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Evaluation of Frequency of Mortality and Risk Factors in Patients with Acute Myocardial Infarction referring to Peymanieh Hospital, Jahrom, Iran During the Years 2013-2017

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Abstract

Introduction: Coronary artery disease is one of the most common and most dangerous causes of mortality. Given the effect of modifiable risk factors such as diabetes and hypertension in the outbreak of heart diseases, the development of cardiovascular diseases can be prevented by controlling risk factors and improving lifestyle. This study aims to evaluate the frequency of mortality and risk factors in patients with acute myocardial infarction. Methods: This cross-sectional descriptive study was conducted on 500 medical records of patients with myocardial infarction in Jahrom University of Medical Sciences hospitals. The demographic characteristics of the subjects (age, sex, marital status, etc.) and the final status of patients after a heart attack, the presence of various risk factors including hypertension, diabetes, hyperlipidemia, and the symptoms that for their reason the patients referred to the hospital were recorded in the data collection form. The data were analyzed using SPSS software. Results: At first, a sample of 500 people was considered, and according to exclusion criteria, 476 people were finally analyzed. Out of 476 patients, 66.8% were male and 33.2% were female. The mean age of the patients was 64 years. There was a significant association between sex and the rate of myocardial infarction (P-value <.05). There was no significant correlation between age and rate of myocardial infarction (P-value> .05). In this study, 39% of the patients had diabetes, 33% had hypertension and 12.5% had dyslipidemia. Moreover, 5.04% of males and 9.5% of females died after myocardial infarction. Conclusion: Myocardial infarction rate has dropped in recent years, but the prevalence of this disease is still increasing.

Key words: Risk Factors, Myocardial Infarction, Mortality.

Introduction

Cardiovascular diseases are the most important causes of mortality in the world. Nowadays, they account for about 35% of total mortalities all over the world and 40% of mortalities are in developed countries and 28% of the mortalities in poor countries (Roger, 2010). Ischemic heart disease is the most common cause of death and disability in the world, so that acute myocardial infarction is one of the most common diagnoses in patients hospitalized in industrialized countries (Go et al., 2013). The mortality rate of acute myocardial infarction is about 30% in the world (Hayashi et al., 2015), so that according to the WHO reports, approximately 17.9 million mortalities caused by cardiovascular diseases are recorded annually[1]. In Iran, 46% of all the mortalities are due to cardiovascular diseases that the most common of them is the heart attack (Sarrafzadegan and Mohammadifard, 2019). Heart failure is the outcome of many cardiovascular diseases, including acute myocardial infarction. The risk factors associated with heart failure due to acute myocardial infarction can be divided into two groups of modifiable risk factors and non-modifiable risk factors. Unmodifiable factors include high age, male sex and family history of early atherosclerosis, and modifiable risk factors include hypertension, dyslipidemia, diabetes, smoking, obesity, inadequate physical activity, and hyperinsulinism (Wang et al., 2018). Epidemiologic studies have shown that heart failure due to acute myocardial infarction causes a significant reduction in quality of life and imposes high costs on people and community so that heart failure caused by acute myocardial infarction is considered as a global epidemic, despite improvements in cardiovascular cardiology therapeutic methods (Roger, 2013; Roger et al., 2012). Therefore, monitoring mortality and the factors affecting it is essential in heart failure treatment programs. The heart failure epidemiology in developed countries is well explained and

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[1] https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death.

updated over time (Benjamin et al., 2017; Ziaeian and Fonarow, 2016). However, the epidemiology of heart failure caused by acute myocardial infarction in Iran, as one of the largest Middle Eastern countries in Southwest Asia and with different ethnicities, has not been investigated. This research aims to evaluate the epidemiology of heart failure caused by acute myocardial infarction and distribution of its risk factors among different age groups, under the influence of lifestyle and their surrounding conditions over time in Jahrom as one of Iran's cities.

