

The comparison of clinical signs presentation in middle age men and women with myocardial infarction

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Original Article

Abstract

Introduction: Acute myocardial infarction (MI) indicates irreversible myocardial injury resulting in necrosis of a significant portion of myocardium. MI is associated with high mortality. The difference between the signs of MI in each gender is unclear. The aim of this study was to describe gender-associated differences in symptom presentation after acute MI.

Methods: This analytic-descriptive research was carried out on 102 patients (44 women and 58 men) with MI experience who referring in Shahid Mohamadi hospital and Abolfazl hospital, Hormozgan, Iran. Patients participating in the study were randomly selected. Individual information; the pain characteristics records, electrocardiogram and laboratory results, pain numerical rating scale, were collected.

Results: The results showed that chest pain was the most common initial symptom in both men and women (92%) This is while sweating in men (74%) and dyspnea in women (61.4) as the second reported sign. No gender-related differences in other symptoms such as vomiting, nausea, dizziness, palpitations, pallor, epigastric pain, chills and weakness were observed.

Conclusion: In this study in patients with MI, women had a worse-risk profile in comparison to men. No significant gender-related differences in symptoms were observed.

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Introduction:

Myocardial infarction is a process in which area of the myocardial cells are permanently destroyed (1). MI usually due to a rupture of atherosclerotic plaque and its subsequent obstruction by a thrombosis due to decreased blood supply to the heart muscle (2). Symptoms of MI include the pain,

and dyspnea, sweating, pallor, nausea and vomiting, weakness and dyspnea (common symptom of MI, especially in the elderly and diabetic patients) (3). At the time of MI catecholamine's leads to secretion of sweat glands as a result, cold sweat sits on the forehead, limbs and palms and the activity of the parasympathetic

nervous system is usually caused by the inferior and posterior MI and can lead to nausea and vomiting. Nausea and vomiting usually confused of food poisoning (4). In general, important to note that any person over 35 years who has chest pain (below the sternum bone), nausea and vomiting and cold sweats referred, MI considered as one of the main diagnoses unless the opposite is true (5). Although advances in diagnosis and treatment of myocardial infarction reduces mortality in recent decades in men but death incidence rate from heart disease among women than men since 1984, is rise (6). Acute myocardial infarction is three times more than car accidents (7). Each year, nearly 1.1 million people affected MI and a quarter of these people die as a result of MI. Half of those who die do not reach the hospital. Cardiovascular disease have a highest mortality rates in the world. And also will be the first cause of death in the world until 2020. Cardiovascular disease are the main cause of adult mortality (is about 46% of the total deaths) in Iran (8). More importantly, the age of the developing this illness has been worrying a decrease in recent years. So that a significant number of victim are young and middle-aged people (9). About 40 percent of patients with MI are under 65 and about 5% of them are less than 40 years. About 85 percent of people who die due to MI 65 or more years of age (10). This illness is clearly seen in males than females, but females also have considerable involvement. The prevalence of the disease in pre-menopausal women less than men however, in the period of menopause increases in women rapidly. So that it occurs in both sexes after age 60 is almost identical (11). Although MI incidence in men than women in middle age which as defined by the World Health Organization included from 45 years to 59 years. But the symptoms are the same in both sexes, is not. Some studies have shown that early signs and symptoms and response to treatment and medicine is different in men and women. This difference can lead to delay in the diagnosis of myocardial infarction. Some studies were mentioned major difference in symptoms and physiological effects of estrogen on the cardiovascular system that increase the risk of coronary disease in men compared to women before menopause (12). There is general agreement that there is no difference between clinical

symptoms of acute coronary syndrome. Some studies have found significant differences between men and women, while others have denied the existence of these differences, Limited and unreliable information about this difference (13).

Therefore, this study was performed to assess the comparison of clinical signs and symptoms presentation in middle age men and women with myocardial infarction in Hormozgan University of Medical Sciences hospitals.

Methods:

This study was a descriptive - analytical study to determine the difference between the symptoms of a heart attack in middle-aged men and women were admitted to hospitals affiliated to Hormozgan University of Medical Sciences in 2015. In this study, all patients were enrolled with acute myocardial infarction who were alert and able to communicate with inclusion criteria for the study and were hospitalized in the cardiac intensive care units of shahid Mohammadi hospitals and Abolfazl hospitals. In this study, by using statistical formulas and the 95% confidence level, the number of samples was 102 patient. Inclusion criteria for the study were: patients were to be aged 45-59 years, the doctor confirmed the diagnosis of myocardial infarction, the patient are not addicted to alcohol or specific drugs, be alert and able to speak, 1 to 7 days have passed since the onset of symptoms, the patient didn't have history of acute musculoskeletal at least a week before the first MI symptom's, didn't have digestive diseases such as gastro-esophageal reflux disease (GERD), and didn't have mental health problems such as alzheimer's disease, mental retardation. Impatience and fatigue patients at the time of answering the questionnaire, the reluctance of patients to continue answering the questions, and to begin pain and shortness of breath when answering were exclusion criteria. Inappropriate time and space conditions, noise and crowding when the questionnaire is completed, affects how they respond, by trying to select the appropriate time when the samples are mentally and physically balanced, this restriction is relative Controlled. The individual and cultural differences of the studied units are beyond the discretion of the researcher. The sampling method in this study was

