Features of Acute Coronary Syndrome in Shariati Hospital, Isfahan, Iran in 2017-2018

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Abstract

Introduction: Cardiovascular diseases are the leading cause of death for people worldwide. The purpose of this study was to determine the diagnostic accuracy of acute coronary syndromes assessment by emergency medicine specialists with accordance to the latest guidelines in shariatic hospital of Isfahan.

Methods: This cross-sectional study involved all consecutive patients that assessed in Emergency Department because of cardiac symptoms throughout one year (April 2017 to January 2018). The raw data were analyzed with SPSS software version 23.

Results: One hundred and seventy-five patients were included in this study. Moreover, pain radiation in the left shoulder (p-value=0.02), cold sweating (p-value=0.01), obesity (p-value=0.00), and chronic diseases (p-value=0.45) recorded more in ACS patients compared to control group. Result showed that the using of nitrate drug leads to significant reduction in pain intensity in ACS patients and make significant higher change in their electrocardiogram (ECG) in comparison to control group. Finally, results indicated that using the troponin test in the final diagnosis, ACS patients showed higher troponin levels compared to control group. Finally, results indicated that using the troponin test in the final diagnosis, ACS patients showed higher troponin levels compared to control group.

Conclusion: Patients with a final diagnosis of ACS are older than the control group. Moreover, the retrosternal pain, chest pain, exertional dyspnea, radiating pain in left shoulder or hands and cold sweating were significantly more common in patients with ACS. Based on this, the quick actions relates to ACS should be implemented to improve the diagnostic accuracy in the future.

Introduction:

Emergency department is a unique environment and physician-staffed Emergency Medical Teams (PEMT) are one of the most important part of the local Emergency Medical Service (EMS)(1).Their role in responding to emergency calls and emergency pre-hospital care is obvious.

Cardiovascular diseases such as heart failure, stroke, acute coronary syndrome, leading causes of death worldwide (2), which need medical quick actions(3). Acute chest pain is

an important and frequently occurring symptom in patients with medical emergencies, which is occur in more than 10% of all emergency medical admissions (4-9). Mortality rate from coronary heart disease in developed countries is about 80%, while in developing countries is about 68%. The commencement of this disease is usually seven to ten years earlier in men compared to the women. Common symptoms of coronary artery disease in the acute phase is the main reason that patients refer to emergency medical centers (10). They include: pain or discomfort in the chest or on shoulder, arm, back, neck or jaw spread and, sometimes heartburn symptoms may feel. Symptoms often start with exercise or emotional stress for a few minutes, however the rest lead to recover them. In these diseases, respiratory lesions also may occur and sometimes there may be no symptoms. In some cases the first symptom is heart attack (11). Moreover, some of these symptoms with other diseases such as gastroesophageal reflux, gastroesophageal, and gastrointestinal, cardiovascular disease can make the wrong diagnosis for doctors. The percentage of the diagnosis made by emergency physicians during consultations is not denied or confirmed by cardiologist. Due to the fact that at the time of initial treatment for these patients has been done and where the misdiagnosis of the disease in some cases, for example misdiagnosis of the disease

in someone with dissection of the artery, can be giving anticoagulants to patients with serious risks, Including life-threatening bleeding. The importance of correct diagnosis of the disease in acute attack of disease in emergency room is necessary. The purpose of this study was to determine the Diagnostic accuracy of Acute Coronary Syndromes assessment by Emergency Medicine Specialists with accordance to the latest guidelines in Shariati Hospital of Isfahan.

Patients and methods:

This study was a cross-sectional study conducted at the Emergency Department of Dr. Ali Shariati Hospital in Isfahan from April 2017 to January 2018. This study was performed on 175 patients presenting with cardiac symptoms (chest pain or umbilical to lower jaw pain that is exacerbated by activity and stress).

In this study, all patients were admitted to the emergency department with initial diagnosis of acute coronary syndromes by emergency doctors. Then, the diagnosis of acute coronary syndromes was confirmed by cardiologist. Finally, all patients received consultations and therapeutic options from cardiologist. Patients diagnosed with one of the following conditions by cardiologist: 1- Acute coronary syndromes (including unstable angina, myocardial infarction or ST-segment elevation, and myocardial infarction without ST-segment

elevation) 2- Not having acute coronary syndromes (chest pain or otherwise).

