

Angiographic Findings, Heart Score, Laboratory Parameters, and Mortality in Patients Presenting to the Emergency Department with Chest Pain

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Abstract

Objective: Ischemic heart disease is the leading cause of global mortality, with chest pain being its most common symptom. Given its high prevalence and associated mortality, a comprehensive evaluation of cardiac function, angiographic findings, HEART Score, laboratory parameters, and mortality risk is essential for improving patient outcomes. This study aimed to examine the relationship between cardiac function, angiography reports, HEART Score, laboratory parameters, and mortality in patients presenting to the emergency department with chest pain.

Materials and Methods: This single-center, retrospective study included 644 patients presenting with chest pain to the Gaziantep City Hospital Emergency Department between January and June 2024. Gaziantep City Hospital is a tertiary-care referral center with an annual emergency department census exceeding approximately 1.2 million visits, including a high volume of cardiovascular emergency admissions. Data on age, gender, laboratory findings, echocardiography, electrocardiography (ECG) changes, HEART Score, angiography reports, and hospital discharge outcomes were analyzed.

Results: Among the 644 patients, 32.8% had myocardial wall motion abnormalities, which were significantly associated with early mortality ($p=0.026$). Two-vessel disease was present in 23.1% of patients, and three-vessel disease was present in 16.1%. Left anterior descending artery (LAD) stenosis $\geq 80\%$ was associated with mortality ($p=0.04$) and multivessel disease ($p<0.001$). Although 47.8% of patients had ischemia-compatible ECG findings, these findings and troponin levels were not significantly associated with mortality. The neutrophil/lymphocyte ratio (AUC=0.641, $p=0.004$) and C-reactive protein (CRP) level (AUC=0.617, $p=0.01$) were significant predictors of mortality.

Conclusion: Myocardial wall motion abnormalities and LAD stenosis $\geq 80\%$ were independent risk factors for mortality. The neutrophil/lymphocyte ratio and CRP level were also useful for predicting mortality. These findings may improve risk stratification and clinical decision-making for patients presenting to the emergency department with chest pain.

Keywords: Acute coronary syndrome, chest pain, HEART score, percutaneous coronary angiography

Introduction

According to data published by the World Health Organization (WHO) in 2019, ischemic heart disease ranks first among the top 10 causes of death [1]. Based on WHO's cardiovascular disease (CVD) reports, an estimated 17.9 million people died from CVDs in 2019, representing 32% of all global deaths. CVDs encompass a range of disorders affecting the heart and blood vessels, including coronary heart disease, cerebrovascular disease, peripheral arterial

disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis, and pulmonary embolism.

A commonly used term, acute coronary syndrome (ACS), describes a sudden condition in patients with coronary artery disease that can lead to myocardial ischemia. Heart attacks and strokes develop acutely and require urgent intervention. The American Heart Association (AHA) states that chest pain is the leading reason for hospital visits related to coronary artery disease



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(CAD) [2]. Patients diagnosed with CAD frequently present to the emergency department with chest pain felt in the middle of the sternum, which may radiate to the left shoulder, arms, elbows, and sometimes the jaw or back, causing discomfort. To reduce the global incidence of CVD and acute coronary syndrome (ACS), it is crucial to establish a universal diagnostic approach and rapid treatment strategy.

Despite advances in diagnostic strategies for chest pain, the relationship between angiographic severity, echocardiographic findings, hematological inflammatory markers, and mortality remains incompletely understood. Identifying predictors of short-term mortality may improve early risk stratification and clinical decision-making in the emergency department.

Therefore, this study aimed to evaluate the association between coronary angiographic findings, echocardiographic parameters, HEART score, and laboratory biomarkers with 30-day mortality in patients presenting to the emergency department with chest pain.

Although previous studies have examined angiographic severity, clinical risk scores, or inflammatory markers individually, few studies have evaluated the combined relationship between coronary angiographic findings, echocardiographic parameters, inflammatory biomarkers, and clinical outcomes in patients presenting to the emergency department with chest pain. In particular, the prognostic value of integrating anatomical findings from coronary angiography with inflammatory biomarkers and echocardiographic abnormalities remains insufficiently explored in emergency department populations. Therefore, the present study aimed to investigate the relationship between coronary angiographic findings, echocardiographic parameters, HEART score, inflammatory biomarkers, and mortality in patients presenting to the emergency department with chest pain.

