CHANGES IN RISK FACTORS, MEDICAL CARE AND RATE OF ACUTE MYOCARDIAL INFARCTIONS IN BIRJAND (1994-2003)

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Abstract

INTRODUCTION: Acute Myocardial Infarction (AMI) is one of the main causes of mortality and morbidity in developing and underdeveloped countries. The aim of the present study was to evaluate the trend of AMI risk factors in the city of Birjand, Iran, between 1994 and 2003.

METHODS: This cross-sectional study was based on the medical records of patients hospitalized due to AMI from 1994 to 2003 in Birjand hospitals. The medical records of the selected patients were summarized by two trained nurses. Information was obtained on the patients' age, sex, risk factors, medical history, cardiac enzyme levels and therapy. The data were analyzed with t-test and chi-square test at $\alpha=0.05$ using SPSS.

RESULTS: 918 patients were hospitalized for AMI between 1994 and 2003 in Birjand hospitals. In this study, 319 patients (34.7%) had no risk factors and others had at least one risk factor. The prevalence of all risk factors had increased, but the increase in the prevalence of dyslipidemia (18.2%, 30.1%, P<0.001) and smoking (18.2%, 23.5%, P=0.03) was statistically significant during ten years of the study.

DISCUSSION: In light of evidence documenting the rising trend of cardiovascular risk factors, it is essential to develop appropriate interventional programs to prevent an imminent cardiovascular disease epidemic in the region.

Introduction

Non-communicable diseases (NCDs) account for a large and increasing burden of disease worldwide. Cardiovascular diseases (CVDs) are the most important cause of NCDs, accounting for 29% of all deaths and 10% of the global disease burden in 2001.[1]

Every year, 17 million people in the world die from CVDs. Moreover, these diseases are among the main causes of disability.[2] In Iran, as in other countries, CVDs are the most common cause of mortality.[3]

In the city of Birjand, the center of South-Khorasan region, Iran, acute myocardial infarction (AMI) was the most common cause of mortality in 2002-2003 (24.1% of total mortality).[4]

The incidence, mortality, and morbidity of AMI has decreased significantly in the US, Brazil, Japan, England, Sweden, Canada, Ireland and Denmark in the past two decades.[5-13]

In developed countries, many factors have probably contributed to the decline in mortality from AMI, including reduced levels of CVD risk factors in the general population,[9,14,15] decline in the incidence and perhaps severity of disease,[6,8] and changes in medical care which may influence survival.[12,16]

The aim of the present study was to evaluate the changes in the prevalence of risk factors and medical care of AMI during 1994-2003 in Birjand.

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Materials and methods

This cross-sectional study was conducted in 2004 in Emam-Reza and Valliassr hospitals in Birjand, the only heart centers in South-Khorasan region.

All medical records of patients hospitalized with AMI from 1994 to 2003 were selected.

Diagnosis of AMI was based on the criteria proposed by Braunwald[17] (symptoms of coronary events, dynamic changes in ECG, changes of cardiac enzymes activity in blood serum).

Blood pressure, blood glucose, serum lipids, previous medical history, medical treatment and ECG of patients were available in medical records.

Two trained nurses summarized the medical records of AMI patients under the supervision of a cardiologist. Data were entered into SPSS and analyzed by t-test and chi-square test at $\alpha=0.05$.

Results

A total of 918 AMI patients were hospitalized in Birjand hospitals between 1994 and 2003.

During 1994-2003, the number of patients with AMI increased significantly (47 in 1994, 201 in 2003).

Of 918 patients, 660 were male (77.9%) and 258 were female (28.1%).

The patients had a mean age of 60.7±12.1 years. Men had a significantly lower mean age than women (men: 58.9±12.2 years, women: 65.3±10.7 years, P<0.001).

Three-hundred-nineteen patients (34.7%) had no risk factors, 599 (65.3%) had at least one risk factor, 293 (31.9%) were hypertensive, 274 (29.8%) were smokers, 175 (19.1%) had dyslipidemia, 108 (11.8%) were diabetic and 39 (4.3%) had positive family history of CAD.

The prevalence of CVD risk factors had increased in these patients during 10 years and the increase in the prevalence of dyslipidemia and smoking was significant (Table 1).

Between 1994 and 2003, the average length of hospital stay for AMI patients decreased from 9.35 days to 7.7 days (P<0.001).

There were substantial changes in the treatment of patients during their hospital stay. During this period, the frequency of thrombolytic therapy increased fivefold (from 3% to 17.4%) and large increases were documented in the numbers of patients receiving captopril (from 2.2% to 45.6%), aspirin (from 55.3% to 98.6%), heparin (from 62.5% to 97.1%) and beta-blockers (from 66% to 77.7%) (Figure 1).

