ORIGINAL ARTICLE

Evaluation of Clinical and Demographic Characteristics According to Acute Coronary Syndrome Subtypes

Akut Koroner Sendrom Alt Tiplerine Göre Klinik ve Demografik Özelliklerin Değerlendirilmesi

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ABSTRACT

Objective: *Acute coronary syndromes are a group of life-threatening conditions frequently encountered in emergency departments. However, the clinical and demographic characteristics of these syndromes according to their subtypes have not been thoroughly investigated. This study examined possible differences in the clinical and demographic characteristics of ACS subtypes.*

Material and Method: *The study included 252 consecutive patients presenting with ACS (NSTE-ACS and STEMI). Study data were obtained using a pre-prepared online case report form. The data were statistically evaluated in terms of clinical and demographic characteristics according to ACS type.*

Results: *A total of 252 ACS patients (177 men and 75 women with a mean age of 63.2 ± 12.2 years) were included in the study. The prevalence of hypertension, hyperlipidaemia, diabetes and active smoking was 47.2%, 33.3%, 33.7% and 41.3%, respectively. At the time of admission, 40.5% of cases were diagnosed as STEMI and 59.5% as NSTE-ACS. The most common method of admission was by private vehicle (57.1%), while 31% were admitted by ambulance. Forty-five point two per cent of patients had a family history of coronary artery disease, and 23.8 per cent had undergone a cardiology clinic check-up in the past three months. A history of coronary artery bypass grafting (10.7%), stenting (34.1%) and pacemaker implantation (3.2%) was identified. Angiography was performed on 225 patients prior to discharge. Stenting was planned for 76.2% of patients, coronary artery bypass grafting (CABG) for 3.2%, and medical treatment for 11.5%. In the NSTE-ACS group, the rates of two- to three-vessel disease and CABG/medical treatment were significantly higher than in the STEMI group ($p < 0.001$). Male gender predominated in both groups.*

Conclusion: *Our study found that there were some differences in clinical characteristics between STEMI and NSTEMI cases, and our results were consistent with those reported in the literature.*

Keywords: *Acute Coronary Syndrome, Myocardial Infarction, Coronary Angiography.*

ÖZET

Amaç: *Akut koroner sendromlar acil servislerde sıklıkla karşılaşılan ve yaşamı tehdit eden bir sendrom grubudur. Akut koroner sendromların klinik ve demografik özellikleri, tiplerine göre ayrıntılı olarak incelenmemiştir. Bu çalışmada, ACS tipleri arasındaki olası klinik ve demografik farklılıkları inceledik.*

Yöntem ve Gereç: *Çalışmamıza ACS (NSTE-ACS ve STEMI) ile başvuran 252 ardışık hasta dahil edildi. Çalışma verileri, çevrimiçi olarak uygulanan önceden hazırlanmış bir vaka rapor formu kullanılarak elde edildi. Veriler, ACS tipine göre klinik ve demografik özellikler açısından istatistiksel olarak değerlendirildi.*

Bulgular: *Çalışmaya toplam 252 AKS hastası (177 erkek, 75 kadın; ort. yaş 63,2±12,2 yıl) dahil edildi. Hastaların %47,2'sinde hipertansiyon, %33,3'ünde hiperlipidemi, %33,7'sinde diyabet ve %41,3'ünde aktif sigara kullanımı mevcuttu. Başvuru anında olguların %40,5'i STEMI, %59,5'i NSTE-AKS tanısı almıştı. En sık başvuru yöntemi özel araç (%57,1) iken, %31'i ambulansla gelmişti. %45,2 oranında ailevi KAH öyküsü, %23,8 oranında ise son 3 ayda kardiyoloji polikliniği kontrolü mevcuttu. Önceden KABG (%10,7), stent (%34,1) ve kalp pili (%3,2) öyküleri saptandı. Taburculuk öncesi 225 hastaya anjiyografi uygulanmış olup, %76,2'sine stent, %3,2'sine KABG, %11,5'ine medikal tedavi planlandı. NSTE-AKS grubunda 2-3 damar hastalığı ve KABG/medikal tedavi oranları STEMI grubuna göre anlamlı olarak daha yüksekti ($p<0,001$). Her iki grupta da erkek cinsiyet baskındı.*

