies.* ***Objective:*** *To describe the sociodemographic features, risk factors, clinical presentation, and treatment patterns of coronary artery disease patients in a tertiary care hospital of Bangladesh.*

Methods: *This prospective cross-sectional study was conducted at the Department of Cardiology, Bangladesh Medical University, Dhaka, Bangladesh, from January 2023 to December 2024. A total of 83 patients with confirmed CAD were enrolled using a purposive sampling technique. Data regarding demographic variables, risk factors, clinical manifestations, and management approaches were collected and analyzed using MS Office tools.*

Results: *The mean age was 56.8 ± 9.7 years, with 72.3% males. Hypertension (65.1%), dyslipidemia (57.8%), diabetes mellitus (48.2%), smoking (44.6%), and family history (31.3%) were common. Typical chest pain occurred in 78.3%. ST elevation myocardial infarction, non-ST elevation acute coronary syndrome, and stable angina were observed in 38.6%, 33.7%, and 27.7%, respectively. Medical therapy, percutaneous coronary intervention, and coronary artery bypass grafting were used in 61.4%, 26.5%, and 12.1% of patients.*

Conclusion: *Patients with coronary artery disease treated at this tertiary care hospital were predominantly middle-aged males with a high burden of modifiable risk factors. Strengthening preventive strategies and early risk factor control is crucial to reducing the impact of CAD in Bangladesh.*

Keywords: *Bangladesh, Coronary artery disease, Risk factors, Treatment profile, Cardiovascular disease*

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Introduction

Coronary artery disease is one of the most important noncommunicable diseases worldwide and remains the leading cause of death despite major advances in diagnosis and treatment.[1] It results from atherosclerotic narrowing or occlusion of the coronary arteries, leading to myocardial ischemia and infarction. Globally, the burden of coronary artery disease has continued to rise due to population aging, rapid urbanization, and increasing prevalence of lifestyle-related risk factors.[2] Low- and middle-income countries now account for the majority of cardiovascular disease–related deaths, with South Asia being a particularly high-risk region.[3] Bangladesh has experienced a rapid epidemiological transition over the past few decades, shifting from communicable diseases to noncommunicable diseases as the predominant health burden.[4] Coronary artery disease has emerged as a major public health concern, contributing substantially to premature mortality, long-term disability, and escalating healthcare costs.[5] Several modifiable and nonmodifiable risk factors are associated with the development of coronary artery disease. Hypertension, diabetes mellitus, dyslipidemia, smoking, obesity, physical inactivity, and unhealthy dietary habits play key roles in disease progression.[6] In South

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Asian populations, coronary artery disease often presents at a younger age and with more severe clinical manifestations compared to Western populations, possibly due to genetic predisposition and higher prevalence of metabolic risk factors.[7] Clinical presentation of coronary artery disease varies widely, ranging from stable angina to acute coronary syndromes, including ST elevation myocardial infarction and non-ST elevation acute coronary syndrome.[8] Early recognition of symptoms and prompt initiation of appropriate treatment are crucial for reducing morbidity and mortality. Advances in pharmacological therapy, percutaneous coronary intervention, and coronary artery bypass grafting have significantly improved survival outcomes; however, access to timely and optimal care remains uneven in resource-limited settings.[9] Tertiary care hospitals play a vital role in the management of coronary artery disease in Bangladesh, as they serve as referral centers for complex cases and advanced interventions.[10] Understanding the demographic characteristics, risk factor patterns, clinical profiles, and treatment strategies of patients treated in such facilities is essential for evaluating current practices and identifying gaps in care. Hospital-based data also provide valuable insights for health planners and policymakers to design targeted preventive and therapeutic strategies.[11] Despite the growing burden of coronary artery disease in Bangladesh, there is a relative scarcity of recent prospective data describing patient profiles in tertiary care settings. Many available studies are retrospective, limited by small sample sizes, or focus on specific subgroups of patients.[12] Updated prospective cross-sectional studies can help capture current trends in risk factors, disease presentation, and management approaches in real-world clinical practice. Therefore, this study was undertaken to describe the profiles of patients with coronary artery disease treated in a tertiary care hospital in Bangladesh. By analyzing sociodemographic characteristics, cardiovascular risk factors, clinical presentations, and treatment modalities, this study aims to contribute to the existing body of evidence and support improved prevention, early detection, and management of coronary artery disease in the Bangladeshi population.[13]

Methodology

This prospective cross-sectional study was conducted at Department of Cardiology, Bangladesh Medical University, Dhaka, Bangladesh, from January 2023 to December 2024. The study population comprised patients diagnosed with coronary artery disease who were admitted to or attended the cardiology department of the hospital during the study period. A total of 83 patients were enrolled using a purposive sampling technique to ensure inclusion of all eligible cases presenting during the study timeframe.

