Assessment of ACS Level in Patients with A typical Chest Pain Admitted to the Hospital in Tehran and Its Correlation with Various Risk Factors

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Cardiovascular diseases are currently the most common causes of death in most parts of the world and Iran. In most cases, heart attack and premature coronary artery disease have a direct correlation with the number and the severity of risk factors for atherosclerosis such as hypertension, diabetes, smoking, obesity, hyperlipidemia, and etc. Given the high prevalence of ACS (acute coronary syndrome), it is necessary to pay a great attention to patients with chest pain. Considering that ACS is a method for the differential diagnosis, the atypical chest pains are required to be of great interest. Since determining the amount of ACS in patients with atypical chest pain, in terms of age, gender, HTN, family history of ischemic heart disease (IHD) and smoking, play an important role in estimating the amount of influence as well as medical advices, prevention and treatment, this study is aimed to investigate the relationship between these factors and the amount of ACS. This study is a cross-sectional study in Besat Hospital. Patients with ECG changes or enzyme elevation and also with a finding in angiography, in favor of ischemia after admission to CCU, were considered as ACS. Personal information about the presence or the absence of risk factors was obtained through the forms designed for this purpose. The results obtained were analyzed with SPSS software and were interpreted using descriptive statistics and statistical tests. Companionship *chance* of the risk factors associated with ACS was analyzed using odds-Ratio statistical analysis. The results showed the relationship between the risk factors examined such as older age, hypertension, diabetes, hyperlipidemia, history of IHD, smoking and the family history of IHD with ACS.

Key words: Ischemic heart disease, Atypical chest pain,
Ischemic heart disease risk factors, Emergency medical services.

Cardiovascular diseases are currently the most common cause of death in most parts of the world and Iran and include 40% of all deaths[1-2]. 25% of people with this disease have been died by a sudden death or acute myocardial infarction with no previous symptoms[3]. A heart attack occurs when a permanent injury or death is occurred in an area of heart muscle due to an inadequate supply of oxygen. Most heart attacks are caused by a clot that blocks one of the coronary vessels. The clot is usually formed in a coronary artery which has been previously narrowed due to atherosclerosis changes. Sometimes, the atherosclerotic plaque inside the arterial wall cracks and results in the

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clot formation which is also called thrombus[4]. The clot in the coronary artery disrupts the blood flow and the oxygen supply to the heart muscle which causes the death of heart cells in that area. In most cases, heart attack and premature coronary artery disease have a direct correlation with the number and the severity of risk factors for atherosclerosis[5-6]. Positive family history is a risk factor for coronary artery disease (the coronary heart disease in first degree relative under the age of 55 years for men and 65 years for women). Metabolic risk factors such as low HDL, high TG, and LDL cholesterol are observed in a significant percentage of the studied population (in some cases two to three times)[7-8]. Other factors such as high blood pressure[9], diabetes[10], smoking[11], and obesity[12] have been proposed and proven as risk factors for the coronary artery disease[13]. Heart is a visceral organ that is located in the middle of chest and its pain is felt in the same area. But the pain can be felt in other areas due to common neurological dermatomes. So as we said, the presentation sites of angina pectoris is from lower jaw to the top of umbilicus and epigastric pain or back pain may also be interpreted as a cardiac atypical pain. However, it is possible that the pain in the chest not be angina[14-15]. Given the high prevalence of ACS, it is necessary to pay more attention to patients with chest pain. Certainly, the medical diagnosis is not difficult in the patients with typical chest pain, but the main problem is in patients with atypical chest pain which involves a differential diagnosis. Given the high prevalence of ACS (acute coronary syndrome), it is necessary to pay a great attention to patients with chest pain. Considering that ACS is a method for the differential diagnosis, the atypical chest pains are required to be of great interest. Since determining the amount of ACS in patients with atypical chest pain, in terms of age, gender, HTN, family history of ischemic heart disease (IHD) and smoking, play an important role in estimating the amount of influence as well as medical advices, prevention and treatment, this study is aimed to investigate the relationship between these factors and the amount of ACS.

METHODS

The Patients with atypical chest pain admitted to the Besat hospital in the first 6 months of 1391 were studied. Non-random sampling was conducted and forms were filled out for each patient with patient's information including risk factors such as Hypertension, diabetes, hyperlipidemia, history of ischemic heart disease, family history of ischemic heart disease, smoking, age and also para-clinical investigations such as examination (BS), cardiac enzymes (ECG) and patient's records. Among patients with atypical pain, the patients with ECG changes or enzyme elevation and also with a finding in angiography, in favor of ischemia after admission to CCU, were considered as ACS.