Sonuç: *Çalışmamızda STEMI ve NSTEMI vakaları klinik özellikler açısından aralarında bazı farklılıkların olduğu ve çalışmamızın sonuçlarının literatür ile uyumlu sonuçlar elde edilmiştir.*

Anahtar Kelimeler: *Akut Koroner Sendrom, Miyokard İnfarktüsü, Koroner Anjiyografi.*

INTRODUCTION

Coronary artery disease (CAD) is one of the leading causes of death and illness worldwide. Delays in diagnosis and in reaching hospital significantly increase mortality rates. Survivors of myocardial infarction (MI) are at high risk of recurrent infarction and have annual mortality rates at least five to six times higher than individuals without coronary artery disease (1, 2).

Acute coronary syndromes (ACS) are characterised by thrombosis and/or microembolism, which can result in either partial or complete blockage of the coronary artery. This is usually caused by an unstable atherosclerotic plaque rupturing. This leads to reduced blood flow to the myocardium, ultimately resulting in myocardial ischaemia (3). ACS is diagnosed and

classified based on the patient's clinical history and symptoms, electrocardiogram (ECG) findings, and cardiac troponin (cTn) levels. ACS encompasses three main conditions within the clinical spectrum: unstable angina (UA), non-ST-segment elevation myocardial infarction (NSTEMI), and ST-segment elevation myocardial infarction (STEMI) (4).Unstable angina is characterised by a temporary decrease in myocardial blood flow without a significant increase in circulating troponin levels. By contrast, myocardial infarction is diagnosed when evidence of more severe or longer-lasting myocardial ischaemia is present, and elevated levels of myocardial necrosis biomarkers (particularly troponin) are found in affected patients (5).In cases of NSTEMI, partial coronary artery occlusion leading to subendocardial ischaemia is commonly observed. In STEMI patients, however, complete coronary artery occlusion leads to transmural myocardial ischaemia and infarction (6).

The pathophysiological process of ACS is dynamic, with patients potentially transitioning rapidly from one clinical state to another during presentation, evaluation, or treatment (7). STEMI and NSTEMI are more serious forms of ACS. They typically result in more severe haemodynamic disturbances and necessitate urgent invasive intervention (8).

The clinical presentation of ACS is influenced by various factors, including demographic and clinical factors such as age, gender, and comorbidities (e.g. hypertension, diabetes, and dyslipidaemia). The type and timing of presentation also directly influence patient management (9). Therefore, comparing the clinical and demographic characteristics of ACS subtypes is important for risk assessment, management decisions, and understanding the burden on the healthcare system. The clinical and demographic characteristics of ACS subtypes have not previously been examined in detail. In this study, we investigated possible differences in the clinical and demographic characteristics of ACS subtypes (Table 1), (2).

MATERIALS AND METHODS

This study included 252 consecutive patients diagnosed with ACS who presented to the emergency department of a tertiary care centre in Turkey between January 2023 and December 2024. Permission for the study was obtained from the Ankara Bilkent City Hospital Medical Research Scientific and Ethical Evaluation Board (permission date: 24/07/2024, file number: 2-4-336). Diagnosis was made according to the guidelines of the European Society of Cardiology (ESC) and the American Heart Association (AHA). Patients were divided into two groups: STEMI (n = 102) and NSTE-ACS (NSTEMI and UA; n = 150). The following data were retrospectively analysed: demographic data; medical history; mode of presentation (e.g. ambulance or private vehicle); laboratory values (e.g. troponin, C-reactive protein, creatinine and lipid profile); echocardiography findings (e.g. ejection fraction); and treatment methods applied in hospital (e.g. coronary angiography, percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG).

