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Risk Factors of Coronary Artery Disease in Women

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Abstract: The present study aimed at evaluating coronary risk factors in women with definite coronary artery disease. This prospective study was conducted on 250 women with primary diagnosis of acute myocardial infarction or unstable angina. The patients were selected randomly using interview and registering the related risk factors. The primary diagnosis included 11.5% of myocardial infarction and 88.5% of unstable angina. All patients had risk factors. Diabetes was seen in 38.5%, hypertension in 78%, smoking in 27%, cholesterol >150 mg in 98%, consumption of oral contraceptive in 57%, family history in 28% and limited physical activity in 2.6% of the patients. Body mass index of 59.6% of the patients was equal to or more than 27 kg m^{-2} . Also, 66.7% of the patients were post menopausal and history of premature hysterectomy was seen in 9.6% of the patients. There were 3 or more risk factors of coronary artery disease in most patients. Considering the known risk factors in women, dyslipidemia, premature menopause, hypertension, oral contraceptives, diabetes and smoking were regarded as the most common ones.

Key words: Coronary artery disease, unstable angina, infarction

INTRODUCTION

In spite of considerable progresses in treating cardiovascular diseases, coronary artery disease constitute one third of women mortality cases. The risk factors known for coronary artery disease in men such as high age, family history, smoking, dyslipidemia and diabetes is associated with increasing the coronary artery disease risk in women but, their relative importance varies. (Cirera *et al.*, 2013; Pilgrim *et al.*, 2012). The difference has resulted in different evaluation algorithm of coronary artery disease in men and women (Stefanini *et al.*, 2012; Zirpoli *et al.*, 2012). Therefore, treatment procedure of the disease slightly varies in women. Accordingly, recommendations suggested by American Heart Association and American College Association indicate to different primary and secondary preventions in women. (Cannon *et al.*, 2012; Cournot *et al.*, 2012). Previous studies state that healthy, strong and nonsmoker women with regular physical activities should be selected to hormone replacement therapy (Boehm *et al.*, 2011; Kivimaki *et al.*, 2011). Generally, hormone therapy is associated with some complications such as increasing chance of cholecystolithiasis, vascular thrombosis, vaginal hemorrhage and changes at triglyceride level. (Boucelma *et al.*, 2011; Wenger *et al.*, 2010). The present study aims at reevaluation of coronary risk factors in women with definite coronary artery disease in Iran.

MATERIALS AND METHODS

This prospective study was conducted on 250 women with primary diagnosis of acute myocardial infarction or unstable angina hospitalized at heart or CCU wards of Tabriz Shahid Madabni hospital from Aug 2011 to Aug 2012. The patients were selected randomly. They were interviewed to obtain information about the patient's height and weight and their lipid profiles were measure. The obtained data as well as results of angiographies conducted in this duration were registered in the questionnaire. The results of the study were statistically analyzed using SPSS, version 16. To account for statistical differences, a chi-square test or Fisher's exact test was used, as appropriate. A p-value of <0.05 was considered significant.

RESULTS

Out of 250 patients with primary diagnosis of unstable angina or myocardial infarction, 124 ones underwent coronary artery angiography and abnormal angiography results were seen in 114 patients. Myocardial infarction and unstable angina were observed in 11.5 and 88.5% of subjects with coronary arteries involvement. Also, 1.7% of the patients with abnormal angiography died due to complications of myocardial infarction. The highest rate of the involvement was seen in the age group

of 65-74 years old. There was history of coronary artery disease in 98.2% of patients with abnormal angiography and history of infarction in 15.8% of cases. History of revascularization was positive in 9.6% of patients with abnormal angiography, 4.4% of PTCA and 5.2% of CABG. The study revealed that 38.5% of patients with abnormal angiography suffered from diabetes type II and 78% from hypertension. Mean BMI was calculated for diabetic patients with abnormal angiography and non-diabetic ones was 28.4 and 28.2 kg m⁻², respectively. Also, 8.7% patients with abnormal angiography were active smokers and 18.4% of them were exposed to cigarette smoke. In 98.2 and 44.7% of cases with obstructive coronary artery diseases, there was serum total cholesterol level >150 mg dL⁻¹ and triglyceride level = 200 mg dL⁻¹. There was LDL >100 mg dL⁻¹ in 94.6% and HDL <40 mg dL⁻¹ in 47.7% of patient with abnormal angiography. BMI = 27 kg m⁻² was seen in 59.6% of patients with abnormal angiography. There was not any relationship between BMI and serum level of cholesterol, triglyceride and LDL. History of consumption of oral contraceptives was observed in 57% and positive history of family coronary artery disease in 28% of the patients. Out of 250 understudy patients, 49.6% underwent coronary angiography. Mild CAD was seen in 12% and involvement of one, two and three vessels in 20.16, 23.4 and 36.3% of cases. Normal angiography was seen in 8%. There was not found any relationship between BMI and number of the involved vessels in the angiography. There were three or more risk factors in 89.6% of the patients.

