Incidence of Myocardial Infarction (MI) in Diabetic Women and Clinical information: A study in Southwestern Iran

Research Article

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Abstract

Introduction: Diabetes is one of the leading causes of death in the world. Due to the fact that diabetes can be one of the causes of heart attack in diabetic patients, so this was done to determine the incidence of heart attack and its related factors in these people. Materials and Methods: The present study is a retrospective cross-sectional descriptive study whose information was extracted from the records of women with diabetes referred to public hospitals in Behbahan by reading. Then the data were entered into SPSS software version 19. And were analyzed using descriptive statistics tests and analytical tests with a significance level of $P < 0.05$. Results: The present study included 1642 diabetic women with a mean age of 54.16 73 73.16 years. Mean BMI in these patients 31.24 ± 1.46, in this study, 248 (15.1%) diabetic women had a history of myocardial infarction after diabetes. Also, the relationship between BMI and history of myocardial infarction was significant ($p = 0.09$), so that patients with higher BMI had a higher history of myocardial infarction. Conclusion: The results of this study showed that the relationship between myocardial infarction history and job type, BMI and type of diabetes was significant in diabetic women. Therefore, it is better for the hospital staff to train diabetic patients to control blood sugar, reduce BMI, as well as reduce smoking and drug use to reduce the risk of heart attack.

Key Words: *Myocardial Infarction, Diabetic Patients, Diabetic Women, Iran.*

Introduction

Diabetes is one of the leading causes of death in the world and a major public health problem that also causes various diseases in people with it (1,2). The disease is characterized by impaired metabolism of carbohydrates, proteins, and fats due to unstable secretion of insulin, secretion of insulin resistance, or both (3). Due to the increasing trend of diabetes worldwide, it is predicted that 693 million people will be infected with this disease by 2045. (4). In Iran, the prevalence of diabetes in 2011 compared to 2005, has increased by 35% , Which is estimated that by 2030, about 9.2 million Iranians will have diabetes (5). On the other hand, the chronic nature of diabetes and new treatments for this disease, which increase the life expectancy of diabetic patients, increase the risk of chronic complications such as ocular, renal, neurological and cardiovascular involvement during the life of diabetic patients, and this It leads to many problems for the diabetic person and imposes a heavy economic burden on the community health system (4). Consequences of poor diabetes control include frequent hospitalizations, high prevalence of complications, and poor quality of life in patients with diabetes (6). According to existing studies, lack of self-care is the most important predisposing factor for diabetes complications and mortality in patients with diabetes. In fact, successful diabetes management depends on patients' self-care, as more than 95% of diabetes care is provided by the patient. This disease requires special self-care behaviors throughout life (7, 8).

Diabetes is also one of the causes of heart attack. Today, myocardial infarction is one of the leading causes of death in human societies. In addition to disabling patients, myocardial infarction imposes heavy costs on communities (9). About 30 to 40 percent of all deaths in the world are due to heart disease. On the other hand, it has been observed that about 38% of all deaths in Iran are related to coronary artery disease (12-9). Therefore, considering that diabetes can be one of the causes of heart attack in diabetic patients and also

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planning to increase the health of patients, it is necessary to study all the risk factors for the disease, so this study, which is based on medical records 1642 The woman was diagnosed with diabetes, with the aim of determining the incidence of myocardial infarction (MI) in diabetic women and its relationship with demographic variables and clinical information.

Materials and Methods

The present study is a retrospective descriptive cross-sectional study whose information was extracted from the files of women with diabetes referred to public hospitals in Behbahan, Khuzestan province, by reading. In this study, 1642 women with diabetes were extracted from the files of patients with this disease who had referred to this hospital from 2015 to 2019 and a medical file had been prepared for them. Samples were entered into the study by census method.

In this study, as mentioned above, 1642 medical records of patients with diabetes were reviewed from all the cases referred to public hospitals in Behbahan, Khuzestan province, and the files of patients with a diagnosis and history of diabetes were extracted and information was obtained. Requirements were collected from the files through a researcher-made checklist. Inclusion criteria included all patients with diabetes in the female sex group and with any diagnosis of diabetes or history of the disease in their records. Other cases with a medical diagnosis other than the disease, cases without a history of diabetes, male diabetics, and incompletely filled cases were excluded.