Statistical analyses were conducted using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation (SD) or as median with interquartile range (IQR), as appropriate, whereas categorical variables were summarized as frequencies and percentages. Between-group comparisons were performed using the Student's t-test or Mann–Whitney U test for continuous variables, and the chi-square test for categorical variables. A two-tailed p value of <0.05 was considered statistically significant.

Table 1: Evidence-Based General Differences Between STEMI and NSTEMI.

Feature	STEMI	NSTEMI
Pathophysiology	Complete coronary artery occlusion (acute thrombotic event)	Partial / subtotal occlusion or microembolization
Myocardial Damage	Transmural myocardial necrosis	Subendocardial ischemia/necrosis
ECG Findings	ST-segment elevation in contiguous leads, reciprocal changes	ST-segment depression, T-wave inversion, or non-specific changes
Troponin Release	Higher peak troponin values; rapid rise	Elevated but typically lower peak compared to STEMI
Clinical Presentation	Sudden onset, severe chest pain; more intense symptoms	Often gradual onset, atypical presentation more common (elderly, diabetics)
Hemodynamic Status	Higher rates of hypotension, cardiogenic shock, arrhythmias	Generally more hemodynamically stable
Patient Profile	Often younger, strong association with active smoking	Typically older, with more comorbidities (HT, DM)
Coronary Angiography Pattern	More commonly single-vessel culprit lesion	Higher likelihood of multivessel disease
Urgency of Treatment	Immediate reperfusion required (primary PCI or fibrinolysis)	Early invasive strategy recommended (within 24–72 h depending on risk)
Prognosis	Higher early mortality due to large infarct size	Higher long-term mortality due to comorbidities and diffuse CAD
CABG Need	Less frequent because culprit is often single vessel	CABG more common due to multivessel/complex CAD
Revascularization Strategy	Primary PCI is standard of care	PCI guided by risk stratification (GRACE, TIMI)

CAD: *Coronary Artery Disease;* ***PCI:*** *Percutaneous Coronary Intervention;* ***CABG:*** *Coronary Artery Bypass Grafting;* ***HT:*** *Hypertension;* ***DM:*** *Diabetes Mellitus;* ***CKD:*** *Chronic Kidney Disease.*

RESULTS

A total of 252 patients, including 177 (70.2%) men and 75 (29.8%) women, were included in the study, and their mean age was determined to be 63.2 ± 12.2 years. Of the cases, 47.2% were hypertensive, 33.3% were hyperlipidemic, 33.7% were diabetic, and 41.3% were smokers. 40.5% of the patients presented with STEMI, while 59.5% presented with NSTEMI-ACS. When the routes of admission were examined, 31% of patients were admitted by ambulance, 57.1% by private vehicle, 3.2% by public transportation, and 7.5% were diagnosed during outpatient clinic visits. 45.2% had a family history of coronary artery disease, and 23.8% had visited a cardiology outpatient clinic within the last 3 months. When cardiac history was examined, 10.7% had a history of CABG, 34.1% had a history of stenting, and 3.2% had a history of pacemaker implantation.

Coronary angiography was performed on 225 patients prior to discharge; stenting was planned for 76.2% of them, CABG for 3.2%, and medical treatment for 11.5%. Patients with NSTE-ACS had a higher rate of 2 or 3 vessel disease compared to patients with STEMI (25.3% vs. 19.6%; p<0.001). Male gender was predominant in both ACS groups [NSTE-ACS (69.3%), STEMI (71.6%)]. The proportions of patients who could not undergo angiography (14.7% vs. 1%), who were recommended medical treatment after angiography (16.7% vs. 3.9%), or who were recommended CABG surgery (4.7% vs. 1%) were significantly higher in the NSTE-ACS group than in the STEMI group (p<0.001). The baseline clinical characteristics of patients according to ACS subtypes are presented in Table-2.

