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Difference in Clinical Symptoms of Myocardial Infarction between Men and Women

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Abstract

Introduction: Cardiovascular disease are the main causes of mortality among men and women so that the difference of acute myocardial infarction (MI) symptoms between men and women can affect on diagnosis and time of decision making for treatment and consequently on disease outcomes. Therefore, knowing different symptoms affects the prognostic of the disease according to the gender. This study conducted aimed to review the difference in clinical symptoms of myocardial infarction between men and women.

Methods: In this cross-sectional study, 169 patients admitted to Cardiac Care Unit at Imam Reza Hospital in Amol diagnosed as acute MI in 2009. Collecting the data was conducted using a demographic data form and symptoms check list and acute myocardial infarction symptoms were evaluated through interview. The data also were analyzed using Software SPSS 16, descriptive statistical methods and odds ratio.

Results: Female gender increased the ratio of weakness to 2.76, vomiting to 1.96, fatigue to 2.47, and anxiety to 2.20 and hiccups to 2.27. Furthermore, female gender increased the ratio of pain associated with acute myocardial infarction in jaw to 3.49, neck to 2.78, throat to 3.24, and shoulder to 2.43 and the left scapula to 2.83.

Conclusion: Atypical symptoms, particularly in females, may cause delay in referring of the patients and also delay in decision making for diagnosis and treatment by the medical team. Hence, staff and patients of ICUs need more special information about recognizing acute myocardial infarction symptoms, especially with regard to the gender.

Keywords: Myocardial infarction, Gender, Clinical symptoms.

Introduction

Cardiovascular diseases are one of the global health problems [1], more than 13 million patients with coronary artery disease are living in the United States [2]. It is the cause of one fifth of the mortality in English men [3] and the main cause of death among women of developed and western countries [3-6[. In Iran also, the rate of mortality resulted from heart diseases is increasing [1].

While the mortality rate in men with coronary artery diseases is declining, this is increasing in women and also the treatment result has been better in men than in women [7], and women have experienced higher side effects following the myocardial infarction than men [4]. Vaccarino (1999) stated that women under 50 years who are admitted in the hospitals due to acute coronary syndromes have mortality rate twice than men [8].

One of the main reasons is that myocardial infarction symptoms are ignored particularly in women. Higher age of the women and having no diagnosed symptoms cause that women delay referring to the hospital [9] and consequently they would receive electrocardiography and resuscitative treatments such as thrombolytic therapy and angioplasty with delay [10]. One of the other possible reasons is that women do not experience some of the diagnosed myocardial infarction symptoms in comparison with men, and therefore it would be hard for them to believe they had myocardial infarction [11]. Whereas women use health services more than men do [4].

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Some studies have shown that clinical symptoms of myocardial infarction are different between women and men [2]. For example, in women, often outbreak of back pain, shortness of breath, nausea, vomiting and weakness is more obvious [2, 12] and in men, in addition to the mentioned symptoms, they usually complain about chest pain too [10-14]. Knowing these symptoms would reduce the time of decision making about diagnostic and therapeutic measures and also would improve the response to the treatment [2]. One of the possible reasons of delay in diagnosis and treatment of myocardial infarction is differentiation and ambiguity of the symptoms especially considering the gender factor [15]. Therefore, proper diagnosis and timely treatment of the patients depend upon accurate assessment and consideration of the symptoms which differ in women and men [16].

Hence, it was decided to conduct this study aimed to identify clinical symptoms of myocardial infarction in men and women and with appropriate and correct education to the society and increasing knowledge of the public make patients to refer to the hospitals as soon as possible and reduce the delay time before admitting. Furthermore, by increasing the understanding of the nurses and emergency and ICU physicians, we would minimize the decision making time to initiate the treatment and achieve better results.

Methods

In this cross-sectional study which was done in 2009, 169 patients who were diagnosed with acute myocardial infarction were studied in purposive sampling method who had already been confirmed by cardiologists and had been admitted in coronary care unit (CCU) of Imam Reza Hospital in Amol. The inclusion criteria included no alcohol addiction, mental, psychological and verbal problems, and lack of decrease in consciousness level, no history of musculoskeletal pain at least one week before manifestation of the symptoms, no digestive diseases such as peptic ulcer and gastroesophageal reflux disease (GERD*)* disease and no congestive heart failure.