Materials and Methods

This single-center, retrospective, observational study was conducted in the Emergency Department of Gaziantep City Hospital. The medical records of adult patients who presented with chest pain between January 1, 2024, and June 30, 2024, were retrospectively reviewed. Ethical approval was obtained from the Gaziantep Islam Science and Technology University Ethics Committee before data collection. (Approval Date: 28/12/2023; Decision No: 496.41.16) The study was conducted in accordance with the Declaration of Helsinki. Due to the retrospective design and use of anonymized data, the requirement for informed consent was waived by the ethics committee.

The inclusion criteria were as follows: patients whose first admission was to our emergency department, with chest pain as the primary complaint; patients aged 18 years or older who were suspected of ACS and underwent diagnostic tests; patients who received a specialist consultation; patients who underwent percutaneous coronary intervention (PCI) as treatment; and patients who provided informed consent. The exclusion criteria were as follows: patients whose first admission was not to the emergency department; patients whose records were incomplete during the archive search; patients who did not receive a specialist consultation; and patients who left the hospital voluntarily before completing treatment.

After applying the inclusion and exclusion criteria, a total of 644 patients were included. Both physical and digital hospital records were reviewed to extract patients' age, gender, laboratory parameters (creatinine kinase-MB [CK-MB], troponin, neutrophil, lymphocyte, and RDW), echocardiography findings, ECG changes (STEMI and non-STEMI), HEART score, angiographic findings (including the left main coronary artery, left anterior descending artery, right coronary artery, and circumflex artery), and discharge status.

Electrocardiographic findings were independently evaluated by two cardiology specialists blinded to patient outcomes. Discrepancies were resolved by consensus to ensure standardized interpretation. Echocardiography was performed during hospitalization using standard transthoracic echocardiography protocols. Left ventricular ejection fraction (EF) and the presence of regional wall motion abnormalities were recorded. Echocardiographic examinations were performed and interpreted by experienced cardiologists according to standard clinical practice.

HEART Score Assessment

The HEART score was calculated for all patients at the time of emergency department admission. The score consists of five components: history, electrocardiography (ECG), age, cardiovascular risk factors, and troponin level, each graded from 0 to 2 points, resulting in a total score ranging from 0 to 10.

Patient history was categorized as slightly suspicious (0 points), moderately suspicious (1 point), or highly suspicious (2 points) for acute coronary syndrome. ECG findings were classified as normal (0 points), nonspecific repolarization disturbance (1 point), or significant ST-segment deviation (2 points). Age was scored as <45 years (0 points), 45–65 years (1 point), and >65 years (2 points). Cardiovascular risk factors included hypertension, diabetes mellitus, hyperlipidemia, smoking, obesity, and a family history of coronary artery disease. Patients with no risk factors received 0

points, those with 1–2 risk factors received 1 point, and those with ≥ 3 risk factors or a history of atherosclerotic disease received 2 points. Troponin levels were scored as normal (0 points), 1–3 \times the normal limit (1 point), or $>3\times$ the normal limit (2 points).

Based on the total HEART score, patients were categorized into low-risk (0–3), moderate-risk (4–6), and high-risk (7–10) groups.

Age Stratification

For subgroup analyses, patients were categorized into two age groups: younger than 45 years (<45 years) and 45 years or older (≥ 45 years). This threshold was selected based on previous literature evaluating premature coronary artery disease. The relationship between age groups and coronary angiographic findings, multivessel disease, and mortality was analyzed.

A sample size calculation was performed using G*Power 3.1 software, considering 30-day mortality as the primary endpoint. With 80% power, a 0.05 type I error rate, and an effect size of 0.30, the minimum required sample size was determined to be 98 patients. However, a total of 644 patients were included to ensure higher statistical power.

Statistical Analysis

Study data were analyzed using SPSS (Statistical Package for the Social Sciences) version 27.0 and MedCalc version 22.007 software. Numerical data were expressed as mean \pm standard deviation and median (interquartile range [IQR]), while categorical data were presented as percentages. The chi-square test was used to compare categorical variables. The Kolmogorov-Smirnov test was used to evaluate the normality of distribution. The independent samples t-test was used for normally distributed continuous variables. Receiver operating characteristic (ROC) analysis was used to calculate the area under the curve (AUC) values of biomarkers. Sensitivity, specificity, and cut-off values for biomarkers were determined using the Youden index J.