simple random sampling. The data collection instrument was a questionnaire using the information in the patient records and patient self-completed questionnaire. For achieving goals of the research in this study, two questionnaires and a scale were used. The questionnaire consists of three parts, the first section includes questions related to demographic characteristics of the participants, the second part of the questionnaire includes questions about medical history and medication history, typical and atypical heart attack symptoms and the third part contains the medical records of patients (acute myocardial infarction according to changes in electrocardiogram and a positive laboratory results, get streptokinase). Patient tests were carried out in the laboratory section of the relevant hospital and were included in the patient records. For assessment of the quality of pain and the dissemination of pain was use McGill pain questionnaire that the most pain prestigious tools. Validity of the questionnaire has been measured by Wedel 1987 and the Ebrahimi nejad in 1997 and Watson 2001. VAS pain scale was used to measure the intensity of pain where score zero indicated no pain and score 10 indicating the most severe pain. The validity of this tool is measured by Manyvn and colleagues in 2007.

After gathering data, all questionnaires were coded and analyzed by using SPSS software. Descriptive statistics (Preparation of tables, absolute and relative distribution frequency, mean and standard deviation, etc.) were used to describe information and to analyze the statistical test, t-test for quantitative variables and chi-square test was used for qualitative variables. The significance level was considered of less than 0.05 for all tests.

Results:

From 102 patients with myocardial infarction were 58 males and 44 females. Most men (53.4%) had the between the ages of 45 -52 years and highest number of women (68.2%) in the age group 52-59 years. Jobs of highest percentage of women (86.6%) were housewives and the highest

percentage of men (27.6%) were employee. In terms of education, the highest percentage of the cases (39.7%) had high school diploma. The highest level of education of women (68.2%) were illiterate. 83.3 percent of women and 81 percent of men were married. In this study, the difference in symptoms of MI between women and men was investigated. The results showed that chest pain was the most common initial symptom in both men and women (92%). This is while sweating in men (74%) and dyspnea in women (61.4) as the second sign reported. No gender-related differences in other symptoms such as vomiting, nausea, dizziness, palpitations, pallor, epigastric pain, chills and weakness were observed (Figure 1). On the other hand in terms of the risk factors associated, Chi-square test showed significant difference between the genders of catching a high blood pressure ($P < 0.05$). According to research findings, there are significant differences between the genders in the history of high cholesterol, diabetes, angina, congestive heart failure and previous MI ($P < 0.05$). Based on statistical analysis, there was no significant difference between the genders in terms of the stress but women than for men (72.7%) were exposed to stress. In terms of the inheritance, according to research findings women than for men (52.3%) cited family history of heart attack but no significant differences between the genders in family history of heart attack.

In terms of the highest percentage of types of acute MI in men (32.8 percent) was anterior MI and the highest percentage of women (45.5 percent) was inferior. That between types of MI and gender were significant differences ($P < 0.05$). According to the research the highest percentage (69.6%) showed ST elevation with Q wave in the ECG. Results of Chi-square test showed significant difference between the symptoms appear in the ECG ($P < 0.05$), in table 1 difference between the symptoms appear in the ECG was noticed.

Table 1. Comparison of myocardial infarction with ECG interpretation in both sexes

Sex	Variable	Men		Women		Total		Test results
		Numaber	Peregnant	Numaber	Peregnant	Numaber	Peregnant	
MI Type	Anterior	19	32.8	15	34.1	34	33.3	P=0.035
	Inferior	14	24.1	20	45.5	34	33.3	
	Lateral	3	5.2	2	4.5	5	4.9	
	Extensive	10	17.2	5	11.4	15	14.7	
	Inferior RvMI	12	20.7	1	2.3	13	12.7	
	Other	0	0	1	2.3	1	1	
	ST elevation with Q wave	32	63.	34	77.3	71	69.6	
Interpretation EKG	ST elevation without Q wave	13	22.4	7	15.9	20	19.6	P=0.003
	Not ST elevation	2	3.4	0	0	2	2	
	Blok	6	10.3	3	6.8	9	.8	

Table 2. Duration of pain based on sex

Sex	Men		Women		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Time in minutes						
1-30	13	22.4	7	15.9	20	19.6
30-60	6	10.3	4	9.1	10	9.8
60-90	34	58.6	20	45.5	54	52.9
90-120	5	8.6	13	29.5	18	17.6
Test result	MV=917.000		P=0.013			