Methodology

In this descriptive cross-sectional study, a census sampling was carried out on 500 medical records of patients with acute myocardial infarction in hospitals affiliated to Jahrom University of Medical Sciences since 2013-2017. These medical records were reviewed after approval by the research committee and ethics committee of Jahrom University of Medical Sciences and obtaining the allowance of relevant authorities. Patients who at least had 2 of the following indicators were included in the study:

1- Typical heart pain 2- Changes in ECG serials for the favor of diagnosis of acute myocardial infarction, including changes in ST, T segment and emergence of Q wave, and so on, 3- Increase in CPK and LDH heart enzymes in serial measurements.

Data including demographic characteristics of the subjects (age, sex, marital status, etc.) and the final status of heart attack, the existence of various risk factors including hypertension, diabetes, hyperlipidemia, the symptoms referred to the hospital, the type and location of acute myocardial infarction and ECG changes were recorded. According to WHO definition, people with hypertension above 140 mmHg or diastolic pressure above 90 were considered as people with hypertension. People who had fasting blood glucose above 126 were also considered as diabetic people. Dyslipidemia also refers to high levels of total cholesterol in fasting (greater than 200mg / dl) and high levels of triglyceride in fasting (greater than 200mg / dl). Data were analyzed using SPSS software.

Results

In this study, 500 people were first examined and finally the results of 476 of them were analyzed according to exclusion criteria. Out of 476 patients, 66.8% (n=318) were male and 33.2% (n=158) were female (Chart 1).

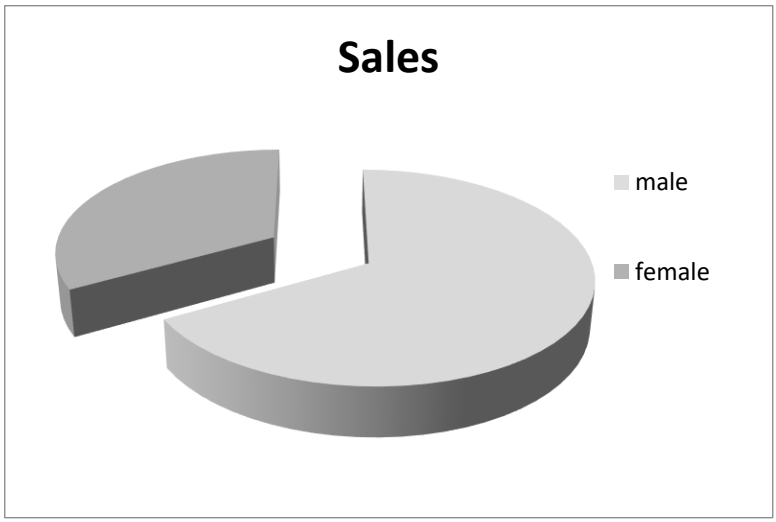

Chart 1: Sex distribution of myocardial infarction

A small percentage of people had age below 30 years. For this reason, in the age classification of the patients, they were classified into 5 classes from 30 to 85 years. in this study, 6.8% of the patients had an age between 30 and 43 years, 26.3% of them had an age between 43 and 57 years, 28.5% of them had an age between 58 and 71 years, 29.8% of them had an age between 72 and 85 years, and 3.5% of them had an age over 85 years.

There was a significant relationship between sex and the rate of myocardial infarction (P-value <.05). There was no significant relationship between age and rate of myocardial infarction (P-value> .05).