DISCUSSION

Results of the study demonstrated that angina is the most common manifestation of coronary artery disease in women (88.5%). Since, coronary artery disease is mainly detected through paying attention to the disease history, existence or nonexistence of risk factors of the disease, history of the disease and the patient's age should be seriously considered (Barchielli *et al.*, 2012). Angina and infarction are regarded as the first marked manifestation of the coronary artery disease in women and men, respectively (Virtanen *et al.*, 2010). Hypertension, as another risk factor of coronary artery disease, was seen in 78% of the understudy patients. Contribution of diabetes may be reported very important in developing coronary artery disease in women such that infarction chance has been reported as 150% in diabetic women and 50% men in comparison with non-diabetic ones in study of Myerson *et al.* (2009). It has been observed in 38.5% of patients with diabetes type II in the present study. Active smoking or being exposed to cigarette smoke increases chance of suffering from coronary artery disease. Myocardial infarction is developed at lower ages in

smoker patients and mortality rate in smoker women in 2.5 times more than that of the nonsmoker ones (Nabi *et al.*, 2008). There were few smoker women in this study. When subject of being exposed to cigarette smoke was posed, the rate increased to 27%. Considering blood lipid levels, it is said that there is a weak relationship between high levels of total cholesterol and LDL and coronary artery disease especially in older than 65 years patients. But, there is a reverse and strong relationship between HDL and coronary artery disease. In the present study, cholesterol >150 mg dL⁻¹ and LDL >100 mg dL⁻¹ were seen in 98.2 and 94.6% of the patients. The findings were not in correspondence with results of the previously conducted researches because it seems that there is a relationship between high level of LDL and coronary artery disease considering the above-mentioned rates. On the other hand, HDL <40 mg dL⁻¹ was observed in 47.4% of the patients emphasizing protective role of HDL against coronary artery disease in women and there was HDL >60 mg dL⁻¹ only in 6% of the patients. There was a reverse relationship between triglyceride level and incidence rate of coronary artery disease in this study. Also, there was triglyceride >200 mg dL⁻¹ and triglyceride level = 150 mg dL⁻¹ in 44.7 and 64.9% of the patients. There was history of consumption of contraceptives in 57% of the patients. According to the available studies, these pills contain few amount of artificial estrogen and have less vascular risks. The risk increases due to aging and smoking. Contraceptives do not increase risk of myocardial infarction unless it is consumed at ages over than 35 years or when they are associated with smoking. In these cases, angiography shows most thrombotic phenomena. Since, our understudy cases were almost at higher ages, it seems that it was associated with other phenomenon in developing atherosclerosis (Ebbesson *et al.*, 2005). There was family positive history in 28% and BMI = 27 kg m⁻² in 59.6% of the patients. Obesity rate or weight gain has been reported about 30% in white women. It indicates high frequency of obesity in our society. There were three or more and even five, risk factors of coronary artery disease in about 89% of the patients. More risk factors can be attributed to obesity of the patients since it is associated with other metabolic disorder syndromes including hyperinsulinemia, hypertriglyceridemia, hypertension and diabetes (Jafar *et al.*, 2005). Considering angiography, involvement of three, two, one and small vessels was seen in 36, 23.4, 20 and 12%, respectively.

CONCLUSION

In this study, unstable angina was introduced as the most common manifestation of coronary artery disease. There were 3 or more risk factors of coronary artery

disease in most patients. Considering the known risk factors in women, dyslipidemia, premature menopause, hypertension, oral contraceptives, diabetes and smoking were regarded as the most common ones.

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