

Predictor Parameters of Acute Coronary Syndrome In Emergency Departments: Systematic Review

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ABSTRACT

Introduction

Nurses play an important role in detecting patients at risk of acute coronary syndrome (ACS) to facilitating their diagnosis and treatment. This literature review aims to know the parameters that can predict acute coronary syndrome (ACS) patients in the Emergency Departments (EDs).

Methods

Databases in the systematic review were PudMed, Sciencedirect, and Researchgate. The inclusion criteria included the patients in the EDs diagnosed with ACS. Data search, filtering and processing were carried out using a PRISMA flow chart while assessment of the quality of research was implemented by using the JBI.

Results

The obtained results were seven research articles. The research showed that predicted parameters ACS consisted of a sequence of comprehensive examination even though the major examination was ECG assessment of symptoms such as chest pain and other typical complaints that became their particular concern.

Conclusion

Finally, this systematic review showed that parameters that can predict ACS consist of a sequence of comprehensive examination besides main supporting examination is ECG assessment of symptoms such as chest pain and other typical complaints which become a particular concern. The researcher recommends a systematic review to be carried out on the same number of samples by specifying one common parameter as well as by taking into account the gender, age, culture and race of respondents that have not much difference.

Keywords

Predictor Parameters; Acute Coronary Syndrome; Emergency Departments

BACKGROUND

In developing countries the main issue that is associated with diseases of the heart and blood vessels and become the main cause of death each year. According to the WHO (2017) deaths from diseases of the heart and blood vessels is estimated at as much as 17.7 million deaths in 2015 and occurs before the age of 70 years by as much as 17 million. The occurrence of premature death caused by cardiovascular disease range of 82% in low-income countries and 37% occur in low-

income countries. In Indonesia the blood vessel and heart disease are on the rise and will give you a load of pain, disability and socioeconomic burden for the families of sufferers, community, and country. In Indonesia the year 2013 prevalence heart disease diagnosis is based on coroner's physician is 0.5% and 1.5% is based on symptoms. Meanwhile, the prevalence of heart failure disease in Indonesia year 2013 based on the doctor's diagnosis of 0.13% (1)

Acute Coronary Syndrome (ACS) is a disease of the heart. Myocardial ischemic State describes the ACS that include unstable angina (UA), non-ST elevated myocardial infarction (NSTEMI) and ST-elevated myocardial infarction (STEMI). Diagnosis and classification of ACS are based on a thorough review towards clinical examination results, including electrocardiogram (ECG) and biochemical markers of myocardial necrosis. Clinical signs and symptoms of ischemia include various combinations of upper extremities, chest pain, discomfort or mandibular epigastrik, dyspnea, diaphoresis, nausea, fatigue, or syncope. The pain and discomfort associated with ACS can occur when moving or at rest and often spread rather than localized, pain radiating to the left arm, right shoulder, or both arms are more likely associated with MI, diaphoresis, palpitations, heart attack, or by clinical presentation without symptoms (2). Increased survival and the aging of the world population, ACS is becoming increasingly common. However, it is not just elderly patients who suffer from this disease. Young patients often present with episodes of unstable angina and acute myocardial infarction. Lifestyle changes, eating habits, and stress related happening lately seems to have influence and make it appear earlier.

Clinical prediction guide is designed to be used to help doctors diagnose ACS determination decisions. Identification of the risk of occurrence of ACS is very necessary carefully, this can help to provide an assessment of whether the patient is at risk the safe for ACS repatriated or moved. If this is not a concern, as a result, many patients with the risk of occurrence of ACS can undergo prolonged observation or repeated outpatient examination, and generates the possibility of improper checks and fees significant for health care. Determination of decision based off direct complaints and combine the variables from the history, physical examination and laboratory tests. At a time when evaluating patients with chest pain in the setting of the ED, doctors rely on information available from the history and physical examination, ECG and cardiac biomarkers. Nurses play an important role in detecting at-risk patients exposed to ACS, facilitating their diagnosis and treatment as well as provide education which can improve the patient's condition. Based on this literature review background want to know the parameters that may predict ACS in patients in the Emergency department.

METHODS

A systematic review was compiled by searching and analyzing the eligible research from writing systematic review. Searching, filtering, and data processing done using flow charts and Prism research quality assessment using JBI (Figure 1). The data are based on a systematic review of this is pubmed, scientdirect, researchgate. The title and abstract of the article are taken from the

database of observed to determine the populations examined, the results, and the design of the study. Systematic Review consists of several research methods, namely; prospective cohort study, a cross-sectional and observational hospital-based study, controlled clinical trial promotion, cohort study retrospectively. A list of references from each article that is considered eligible for inclusion in the systematic review. This process continues until there are no new articles identified.