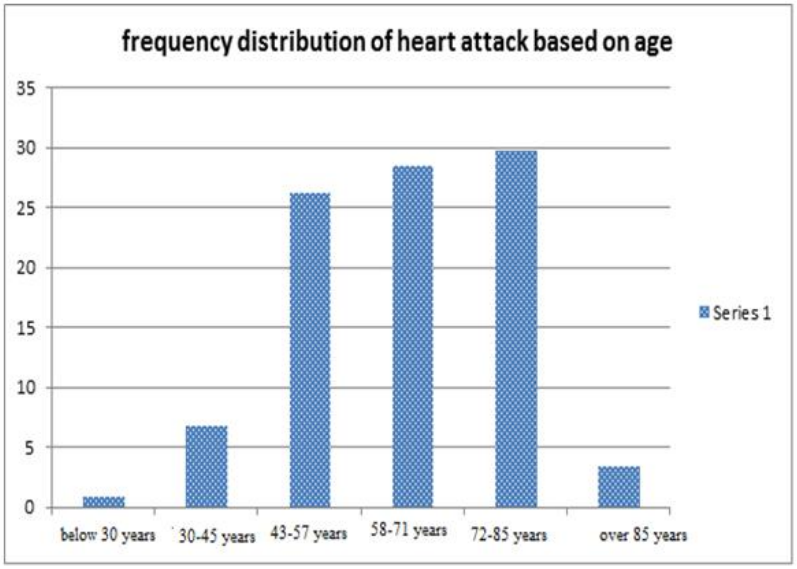

Chart 2- frequency distribution of heart attack based on age

The mean age of the patients was 64 years old. The lowest age was 29 years old (1 man) and the highest age was 100 years of old (one woman) (Chart 2).

In terms of the high risk factors for acute myocardial infarction, 39% of people had diabetes, 33% of them had hypertension and 12.5% of them had dyslipidemia (It should be noted that information on smoking and alcohol use as well as family history of heart disease of patients were not available (Chart 3).

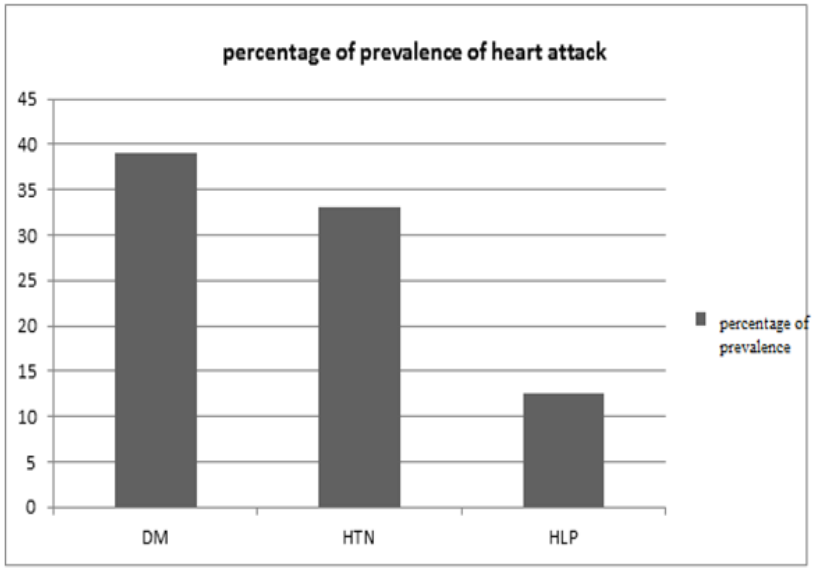

Chart 3- Percentage of the prevalence of risk factors for acute myocardial infarction

Other cases examined in this study included chest pain (87%), dyspnea (22.2%), cold sweating (22%), nausea and vomiting (16.4%), with epigastric pain (6.6%), reduced consciousness and also feeling fatigue (1.6%). They were not seen in any of the patients (Chart 4).

