

Outcome of Coronary Angiography in Patients with Non-specific Chest Pain Attending in a Tertiary Hospital

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ABSTRACT

Background: Chest discomfort often leads to assessment, but the majority of instances are not heart-related. Numerous low-risk patients receive coronary angiography, frequently showing normal or non-blocked arteries. This study evaluates angiographic results in individuals experiencing non-specific chest pain at a tertiary medical facility. **Methods & Materials:** This cross-sectional research involved 180 adult patients experiencing non-specific chest pain who were scheduled for elective coronary angiography at Ashiyan Medical College Hospital, Dhaka, Bangladesh (2025). Information regarding demographics, risk elements, and angiographic observations was gathered. Coronary outcomes were categorized as normal, non-obstructive, or obstructive and examined using SPSS, with ethical approval and informed consent secured. **Results:** In a group of 180 patients (average age 52.6 ± 11.8 years; 61.1% male), conditions such as hypertension, dyslipidemia, smoking, and diabetes were prevalent. Angiography revealed normal arteries in 43.3%, non-obstructive CAD in 28.9%, and obstructive CAD in 27.8%. The majority of obstructive cases showed single-vessel disease (56%), primarily affecting the left anterior descending artery. All key risk factors showed a strong correlation with obstructive CAD, particularly diabetes ($p < 0.001$). **Conclusion:** The majority of patients experiencing non-specific chest pain showed either normal or non-obstructed coronary arteries. Obstructive CAD was less frequent and closely linked to conventional risk factors, notably diabetes. Thorough risk evaluation is essential to prevent unwarranted angiography.

Keywords: Coronary Angiography, Non-specific Chest Pain, Risk factors, Acute coronary syndrome.

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INTRODUCTION

Chest discomfort frequently leads to emergency room visits, yet more than fifty percent of patients leave without a cardiac diagnosis or identifiable reason ^[1]. Approximately 15 million individuals experience chest pain each year; while many are hospitalized, less than 10% are eventually diagnosed with acute coronary syndrome ^[2]. In patients with chest pain, cardiologists primarily assess cardiovascular reasons ^[3]. The objective is to recognize acute coronary syndrome (ACS) and other serious conditions; if ruled out, patients may be safely discharged, taking into account issues such as pulmonary embolism and aortic dissection ^[4,5].

At present, early invasive approaches and guideline-driven medical treatment for acute coronary syndrome (ACS) are well recognized ^[6]. Coronary angiography is the benchmark for coronary artery disease; however, it often yields low results in cases of non-specific chest pain, typically revealing normal or non-obstructive results in patients with low to intermediate risk ^[7]. Even with normal coronary angiograms, 44% of individuals experiencing non-cardiac chest pain continue to think they

have heart disease, and 50% indicate restrictions in daily activities. Additionally, raised troponin levels can happen in the absence of chest pain or ECG alterations, frequently resulting in unwarranted additional testing without evident clinical advantage ^[8,9].

A study revealed that a significant number of patients sent for coronary angiography due to chest pain possess normal or nearly normal coronary arteries, with many showing no signs of obstructive coronary artery disease ^[10]. Likewise, previous research indicates that almost 20% of patients receiving diagnostic angiography for chest pain possess normal coronary arteries, even with persistent symptoms ^[11]. Additional research has shown that results in patients with normal coronary angiograms tend to be more favorable than in those with obstructive disease, featuring low annual rates of myocardial infarction and cardiac death, although not completely insignificant ^[12].

Research carried out in Bangladesh revealed that within patients who exhibited non-specific chest pain and underwent coronary angiography, a significant number had normal or non-obstructive coronary arteries, whereas just a small fraction exhibited

obstructive coronary artery disease. Numerous cases were eventually linked to non-cardiac reasons despite initial beliefs of ischemic heart disease ^[13].

Local evidence regarding the diagnostic yield of coronary angiography in patients suffering from non-specific chest pain is scarce, even though many reports indicate normal or non-obstructive results, implying potential overuse of invasive procedures. Consequently, this research seeks to evaluate the angiographic results in these patients visiting a tertiary hospital, emphasizing the occurrence of normal, non-obstructive, and obstructive coronary artery disease.

METHODS & MATERIALS

Study Design

This was a hospital-based cross-sectional observational study conducted to evaluate the outcomes of coronary angiography in patients presenting with non-specific chest pain.

Study Setting and Period

The study was conducted in the Department of Cardiology of Ashiyan Medical College Hospital, Dhaka, Bangladesh. Data were collected over a defined study period from January 2025 to December 2025.