All patients followed for evaluation in this research until discharge. The researcher completed the checklist at the time of hospitalization, which contained demographic data, clinical and Para-clinical information associated with acute coronary syndrome. Moreover, the checklist was designed according to the review of several studies, the latest guidelines on the diagnosis of acute coronary syndromes, clinical experience, and cardiologist's opinions. Then, comparison and statistical analysis were performed between two groups of patients with and without definitive diagnosis of acute coronary syndromes. The diagnostic evaluation of acute coronary syndrome by a cardiologist was based on electrocardiographic changes, cardiac enzymes with at least one type of heart disease symptoms. In current research, patients were excluded from the analysis when they did not complete the checklist or in cases of defective in the patient's health information occurred.

All statistical analyses were performed using SPSS software version 23 and variables were analyzed using the Student t-test and chi-square test. In this study, a P-value of 0.05 or less was considered statistically significant.

Ethical considerations

The study was based on the declaration of Helsinki. Patients were enrolled with their consent and any compulsion to participate in the study was not applied. In addition, patients in every moment of this study could freely be excluded and their output had no effect in their treatment. At all stages of the study, the information was confidential.

Results:

The study comprised 175 patients 78 (44.6%) female and 97 (55.4%) male with the Mean±SD age of 16.2±61.2 ranged from 22-95 years old. Among all of them 128 patients (73.1%) were diagnosed with acute coronary disease and 47 patients (26.9%) were with non-cardiac chest pain. Based on the results, we have not seen statistical significance between sex with acute coronary syndrome (ACS); P<0.164. With acute coronary syndrome (ACS) statistical significance was not seen between sex and gender P<0.164. In addition, results showed that there is a statistical significance in the relationship between age and having ACS. In other words, the mean age of patients with ACS showed to be higher compared to patients with no ACS. Significant findings were observed in the retrosternal pain and exceptional dyspnea with ACS (p=-164). It can be show that patients who have retrosternal pain and exertional dyspnea may have ACS in final diagnosis.

This study also indicated that in the final diagnosis, pain radiation in the left shoulder (p-value=0.02), cold sweating (p-value=0.01), obesity (p-value=0.00), and chronic diseases (p-value=0.45) occurs more in patients with ACS compared to patients without ACS. In our study, we also demonstrated that the use of nitrate as a drug significantly decreased pain intensity in patients with ACS to a higher degree compared to patients with non-cardiac pain (p-value=0.035). Moreover, the results indicated that a change in ECG in patients with ACS is higher than patients with non-cardiac pain (p-value=0.05).

Finally, we show that using the troponin test in the final diagnosis, patients with ACS showed higher troponin levels compared to patients with non-cardiac pain (p-value=0.005). Moreover, using troponin after 6 hours remained the same level (p-value=0.005).

Discussion:

Cardiovascular diseases such as acute coronary syndrome (ACS), heart failure, and stroke are the leading causes of years of life lost worldwide (2). Among patients with ACS, multimorbidity can increase the rate of in-hospital complications and the length of stay (12).

In this study, we evaluated the diagnostic accuracy of medical evaluation of acute coronary syndrome in 2017-2018. We further reported the prevalence of unstable angina, and acute myocardial infarction with and without ST elevation over a year. Biranvand and colleagues (13) also showed that 81.2% of patients with early diagnosis of acute coronary syndromes were eventually diagnosed with the disease and the rest (19.8%) were without acute coronary syndrome.

In our study in the emergency department of Dr. Ali Shariati Hospital of Isfahan, we evaluated the Diagnostic accuracy of Acute Coronary Syndromes assessment by Emergency Medicine Specialists in 175 patients with primary acute coronary syndrome diagnosis. The results of the present study indicated that 73/1% patients with primary diagnosis of acute coronary syndromes were ultimately diagnosed with the disease and others (26/9%) were diagnosed without acute coronary syndromes. The discrepancy in the results of this study may be due to differences in diagnostic methods, equipment, and skilled human resources.