All hypotheses were tested using a two-tailed approach, and a p-value of <0.05 was considered statistically significant.

Results

During the study period, a total of 1192 patients presented to the emergency department with chest pain and were screened for eligibility. After applying the inclusion and exclusion criteria, 644 patients were included in the final analysis. The patient selection process is illustrated in Figure 1.

The demographic data of the patients are shown in Table 1. The median age of the study patients was 61.49 years (range, 18–97

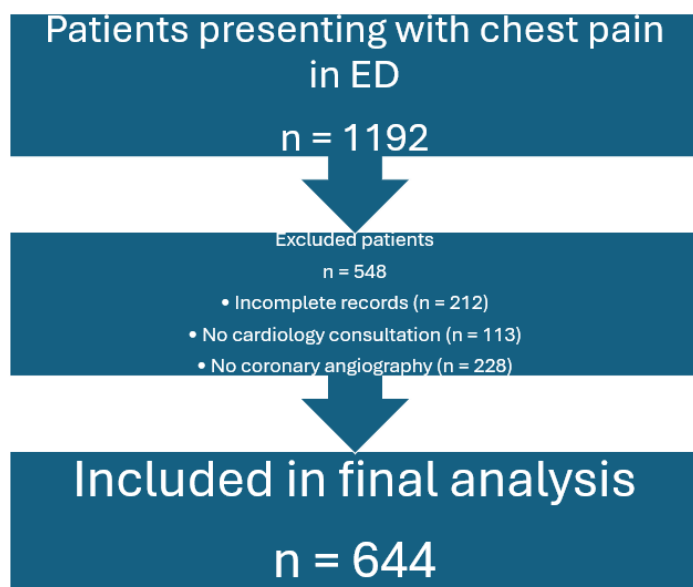


Figure 1. Patient selection process flow diagram

years). In total, 63.2% of the patients were male. When the patients' HEART scores were categorized according to risk groups, 79.2% of the patients were found to be at moderate risk.

In our study, as shown in Table 2, analysis of ejection fraction (EF) values revealed that 36.3% of patients had EF $>60\%$, 46% had EF between 40% and 60%, and 17.7% had EF $<40\%$. Additionally, the overall mortality rate was found to be 5.9%. The number of patients with wall motion abnormality detected on echocardiography (ECHO) was 211 (32.8%). When echocardiographic findings were compared with early mortality, mortality was found to be significantly higher in patients with wall motion abnormality ($p=0.026$). Furthermore, the presence of LAD stenosis $>80\%$ on coronary angiography ($p=0.04$) and echocardiographic wall motion abnormality ($p=0.026$) were both associated with increased

Table 1. Demographic characteristics of study patients and HEART score

Presentiable	Mean \pm SD; n (%)
Age (Years)	61.49 (18–97)
Gender	
Male	408 (63.2)
Female	236 (36.8)
HEART score	
Low risk (0–3)	72 (11.2)
Moderate risk (4–6)	510 (79.2)
High risk (>7)	62 (9.6)

SD: standard deviation, n: number

Table 2. Echocardiographic and coronary angiography results of patients

Presentable	n (%)
EF values (%)	
>60	234 (36.3%)
40-60	296 (46.0%)
<40	114 (17.7%)
Echocardiographic wall motion abnormality	
Present	211 (32.8%)
Absent	433 (67.2%)
ECG findings (Ischemia-Consistent)	
Present	308 (47.8%)
Absent	336 (52.2%)
LAD critical stenosis	
Present	318 (49.4%)
Absent	326 (50.6%)
RCA critical stenosis	
Present	231 (35.9%)
Absent	413 (64.1%)
LMCA critical stenosis	
Present	28 (4.3%)
Absent	616 (95.7%)
CX critical stenosis	
Present	250 (38.8%)
Absent	394 (61.2%)
Two-Vessel disease	
Present	149 (23.1%)
Absent	495 (76.9%)
Three-Vessel disease	
Present	104 (16.1%)
Absent	549 (83.9%)
LAD >80% stenosis	
Present	276 (42.9%)
Absent	368 (57.1%)
Mortality	
Present	38 (5.9%)
Absent	606 (94.1%)