Study Population

The study population included adult patients (≥18 years) who presented with non-specific chest pain and underwent elective diagnostic coronary angiography during the study period. A total of 180 patients fulfilling the eligibility criteria were enrolled using a consecutive purposive sampling technique.

Patients were included if they presented with non-specific chest pain, underwent diagnostic coronary angiography, and provided informed written consent for participation in the study. Patients were excluded if they had confirmed acute coronary syndrome (STEMI, NSTEMI, or unstable angina), previously diagnosed coronary artery disease or history of revascularization (PCI or CABG), valvular heart disease, cardiomyopathy, or incomplete angiographic data.

Data Collection Procedure

Data were collected using a structured case record form. Information regarding demographic variables (age, sex), cardiovascular risk factors (hypertension, diabetes mellitus, smoking status,

dyslipidemia), and clinical presentation were recorded. Coronary angiography findings were obtained from the catheterization laboratory reports.

Coronary Angiography and Definitions

Coronary angiography was performed using standard femoral or radial access techniques. Significant coronary artery disease was defined as ≥50% luminal stenosis in any major epicardial coronary artery.

Patients were categorized as:

- Normal coronary arteries: No visible stenosis
- Non-obstructive CAD: <50% luminal stenosis
- Obstructive CAD: ≥50% luminal stenosis

Extent of disease was further classified as single-vessel, double-vessel, or triple-vessel disease.

Statistical Analysis

Data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 25.0. Continuous variables were expressed as mean ± standard

deviation, and categorical variables as frequency and percentage. Chi-square test was used to assess the association between categorical variables. A p-value <0.05 was considered statistically significant.

Ethical Consideration

Ethical approval was obtained from the Institutional Review Board (IRB) of the study hospital. Written informed consent was taken from all participants prior to data collection. Confidentiality and anonymity of patient information were strictly maintained throughout the study.

RESULTS

Table I shows total of 180 patients with non-specific chest pain underwent coronary angiography during the study period. The findings are presented in the following tables. The mean age of the study participants was 52.6 ± 11.8 years, with a male predominance (61.1%). Half of the patients had hypertension, while 33.3% had diabetes mellitus. Smoking and dyslipidemia were present in 41.7% and 44.4% of patients, respectively.

Table I

Baseline characteristics of the study population (n = 180).

Variables	Frequency (n)	Percentage (%)
Age (years)	Mean ± SD = 52.6 ± 11.8	—
Sex		
Male	110	61.1
Female	70	38.9
Hypertension	90	50.0
Diabetes mellitus	60	33.3
Smoking history	75	41.7
Dyslipidemia	80	44.4

Table II presents coronary angiography revealed that 43.3% of patients had normal coronary arteries, 28.9% had non-obstructive coronary artery disease (CAD), and 27.8% demonstrated obstructive CAD.

Table II

Coronary angiography findings (n = 180).

Angiographic outcome	Frequency (n)	Percentage (%)
Normal coronary arteries	78	43.3
Non-obstructive CAD (<50% stenosis)	52	28.9
Obstructive CAD (≥50% stenosis)	50	27.8

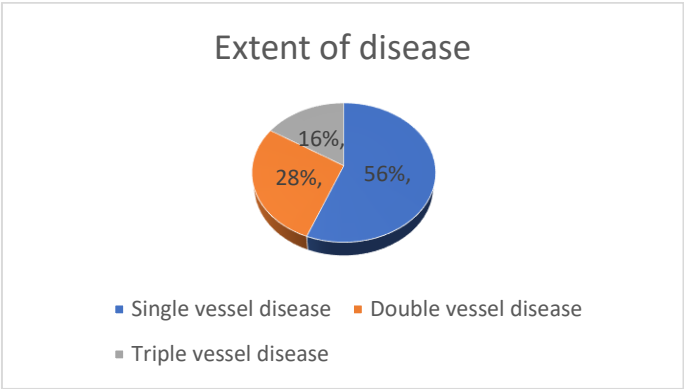


Figure 1 Extent of coronary artery disease among obstructive CAD patients (n = 50).

Figure 1 shows among patients with obstructive CAD, more than half (56%) had single-vessel disease, while 28% and 16%

had double- and triple-vessel disease, respectively. Table III shows the left anterior descending artery was the most frequently involved

vessel (76%), followed by the right coronary artery (52%) and left circumflex artery (40%).

