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The Relationship Between Recognition of Signs and Symptoms of NSTE-ACS and the Success of Initial Management in Indonesia: A Literature Review

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ABSTRACT

Background: Non-communicable diseases (NCDs) have become a global health concern, with cardiovascular diseases being a leading cause of mortality, particularly in developing countries like Indonesia. According to the World Health Organization (WHO), 40 million people worldwide suffer from NCDs, and cardiovascular diseases accounted for 21.1% of global deaths in 2017. In Indonesia, 1.5% of the population across all age groups suffers from cardiovascular diseases (Riskesdas, 2018). Acute Coronary Syndrome (ACS), encompassing ST-Elevation Myocardial Infarction (STEMI), Non-ST-Elevation Myocardial Infarction (NSTEMI), and Unstable Angina Pectoris (UAP), is the primary contributor to cardiovascular mortality. Studies indicate that NSTEMI and UAP are more prevalent than STEMI, with smoking identified as a dominant risk factor. This underscores the need for targeted strategies in recognizing and managing ACS to improve patient outcomes. Given the significant variability in clinical presentations and the critical need for early intervention, this literature review aims to synthesize current evidence on the relationship between symptom recognition and the success of initial management. Understanding these dynamics is essential to improve diagnostic accuracy, enhance treatment strategies, and ultimately reduce the burden of NSTE-ACS on healthcare systems. ***Objective:*** To explore the relationship between the recognition of signs and symptoms of Non-ST-Elevation Acute Coronary Syndrome (NSTE-ACS) and the effectiveness of initial management strategies, as evidenced by existing literature. ***Result:*** This literature review highlights the importance of early recognition of symptoms and timely management in improving outcomes for patients with Non-ST-Segment Elevation Acute Coronary Syndrome (NSTE-ACS). Prompt diagnosis, particularly in identifying high-risk patients, allows for the effective use of invasive interventions such as coronary angiography and PCI. These strategies have been shown to reduce recurrent infarction, and rehospitalization, and improve overall clinical outcomes. The findings emphasize the need for enhanced diagnostic protocols and continued training for healthcare professionals to improve the management of NSTE-ACS, ultimately reducing morbidity and mortality associated with the condition.

Keywords: Non-ST-Elevation Acute Coronary Syndrome; NSTE-ACS; symptom recognition; initial management; cardiovascular diseases; acute coronary syndrome.

INTRODUCTION

Over the years, non-communicable diseases (NCDs) have become a significant concern for all countries (1). According to WHO, 40 million people worldwide suffer from NCDs, with cardiovascular disease being one of the leading causes. NCDs are most prevalent in developing countries, including Indonesia (2). Data from the American Heart Association (AHA) reported 17.8 million cases of cardiovascular diseases globally in 2017. These diseases accounted for 21.1% of all deaths, showing an increase from 2007 to 2017 (3). Based on the 2018 Riskesdas data, 1.5% of Indonesia's population across all age groups suffers from cardiovascular diseases (4).

Acute Coronary Syndrome (ACS) is the leading contributor to cardiovascular diseases (5). A survey conducted by Riskesdas in 2018 revealed that ACS accounted for 12.9% of total deaths in Indonesia (4). A sudden reduction in coronary blood flow characterizes ACS, which includes ST-Elevation Myocardial Infarction (STEMI), Non-ST-Elevation Myocardial Infarction (NSTEMI), and Unstable Angina Pectoris (UAP).

A 2014 study conducted at RSUP by Prof. Dr. R. D. Kandou Manado reported 126 ACS cases, with the prevalence of NSTEMI being higher than STEMI, comprising 35 NSTEMI cases and 19 STEMI cases. However, the study also showed that Unstable Angina Pectoris had the highest prevalence, with approximately 72 cases (6). Another study in Aceh involving 274 samples concluded that the dominant type of ACS was NSTEMI/UAP, with 166 cases compared to 107 cases of STEMI, and found that smoking was the dominant risk factor (7). These studies suggest that NSTEMI and UAP have a higher prevalence than STEMI.

Despite advancements in treatment, the success of initial management in ACS cases, particularly NSTE-ACS, remains closely tied to the timely and accurate recognition of its symptoms. Misdiagnosis or delays in identifying key clinical features can result in suboptimal outcomes. This highlights the need for a comprehensive review of the relationship between symptom recognition and the effectiveness of initial management strategies. Such insights could guide improvements in diagnostic protocols and intervention approaches, ultimately enhancing patient care and reducing the burden of ACS on healthcare systems.

DEFINITION

Non-ST-Segment Elevation Acute Coronary Syndrome (NSTE-ACS) comprises Non-ST Elevation Myocardial Infarction (NSTEMI) and Unstable Angina Pectoris (UAP). NSTE-ACS is considered a condition with variable prognosis and management, depending on its underlying causes. The definition of Non-ST-Elevation Acute Coronary Syndrome (NSTE-ACS) refers to a collection of symptoms arising from impaired perfusion (blood flow) to the myocardium due to partial or total obstruction of the coronary arteries but without ST-segment elevation on the electrocardiogram (ECG). This condition can be classified into two main groups: Non-ST Elevation Myocardial Infarction (NSTEMI) and Unstable Angina Pectoris (UAP). In NSTE-ACS, coronary obstruction typically does not result in total myocardial necrosis (tissue death) as seen in ST-Elevation Myocardial Infarction (STEMI), but it can still lead to ischemia and serious hemodynamic instability (8).