N: number, EF: Ejection fraction, ECG: Electrocardiogram, LAD: Left anterior descending artery, RCA: Right coronary artery, LMCA: Left main coronary artery, Cx: Circumflex artery

mortality. A total of 644 patients underwent echocardiography in our hospital. Among them, 36.3% had an ejection fraction (EF) >60%. Additionally, 32.8% of patients showed myocardial wall motion abnormality on echocardiography. At the time of emergency department admission, 47.8% of patients exhibited electrocardiographic (ECG) findings consistent with ischemia. Analysis of their reports showed that 23.1% had critical stenosis in two vessels and 16.1% had critical stenosis in three vessels. When 30-day mortality was evaluated, the overall mortality rate was calculated as 5.9% (Fig. 2).

The study categorized patients' EF values according to the heart failure classification. A significant association was found between low EF values and myocardial wall motion abnormality (Table 3, Fig. 1).

The relationship between laboratory test results at emergency department admission and mortality was analyzed, as shown in Table 4. CRP level (p=0.04), white blood cell (WBC) count (p<0.001), and neutrophil/lymphocyte ratio (p<0.001) showed significant differences between the two groups. No significant relationship was found between troponin levels and mortality.

Patients' HEART scores calculated in the emergency department were categorized into low-, moderate-, and high-risk groups, and their relationship with mortality was analyzed, as shown in Table 5. No significant association was found between HEART score risk groups and mortality (p=0.11).

In patients with LAD stenosis >80% following the CAG procedure, the relationship with concomitant stenosis in other vessels was

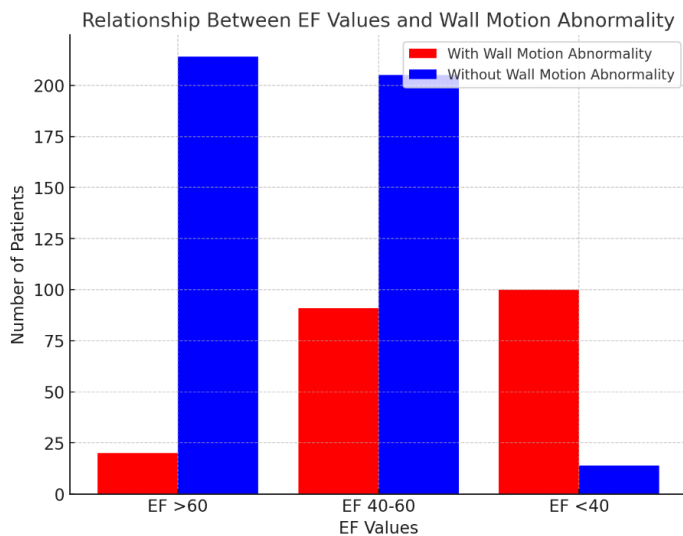


Figure 2. The relationship between EF values calculated during echocardiography and myocardial wall motion abnormality in study patients

Table 3. Relationship between EF values and wall motion abnormality in echocardiography

Parameters	EF values				p*
	EF >60	EF <60 -EF>40	EF<40	Total	
Echocardiographic wall motility Abnormality					
Present	20	91	100	211	<0.001
Absent	214	205	14	433	

* Chi-square test was used. EF: Ejection Fraction

Table 4. Relationship between laboratory results and mortality

Parameters	30-Day Mortality Mean \pm SD			p*
	Absent	Present		
Troponin değeri (ng/L)	7456.36 \pm 2366.7	8507.73 \pm 2149.29		0.089
CRP (mg/L)	31.67 \pm 28.2	50.9 \pm 17.05		0.04*
Neutrophil count ($\times 10^9/L$)	8.09 \pm 4.9	10.35 \pm 6.00		0.006
Lymphocyte count ($\times 10^9/L$)	2.2 \pm 1.25	1.68 \pm 1.13		0.594
CKMB (U/L)	39.05 \pm 27.78	24.71 \pm 14.8		0.890
WBC ($\times 10^9/L$)	10.93 \pm 3.78	12.35 \pm 5.6		<0.001*
Neutrophil/Lymphocyte Ratio	5.48 \pm 4.3	11.02 \pm 14.6		<0.001*

*Independent Samples T-Test was used. A p-value <0.05 was considered statistically significant. SD: Standard deviation, CRP: C-Reactive protein, CKMB: Creatinine kinase-MB, WBC: White blood cell count

Table 5. Relationship between HEART score and mortality

Mortality	HEART score			p*
	Low risk	Moderate risk	High risk	
Present	1	31	6	0.11
Absent	71	479	56	

* Chi-square test was used

examined, and LAD stenosis >80% was found to be significantly associated with multivessel disease ($p<0.001$) (Table 6).