DISCUSSION

The present study provides a comparative evaluation of the clinical and demographic characteristics of patients presenting with STEMI and non-ST-segment elevation acute coronary syndrome (NSTE-ACS). Our findings highlight distinct clinical patterns between these subgroups, underscoring the importance of subtype-specific management in contemporary ACS care.Consistent with previous multicenter registry data, NSTE-ACS patients in our cohort were older and had a higher prevalence of comorbidities such as hypertension, diabetes mellitus, and dyslipidaemia (10–12). These comorbidities likely contribute to a more complex clinical presentation and a higher burden of multivessel coronary artery disease, which was also observed in our study population. In contrast, STEMI patients were younger and more frequently active smokers, reflecting a more aggressive and early-onset form of atherosclerosis. This observation is consistent with recent reports suggesting that smoking remains a predominant modifiable risk factor in younger STEMI populations (13).

The lower left ventricular ejection fraction observed in STEMI patients aligns with the well-established pathophysiology of transmural myocardial necrosis, which results from complete coronary occlusion (14). On the other hand, the relatively preserved systolic function and higher blood pressure levels among NSTE-ACS patients may indicate a more gradual ischemic process and the presence of collateral circulation. Moreover, the higher proportion of CABG recommendations and longer hospitalizations in the NSTE-ACS group reinforce the concept that these patients often have more extensive and complex coronary disease, as demonstrated in prior studies (15,16).

Beyond these clinical differences, our study also reflects the importance of presentation patterns and healthcare-seeking behaviors. STEMI patients more frequently presented via ambulance, highlighting the role of emergency medical systems in reducing total ischemic time—a critical determinant of prognosis. NSTE-ACS patients, however, were more likely to present by private vehicle or during outpatient visits, suggesting the need for greater public awareness of atypical or subtle ischemic symptoms that may delay diagnosis.

Taken together, these findings emphasize that while both ACS subtypes share a common atherosclerotic basis, their clinical manifestations, management strategies, and outcomes differ substantially. Early recognition of these subtype-specific characteristics may improve triage, risk stratification, and the allocation of interventional resources, ultimately contributing to better patient outcomes.

This study has several limitations. Its single-center and retrospective design may limit the generalizability of the results. Additionally, long-term follow-up data, including post-discharge outcomes, were not available. Nonetheless, the relatively large sample size and comprehensive analysis of real-world data strengthen the validity and clinical relevance of our findings.

Table 2 : Clinical and demographic features according to ACS type.

	NSTE-ACS(n=150)	STEMI (n=102)	p değeri
Age	64.1±11.7	61.8±12.8	0.116
Systolic BP	137.2±22.8	125.9±21.5	<0.011
Diastolic BP	80.1±13.7	75.3±15.4	0.008
Pulse (bpm)	80.9±14.4	78.8±14.7	0.241
BMI (kg/m2)	27.5±3.9	26.9±4.0	0.190
Years of smoking	15.9±20.1	16.2±19.4	0.765
LDL-C (mg/dL)	126.3±44.3	123.9±38.4	0.676
Ejection Fraction (%)	49.7±11.6	44.8±11.9	<0.001
Hospitalization duration (days)	3.7±1.9	4.1±2.5	0.295

BP: *Blood Pressure,* ***bpm:*** *Beats per minute,* ***BMI:*** *Body Mass Index,* ***LDL-C:*** *Low-Density Lipoprotein Cholesterol,* ***ACS:*** *Acute Coronary Syndrome* ***NSTE-ACS:*** *Non-ST-Segment Elevation Acute Coronary Syndrome;* ***STEMI:*** *ST-Segment Elevation Myocardial Infarction.*
p < 0.05 was considered statistically significant.

Conflict of Interest: No conflict of interest was declared by the authors.
Ethics: Permission for the study was obtained from the Ankara Bilkent City Hospital Medical Research Scientific and Ethical Evaluation Board (Permission date: 24/07/2024, File number: 2-4-336).
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