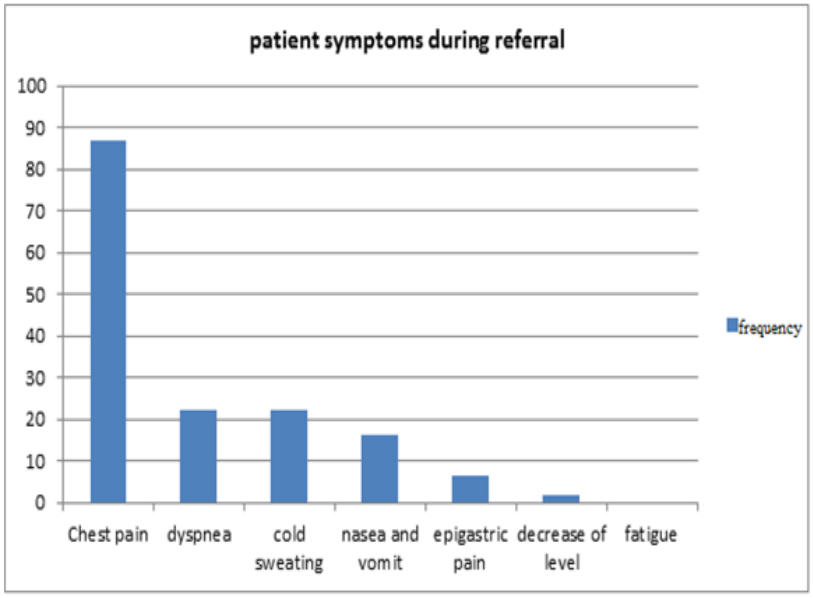

Chart 4- Frequency of symptoms during patients' referral

As chest pain is a common symptom when patients refer to hospital, the age distribution of chest pain was shown by chart (Chart 5).

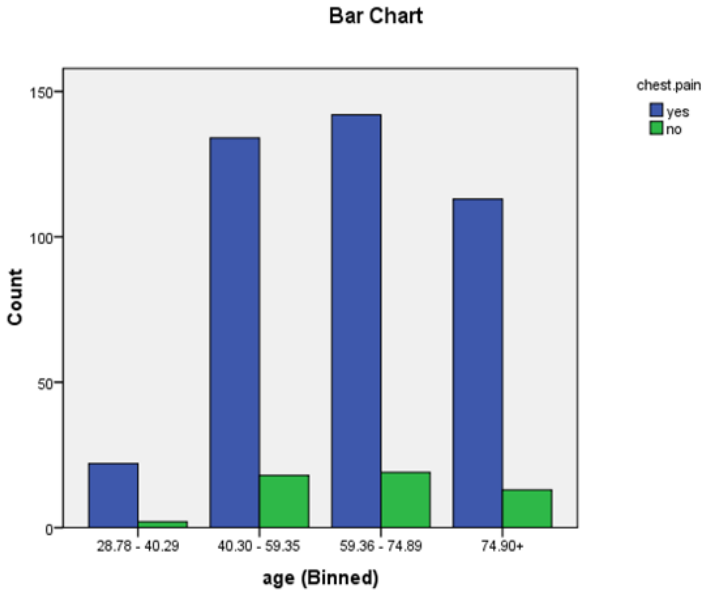

Chart 5 – age distribution of chest pain in patients

As stated before, diabetes was one of the most commonly reported risk factors for people with acute myocardial infarction. As shown in Chart 6, the prevalence of diabetes is higher in males than that in females, so that 29% of males and 32% of females had diabetes.