The relationship between LAD stenosis >80% and critical stenosis in the circumflex artery (CX), right coronary artery (RCA), and left main coronary artery (LMCA) was analyzed.

- CX stenosis was significantly associated with LAD stenosis >80% ($p<0.001$). Among patients with CX stenosis, 141 (56.4%) also had LAD stenosis >80%, while 109 (43.6%) did not.

- RCA stenosis showed a significant relationship with LAD stenosis >80% ($p<0.001$). Among patients with RCA stenosis, 125 (54.1%) had LAD stenosis >80%, while 106 (45.9%) did not.
- LMCA stenosis was also significantly associated with LAD stenosis >80% ($p<0.001$). Among patients with LMCA stenosis, 21 (75%) had LAD stenosis >80%, while 7 (25%) did not.

These results indicate that critical stenosis in the CX, RCA, and LMCA is strongly associated with LAD stenosis >80%.

In our study, patients were grouped as older or younger than 45 years, and the relationship with CAG results was examined. Being older than 45 years was found to be associated with multivessel disease ($p<0.001$). When patients were grouped by age, no significant relationship was observed between mortality and LAD stenosis >80% (Table 7).

Table 6. Relationship between LAD >80 stenosis and multivessel disease

Parameters	LAD > 80 Stenosis n (%)			
	Present	Absent	Total	p*
Two-vessel disease present	98	31	129	<0.001
Absent	178	317	595	
Three-vessel disease present	87	17	104	<0.001
Absent	189	351	540	

* Chi-square test was used. LAD: Left anterior descending artery, N: number

Table 7. Relationship between multivessel disease, LAD >80% stenosis, and mortality in patients grouped by age (<45 and \geq 45 years)

Parameters	Age			p*
	<45	>45	Total	
Two-vessel disease present	9	140	149	0.017
Absent	65	430	495	
Three-Vessel disease present	4	100	104	0.008
Absent	70	470	540	
LAD >80 stenosis present	26	250	276	0.154
Absent	48	320	368	
Mortality present	2	36	38	0.215
Absent	72	534	606	

LAD: Left anterior descending artery

The association between coronary angiography (CAG) findings, echocardiography (ECHO) findings, and mortality was evaluated. The presence of LAD stenosis >80% was significantly associated with 30-day mortality ($p=0.04$). Additionally, echocardiographic wall motion abnormalities were found to be significantly related to mortality ($p=0.026$). Other coronary findings, including two-vessel disease ($p=0.203$), three-vessel disease ($p=0.302$), RCA critical stenosis ($p=0.89$), LMCA critical stenosis ($p=0.237$), and CX critical stenosis ($p=0.345$), were not significantly associated with mortality. Similarly, ischemic ECG findings ($p=0.34$) and elevated troponin levels above the cut-off value ($p=0.349$) were not statistically significant in predicting 30-day mortality.

When laboratory results were evaluated for mortality prediction using ROC analysis, the neutrophil/lymphocyte ratio (NLR) was found to be a significant predictor, with an AUC of 0.641 ($p<0.004$). CRP levels ranked second, with an AUC of 0.617 ($p=0.01$). However, troponin levels were not statistically significant for mortality prediction ($p=0.23$) (Fig. 3).

Discussion

This study evaluated the relationship between coronary angiographic findings, echocardiographic parameters, inflammatory biomarkers, and mortality in patients presenting to the emergency department with chest pain. The main findings of this study were that severe LAD stenosis was associated with mortality, echocardiographic wall motion abnormalities were predictive of adverse outcomes, inflammatory markers such as neutrophil-to-lymphocyte ratio and C-reactive protein demonstrated prognostic value, and the HEART score was not significantly associated with mortality. The HEART score was originally developed to predict major adverse cardiac events rather than mortality alone. Therefore, the lack of association between HEART score categories and mortality in our study should be interpreted cautiously and does not necessarily indicate that the HEART score is ineffective for risk stratification in patients presenting with chest pain.