SIGN AND SYMPTOMS

The primary symptom initiating diagnostic and therapeutic measures in patients with suspected Acute Coronary Syndrome (ACS) is chest pain, specifically prolonged chest pain (lasting over 20 minutes) at rest. Non-ST-Segment Elevation Acute Coronary Syndrome (NSTE-ACS) refers to patients with acute chest pain but without persistent ST-segment elevation on electrocardiogram (ECG). ECG changes may include transient ST-segment elevation, persistent or transient ST-segment depression, T-wave inversion, flattened T waves, pseudo-normalization of T waves, or a normal ECG, which occurs in approximately 30% of cases (8; 9).

The clinical spectrum of NSTE-ACS ranges from asymptomatic presentations to individuals with ongoing ischemia, electrical or hemodynamic instability, or cardiac arrest. The pathological correlation at the myocardial level includes cardiomyocyte necrosis [NSTE-myocardial infarction (NSTEMI)] or, less commonly, myocardial ischemia without cell loss [Unstable Angina Pectoris (UAP)]. A small proportion of patients may experience ongoing myocardial ischemia characterized by one or more of the following: recurrent or persistent chest pain, significant ST-segment depression on a 12-lead ECG, heart failure, and hemodynamic or electrical instability.

Due to the critical condition of the myocardium and the risk of malignant ventricular arrhythmias, coronary angiography is promptly performed, followed by revascularization if necessary (9).

The presentation of NSTEMI or Unstable Angina can include persistent or transient ST-segment depression, T-wave inversion, flattened T waves, pseudo-normalized T waves, or no ECG changes. The distinction between NSTEMI and Unstable Angina lies in laboratory findings. An elevated troponin level confirms a diagnosis of NSTEMI, while normal troponin levels indicate Unstable Angina (10).

RISK FACTOR AND COMPLICATIONS

A study conducted at RS Husada Utama Surabaya in 2018–2019 included 116 patients diagnosed with coronary artery disease (CAD), encompassing Unstable Angina Pectoris (UAP), Non-ST Elevation Myocardial Infarction (NSTEMI), and ST-Elevation Myocardial Infarction (STEMI). The characteristics of cardiovascular risk factors in acute coronary syndrome (ACS) patients admitted to the hospital showed that among non-modifiable risk factors, the majority of patients were in the 56–65 age group (35.3%), with most being male (56.0%). The average age of male patients was 58.2 years, while female patients had an average age of 66.6 years. For modifiable risk factors, ACS cases were predominantly associated with hypertension (91.4%), diabetes mellitus (77.6%), dyslipidemia (18.1%), smoking (25.0%), and overweight/obesity (23.3%) (11).

NSTEMI can lead to various complications, including acute pulmonary edema, cardiac arrest, and even death (12). Meanwhile, according to research by Goyal and Zeltser, critical complications of Unstable Angina include myocardial infarction, stroke, and death (13).

MANAGEMENT

It is recommended that patients with high-risk NSTE-ACS receive an immediate invasive approach, including emergency angiography and PCI (Percutaneous Coronary Intervention) if necessary. Patients with high-risk NSTE-ACS should be evaluated for early invasive approaches (i.e., within 24 hours) and should undergo inpatient invasive methods. The strategy may be adjusted depending on the clinical suspicion for patients who do not meet the criteria for very high or high risk (typically patients with clinical suspicion of NSTE-ACS and non-elevated troponin, or patients with elevated troponin who do not meet the criteria for myocardial infarction). Inpatient invasive techniques are recommended for individuals with a high suspicion index for urinary anomalies. On the other hand, a selective invasive approach is recommended for individuals with a low suspicion index (14).

Meanwhile, PCI combined with antithrombotic therapy stabilizes the lesion causing the attack, thereby reducing the risk of recurrent infarction (heart attack) related to the lesion.

Coronary Artery Bypass Grafting (CABG) provides protection against complications such as blockage or narrowing of blood vessels (though it may not entirely prevent embolism in distal parts) arising from the causative lesion, as well as the progression of disease in blood vessel segments near the bypass junction. Compared to a selective invasive strategy, routine invasive strategies in NSTE-ACS have been shown to improve clinical outcomes and reduce episodes of recurrent acute coronary syndrome, rehospitalizations, and the need for revascularization (9).

CONCLUSIONS

In conclusion, Non-ST-Segment Elevation Acute Coronary Syndrome (NSTE-ACS), which encompasses NSTEMI and Unstable Angina Pectoris, is a significant contributor to the global burden of cardiovascular diseases. The early recognition of its symptoms, especially chest pain, and the timely management of patients are crucial in improving outcomes. As seen in the studies reviewed, prompt diagnosis and the appropriate use of interventions such as coronary angiography and PCI significantly reduce the risk of complications like recurrent infarction and rehospitalization. Identifying high-risk patients early allows for the implementation of invasive strategies, which have been shown to improve clinical outcomes. Therefore, enhancing diagnostic protocols and ensuring that healthcare professionals are trained to recognize the signs of NSTE-ACS effectively will be critical in reducing the morbidity and mortality associated with this condition. Future research should continue to focus on refining diagnostic approaches and treatment strategies to further optimize patient care in the management of NSTE-ACS.

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