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Difference in clinical manifestations of myocardial infarction between men and women in Iran in 2014-2015

Narjes Rajaei Behbahani[1], Koroush Etemad[1*], Yadollah Mehrabi[1], Ali Ahmadi[2], Jalil Hasani[1]

[1]*Epidemiology Dept., Shahid Beheshti University of Medical Sciences, Tehran, I.R. Iran;*
[2]*Social Health Determinants Research Center, Shahrekord University of Medical Sciences, Shahrekord, I.R. Iran.*

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ABSTRACT

Background and aims: Cardiovascular diseases are the main cause of mortality among men and women so that the difference in acute myocardial infarction (AMI) symptoms between men and women can affect diagnosis and time of decision making for treatment and consequently disease outcomes. Therefore, knowledge of different symptoms affects the prognosis of the disease according to the gender. This study was conducted to determine the difference in clinical manifestations of MI between men and women.

Methods: In this cross-sectional, descriptive-analytical study all patients with primary diagnosis of AMI (n: 33831) in Iran in 2014-2015 were included. Data analysis was done by Stata. For descriptive data, central indices and distribution were used, and for investigation of the association among the variables, independent t-test and logistic regression were used.

Results: Overall, 33831 patients were included in this study, of whom, 24532 (51.72%) were male and the rest were female. Mean age at MI incidence was 80.0 7.59 years in men and 13.66 13.0 in women. Being female increased the likelihood of dyspnea by 3.1 times, vomiting by 31.1 times, and jaw pain by 21.1 times. No significant difference was seen in left arm pain, chest pain, nausea, and sweating between men and women (P>0.05).

Conclusion: Atypical symptoms, particularly in women, may cause the delay in referring 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 AMI symptoms, especially with regard to gender.

Keywords: Myocardial infarction, Gender, Clinical manifestations, Iran.

Original article

INTRODUCTION

Cardiovascular diseases, particularly acute coronary syndrome, are the most common and the most significant reason for mortality in most communities.[1,2] Myocardial infarction (MI) is a process by which an area of myocardial cells is constantly destroyed. Medical treatment of MI that aimed to prevent or minimize the

[*]**Corresponding author:** Koroush Etemad, Epidemiology Dept., Shahid Beheshti University of Medical Sciences, Tehran, I.R. Iran, Tel: 00989122971336, E-mail: etemadk@gmail.com

damage to heart tissue and prevent the symptoms is considered as its fatal symbol, so that acute coronary disease is the reason for 1.5 of the deaths.[3-5] Unfortunately, the rate of these diseases is on rise in developing countries because of urbanism characteristics, decline in physical activity, weight gain, increased smoking, occupational and mental stresses as well as inattention to health recommendations.[6,7]

The incidence rate of this disease is lower in high income countries. Low income communities such as India, Pakistan, Sri Lanka, and Nepal have a higher contribution to this disease prevalence.[8] The actual prevalence of cardiovascular disease in men and women aged 35-44 years is 5.0% and 18.0%, respectively, and in men and women over 60 years is 5.20% and 1.17%, respectively.[4]

In Iran, this disease is one of the most common reasons for mortality and 6.3 million individuals with cardiovascular disease are annually hospitalized in the hospitals affiliated with Ministry of Health and Medical Education, accounting for approximately 46% of mortality.[9,10] By World Health Organization, about 25 million individuals are projected to die because of cardiovascular diseases in 2020.[11]

Some studies have indicated that clinical manifestations of MI are different in men and women, so that women present with back pain, dyspnea, nausea, vomiting, and weakness more frequently, and men, besides these symptoms, complain of chest pain, as well.[12-15]. For example, Chen et al found that women reported chest discomfort, pain/discomfort in other body parts rather than chest, and unreasonable stress (anxiety) significantly more than men and developed chest pain, chest discomfort/pain, and discomfort/pain in the left side of chest less than men.[15]

Pain/discomfort started around arm and/or other parts of the body more frequently in women than men, and then spread into chest. For the quality of pain/discomfort, there was no significant difference in pattern and intensity between men and women. The women experienced dyspnea, nausea, decreased appetite, pain/discomfort in right arm, and pain/discomfort only in arms insignificantly less than men.

Further, Culic et al indicated that women experienced some symptoms such as arm pain, neck pain, back pain, and headache more than men, and certain symptoms including vomiting, dyspnea, and coughing are mainly seen in women. Men present more frequently with chest pain, sweating, bloat, and hiccup.[16]

Vaccarino et al argue that the mortality in the women under 50 years hospitalized for acute coronary syndrome is twice than men, which is mainly due to the fact that MI symptoms are disregarded particularly in women. Being older and not presenting with known diagnostic symptoms cause women refer to hospital more lately.[17,18]

Another possible explanation is that women do not present with some of the known symptoms of MI compared to men, and hence, it is hard for them to think of MI happening to them, while women receive health care services more than men.[19,20]

A possible reason for late diagnosis and treatment of MI is variable and unclear symptoms especially with regard to gender.[21] Being aware of these symptoms reduces the time needed for taking decisions regarding the diagnostic and treatment measures, and improves the response to treatment.[12] Therefore, appropriate diagnosis and early treatment of the patients depend on accurate assessment and consideration of the difference in the symptoms between men and women.[22]

Regarding the necessity of further recognition of differences and similarities of MI symptoms between women and men, we conducted this study to compare them between men and women, so that appropriate training of community and increase public knowledge to cause earlier referring of the patients and decrease in pre-hospital delay as much as possible. Also, the time needed for decision taking for beginning of the treatment will be minimized through increasing knowledge of the nurses and physicians in emergencies and intensive care units, and a better outcome could be derived from treatment.