Inclusion criteria: Patients of both sexes aged 30 years and above with a confirmed diagnosis of coronary artery disease based on clinical evaluation, electrocardiogram, and relevant laboratory or imaging investigations were included. Patients with stable angina, acute coronary syndrome, or prior documented myocardial infarction were also considered eligible for the study.

Exclusion criteria: Patients with congenital heart disease, valvular heart disease, cardiomyopathy, or other significant systemic illnesses were excluded. Those unwilling to provide informed consent or unable to participate in data collection were also excluded from the study to maintain data quality and reliability.

Study procedure: After obtaining written informed consent, participants were interviewed using a structured data collection sheet. Sociodemographic information, cardiovascular risk factors, clinical presentation, and details of treatment were recorded. Clinical examination and relevant investigations were reviewed to confirm diagnoses. All procedures followed ethical guidelines and hospital protocols for patient care.

Data analysis: Collected data were entered into Microsoft Excel and analyzed using MS Office tools. Quantitative variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. Descriptive analysis was performed to summarize patient profiles and treatment patterns systematically.

Result

A total of 83 patients with coronary artery disease were enrolled, with a mean age of 56.8 ± 9.7 years. Most participants were male (72.3%), and the majority belonged to the 51–60 years age group (39.8%), followed by 41–50 years (28.9%) and above 60 years (22.9%). Female patients comprised 27.7% of the study population. The distribution of age and sex showed no statistically significant difference ($p = 0.312$). Regarding cardiovascular risk factors, hypertension was the most prevalent (65.1%), followed by dyslipidemia (57.8%), diabetes mellitus (48.2%), smoking (44.6%), and a positive family history of coronary artery disease (31.3%). Multiple risk factors were present in 58.1% of patients. Risk factor distribution between male and female patients showed that smoking was significantly higher among males (53.3% vs. 14.3%, $p < 0.001$), while diabetes and hypertension were more evenly distributed ($p > 0.05$). Presenting

symptoms varied, with typical chest pain reported in 78.3% of patients, dyspnea in 35.4%, and palpitation in 18.1%. Electrocardiographic and biochemical findings revealed that ST elevation myocardial infarction was the most common diagnosis (38.6%), followed by non-ST elevation acute coronary syndrome (33.7%) and stable angina (27.7%). Treatment patterns indicated that most patients received optimal medical therapy (61.4%), while 26.5% underwent percutaneous coronary intervention and 12.1% were referred for coronary artery bypass grafting. Treatment choice was significantly associated with diagnosis type (p = 0.022), with patients presenting with ST elevation myocardial infarction more likely to undergo intervention. Comorbid conditions were also analyzed. Hypertension and diabetes mellitus were the most frequent comorbidities, affecting 65.1% and 48.2% of participants, respectively. There was a significant association between the presence of comorbidities and age (p = 0.041), with older patients showing a higher prevalence. Overall, these findings highlight a predominance of middle-aged male patients with multiple modifiable risk factors and varied clinical presentations.

Table-I

Distribution of patients by age and sex

Age group (years)	Male n (%)	Female
31–40	5 (8.3)	3 (13.0)
41–50	17 (28.3)	7 (30.4)
51–60	24 (40.0)	9 (39.1)
>60	15 (25.0)	3 (17.4)
Total	60 (100)	23 (100)

p-value = 0.312, Chi-square test

Table-II

Distribution of cardiovascular risk factors

Risk factor	n (%)1 p-value	Male vs Female
Hypertension	54 (65.1)	0.274
Dyslipidemia	48 (57.8)	0.451
Diabetes mellitus	40 (48.2)	0.389
Smoking	37 (44.6)	<0.001
Family history	26 (31.3)	0.212

Data analyzed using the Chi-square test

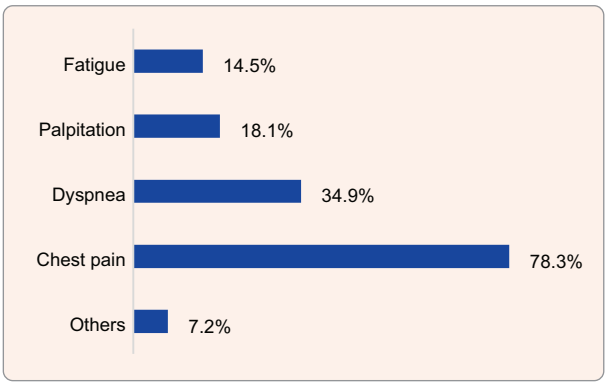

Figure 1: *Presenting symptoms*

Table-III

Type of coronary artery disease

Diagnosis	n (%)
ST elevation MI	32 (38.6)
Non-ST elevation ACS	28 (33.7)
Stable angina	23 (27.7)