The most prominent symptom of ischemic heart disease is chest pain, which may radiate to the left shoulder, arm, elbow, jaw, or back and often indicates coronary artery disease-related chest pain [3]. Chest pain is also one of the most common reasons for emergency department visits [1]. However, not all admissions for chest pain are related to coronary artery disease, as only a portion of these cases represent true cardiac pathology [3]. The 2021 AHA/ACC/AASE/CHEST/SAEM/SCCT/SCMR guideline for the evaluation and diagnosis of chest pain introduced updated approaches emphasizing cost-effective diagnostic strategies and shared decision-making in the management of patients presenting with

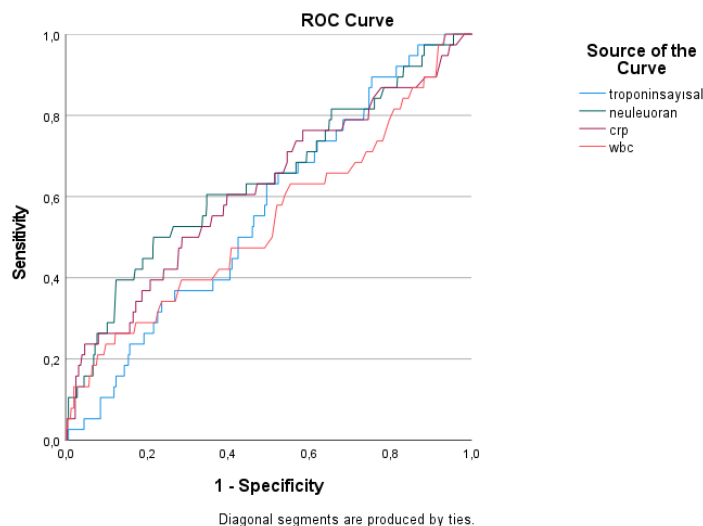


Figure 3. ROC analysis of hematologic parameters for mortality prediction

suspected cardiac chest pain [4].

Our findings suggest that severe stenosis of the left anterior descending artery may be associated with an increased mortality risk. The LAD artery supplies a large portion of the left ventricular myocardium, and critical stenosis in this vessel can result in extensive myocardial ischemia and impaired ventricular function. Previous studies examining hemodynamically significant LAD disease have similarly demonstrated its association with adverse clinical outcomes [5]. In addition, inflammatory biomarkers, including CRP, WBC count, and neutrophil-to-lymphocyte ratio, were associated with mortality, whereas troponin levels did not demonstrate a similar relationship. These findings suggest that while troponin is essential for the diagnosis of acute coronary syndrome, it may be less useful as an isolated predictor of mortality in patients presenting with chest pain.

Various risk stratification models have been developed for the evaluation of coronary artery disease. The HEART score, which incorporates history, ECG, age, risk factors, and troponin levels, is one of the most widely used clinical risk classification systems for patients presenting with chest pain. Its primary aim is to predict major adverse cardiac events rather than mortality alone. In our study, the HEART score did not show a significant association with mortality, which is consistent with previous studies reporting that clinical risk scores may be more effective in predicting composite cardiac events rather than mortality specifically [6–8].

In a study by Daniel Nour et al. [9], angiographic determinants of coronary hemodynamics were evaluated in patients undergoing coronary angiography, demonstrating frequent involvement of the LAD artery in patients with coronary artery disease. In our study, we also observed a substantial prevalence of LAD involvement and

a strong association between LAD lesions and multivessel disease. This relationship may partly explain the prognostic significance of severe LAD stenosis observed in our cohort.

Hematological parameters are routinely measured in patients presenting to the emergency department and may provide additional prognostic information. In our analysis, inflammatory markers such as CRP, WBC count, and neutrophil-to-lymphocyte ratio were associated with mortality. Increasing evidence suggests that systemic inflammation plays an important role in the development and progression of atherosclerosis. Previous studies have also reported that the neutrophil-to-lymphocyte ratio may serve as a simple and inexpensive marker reflecting the inflammatory status of patients with cardiovascular disease [10]. In addition, other hematological ratios, including monocyte-to-lymphocyte ratio and monocyte-to-HDL ratio, have been reported to correlate with disease severity in coronary artery disease [11].