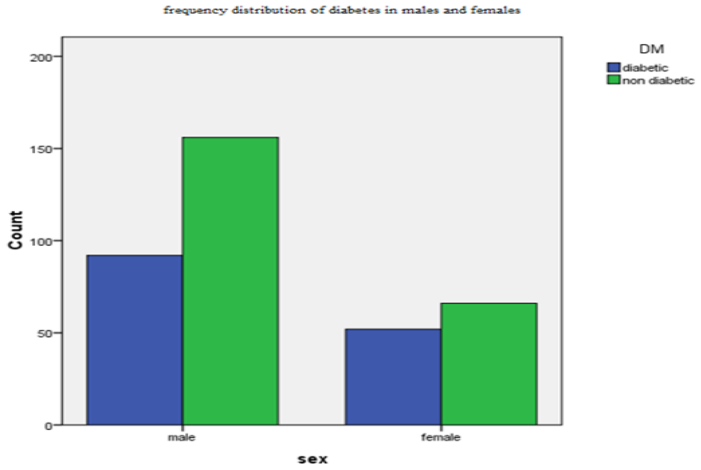

Chart 6- frequency distribution of diabetes in males and females

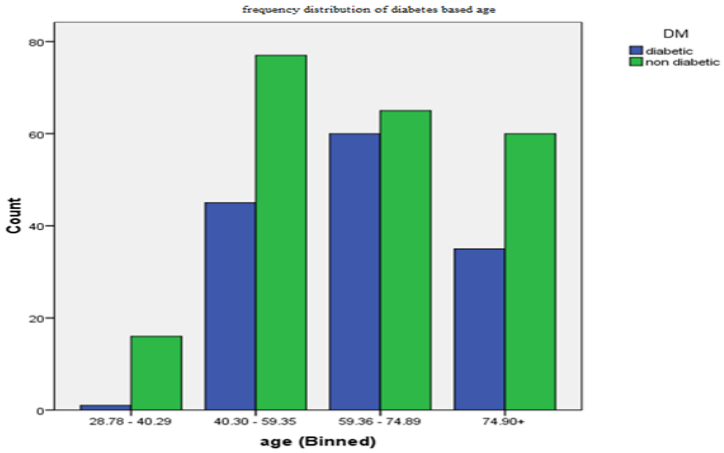

Chart 7- frequency distribution of diabetes based on age

Another important factor involved in heart disease is hypertension. The distribution of the frequency of hypertension based on sex and age is shown in Charts 7 and 8. Charts 9 and 10 also show the distribution of dyslipidemia based on age and sex.