Determination of inclusion criteria will be reviewed developed by using the acronym PICO. Population: patients/Patient in the emergency room intalasi terdiagnosa acute coronary syndrome through physical examination, laboratory examination, anemia, intervention: studies on acute coronary syndrome manifestations, comparison Intervention: -, learning outcomes: the manifestation of acute coronary syndrome. The research that included only published in the language of the United Kingdom. Restrictions on date of publication is performed starting from the year 2003 up to the year 2017. The main population of the specified, all patients at ED.

RESULTS

On this review found seven systematic research that can be used and are qualified. The total sample in the sistemtis this review is 15,472. Results are presented in table 1

DISCUSSION

On this review found seven systematic research that can be used and are qualified. The total sample in the sistemtis this review is 15,472. Research conducted in the year 2014 explained that doctors at ED using a symptom assessment tool as the most important and primary in determining the level of suspicion of ACS. ECG is the primary determination in the determination of diagnose ACS, while levels of troponin T level are only a small role to assess the possibility of terjadinya ACS. Assessment of symptoms is also more important than the ECG and troponin T to know the suspicions against the ACS. In patients with ST elevation on the ECG, 71% are thought to have a clear ACS, compared with only 6% of those with typical symptoms on ACS and 10% of them with positive troponin T. The quality of chest pain, the duration and the severity is a predictor of suboptimal ACS. Even so, doctors at ED using the symptoms as the most important factor to determine the possibility of ACS. The study recommends that the need for further research concerning the prediction of ACS based on symptoms that can help to improve decision-making on patients at ED (3).

Previous research in 2003 showed clinical symptoms were used to predict the ACS is indigestion or pain fuel type (3.0, $p \frac{1}{4}$ 0.034), pain that radiates to the left (2.4, $p \frac{1}{4}$ 0.013) or right (5.7, $p < 0.001$), vomiting (arm 3.5, $p \frac{1}{4}$ 0.007), and a history of smoking before (5.1, $p < 0.001$) or current (3.7, $p < 0.001$)(4). Other research conducted in 2012 showed that the symptoms most often occur on the overall sample was chest pain, occurs at 408 (72%) of respondents, such research shows

comparison of symptoms among patients with non-ACS and ACS in a complaint of shortness of breath and dizziness/fainting is more likely to occur on non-ACS group. While chest pain and arm pain is more likely to occur on the Group of ACS (5). In the study stated that the arm pain does seem to help in diagnosing the ACS. This shows that the arm pain should be asked specifically because the diagnostic significance in most patients the ACS.

Ekelund et al, suggests that there is a variation of sirkarkadian that occurs in patients with chest pain who come to the ED and diagnosis of ACS (6). done Pour et al. research founding risk factors associated with the symptoms of atypical and typical of young and elderly patients, showed that older patients have a statistically significant difference in the typical symptoms like pain chest pain, arm pain, jaw/neck and dyspnea as compared to younger patients. Older patients have no significant difference on atypical symptoms than younger patients. Although based on the above research chest pain is a common symptom found in ACS, but complaints of chest pain can also be found in patients with non-ACS with the proven preasetasi high enough occurrence that is 65%. Therefore the assessment of chest pain right into typical/atypical is very important. The low specificity of the initial assessment of the patient labeling without causing ACS became at ED (7)

ACS prediction considerations can be determined through sex, and age and risk factors. Research in 2006 shows that men are more likely than patients showed symptoms of chest pain, left arm pain or diaphoresis. Nausea is more common in women, a complaint of shortness of breath occurs in men and women (8). According to Rosenfeld, et al (2015) are the most common symptoms in women and men is the discomfort of the chest, chest pain, and pressure on the chest. The results showed patients with ACS more likely showed the symptoms on the chest and respiratory complaints in patients younger women tend to show the symptoms of heav (9). Pour et al (2015) disclosing differences based on age that the diagnosis of ACS in older patients is difficult because the natural and pathological changes. Chronic diseases and physiological from pathological picture of old age and may affect the presentation of symptoms of ACS. Older patients and younger with a history of risk factors such as obesity, hypertension and smoking have little opportunity to experience the typical symptoms. A history of coronary heart disease was discovered as a strong predictor of acute coronary syndrome in men and women. The ratio of the size of the pelvis in males and obesity in women is highly associated with acute coronary syndrome (10). Other risk factors are reinforced by research that has been said by Ceponiene et al, i.e. the prevalence of smoking, being overweight or obese, and dislipidaemia was significantly higher in younger patients. Hypertension is very common in all subgroups age. More than half of all patients aged 45 years have three or four risk factors of cardiovascular disease. Cigarette smoking, hypertension, diabetes, and dislipidaemia can significantly associated with ACS. (11)