Age-related differences in coronary artery disease have been reported in several studies. Younger patients tend to demonstrate less extensive coronary involvement, whereas older patients more frequently exhibit multivessel disease and higher mortality rates. Studies comparing younger and older populations with coronary artery disease have similarly reported that multivessel involvement and more complex coronary lesions are more common among older patients [12]. A large meta-analysis conducted in South Africa also reported variability in mortality rates among young patients with coronary artery disease [13].

Endothelial dysfunction and inflammatory activation are known to contribute to the pathogenesis of coronary artery disease. [13,14] CRP is one of the most widely used inflammatory markers in clinical practice and has been investigated extensively in relation to coronary artery disease. Several studies have demonstrated a relationship between elevated CRP levels and the presence or severity of coronary artery disease [15–18]. For example, Zhu et al. [15] reported a positive correlation between high-sensitivity CRP and coronary artery disease, while a meta-analysis by Qureshi et al. [16] also demonstrated a relationship between CRP levels and cardiovascular risk. However, other studies have reported conflicting findings regarding the association between CRP and coronary artery disease [17]. These inconsistencies highlight the complexity of inflammatory pathways involved in atherosclerosis.

Chest pain remains one of the leading causes of emergency department visits worldwide. Although not all cases are related to cardiac disease, a subset of patients may have significant coronary pathology requiring urgent evaluation. Coronary angiography remains the gold standard for diagnosing coronary artery disease; however, assessment of cardiac function is also important in

determining patient prognosis. Echocardiography is widely used in clinical practice because it is noninvasive, readily available, and provides rapid information regarding cardiac structure and function [19]. Previous studies evaluating revascularization strategies in patients with reduced left ventricular function have demonstrated differences in long-term outcomes between percutaneous coronary intervention and coronary artery bypass grafting [20]. The presence of echocardiographic wall motion abnormalities in our study supports the importance of functional cardiac assessment in patients with suspected coronary disease.

This study has several strengths. The relatively large sample size enhances the statistical power and reliability of the findings. In addition, the study provides a comprehensive evaluation of coronary angiographic findings, inflammatory laboratory markers, and echocardiographic parameters, allowing a multidimensional assessment of patients presenting with chest pain in the emergency department.

However, several limitations should be considered. First, this was a single-center study, which may limit the generalizability of the findings. Second, only patients who underwent coronary angiography were included, which may introduce selection bias. Third, the study focused on routinely available laboratory markers and did not evaluate additional biomarkers that may provide further prognostic information. Finally, long-term outcomes beyond the early follow-up period were not assessed.

Our findings highlight the potential importance of combining anatomical, functional, and inflammatory markers when evaluating patients presenting with chest pain. Identification of severe LAD stenosis, echocardiographic abnormalities, and elevated inflammatory markers may assist clinicians in identifying patients at increased risk of adverse outcomes. Future research should focus on multicenter prospective studies to further evaluate the prognostic value of these markers and to explore strategies for improving risk stratification and management in patients with suspected coronary artery disease.

Study Limitations

This study has several limitations. First, it was retrospective and single-center, which may limit the generalizability of the results. Second, only patients who underwent coronary angiography in our hospital were included; therefore, patients managed with alternative strategies, such as CABG or optimal medical therapy, were not evaluated. Third, the analysis was limited to routinely available laboratory markers (NLR, CRP, and WBC), and other potential prognostic biomarkers were not assessed. Finally, long-term outcomes beyond 30-day mortality were not collected, restricting conclusions to short-term prognosis.

Conclusion

Our study highlights that LAD stenosis >80% is significantly associated with mortality, reinforcing its importance as a critical determinant of adverse outcomes. Hematological markers, particularly NLR and CRP, were valuable predictors of mortality, whereas troponin was not significantly associated with early mortality.

These findings suggest that incorporating inflammatory markers into CAD risk assessment may improve the early identification of high-risk patients. Further research is needed to refine risk stratification tools and individualized treatment strategies.

Ethics Committee Approval: This study was approved by the Gaziantep Islam Science and Technology University Ethics Committee before data collection (Approval Date: 28/12/2023; Decision No: 496.41.16).

Informed Consent: Written informed consent was obtained.

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