By reviewing published studies about clinical symptoms of acute myocardial infarction which was obtained through MEDLINE and CINAHLE sites during 2000-2009, a two-part questionnaire was designed. The first part included underlying and demographic information and the second part included signs and symptoms of acute myocardial infarction which obtained through interviewing with the patients. The searched keywords in these sites were "acute myocardial infarction", "signs", "gender differences" and "clinical features".

In order to determine content validity of the questionnaire, it was given to 10 cardiologists and then, it was judged and evaluated and its reliability was calculated using internal consistency by Cronbach's alpha (α=0.91) and also re-test method (r=0.88).

In order to calculate body mass index (BMI), weight in kilogram divided by the square of height and divided into four groups of thin (<18.5), normal (18.5-25), overweight (25-30) and obese (>30). Analyzing the data was done using SPSS software, version 16 and descriptive statistics and odds ratio. In order to observe the ethical principles, study subjects were assured about confidentiality of their information.

Results

The total of 169 study subjects, 110 of them were males (65.1%) and 59 of them were females (34.9%). Mean age of the men was 57.34 ± 13.66 years (CI 95%: 59.39-55.29) and mean age of the women was 61.64 ± 9.51 years (CI 95%: 63.07-60.21). Most of the men

(49.4%) and women (39.3%) had a normal BMI. In terms of marital status, 105 of the men (95.3%) and 39 of the women (66.4%) were married. In this study, 38.18% of the men and 18.64% of the women were farmers and 44.54% of the men and 76.27% of the women were illiterate. Among the study subjects, 61% and 9% of men and women, respectively, reported the smoking history. There was the history of cardiovascular disease in first degree relatives of 45.9% of the men and 41.8% of the women. In reviewing the history of disease in men, it was indicated that 19.8% had diabetes, 40.7% had hyperlipidemia and 25.45% had hypertension. On the other hand, in women it was indicated that 47.5% had diabetes, 60.7% had hyperlipidemia and 49.1% had hypertension.

According to the symptoms of acute myocardial infarction in this study, female gender increased the ratio of weakness to 2.76, vomiting to 1.96, fatigue to 2.47, and anxiety to 2.20 and hiccups to 2.27 (Table 1). Moreover, results of the present study showed that female gender increased the ratio of pain associated with acute myocardial infarction in jaw to 3.49, neck to 2.78, throat to 3.24, and shoulder to 2.43 and the left scapula to 2.83 (Table 2). The reported results of the odds ratio in this study are all crude results, and because each of these symptoms is used in the diagnosis, independently and separately from each other, calculating the adjusted values will not meet the ultimate objective.

Table 1. Odd ratios and 95% confidence intervals of symptoms in women versus men with AMI

Gender (n)	Male (110)	Female (59)	OR	CI95%
Symptoms	F (%)	F (%)		
Chest pain	107(97.3)	55(93.2)	0.38	0.08- 1.78
Dyspnea	64(58.2)	38(64.4)	1.30	0.67- 2.50
Weakness	33(30)	32(54.2)	2.76	1.43- 5.32
Sweating	82(74.5)	46(78)	1.20	0.57- 2.55
Nausea	41(37.3)	30(50.8)	1.74	0.91- 3.30
Vomiting	30(27.3)	25(42.4)	1.96	1.00-3.80
Fatigue	34(30.9)	31(52.5)	2.47	1.29-4.74
Hiccup	16(14.5)	17(28.8)	2.37	1.09-5.15
Bleaching	29(26.4)	19(32.2)	1.32	0.66-2.64
Tinnitus	16(14.5)	10(16.9)	1.19	0.50-2.84
Anxiety	32(29.1)	28(47.5)	2.20	1.14-4.24

Table2: Odd ratios and 95% confidence intervals of site of pain in women versus men with AMI