The findings in the seven articles above have implications for the order of clinical practice, among others; the diagnosis of ACS in older patients is more difficult because of the occurrence of natural and pathological changes associated with the process of cutting down in the elderly. Identifying

the symptoms of ACS is very important for treatment and care that produce successful and immediate outcomes. Chronic diseases and age-specific physiological and pathological features can affect the presentation of symptoms of ACS in the elderly. Understanding the symptoms-related factors can help in early detection and more appropriate medical care in patients with acute coronary syndrome. Symptoms of ACS are influenced by risk factors, namely older and younger patients with a history of risk factors such as obesity, hypertension and smoking have little chance of experiencing typical symptoms. One of the important tasks of clinical care and care providers is getting accurate data related to patient history with heart complaints. Identifying the symptoms of ACS is important for successful and immediate treatment. Care must be taken in examining the history of patients suspected of having ischemic heart problems in the emergency department. The importance of health education, public health messages, and patient education focusing on chest pain. Practitioners can use the findings in this article as a basis for assessing the full spectrum of patients who experience symptoms of ACS.

Limitations

Quality of the research methodology and the different amount of research is too significant though it meets the criteria of inclusion has a limitations. Literature used in the systematic review is there are still articles that can increase the risk of occurrence of bias. Although only 7 studies that meet the criteria for inclusion, but in doing the literature search conducted by not limiting the same characteristics.

CONCLUSIONS

Parameters that can predict Acute Coronary Syndrome in patients in the ED consists of a series of comprehensive study, although the main support is the examination of ECG. The study of symptoms like chest pain complaints and other typical complaints being of particular concern. Consideration of age, gender, and risk factors such as hypertension, dispilidemia, hiperkolesterol, diabetes, obesity can be a parameter to predict the ACS. Researchers recommend that do a systematic review of a number of the same sample using the same parameter and gender, age, culture, and race of respondents who are not much different.

Declarations

Authors' contributions

In this article, each author has its own contiburion. Imelda Feneranda as main author and researcher.

Consent for publication

Not applicable

Availability of data and materials

The original data in this article will not be shared because author thinks its research privacy. If need more information, author can be contacted through the information about corresponding author above.

Competing interests

None of the authors have conflict of interest, relevant with thid study.