Table III
Distribution of coronary artery involvement in obstructive CAD (n = 50).

Coronary artery involved	Frequency (n)	Percentage (%)
Left anterior descending (LAD)	38	76.0
Right coronary artery (RCA)	26	52.0
Left circumflex artery (LCX)	20	40.0
Left main coronary artery	6	12.0

Table IV presents hypertension, diabetes mellitus, smoking, and dyslipidemia were all significantly associated with obstructive

CAD. The strongest association was observed with diabetes mellitus (p < 0.001),

followed by dyslipidemia (p = 0.001) and smoking (p = 0.002).

Table IV
Association of cardiovascular risk factors with obstructive CAD (n = 180).

Risk factors	Obstructive CAD (n=50), n (%)	Non-obstructive/Normal (n=130), n (%)	p-value
Hypertension	34 (68.0)	56 (43.1)	0.003
Diabetes mellitus	28 (56.0)	32 (24.6)	<0.001
Smoking	30 (60.0)	45 (34.)	0.002
Dyslipidemia	32 (64.0)	48 (36.9)	0.001

DISCUSSION

This study found that the majority of patients experiencing non-specific chest pain were middle-aged men with various cardiovascular risk factors. Ilangkovan et al. 2017 reported consistent results, with 55% female and 45% male participants, and a median age of 54 years. Nonetheless, patients with clinical outcomes were older and more frequently male. They demonstrated an increased comorbidity burden, with a Charlson score of ≥1 in 50% compared to 23%, along with greater smoking rates [14]. In this study, 43.3% exhibited normal coronary arteries, 28.9% showed non-obstructive CAD, and just 27.8% had obstructive CAD. This aligns with Patel et al., who found a low diagnostic yield in elective coronary angiography alongside a significant number of non-obstructive results [15]. This study indicated that obstructive CAD was primarily restricted, with single-vessel disease occurring in 56%, followed by double-vessel disease at 28% and triple-vessel disease at 16%. This pattern aligns with Ko et al., who found that the majority of patients receiving elective coronary catheterization exhibited no or limited (typically single-vessel) obstructive coronary disease, whereas widespread multivessel disease was less frequent [16]. In this research, the LAD artery was the most frequently affected vessel, followed by RCA and LCX, while left main disease was the least common. This demonstrates the usual pattern of coronary atherosclerosis with primary impact on major epicardial

arteries, particularly the LAD. Sukhija et al. also found that in patients receiving coronary angiography for suspected CAD, the disease is often confined to major vessels, whereas left main and multivessel involvement is less common [17]. Hypertension, diabetes, smoking, and dyslipidemia showed a notable correlation with obstructive CAD, with diabetes exhibiting the strongest link. Ko et al. 2014 also discovered that traditional risk elements, particularly diabetes, are closely associated with obstructive coronary artery disease in patients undergoing angiography, and the risk amplifies with the presence of multiple concurrent factors [18]. This study finds that the majority of patients experiencing non-specific chest pain possess non-obstructive or normal coronary arteries, whereas obstructive CAD is rarer and closely linked to conventional cardiovascular risk factors, especially diabetes mellitus.

CONCLUSION

Among patients with non-specific chest pain, a significant number had either normal or non-obstructive coronary arteries, whereas under one-third exhibited obstructive coronary artery disease. Obstructive disease was strongly linked to conventional cardiovascular risk factors, especially diabetes mellitus. These results indicate that thorough clinical assessment and risk categorization are crucial to enhance patient selection for coronary angiography and to minimize unnecessary invasive treatments.

REFERENCES

1. Kisely SR, Campbell LA, Skerrett P. Psychological interventions for symptomatic management of non-specific chest pain in patients with normal coronary anatomy. Cochrane Database of Systematic Reviews. 2005(1).
2. Groarke J, O'Brien J, Go G, Susanto M, Owens P, Maree AO. Cost burden of non-specific chest pain admissions. Irish journal of medical science. 2013 Mar;182(1):57-61.
3. Stochkendahl MJ, Christensen HW. Chest pain in focal musculoskeletal disorders. Medical Clinics. 2010 Mar 1;94(2):259-73.
4. Ruddox V, Mathisen M, Otterstad JE. Prevalence and prognosis of non-specific chest pain among patients hospitalized for suspected acute coronary syndrome-a systematic literature search. BMC medicine. 2012 Jun 12;10(1):58.
5. Amsterdam EA, Kirk JD, Bluemke DA, Diercks D, Farkouh ME, Garvey JL, Kontos MC, McCord J, Miller TD, Morise A, Newby LK. Testing of low-risk patients presenting to the emergency department with chest pain: a scientific statement from the American Heart Association. Circulation. 2010 Oct 26;122(17):1756-76.
6. Authors:, Valgimigli M, Patrono C, Collet JP, Mueller C, Roffi M, Document Reviewers:, Baumgartner H, Gaemperli O, Zamorano JL. Questions and answers on coronary revascularization: a companion document of the 2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. European heart journal. 2016 Jan 14;37(3):e8-14.
7. Patel MR, Dehmer GJ, Hirshfeld JW, Smith PK, Spertus JA. Accf/scai/sts/aats/aha/asnc 2009 appropriateness criteria for coronary revascularization: a report by the american