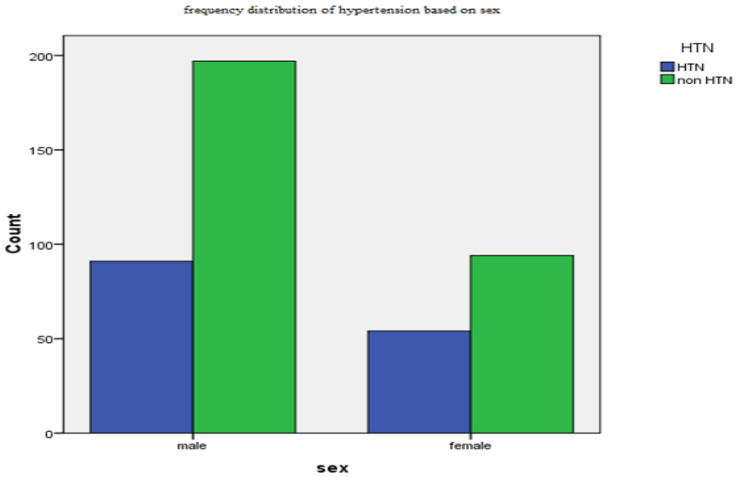

Chart 8: Distribution of hypotension based on sex

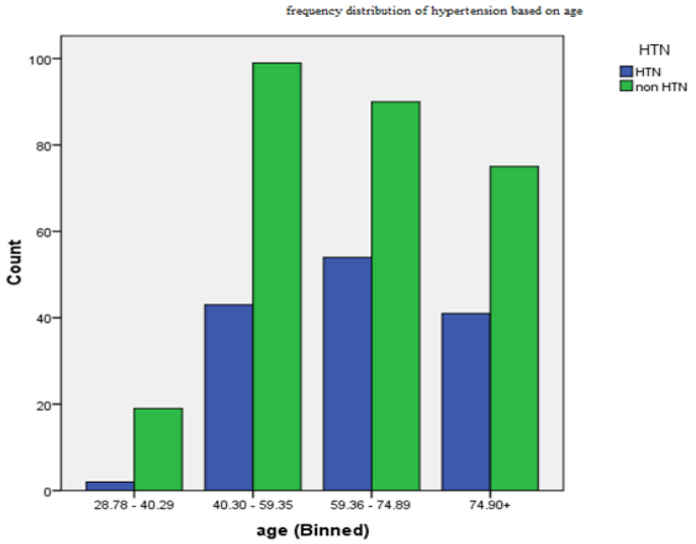

Chart 9: frequency distribution of hypertension based on age

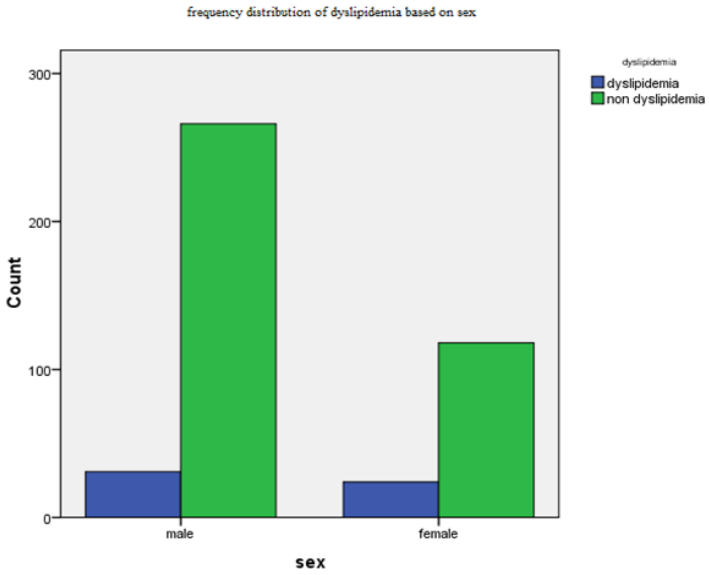

Chart 10: frequency distribution of dyslipidemia based on sex

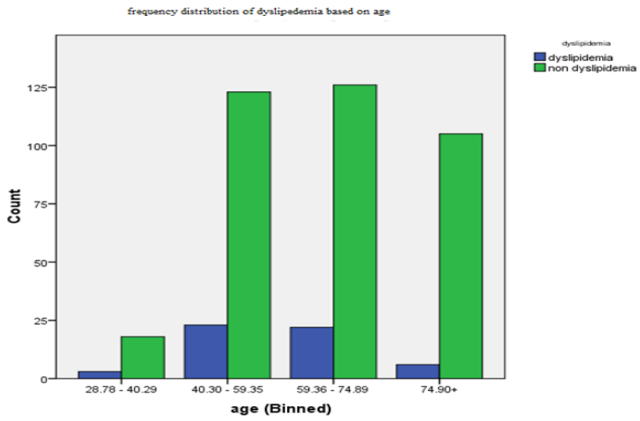

Chart 11- frequency distribution of dyslipidemia based on age

In the next step, the ECG of patients was evaluated and the frequency of ECG findings was as follows (Table 1):

Table 1- Frequency of pathologic findings in ECG

Percent	Feathers
38%	ST. Elevation
19.9%	ST. Depresion
33.7%	T. Invert
2.5%	T. tall
2.1%	RBBB
3.1%	LBBB
1.4%	A.F
0.4%	V.T
0.4%	V.F
0.2%	AV .Block

Finally, the rate of mortality in patients with acute myocardial infarction was examined. 6.6% of patients died at the end of study and 76.4% of the people were discharged from hospital. Moreover, 5.5% were transmitted to other hospitals for reasons such as the need for angiography and 3.7% left the hospital with consent and no further information is available on them.

Out of those who died, 52 percent were male and 48 percent were female. Out of those discharged, 70 percent were male and 30 percent were female. Out of those who were transferred to other hospitals, 48% were male and 52% were female. The mean age of those who died was 73.5 years. At the end of the study, 5.04% of males and 9.5% of females died (Chart 12).