Necessary permits for this article were obtained from the Faculty of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran. Before starting the study on these patients and collecting data, first a written letter of introduction was referred to the public hospitals of Behbahan by the Vice Chancellor for Research, School of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, then the necessary permits to access the archive department. The researchers were given this study and 1642 cases were reviewed.

The information studied in this study includes demographic indicators of patients such as age, marital status, employment status as well as clinical information such as blood sugar and BMI, history of heart attack, type of diabetes, history of smoking or drug abuse, having or not having. The use of insulin or oral medications such as metformin and glibenclamide and other oral medications to control blood sugar were collected from patients' medical records. Then the data were entered into SPSS software version 19 and analyzed using descriptive statistics and Chi-square and Chi-square-Pearson analytical tests, T-test, ANOVA and significance level $P < 0.05$.

Results

The present study included 1642 diabetic women with a mean age of 54.16 ± 16.73 years. The mean blood glucose of these patients was 201.23 ± 63.81. The mean BMI in these patients was 32.24 ± 1.46, which indicates class I obesity.

In terms of marital status, 1245 women (75.8%) were married and the remaining 397 (24.1%) were single or their spouses had died.

In terms of employment, 647 people (39.4%) were housewives, 475 people (28.9%) had government jobs, and 520 people (31.6%) had freelance jobs. And the relationship between job type and history of heart attack in diabetic women was significant ($P < 0.05$), so that diabetic women with government jobs were more likely to have a heart attack.

In this study, 248 (15.1%) diabetic women had a history of myocardial infarction after diabetes. Of these, 214 (86.2%) had type 2 diabetes and the rest, 34 (13.8%), had type 1 diabetes (Figure 1).

Also, the relationship between BMI and history of myocardial infarction was significant ($T=120.31 p=0.09$), so that patients with higher BMI had a higher history of myocardial infarction.

In this study, the relationship between type of diabetes and history of myocardial infarction was significant ($T=128.70, p=0.007$), so that patients with type 2 diabetes had a higher history of myocardial infarction.

In this study, 879 patients (53.5%) used insulin, and the rest of the patients used metformin, glibenclamide, and other oral medications to control their blood sugar. The relationship between patients taking metformin and myocardial infarction was significant ($P < 0.05$), ie patients taking this oral drug were less likely to have a heart attack.

In this study, 214 patients (13.0%) had smoking or drug use, in which diabetic patients who smoked or used drugs more than non-smokers had a heart attack, but this relationship was not statistically significant ($T=124.56 p=0.02$) (Figure 2).

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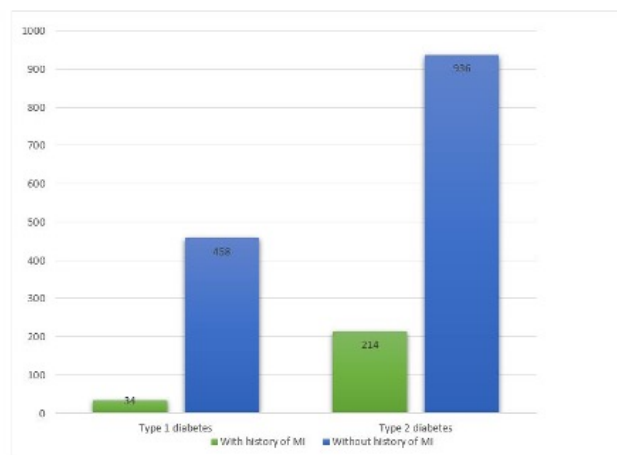