Inclusion and exclusion criteria

People who were admitted with chest pain were examined. The patients whose pain was atypical were studied and those who were typically were excluded.

Methods of data analysis

The data collected and the results were analyzed with SPSS software. Chi square (X2) and Fisher's exact tests were used to study the relationship between the risk factors and ACS. If the data in each cell be greater than 5, the chi-square (X2) was applied and if it be less than 5, the Fisher's exact test was applied. Companionship chance of the risk factors associated with ACS was analyzed using odds-Ratio statistical analysis.

Implementation constraints and the method to reduce it :

About the risk factors such as hyperlipidemia, given the fact that TG and CHO tests are not performed on patients who are under care in emergency, it was tried to solve the problem in terms of hyperlipidemia with taking a thorough history from patients based on anti-hyperlipidemic drugs and also, if possible, bringing the previous tests.

Ethical considerations

Ethical issues were considered during the examination, medical history and filling out the forms and the patients were assured that their information would be kept confidential.

RESULTS

In this study conducted among 150 patients with atypical chest pain, 91 patients were male and 59 patients were female of those 11 patients had ACS those 8 patients were males and 3 patients were females. There was no significant

relationship between gender and ACS based on statistical analysis (X2) Chi-Square or if the data be less than 5 in Fisher's exact test.

Considering that high blood pressure is a risk factor for ACS, according to the study, 24 patients admitted to the emergency with atypical pain had high blood pressure of those 6 patients had ACS and based on mentioned statistical analysis, there is a significant relationship between HTN and ACS (P<0.05) (table 1).

Table 1. The relationship between high blood pressure and ACS

Variables under study		ACS		Total	p-value
		Yes	No	people	
Blood pressure	Normal	5	121	124	0.002*
	High	6	18	24	
	Total people	11	139	150	

Comparison is based on statistical analysis X^2,
* Indicates a statistically significant correlation (P <0.05)

Table 2. Relationship between hyperlipidemia and ACS

Variables under study		ACS		Total	p-value
		Yes	No	people	
HLP	Normal	7	9	16	0.000*
	High	4	130	134	
	Total people	11	139	150	

Comparison is based on statistical analysis X^2,
* Indicates a statistically significant correlation (P <0.05)

Table 3. Relationship between smoke and ACS

Variables under study		ACS		Total	p-value
		Yes	No	people	
Smoke	Normal	9	10	19	0.000*
	High	2	129	131	
	Total people	11	139	150	

Comparison is based on statistical of Fisher's exact test
* Indicates a statistically significant correlation (P <0.05)

Table 4. Relationship between family history of IHD and ACS

Variables under study		ACS		Total	p-value
		Yes	No	people	
Family history of IHD	Normal	9	10	19	0.000*
	High	2	129	131	
	Total people	11	139	150	

Comparison is based on statistical of Fisher's exact test
* Indicates a statistically significant correlation (P <0.05)

Table 5. The relationship between older age and ACS

Variables under study		ACS		Total	p-value
		Yes	No	people	
50 years and older	Normal	8	52	60	0.000*
	High	3	87	90	
	Total people	11	139	150	

Comparison is based on statistical of Fisher's exact test
* Indicates a statistically significant correlation (P <0.05)

Diabetes is another risk factor for ACS, according to the study conducted, 16 patients had diabetes of those 8 patients had ACS. Based on the mentioned statistical analysis, there is a significant relationship between diabetes and ACS (P<0.05).

Hyperlipidemia is another risk factor for ACS, according to the study conducted 16 patients had HLP of those 7 patients had ACS. Based on the mentioned statistical analysis, there is a significant relationship between HLP and ACS (P<0.05) (Table 2).

Among the patients, 17 patients had a history of Ischemic Heart Disease of those 7 patients had ACS. Based on the statistical analysis, there is a significant relationship between the history of IHD and ACS (P<0.05).

Smoking is another risk factor for ACS, according to the study, 19 patients were smoker of those 9 patients had ACS. Based on the statistical analysis, there is a significant relationship between smoking and ACS (P<0.05) (Table 3).