Gender (n)	Male (110)	Female (59)	OR	CI95%
Site of pain	F (%)	F (%)		
Jaw	17(15.5)	23(39)	3.49	1.67-7.29
Neck	23(20.9)	25(42.2)	2.78	1.39-5.55
Throat	15(13.6)	20(33.9)	3.24	1.50-6.98
Tooth	14(12.7)	11(18.6)	1.57	0.66-3.72
Left shoulder	43(39.1)	36(61)	2.43	1.27-4.66
Right shoulder	26(23.6)	21(35.6)	1.78	0.89-3.59
Left arm	53(48.2)	31(52.5)	1.19	0.63-2.24
Right arm	39(35.5)	17(28.8)	0.73	0.37-1.46
Left side of chest	62(56.4)	37(62.7)	1.30	0.68-2.49
Right side of chest	47(42.7)	20(33.9)	0.68	0.35-1.32
Sternum	79(71.8)	46(78)	1.38	0.66-2.91
Left scapula	41(37.3)	37(62.7)	2.83	1.47-5.44
Epigastria	31(28.2)	19(32.2)	1.21	0.61-2.40

Discussion

The results of the present study showed no difference between chest pain in the men and women. Whereas, some of the researchers beloved chest pain was less in women than in men [2, 9, 16] including Nikravan et al. that announced that following the MI, men experienced more chest pain than women and women felt pain in other areas except the chest [17]. However, in the present study, location and onset of the pain was different in the two sexes; so that odds ratio of experiencing the pain associated with MI in jaw, neck, throat, shoulder and left scapula was more in women than in men. Other studies also had mentioned the differences between both genders; e.g., Thuresson believed that women had expressed their pain and discomfort symptoms more in neck, chin and back areas [19]. On the other hand, some studies have shown that women mostly reported low back pain [2, 12] and men mostly chest pain [10, 13, 14]. Nikravan et al. also found that women usually complained about pain between the two scapula and back and men usually complained about pain at the center and left side of the chest. The female participants of their study reported the onset of the pain from chest to the scapula, right arm and between the two scapula and men reported the onset of the pain from chest to the left scapula and arm, scapula and both arms, forearms and both sides hands [17]. Now given that both patients and healthcare

providers consider the chest pain as the most important common sign of MI [10] and particularly in recent years, describing MI symptoms had been more based on men's statements and symptoms in women have been known as atypical symptoms (versus classic symptoms) [16], it seems necessary that notice to the current differences in experiences of pain caused from MI in women and men and reduce the possible delay in initiating the treatment.

The results of the present study in reviewing other symptoms of MI indicated that men and women manifested different signs and symptoms in association with myocardial infarction. Odds ratio of emerging weakness, fatigue, anxiety, and hiccups signs had been more in women than in men but there was no difference between the two sexes in experiencing shortness of breath, sweating, nausea, burping and tinnitus. Study of Nikravan et al. showed different results though; according to their study, signs of vomiting, shortness of breath, fatigue and anxiety had been higher in women than in men and hiccups, sweating and faint had been more in men [17]. The study of Culić et al. also reported higher rate of hiccups in men than in women. Culić et al. also reported that men experienced more pain in chest and sweating while women experienced shortness of breath [19]. Kosuge et al. also reported that women did not have chest pain after MI and complained mostly nausea, vomiting and shortness of breath [9]. In the study of Devon et al., women significantly experienced symptoms of indigestion, palpitation, nausea, tingling of the fingertips, fatigue, and weakness and cough more than men and men mostly experienced dizziness [2].

Conclusion

Publishing the contradictory results following the acute myocardial infarction in men and women can be considered in two ways. Firstly, it is possible that MI is concurrent with many other diseases and comorbidities and more importantly, non-typicality of the symptoms, particularly in women, may cause delay in referring the patients and also, delay in decision making for diagnosis and treatment by the medical team and consequently, lead to increase in mortality. Hence, it is necessary to consider some programs to educate the community and also health care staff especially in the emergency unit. Since, age is another important factor in incidence of the clinical symptoms in these patients, it is recommended that researchers investigate the effect of age on symptoms of acute MI in the future studies.

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