FIGURE 1. Changes in Acute medical care of patients who were hospitalized for definite acute myocardial infarction in 1994 and 2003
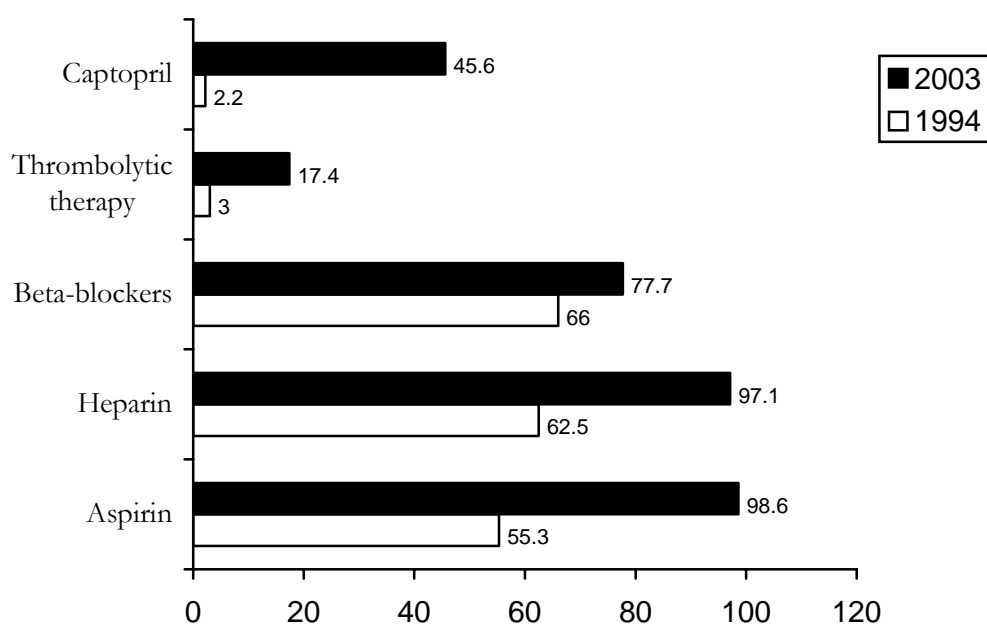
Showing percentage of patient treated: The differences between 1994 and 2003 were statistically significant (P<0.05) in all cases.

TABLE 1. Changes in CVD risk factors of patients hospitalized for definite AMI between 1994 and 2003

Risk Factor	Prevalence in 1994	Prevalence in 2003	P value
Hypertension	31.8%	31.9%	0.24
Smoking	18.2%	23.5%	0.03*
Hyperlipidemia	18.2%	30.1%	<0.001*
Diabetes	10.2%	12.5%	0.06
Positive family history of CVD	2%	2.5%	0.20

*P value is significant.

Discussion

71.9% of the patients hospitalized with definite AMI were male and 28.1% were female. In other studies too, the percentage of men was higher than that of women.[8,18-20] The lower prevalence of AMI in women was likely due to the protective effects of estrogen. However, women too, should be educated about the symptoms of AMI and control of CVD risk factors.

AMI in women occurred at the mean age of 60.7 years, which was 7 years later than in men. The results of other studies are in agreement with our findings.[4,9,17]

In this study, the rate of hospitalization due to AMI increased significantly from 1994 to 2003; the rise in the rate of AMI could be attributed to increased awareness and earlier seeking of medical care, greater use of diagnostic procedures, and the rise in the prevalence of CVD risk factors.

Substantial declines in AMI rates have been shown in some studies. In the United States for example, the rate of AMI decreased from 525 per 100,000 to 482 per 100,000 between 1988 and 1997.[5] Similar trends have been reported in Sweden,[9] Japan,[7] and Denmark.[13]

In Carolina, the rate of hospitalizations due to AMI decreased between 1987 and 1990, but remained unchanged between 1990 and 1994.[14]

The difference between AMI rates in Birjand and rates reported by the aforesaid studies may be due to significant improvements in primary and secondary prevention in developed countries. Evaluation of CVD risk factors showed that hypertension and smoking were the most prevalent risk factors in Birjand. Diabetes and smoking in Yazd,[20] smoking and hyperlipidemia in Gillan,[18] smoking in Ghazvin,[19] and smoking and hypertension in Mexicocity[6] were the most prevalent risk factors. These findings are in agreement with our study. In Carolina,[14] the prevalence of hypertension, hyperlipidemia and smoking decreased between 1985 and 1990. In Birjand, however, the prevalence of CVD risk factors, especially dyslipidemia and smoking increased in AMI patients between 1994 and 2003; this difference highlights the need for interventional program to reduce CVD risk factors in the region.

The changes in the treatment of AMI documented in this study are evidence of the important role of acute medical care in decreasing mortality due to AMI.

A study conducted by Mahon[12] demonstrated a large increase in thrombolytic therapy, which is in agreement with this study.

Treatment with other drugs such as aspirin,[16] beta-blockers,[7] angiotensin converting enzyme inhibitors,[7,8] and anticoagulants[12] which have established effects on the survival of MI patients was also more prevalent in 2000 than in 1985. We conclude that the increase in the prevalence of AMI and its associated risk factors in Iran should be tackled urgently through appropriate health measures, which should inevitably include education of the public and lifestyle modification.

Acknowledgements

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