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Figures

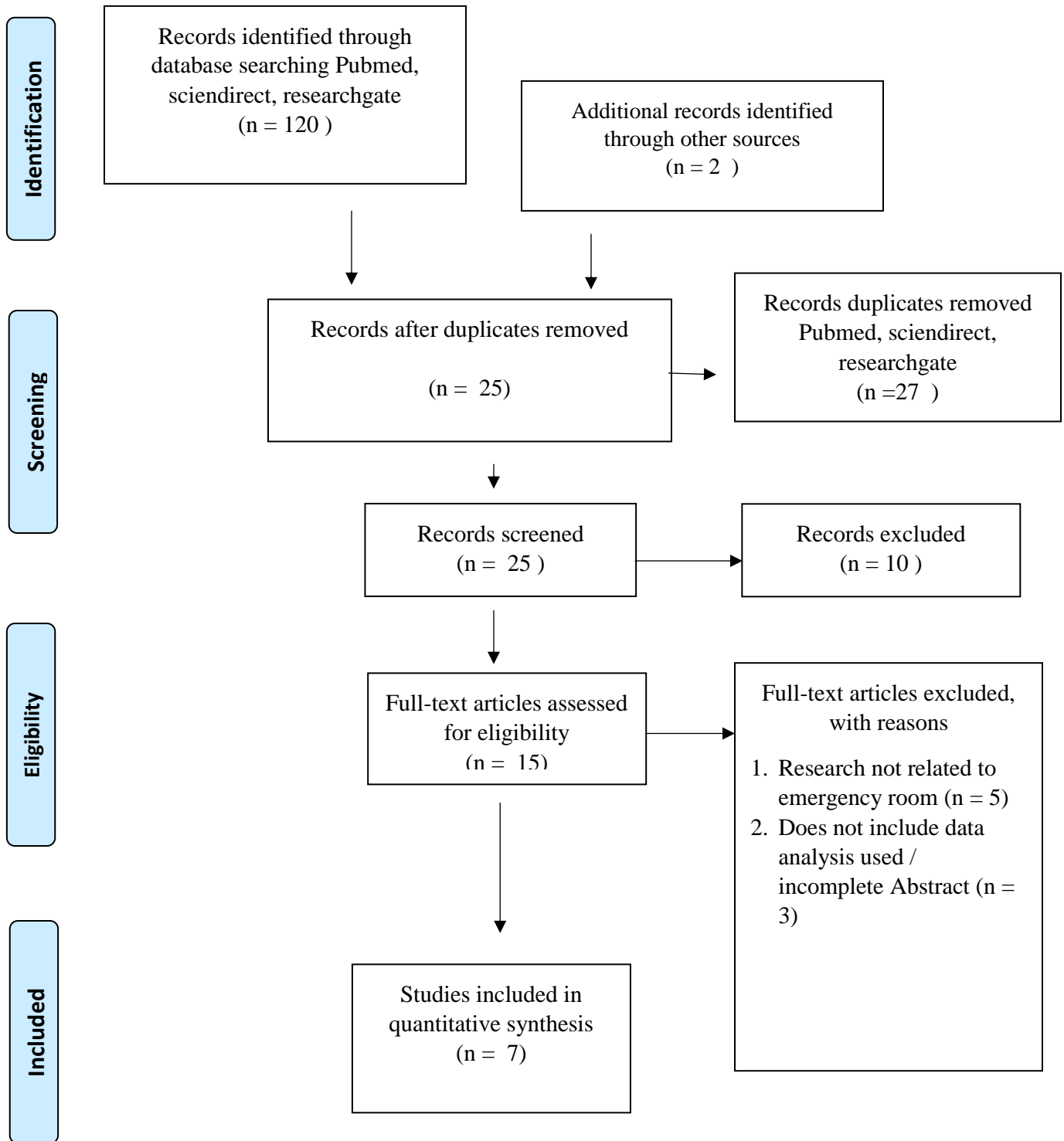


Figure 1. Flowchart Prisma

Table. 1 Combaining literature

Authors & year	Level (JBI)	Purpose	Method (design)	Sample	Data analysis	Major findings	Weakness	Strength
(Pour, Norouzzadeh, & Heidari, 2015)	3c	The purpose of this study was to determine the risk factors for ACS related to typical and atypical symptoms in older and younger patients	Prospective study	N= 446	SPSS version 16.0.	The results of this study indicate that typical symptoms such as chest pain, arm pain, jaw / neck pain and dyspnea are more predictive of older children with ACS than younger patients..	This study has several emerging risk factors such as lipoprotein abnormalities, hypercoagulation state, elevated levels of homocysteine, inflammatory markers and platelet glycoprotein not evaluated.	<ol style="list-style-type: none"> 1. This study presents complete inclusion criteria 2. This study presents the implications of the results of research on practice
(Pelter et al., 2012)	1c	To compare whether there are differences in symptoms in CAD patients	RCT	N=565	SPSS version 19, Chicago, IL	The most common symptoms in all samples were chest pain and arm pain more likely to occur in the ACS group.	This study does not collect information about current treatments	Large samples
(Ekelund, Akbarzadeh, Khoshnood,	3c	The purpose of this study was to explain whether	Retrospectively	N=8763	SPSS for Windows version 18	There is a clear but moderate circadian	This research was only conducted in 1 single hospital	Large samples

Björk, & Ohlsson, 2012)		the possibility of ACS among patients with emergency pain patients with chest pain varied during presentation.				variation in the likelihood of ACS among patients with chest pain.		
(Kamali, Söderholm, & Ekelund, 2014)	3c	to analyze the relative contributions of these three diagnostic modalities to ED physicians' evaluation of the possibility of an ACS in clinical practice.	Prospective study	N=1151	SPSS for Windows version 18	EKG and TnT do not contribute significantly to the assessment of ACS with positive TnT.	This study was conducted in one university ED hospital only, and the results did not need to be generalized to the population of doctors or other patients	Large samples
(Rosenfeld, et al , 2015)	3c	Identify individuals who come to ED for ACS suspected of having similar clinical symptoms and characteristics	Prospective	N=874	SPSS, version 19.0	Four classes of symptoms were identified: Symptom Weight (Class 1), Chest Symptoms and Breath Breath (Class 2), Chest Symptoms (Class 3), and Tiredness	Selection of bias data	Large sample
(Goodacre, Angelini, Arnold, Revill,	3c	To identify clinical features that independently	Prospective study of patients enrolled in a	N=972	SPSS for Windows	ACS was diagnosed in 77 (7.9%) of 972 patients	the initial complaint documentation is not included	Large sample

& Morris, 2003)	predict ACS in patients with acute and undifferentiated chest pain.	randomized controlled trial	recruited. The following characteristics are independent predictors of ACS: indigestion, pain that spreads to the arms, vomiting	Handling of bias data is not included				
(Parkash, Hameed, & Islam, 2010)	3c	To determine the sensitivity and specificity of the initial clinical assessment of the diagnosis of acute coronary syndrome (ACS) in patients who experience acute chest pain by a cardiologist who lives in the emergency room and assesses 30 days of ACS and non-ACS patients	Prospective cohort study	N=202	SPSS version 14	The sensitivity of the initial assessment of ACS by cardiology patients is 100%.	One of the main limitations of this study is that 19.9% of good patients did not have a heart examination.	Handling of bias data is not included

