Acute Myocardial Infarction in Women

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Abstract

Background- Epidemiological evidence shows that among women the incidence of acute myocardial infarction (AMI), risk factors of cardiovascular disease, and mortality rate of AMI are different. The objective of this study was to compare the baseline characteristics, risk factors, medical care, and mortality of AMI between women and men.

Methods- In this descriptive-analytical study, we examined data from medical charts and administrative files of patients that were hospitalized with AMI between 1994 and 2003 in Birjand hospitals. Questionnaires were completed by two educated nurses under the supervision of a cardiologist and the data were analyzed with SPSS software.

Results- From 918 patients, 71.9% were male (M) and 28.1% were female (F). The women were older than the men (mean age 65.62 ± 10.56yr in F vs. 58.98 ± 12.11yr in M) and had a greater incidence of hypertension (50% in F vs. 24.6% in M, $p<0.001$) and diabetes mellitus (17% in F vs. 9.8% in M, $p<0.006$), but smoking was more common in the men (13.7% in F vs. 36.3% in M, $p<0.001$). Intra-hospital mortality was higher in the women but not significantly (10.4% in F vs. 8.6% in M, $p=0.42$). Fasting blood sugar (FBS), cholesterol level, and diastolic blood pressure (DBP) were significantly higher amongst the women.

Conclusion- Women with AMI had older age and higher incidence of diabetes and hypertension. Thus designing interventional programs for reducing these risk factors by education in women is needed ***(Iranian Heart Journal 2009; 10 (1):31-34).***

Key words: acute myocardial infarction ■ female ■ risk factors

Acute myocardial infarction (AMI) is the single most common cause of death in both women and men in large parts of the world.[1] AMI accounts for a great number of deaths in Iran[2] and in Birjand[3] as well.

Several studies have shown that the incidence of AMI in men is higher than that in women.[4-8] In recent years, not only has the incidence of AMI in women increased, but also the burden of AMI on the mortality of women has also increased.[4-6]

Previous studies have suggested differences in the epidemiology of AMI in women. Women, on average, were older than men and had a higher prevalence of hypertension (HTN), diabetes mellitus (DM), dyslipidemia, and in-hospital mortality.[7-8]

However in other studies, no difference was seen in long-term mortality after myocardial infarction between men and women.[9-11]

In the present study, we assessed the incidence, risk factors, mortality, and use of pharmacological agents between men and women in a cross-sectional study of all AMI patients admitted to Birjand hospitals between 1994 and 2003.

Received Oct.. 23, 2007; Accepted for publication June 2, 2008.
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Methods

This is a descriptive study conducted between 1994 and 2003 in Birjand, a city in the East of Iran. We obtained lists of all patients who were hospitalized in Birjand with AMI.

The diagnosis of AMI was based on the criteria proposed by Braunwald:[12] dynamic changes of electrocardiography indicating the development of AMI and changes of cardiac enzyme activity in the blood stream. The medical records of the selected patients were reviewed by two trained nurses; and information was obtained on the patients' age, risk factors, use of pharmacologic agents, and mortality in the men and women.

The data were then entered into SPSS software, and data analysis was performed using the chi-square (X^2) and t-test at α=0.05.

Results

From 1994 to 2003, 918 patients were hospitalized with definite AMI in Birjand. 71.9% of the subjects were men with a mean age of 58.9±12.1 years, and 28.1% were women with a mean age 65.6±10.6 years (p<0.001).

The prevalence of cardiac risk factors between the men and women is compared in Table I.

Table I. Frequency distribution of risk factors in men and women with definite AMI

Risk Factor	Women	Men	P-value
Mean age (years)	65.6±10.6	58.9±12.1	<0.001*
Hypertension	129 (50%)	161 (24.4%)	0.001*
Diabetes	44 (17%)	65 (9.8%)	0.002*
Dyslipidemia	49 (19%)	128 (19.4%)	0.88
Cigarette smoking	35(17.6%)	240 (36.4%)	0.001*
Positive family history	11 (4.3%)	28 (4.2%)	0.99

Total: men=660, women=258 *statistically significant

Table II presents the mean level of fasting blood sugar (FBS), serum lipids, and blood pressure in the men and women.