- college of cardiology foundation appropriateness criteria task force, society for cardiovascular angiography and interventions, society of thoracic surgeons, american association for thoracic surgery, american heart association, and the american society of nuclear cardiology endorsed by the american society of echocardiography, the heart failure society of America, and the society of Journal of the American College of Cardiology. 2009 Feb 10;53(6):530-53.
8. Shimoni Z, Arbuzov R, Froom P. Troponin testing in patients without chest pain or electrocardiographic ischemic changes. *The American Journal of Medicine*. 2017 Oct 1;130(10):1205-10.
 9. Wertli MM, Dangma TD, Müller SE, Gort LM, Klauser BS, Melzer L, Held U, Steurer J, Hasler S, Burgstaller JM. Non-cardiac chest pain patients in the emergency department: Do physicians have a plan how to diagnose and treat them? A retrospective study. *PloS one*. 2019 Feb 1;14(2):e0211615.
 10. de Lange TS, Tijssen RG, Damman P, van Bergen PF. Clinical characteristics of patients with suspected cardiac chest pain and angiographically normal coronary arteries in a secondary care hospital. *Netherlands Heart Journal*. 2017 Jun;25(6):370-5.
 11. Di Fiore DP, Beltrame JF. Chest pain in patients with 'normal angiography': could it be cardiac?. *JBIC Evidence Implementation*. 2013 Mar 1;11(1):56-68.
 12. Hanson CA, Lu E, Ghumman SS, Ouellette ML, Löffler AI, Beller GA, Bourque JM. Long-term outcomes in patients with normal coronary arteries, nonobstructive, or obstructive coronary artery disease on invasive coronary angiography. *Clinical Cardiology*. 2021 Sep;44(9):1286-95.
 13. Nasrin S, Cader FA, Haq MM. Clinical and Angiographic Characteristics of Female Patients Undergoing Coronary Angiography in a Tertiary Hospital in Bangladesh. *Ibrahim Cardiac Medical Journal*. 2017;7(1-2):9-14.
 14. Ilangkovan N, Mickley H, Diederichsen A, Lassen A, Sørensen TL, Sheta HM, Stæhr PB, Mogensen CB. Clinical features and prognosis of patients with acute non-specific chest pain in emergency and cardiology departments after the introduction of high-sensitivity troponins: a prospective cohort study. *BMJ open*. 2017 Dec 1;7(12):e018636.
 15. Patel MR, Peterson ED, Dai D, Brennan JM, Redberg RF, Anderson HV, Brindis RG, Douglas PS. Low diagnostic yield of elective coronary angiography. *New England Journal of Medicine*. 2010 Mar 11;362(10):886-95.
 16. Ko DT, Tu JV, Austin PC, Wijeyesundera HC, Samadashvili Z, Guo H, Cantor WJ, Hannan EL. Prevalence and extent of obstructive coronary artery disease among patients undergoing elective coronary catheterization in New York State and Ontario. *Jama*. 2013 Jul 10;310(2).
 17. Sukhija R, Yalamanchili K, Aronow WS. Prevalence of left main coronary artery disease, of three-or four-vessel coronary artery disease, and of obstructive coronary artery disease in patients with and without peripheral arterial disease undergoing coronary angiography for suspected coronary artery disease. *The American journal of cardiology*. 2003 Aug 1;92(3):304-5.
 18. Ko DT, Wijeyesundera HC, Udell JA, Vaccarino V, Austin PC, Guo H, Velianou JL, Lau K, Tu JV. Traditional cardiovascular risk factors and the presence of obstructive coronary artery disease in men and women. *Canadian Journal of Cardiology*. 2014 Jul 1;30(7):820-6.