Table 3. Pain intensity based on sex

Sex	Men		Women		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Intensity of pain						
5	0	0	2	4.5	2	2
6	5	8.6	2	4.5	7	6.9
7	6	10.3	6	13.6	12	11.8
8	10	17.2	19	43.2	29	28.4
9	33	56.9	15	34.1	48	47.1
10	4	6.9	0	0	4	9.3
Test result	MV=919.500		P=0.010			

In most of the subjects (45.1%), CPK-T levels was positive. According to statistical test results, there were significant difference between the laboratory values of CPK-T, LDH, FBS and CHOL ($P < 0.05$).

According to the findings, greatest percentage of samples (52.9%) mentioned duration of pain between 60 to 90 minutes. According to Mann-Whitney test there was a significant difference

between both genders and duration of pain ($P = 0.013$) (Table 2).

56.9% of men reported the pain intensity 9 and 43.2% of women have mentioned pain intensity 8 (Table 5). Moreover, the statistical tests showed significant differences between the genders on the quality of throbbing pain (Table 4). According to Chi-Square test, there was a significant difference between type of pain and gender ($P = 0.003$) (Table 5).

Table 4. Quality of pain based on sex

Sex	Men		Women		Total		Test result
	Number	Percentage	Number	Percentage	Number	Percentage	
Pulsating	0	0	2	4.	2	2	P=0184 DF=1 X ² =2.689
Crusher	20	34.5	12	27.3	32	31.4	P=0.288 Df=1 X ² =0.604
Prickle	15	25.9	19	43.2	34	33.3	P=0.042 Df=1 X ² =3.377
Dip the knife in chest	8	13.8	2	4.5	10	18.8	P=0.478 Df=1 X ² =0.250
Deathlike	1	1.7	2	4.5	3	2.9	P=0.297 Df=1 X ² =0.698
Buring	19	33.3	21	47.7	40	39.6	P=0.194 Df=1 X ² =2.151
Crush	8	13.8	2	4.5	10	9.8	P=0.110 Df=1 X ² =2.420
Hazy	2	3.4	0	2	2	2	P=0321 Df=1 X ² =1.548

Table 5. Type of pain based on sex

Sex	Men		Women		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Sudden locally	37	63.8	27	61.4	64	62.7
Sudden spread out	4	6.9	10	22.7	14	13.7
Quantized locally	16	27.6	2	4.5	18	17.6
Quantized spread out	1	1.7	3	6.8	4	3.9
Test result	X ² =16.41		Df=1		P=0.003	

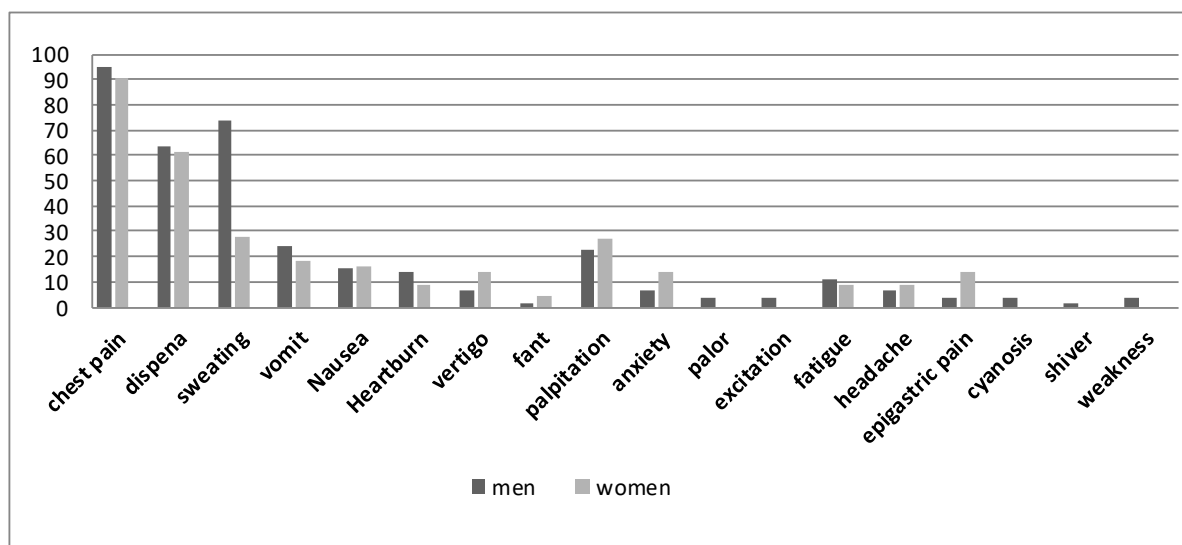


Figure 1. Compare symptoms of MI

Conclusion:

The results of this study, aimed at examining symptoms associated with MI in middle-aged women and men, showed that symptoms of MI in highest percentage of men and women, were noted the chest pain as the primary symptom and expressed sweating as the second sign while second sign in the women was dyspnea. Also according to research findings, weakness, feeling chills,

cyanosis, flushing and pallor were observed mostly in men and symptoms of dizziness, fainting, palpitations, anxiety, headache and epigastric pain in women were more than men. The results of this study are consistent with findings of Tofighian that showed women (63 percent) complained of nausea, sweating while 75 percent of men complained sweating and 55 percent of nausea with pain (14) and in general no gender-related differences in other

symptoms such as vomiting, nausea, dizziness, palpitations, pallor, epigastric pain, chills and weakness were observed, which is in line with the studies of other researchers (15) The results of the study showed that angina were not statistically different and are similar in two group and only women show atypical symptoms such as anxiety, headache and epigastric pain more than men, contrary to Emran findings, he was reported general weakness and sweating in women although the statistical difference was not significant (16,3) Nikravan in their study showed that symptoms such as vomiting, dyspnea and fatigue in women more than men significantly and for other symptoms such as nausea, loss of appetite and heartburn there was no difference between the two groups.

According to the findings of the present study, the highest percentage of men (34.5%) had Crusher pain and the highest percentage of women (47.7%) expressed burning pain, as well as Significant differences in statistical tests on the quality of pain relief were observed between the two sexes ($p = 0.042$) which is consistent with the results of other study (17).

According to the findings of the research, the numerical scale of pain from grade 1, which was mild pain and score 10 was the most severe pain, 58.9% of men had pain intensity of 9 and the highest percentage of women (43.2%) pain intensity of 8. Also, according to the results of the Mann-Whitney test, there was a significant difference between the two sexes in terms of pain intensity ($P=0.01$) which is consistent with the results of the kosuge study (18).

In our study other demographic result showed that women were significantly older than men, Nikravan and coworkers showed in a study performed in 2009, the average age of women was 58.70 and men are 55.97 (13). In terms of jobs, the highest percentage of women (88.6 percent) were housekeeper and the highest percentage of males (27.6 percent) were employee. Statistical test showed significant difference between genders in terms of employment ($P<0.05$) Woods and coworkers in the study of gender differences in symptom experiences of patients with acute coronary syndromes as this research there is a significant difference between gender and type of jobs between men and women. ($P<0.05$) (19).

Also in this study, the highest percentage of the cases (39.7 percent) below the diploma in term of level of education and female illiteracy rate (68.2 percent) statistical test showed significant difference between genders in terms of education ($P<0.05$).

Ranjbar and coworkers showed in a study did compared the clinical symptoms of acute coronary syndrome in men and women that the level of education (60.6 percent) units of study are below diplomas and Devon and coworkers in 2008 showed that 45 percent of women and 37 percent of men had a university education (20). According to the findings study, women have been reported high blood pressure, high cholesterol, history of diabetes, congestive heart failure, angina and previous myocardial infarction. The statistical tests showed significant differences between genders in terms of a history of high blood pressure, high cholesterol, history of diabetes, angina, congestive heart failure and previous myocardial infarction ($P<0.05$). In study of Raei and coworkers, history of high cholesterol in women significantly more than men only (22). In another study that was performed in 2009 by Mahmoud et al the patients of some metabolic parameters were compared and showed the average concentration of total cholesterol and blood pressure was higher in women than men (22). In a study by other researchers history of angina, diabetes, hypertension were reported by women more than men but in all the cases cited there was no significant differences between men and women and only a history of high cholesterol in women (38 percent) were more than men (22.7%) significantly (3).

According to the findings of study, women more than men cited family history of MI, but according to statistical tests did not were show significant differences between the genders in terms of family history of MI. Nikravan and coworkers reported that women 52.1 percent and men 58.8 percent reported a family history of heart attack (13). Finally, in order to achieve the main research question, the "identification of symptoms of myocardial infarction in middle-aged women and men admitted to CCU departments of hospitals affiliated to Hormozgan University of Medical Sciences and Health Services", the results showed

that the symptoms in women and men with acute coronary syndrome are somewhat different.

In general research showed that the typical heart attack symptoms such as chest pain no significant difference between two genders and only atypical symptoms such as gastrointestinal symptoms in men and women with acute coronary syndrome were the different.

The public and health care providers should be trained gender differences in experiences coronary syndrome. The general public should learn that the signs of a multiple heart attack are diverse and know that all of coronary attacks does not show with severe pain in his chest. Women should be trained in particular that they may be more likely to experience non-typical symptoms associated with coronary artery disease than men.

Conflict of interest:

The authors declare no conflict of interest.

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