In addition, we found similar results between the two groups. The percentage of men in the group of patients with acute coronary syndromes slightly higher than patients without acute coronary syndromes (85/6% vs. 46/7%), however, it is not statistically significant. The results of this study showed that there was no significant difference between the two groups of patients with and without acute coronary syndrome. It was shown

that the number of patients with the age of 65 years and older were significantly higher in patients with acute coronary synd rome compared to patients without the acute coronary syndrome (46/1 vs. 19/1). Therefore, patients' (≥65 years) are at high risk for developing acute coronary syndrome. Ahmadi et al also showed that the prevalence of high blood pressure in patients with acute coronary syndrome 35/5%, respectively, which is consistent with our results (14). Biranvand and colleagues also showed that the prevalence of chronic diseases and history of the acute coronary syndrome are significantly higher in patients with acute coronary syndrome than in patients without it (13).

 Moreover, statistical analysis showed that the mean age of patients with acute coronary syndrome was significantly higher than the mean age of patients without acute coronary syndrome (8.64 years vs. 2.51 years). Other studies also showed that patients with a normal ECG on admission have low risk of acute coronary syndrome, which is consistent with our results (15, 16). The evidence presented here is consistent with the previous studies that reported among patients with acute coronary syndrome 53/2% ECG was abnormal (initial and serial ECG) (17).

This study showed that patients' (≥65 years) were significantly higher in patients without acute coronary syndrome (1.46 vs. 1.19) than in patients with acute coronary syndrome. Majidi

et al reported in patients with acute coronary syndrome: chest pain (97%), shortness of breath (73%), perspiration (67%) discomfort (59.5%) and nausea (53.5%) (18), which is consistent with our results that 81%, 50%, 51%, 57% and 9.35%, respectively.

In addition, the results showed that patients with acute coronary syndrome have significantly higher percentage of "obesity and sedentary lifestyle", "chronic diseases, hypertension and hypertension in the history of their lives.

Our results showed that the patients with acute coronary syndrome had significantly reduction in their severity of pain, after nitrate intake in the emergency department (38.3% vs. 21.3%). In other words, patients with an initial diagnosis of acute coronary syndrome may have acute coronary syndromes if they have pain relief after consuming nitrates in the emergency department. Henrikson CA et.al (19)showed that In patients with active coronary artery disease as the likely cause of their chest pain, 35% (49 of 141) had chest pain relief with nitroglycerin. In contrast, in patients without active coronary artery disease, 41% (113 of 275) had chest pain relief .Our study contradicts the results of this study.

The results of this study showed that only 62.5% of patients with acute coronary syndrome had abnormal ECG and abnormal serial ECG and

others had normal serial ECG. This result means that if decisions on this group of patients were made solely on the basis of his ECG, more than half of them would be mistaken. Therefore, the simultaneous use of other tools, including physical examination, laboratory tests, and repeated ECG, whether or not present, is a more rational approach to dealing with patients with cardiovascular risk factors, especially in the emergency department. Finally, our study show that About 30% of patients with non-cardiac chest pain go wrong in diagnosing acute coronary artery bypass grafting and treatment, providing more appropriate ambulance facilities for definitive diagnosis, admission and recommendation. However, patients with acute coronary syndrome should be accurately diagnosed and appropriately admitted, depending on the patient characteristics in each area and the available facilities. Since chest pain is a portion of complaint in patients who come to the emergency room (20) and its diagnosis is very important, there is a great deal of research nowadays on providing solutions that enable correct diagnosis and appropriate treatment. Of course, this should not lead to inaccurate hospitalization and ischemic heart disease, but it should not mistakenly lead to ischemic heart failure and discharge. It should first provide accurate statistics of the number of patients and then identify the factors that contribute to its correct diagnosis in emergency