Another risk factor is the family history
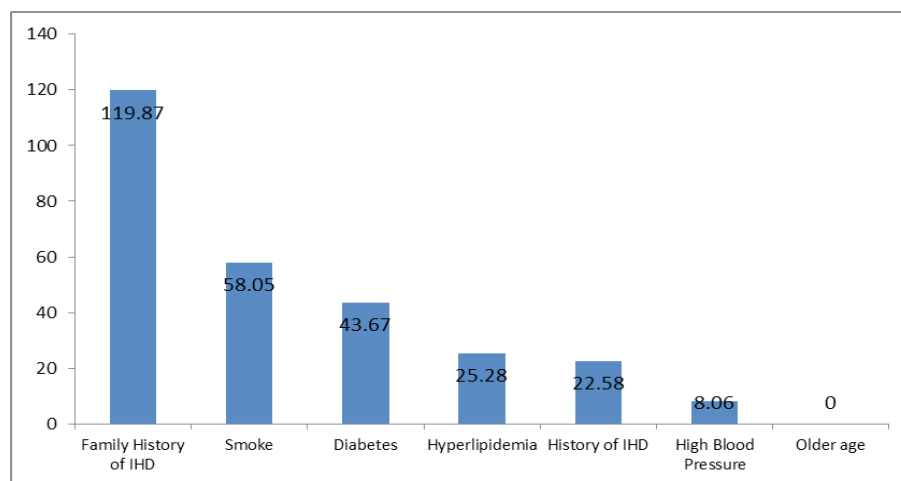
Fig. 1. Companionship *chance* of the risk factors associated with ACS through the Odds-Ratio

of ischemic heart diseases. According to the study, 19 patients had IHD history of those 9 patients had ACS and based on the statistical analysis, there is a significant relationship between the family history of IHD and ACS (P<0.05) (Table 4).

Age is another variable studied in patients. 60 patients were over 50 years of those 8 patients had ACS. Based on the statistical analysis, there is a significant relationship between the older age and ACS (P<0.05) (Table 5). After considering the companionship risk of various factors with ACS through ODD ratio, the greatest risk was related to the family history and the lowest was related to older age (Chart

DISCUSSION

In this study, 150 patients admitted to the emergency of Besat hospital with atypical chest pain were entered into the study and the questionnaires were filled out by the patients' information such as risk factors, paraclinical examinations and records.

In this study, among the 150 patients with atypical chest pain, 91 patients were male and 59 patients were female. In a study in 1385 to assess the epidemiology of acute coronary syndrome in Shahid Beheshti Hospital of Kermanshah 1466 patients were studied of which 1038 patients were male (70.9%) and 428 patients were females (29.1%) (17). The results show that the heart disease is more prevalent in men than women.

In this study conducted among 150 patients with atypical chest pain, 24 patients had high blood pressure of those 6 patients had ACS. Also, 16 people had diabetes of those 8 patients had ACS. According to the study conducted 16 patients had HLP of those 7 patients had ACS. In a study conducted in 1385, of 1466 patients hospitalized with ACS, 33% had hypertension, 14% hyperlipidemia and 12% diabetes[17]. In a study conducted in 1386 on the prevalence of coronary artery disease and the associated risk factors showed that 20.6% of ACS patients had hypertensive, 5.3% had diabetes, 39.9% ad high cholesterol, 58.6% had high triglycerides, 38% had high LDL, 32.6% had low HDL (10). The results show that the ACS in patients with hypertension, diabetes and hyperlipidemia is more prevalence and HTN, DM and HLP are the risk factors for coronary heart disease. In our study among 150 patients, 19 patients were smokers of those 9 patients had ACS. In a study conducted in 1385 on the assessment of risk factors and mortality in ACS patients, 45% of people hospitalized with heart disease were smoker. In a study conducted in 1386, 14.7% of ACS patients were smoker. These results show that the smoking is another risk factor for coronary heart disease. In our study among 150 patients, 19 patients had family history of ischemic heart disease of those 9 patients had ACS. In a study conducted in 1386 on the prevalence of coronary disease and the associated risk factors in first-degree relatives, 700 healthy individuals with no symptom of *the history of premature coronary heart disease* were examined in one of the first-degree relatives and among 700 people, 6.4% had electrocardiogram changes, 3% had Isckemic findings in Echo, 7.3% had positive exercise test and 2.1% had positive myocardial perfusion scan[10]. As a result, it is recommended to evaluate the risk factors in all first-degree relatives of patients with premature coronary artery disease and the history of IHD in the individual or family is considered a risk factor for ACS.

CONCLUSION

According to this study, the patients with atypical chest pain who are admitted in the emergency department and have the risk factors, especially more than 2 risk factors, must be under consideration and their serials must be investigated with EGG and enzyme. But the patients with no risk factor can be discharged from the emergency department after taking ECG, if the ECG be normal. On the other, if all the patients with atypical pain be under consideration in the emergency department, the management will face several problems, therefore, it is necessary to conduct a study to find a solution for dealing with these patients.

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