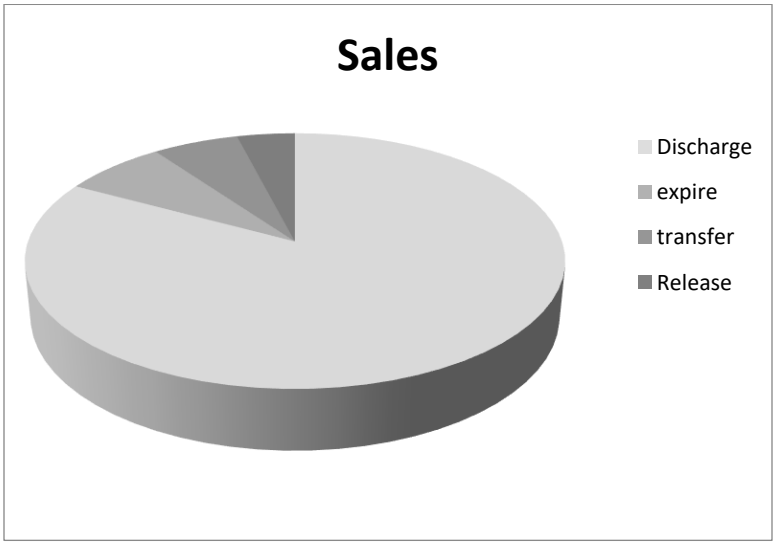

Chart 12- final result of patients with acute myocardial infarction

Conclusion

Nowadays, human community diseases are moving from infectious and contagious diseases to degenerative and non-degenerative diseases. In this regard, coronary artery diseases have great importance due to their prevalence and mortality at the community level. Since one of the goals of health systems is to delay the occurrence and mortality of diseases, if the health system can increase the mean age of the patients of these diseases over time, we conclude that the health system has been successful in achieving this goal. The aim of this study is to evaluate the epidemiology of acute myocardial infarction and the mortality caused by it and its risk factors. Based on the results of this study, 66.8% of patients with acute myocardial infarction diagnosis were male and 33.2% of them were female, indicating that the number of this disease was higher in males than that in females. The lower prevalence of this disease in females, compared to males, has been also reported in other studies (Chandrasekhar et al., 2018; Lichtman et al., 2018). In this study, the mean age of patients was 64 years. In other studies, the mean age of this disease has been reported 64-68 years (Sanchis-Gomar et al., 2016; Mozaffarian et al., 2016). According to the results of this study, the highest rate of myocardial infarction was between the ages of 43 and 85 years. It is

similar to the results of previous studies. As environmental and climatic factors are among the factors affecting myocardial infarction, we compared the results of this study with those of a similar study conducted during the years 2002 to 2005 in order to find a better solution to prevent and treat the heart diseases based on the possible changes seen (Pop et al., 2004; Yoshida et al., 2005). In terms of the high risk factors related acute myocardial infarction, 39% of the people had diabetes (29% of them were male and 32% of them were female). In the previous study, this figure was 22.8% in females and 14.92% in males. As seen, the percentage of people with diabetes and acute myocardial infarction has increased over recent years. In this study, 33% of all people had hypertension (28% of males and 33% of females had hypertension). This figure shows a decrease compared to the previous study, in which it was 27.62% in males and 56.14% in females with acute myocardial infarction. It seems that the rate of women affected by myocardial infarction has fallen. Dyslipidemia was also considered as one of the factors affecting a heart attack in this study. 12.5% of all people with acute myocardial infarction had dyslipidemia (9.7% of males and 15.1% of females).

The results of this study are similar to those of the previous study, which shows that the rate of dyslipidemia women afflicted with myocardial infarction is more than that of men. The most common symptom among the patients was chest pain, which is similar to the previous one. Other symptoms included shortness of breath and cold sweating and nausea and vomiting. About ECG findings, the most result was ST-segment elevation, which is similar to the results of the previous study. The mortality and outcomes of patients were among the cases examined in this study. A large number of patients were discharged from the hospital, which is in line with the results of previous studies (Pop et al., 2004; Yoshida et al., 2005). In terms of mortality rate, 5.04% of males and 9.5% of females died after heart attacks, which is in line with the result of previous study conducted in 2005, in which it was found that a higher percentage of females compared to males died after a heart attack (Vaccarino et al., 2009). However, by comparing these two results, we find that the rate of mortality rate after a heart attack had dropped dramatically in recent years, which could be due to the provision of better healthcare and a better and faster diagnostic process. However, it should be noted that women had more risk factors than men in this study, which may justify the higher rate of mortality in women in this study. Despite progresses and developments in all aspects of science, cardiovascular disease is still one of the most common causes of mortality in the world. In Iran, according to the Ministry of Health, these diseases account for 39% of the mortalities. According to the results of this study and previous studies, it can be concluded that identifying risk factors of heart attack can be effective in reducing the rate of mortality caused by heart attacks. As reported above, the rate of mortality caused by heart attacks has declined in recent years, but the prevalence of this disease is still increasing. It is recommended that measures in other cities and provinces of Iran develop culture and create healthy behaviors to reduce the risk factors of this disease.

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