MI: Myocardial infarction, ACS: Acute coronary syndrome

Table-III

Treatment modalities

Treatment modality	n (%)
Optimal medical therapy	51 (61.4)
Percutaneous coronary intervention	22 (26.5)
Coronary artery bypass grafting	10 (12.1)

p-value = 0.022, Chi-square test (association with diagnosis type)

Table-V

Comorbid conditions by age group

Comorbidity	n (%)	p-value
Hypertension	54 (65.1)	0.041
Diabetes mellitus	40 (48.2)	0.041
Chronic kidney disease	8 (9.6)	0.287
Stroke	3 (3.6)	0.312

Data analyzed using the Chi-square test

Discussion

In this prospective cross-sectional study, the demographic and clinical profiles of coronary artery disease (CAD) patients treated at a tertiary care hospital in Bangladesh were analyzed. The predominance of male patients (72.3%) and the mean age of 56.8 years are consistent with previous studies in South Asia, where men have higher

exposure to modifiable risk factors such as smoking and central obesity [14,15]. This gender difference may also reflect sociocultural factors influencing health-seeking behavior, with males more likely to present to tertiary hospitals [16]. Most patients in our study were in the 51–60 years age group, which aligns with earlier hospital-based research in Bangladesh, indicating that CAD often manifests in the fifth decade of life [17]. The relatively younger age of onset compared to Western populations may be due to a higher prevalence of metabolic risk factors, including diabetes mellitus, hypertension, and dyslipidemia, along with genetic predisposition common among South Asians [18]. These findings underscore the importance of early detection and targeted preventive measures in middle-aged populations. Hypertension (65.1%), dyslipidemia (57.8%), and diabetes mellitus (48.2%) were the most prevalent risk factors, consistent with prior studies in Bangladesh [15,19]. These metabolic abnormalities contribute significantly to atherosclerotic progression and underscore the need for regular monitoring and aggressive management of modifiable risk factors. Smoking was prevalent in 44.6% of patients, predominantly among males, highlighting a persistent public health challenge [15]. Multiple risk factors coexisted in over half of the participants, emphasizing the additive effect of comorbidities on CAD development [20]. Clinical presentation in this cohort showed that typical chest pain was the predominant symptom (78.3%), followed by dyspnea and palpitations. ST-elevation myocardial infarction accounted for 38.6% of cases, non-ST elevation acute coronary syndrome 33.7%, and stable angina 27.7%. These patterns reflect the acute disease burden observed in tertiary care centers in Bangladesh and are consistent with findings from similar hospital-based studies [21,22]. Early recognition of symptoms and timely intervention remain critical to reducing morbidity and mortality. Regarding management, most patients received optimal medical therapy (61.4%), while percutaneous coronary intervention and coronary artery bypass grafting were performed in 26.5% and 12.1% of patients, respectively. This distribution is comparable to other tertiary hospital reports in the region and reflects evolving interventional capabilities alongside pharmacological management [23,24]. Treatment choice was significantly associated with the type of CAD, with patients presenting with ST-elevation myocardial infarction more likely to undergo invasive interventions. Comorbid conditions, particularly hypertension and diabetes mellitus, were significantly associated with older age, highlighting the cumulative cardiovascular risk in aging populations [25]. This emphasizes the importance of integrated care approaches to manage multiple comorbidities alongside primary CAD treatment. Overall, these findings reinforce the multifactorial nature of CAD in Bangladesh, with high prevalence of modifiable risk factors and variable clinical presentations. Strengthening preventive strategies, raising public awareness, and ensuring access to timely interventional care are essential to mitigate the growing burden of coronary artery disease in Bangladesh and similar South Asian contexts [23,25].

Limitations:

This study was conducted in a single tertiary care hospital with a relatively small sample size, limiting generalizability. Purposive sampling may introduce selection bias, and the cross-sectional design prevents establishing causal relationships between risk factors and coronary artery disease outcomes.

Conclusion

Coronary artery disease patients treated at this tertiary care hospital were predominantly middle-aged males with a high prevalence of modifiable risk factors, including hypertension, dyslipidemia, diabetes, and smoking. Typical chest pain was the most common presenting symptom, while ST-elevation myocardial infarction was the leading diagnosis. Most patients received optimal medical therapy, with a subset undergoing interventional procedures. These findings highlight the need for targeted prevention, early detection, and timely management strategies in Bangladesh.

Recommendation:

Strengthening public awareness programs, promoting lifestyle modifications, and implementing routine screening for cardiovascular risk factors are essential. Early diagnosis, effective risk factor management, and timely access to medical and interventional care can help reduce the burden of coronary artery disease in Bangladesh.

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