METHODS

The present study was cross-sectional, descriptive-analytical. The study population consisted of all the patients with primary diagnosis of AMI in 2014-2015 in Iran (n: 33831). The individual data of the patients with MI were daily recorded and entered into National Registry of Myocardial Infarction by their national code, unique to any individuals, in the cardiac care units of the hospitals across the country by matron with a cardiologist's approval for the already publicized definitions of MI.

The data were electronically collected in all the hospitals across the country, and monitored by the experts of national plan of MI registry at Ministry of Health and Medical Education. These data were accessed with reference to a formal agreement between Department of Epidemiology, School of Health at Shahid Beheshti University of Medical Sciences and Cardiology Office of Management Center for Non Communicable Diseases at Ministry of Health and Medical Education. Further, the patients' data were dealt with as confidential and the findings were published as anonymous.

The data were analyzed by Stata 12. For descriptive data, central indices and distribution were used, and to investigate the association between the variables, independent t-test and logistic regression were used. In this study, the level of significance was considered as <0.05.

RESULTS

Overall 33831 patients with AMI were studied. About 9299 (27.5%) of the participants were women. Mean age was derived 59.7±0.80 years (CI 95%: 5.59-8.59) in men and 66.13±0.13 years (CI 95%: 4.66-9.65) with a statistically significant difference (P<0.001). Approximately 7.35% of the men and 9.72% of the women were illiterate, and only 3.8% and 1% of the men and women, respectively, had academic education and 3.31% of the men and 4.18% of the women had history of smoking. Mean number of the cigarettes used per day was 11 in men and 7 in women, with a statistically significant difference (P<0.001).

For disease history, 2.18% of the men and 8.24% of the women had history of coronary heart disease, 29% of the men and 1.54% of the women had history of hypertension, 9.17% of the men and 4.34% of the women had history of diabetes, 7.3% of the men and 3% of the women had history of PCI (Percutaneous Coronary Intervention), 1.18% of the men and 26% of the women had history of hyperlipidemia, and 7.2% of the men and 5.2% of the women had history of CABG (Coronary Artery Bypass Grafting).

For the clinical symptoms at AMI in the participants, the risk of dyspnea, vomiting, and jaw pain was 1.3, 1.31, and 1.21 times higher in women than men, respectively. There was no significant difference in other AMI symptoms between men and women (Table 1).

Table 1: The association between symptoms of acute myocardial infarction and gender

Symptoms	Men (%)	Women (%)	Odds ratio	CI 95%	P
Dyspnea	2747 (11.2)	1310(14.1)	1.3	1.21-1.39	<0/001
Sweating	3661(17.5)	1317(14.2)	0.094	0.88-1.007	0.078
Vomiting	1537(6.3)	748(8.04)	1.31	1.19-1.43	<0.001
Nausea	2399(9.8)	974(10.5)	1.08	0.99-1.17	0.057
Chest Pain	2879(11.7)	1088(11.7)	1	0.92-1.07	0.93
Left Arm Pain	3976(16.21)	1580(16.99)	1.06	0.99-1.13	0.082
Jaw pain	521(2.12)	239(2.57)	1.21	1.04-1.42	0.014

Overall, in this study, 5.59% of the women and 2.18% of the men died after AMI. The difference was statistically significant so that the death risk was 2.65 times higher in the women than men (P<0.001, CI 95%: 2.34-3).

DISCUSSION

Recognition of primary symptoms of acute coronary syndrome is a key for preventing the mortality due to this disease for treatment team in and outside the hospital. Analysis of the data indicated that some non-specific symptoms are more likely to develop in women than men.

The findings indicated that the quality of chest pain was not different between men and women, which are consistent with Chen et al study. Chen et al also found a difference in pain quality between men and women.[15] However some researchers have argued that chest pain is less frequently seen in women than in men.[12,18,22] For example, Nikravamemofrad et al reported that after the MI men experienced chest pain more than women, and women experienced more discomfort in a body part rather than chest.[23]

Given that both patients and healthcare services professionals consider chest pain as the most significant problem due to MI, and description of MI symptoms, particularly in recent years, has been mainly based on men's statements, and women's symptoms are typically known as atypical (versus classic). Then, it is necessary to consider the current differences in experiencing pain due to MI between men and women and decline the potential delay in beginning of the treatment.[14,22]

For symptoms, certain symptoms such as vomiting and dyspnea were more frequent in the women than the men. For other symptoms such as left arm pain, chest pain, nausea, and sweating, no significant difference was seen between the men and the women.

Culic et al concluded that women experienced vomiting significantly more than men, and men experienced certain symptoms including sweating significantly more than women, which is consistent with the present study only for some symptoms such as dyspnea.[16] Kosuge et al reported that women after MI did not develop chest pain and mainly experienced nausea, vomiting, and dyspnea.[18] In Devon et al study, women had indigestion, heartbeat, nausea, fatigue, weakness, and coughing significantly more than men, and men reported dizziness more frequently.[12]

CONCLUSION

Inconsistent findings on AMI in men and women could be considered from two perspectives. Firstly, MI could be co morbid with many other diseases and secondly atypical symptoms, particularly in women, could lead to delayed referring of the patients and hence late taking of decisions on diagnosis and treatment by medical team, ultimately resulting in increased mortality. Therefore, it is necessary to develop plans for training communities and health care personnel, especially in emergency wards.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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