Figure 1: Frequency comparison of history of MI (with and without history) in diabetic patients type 1 and 2.
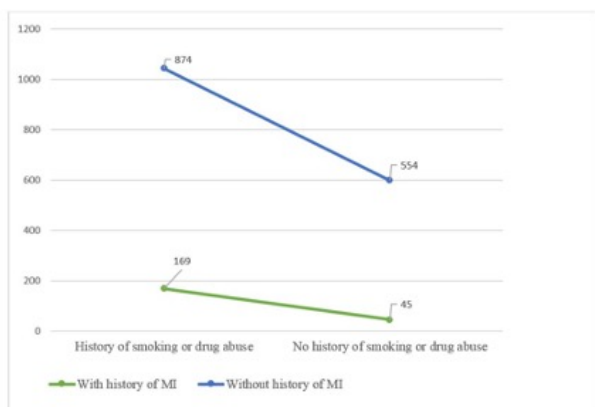
Figure 2: Frequency comparison of history of MI (with and without history) in diabetic patients type 1 and 2.

Discussion

In this study, 248 (15.1%) diabetic women had a history of myocardial infarction after diabetes. In general, in previous studies, diabetes has been one of the causes of cardiovascular disease. For example, ischemic heart disease is one of the macrovascular complications of diabetes, which despite its higher prevalence in diabetic patients than non-diabetic people, the resulting mortality is higher in these patients. In addition to diabetes and impaired glucose tolerance, other factors such as old age, hypertension and smoking have a proven role in atherosclerosis and ischemic heart disease (15-13). In a study (16), which was performed on more than 1000 patients with type 2 diabetes, about 26.8% of patients had coronary artery disease (CHD), of which 47% were unaware of their disease and during the next study of coronary artery disease. They became known. Also, age factors, longer history of diabetes, history of high blood pressure and also low left ventricular ejection fraction were the most important factors. Coronary artery disease is one of the most important causes of morbidity and mortality in various countries, including Iran (17).

In this study, 248 (15.1%) diabetic women had a history of myocardial infarction after diabetes. Of these, 214 (86.2%) had type 2 diabetes and the rest had 34 (13.8%). Also, the relationship between BMI and history of myocardial infarction was significant (p = 0.09), so that patients with higher BMI had a higher history of myocardial infarction. In this study, the relationship between type of diabetes and history of myocardial infarction was significant (p = 0.007), so that patients with type 2 diabetes had a higher history of myocardial infarction. In the study, Hayashi et al followed 4014 patients with type 2 diabetes without a previous history of CVA and IHD for 5.5 years. 46% of patients were female. Patients were divided into three age groups: less than 65 years, between 65 and 74 years and older equal to 75 years. During follow-up, 10% of patients developed IHD and CVA. In the study (16), diabetic patients with ischemic heart disease had higher microvascular complications than diabetics without ischemic heart disease, which was consistent with the study (18). Also in the study of Kannel et al. (19),

diabetes doubled the incidence of ischemic heart disease in men and tripled in women.

High triglycerides are one of the most important risk factors for cardiovascular disease in type 1 diabetic patients. In a study cited in Study 20, elevated triglyceride levels were strongly associated with cardiovascular disease in diabetic and non-diabetic individuals. Also in study (20), due to the relatively high prevalence of cardiovascular risk factors in type 1 diabetic population and the modifiability of these factors, it was recommended that in order to teach optimal control of diabetes, increase physical activity and continuous follow-up of these risk factors Take measures in type 1 diabetic patients.

In general, it can be concluded that the prevalence of ischemic heart disease, especially asymptomatic and undiagnosed cases, is high in people with diabetes and age, especially over 50 years, high blood pressure, long duration of diabetes and low ventricular ejection fraction. The left is an important factor associated with cardiovascular involvement (16).

Conclusion

The results of this study showed that the relationship between myocardial infarction history and job type, BMI, type of diabetes was significant in diabetic women. Also, patients who smoked or used drugs were more likely to have a heart attack than non-smokers. Also, patients taking metformin were less likely to have a heart attack than those taking other blood sugar-controlling drugs. Therefore, it is better for the Ministry of Health and Medical Education to provide diabetic patients with the necessary training to control blood sugar, reduce BMI, as well as reduce smoking and drug use, to prevent an increase in heart attacks in these patients.

Conflict of interest

The authors of this article have no conflict of interest.

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