Table II. Comparison of mean levels of FBS, serum lipids, and blood pressure in women and men

Object	Women	Men	P-value
FBS (mg/dl)	138.4±75.4	122.2±52.6	0.001*
Cholesterol(mg/dl)	214.7±61.7	199.6±49.5	<0.001*
Triglyceride (mg/dl)	138.8±69.8	138.4±103.7	0.95
SBP (mmHg)	125.3±25.9	121.5±26.1	0.07
DBP (mmHg)	87.6±15.5	75.6±16.3	0.01*

SBP: systolic blood pressure, DBP: diastolic blood pressure

Comparisons revealed a statistically significant difference between blood sugar, cholesterol, and diastolic blood pressure in the two groups. Acute medical care of the patients is presented in Figure 1.

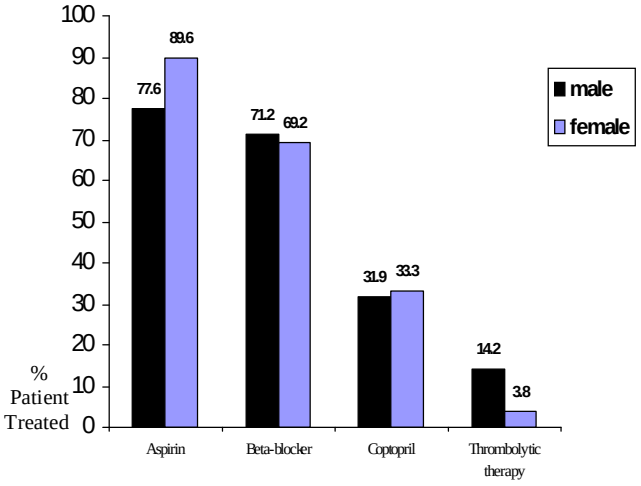

Fig. 1. Comparisons of acute care of men and women with definite AMI

Only the frequency of the administration of thrombolytic therapy was significantly lower in the women (3.8% in women vs. 14.2% in men, p<0.001).

Intra-hospital mortality of women was higher than that of the men, but not significantly (10.4% in women vs. 8.7% in men, p=0.42).

Discussion

In our study, 28.1% of the patients hospitalized with a definite diagnosis of AMI were women, and the women on average were older than the men. The results of other studies are in agreement with this finding.[4-6] The lower prevalence of AMI in the women may be due to the protective effect of estrogen in women.[13]

In accordance with other studies, the prevalence of hypertension and diabetes mellitus was higher (statistically significant) in the women than that in the men and the prevalence of smoking in the men was three-times that of the women.[11-14]

In our study, there was increased in-hospital mortality among the women compared with the men, but not significantly. In the majority of reports, in-hospital mortality of women was higher than that of the men[7,8] but in other studies, for example in Yazd (2000-2001), there was no difference between male and female in-hospital mortality from AMI.[9-11]

Medical care has an important role in reducing the mortality of patients. In a recent publication from the Neufeld Cardiac Research Institute[7], Gotllieb et al. noted that women were less likely to be treated with aspirin, beta-blockers, captopril, and thrombolytics, but in our study the medical management was similar except for thrombolysis.

In our study, thrombolytics were used significantly less frequently in the women (three-times lower in women). One of the most important reasons for a poorer prognosis of AMI in the women in our study may be due to this lower use of thrombolysis in the men.

Several earlier studies also have noted that women are less likely to receive thrombolysis therapy due to older age, co-morbid conditions, and late arrival.[15-17]

Conclusion

Sex differences in the management, risk factors, and outcome of AMI in Birjand are similar to those in other parts of the world. Despite the low prevalence of AMI in the women, in-hospital mortality in the women was higher, which may be due to older age, greater co-morbidity (especially DM and HTN), and especially, less use of thrombolysis in the women. We compared only the in-hospital differences in management, risk factors, and outcome after AMI in women and men. We unfortunately did not assess sex-based differences in management, risk factors, and short- and long-term mortality after AMI in the present study. Further studies are required to clarify these issues.

Acknowledgments

We are indebted to all physicians and nurses in the cardiac wards in Birjand. We are also grateful to Miss Assiabani and Talebi for data collection.

Conflict of Interest

No conflicts of interest have been claimed by the authors.

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