care using strategies such as a chest pain clinic in the emergency room and faster cardiac tests such as exercise testing, incorrect or incomplete registration to prevent its registration. It was also shown that retrosternal pain, chest pain, ACS criteria, exertional dyspnea, radiation to the left shoulder or hands, and cold sweating were significantly higher in patients with acute coronary syndrome than in non-thoracic patients. Ahmadi et al (15) showed that prevalence of hypertension in patient with ACS was 35.2 % which is similar to our result. Obesity and hypertension and previous history of acute coronary syndromes were more common in patients with coronary syndrome than patients without chest pain. DeVon, H. A et al and Majahalme, S. K.et al have the same result with our finding (21, 22). Pain reduction after nitrate intake, changes in baseline, serum and troponin positive levels at baseline and after 6 hours were significantly more common in patients with acute coronary syndrome than in patients without chest pain. Also, Scheuermeyer FX et al (16) showed that Patients with normal troponin levels at baseline and two hours after the visit have a very low risk of acute coronary syndrome which is corresponded with the results of our study.

Conclusion:

It was shown that patients with a final diagnosis of acute coronary syndrome are older than the

control group; while the gender difference was not observed between the groups with and without the disease. It was also shown that the retrosternal pain, chest pain meets the criteria for ACS, exertional dyspnea, radiating pain in left shoulder or hands and cold sweating were significantly more common in patients with syndrome of acute coronary syndrome than people with non -cardiac chest pain

Finally, this study showed that changes in ECG, troponin, and some clinical symptoms and cardiovascular risk factors were more common in patients with a final diagnosis of acute coronary syndrome than in patients with non-cardiac chest pain.

Authors' Contributions:

All the listed authors were equally involved in preparation of manuscript. All authors have approved the final version of manuscript.

Conflict of Interest Disclosures:

There are no conflicts of interest in terms of the present manuscript.

Ethical approval/Consideration:

This study was registered at ethics committee of Islamic Azad University of Najafabad, Isfahan, Iran. A written informed consent was taken from patients for participating in this study. All the personal information remained anonymous.

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	With(+) or Without(-)	All emergency admissions with ACS	ACS(percentage)	Non-ACS(percentage)
Table 1: Baseline characteristics of all emergency admissions with ACP				
N		175	128(73.1%)	47(29.1%)
male		97 (55.4%)	75 (58.8%)	22(46.8%)
female		78(44.6%)	53(41.4%)	25(53.2%)
Mean age (years old)		16.2±61.2	64.8	51.2
retrosternal pain	+	92(52.6%)	80(62.5%)	12(25.5%)
	-	83(47.4%)	48(37.5%)	35(74.5%)
exceptional dyspnea	+	72(41.1%)	64(50%)	**8(17%)**
	-	103(58.9%)	64(50%)	39(83%)
pain radiation to left shoulder	+	67(38.3%)	58(45.3%)	9(19.1%)
	-	108(61.7%)	70(54.7%)	38(80.9%)
Cold sweating	+	80(45.7%)	66(51.6%)	14(29.8%)
	-	95(54.3%)	62(48.4%)	33(70.2%)
obesity	+	92(52.6%)	78(60.9%)	14(29.8%)
	-	83(47.4%)	50(39.1%)	33(70.2%)
Chronic disease	+	56(32%)	46(35.9%)	10(21.3%)
	-	119(68%)	82(64.1%)	37(78.7%)
The use of nitrate as a drug significantly decre ased pain intensity	+	59(33.7%)	49(38.3%)	10(21.3%)
	-	116(66.3%)	79(61.7%)	37(78.7%)
Change in ECG	+	41(23.4%)	36(28.1%)	5(10.6%)
	-	134(76.6%)	92(71.9%)	42(89.4%)

	With(+) or Without(-)	All emergency admissions with ACS	ACS(percentage)	Non-ACS(per-centage)
troponin levels test in admission	+	25(14.3%)	24(18.8%)	1(2.1%)
	-	150(85.7%)	104(81.3%)	46(97.9%)
troponin after 6 hours of admission	+	25(14.3%)	24(18.8%)	1(2.1%)
	-	150(85.7%)	104(81.3%)	46(97.9%)

Table 1: Baseline characteristics of all emergency admissions with ACP