



Ideal Cardiovascular Health by Gender in Cardiology Outpatients: A Cross-Sectional Study

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Abstract

Introduction: Ideal cardiovascular health (ICH) has defined to reduce cardiovascular disease and to improve health by 2020. The aim was to evaluate ICH and recurrence of myocardial infarctions by gender in cardiology outpatients.

Methods: The questionnaire form was applied by face-to-face interviews method by researchers. It was used American Heart Association definitions to determine the cardiovascular risk factors and ICH. Having each risk factor was defined as 1 point. According to this, the total cardiovascular health score calculated ranged from 0 to 7. It is considered statistically significant if $p \leq 0.05$.

Results: The ages of 261 participants of the study group ranged between 18 and 83, the mean age \pm standard deviation (SD) was 50.68 ± 15.39 years in the entire study group, 51.03 ± 15.17 years in men and 50.44 ± 15.58 years in women ($p > 0.05$). The ICH status among the participants was found to be 4.6%. In the study, in both sexes there was a moderate positive correlation between the total cardiovascular health score and the number of experienced myocardial infarctions.

Discussion and Conclusion: ICH frequency was found to be very low in both sexes. Furthermore, ICH score was associated with myocardial infarction recurrences in both sexes.

Keywords: Cardiovascular diseases; cross-sectional studies; myocardial infarctions.

Cardiovascular disease (CVD) is one of the most important cause of morbidity and mortality in Turkey as it is in the world^[1,2]. CVD is responsible for 31% of deaths in worldwide and 48% of deaths in Turkey^[2,3]. In recent years, the use of primary and secondary prevention strategies for the identification of risk factors for CVD diseases, especially in developed countries, has become more effective. Although studies in the United States over the past 30 years to control the risk factors have reduced mortality by about 50%, it is stated that secondary prevention is still not at the desired level^[4]. In patients who experienced myocardial infarction, the risk of recurrent disease was significantly increased, and the annual

mortality rate of these patients increased 6 times compared to the normal population^[5]. The American Heart Association (AHA) has defined ideal cardiovascular health (ICH) to reduce CVD and to improve health by 2020. Individuals with healthy lifestyle behaviors (no smoking, body mass index < 25 kg/m², adequate physical activity, and compliance with the healthy nutritional criteria recommended by the guidelines) and having optimal health factors (total cholesterol lower than 200 mg/dL, blood pressure lower than 120/80 mm/Hg, and fasting blood glucose lower than 100 mg/dL) are called ICH^[6]. It is estimated that sustaining ICH will reduce the risk of CVD by 5%^[4].

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Submitted Date (Başvuru Tarihi): 08.02.2019 **Accepted Date (Kabul Tarihi):** 09.05.2019

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The incidence of cardiovascular risk factors not only varies widely among societies but also varies widely between men and women^[7]. Physical inactivity and hyperlipidemia are more common in women, and smoking found more commonly in men^[1,7]. In addition, these risk factors do not have the same cardiovascular effects in male and female sex^[8]. For example, diabetes contributes more to cardiovascular mortality in women than in men. In addition, women's awareness of cardiovascular risk factors is reported to be inadequate than men^[9].

Intensive preventive and curative programs for risk factors in the patient group increase the survival and quality of life in patients with CVDs. It is known that the key approach for the prevention of CVDs and myocardial infarction is the modification of risk factors and this preventive approach is cost-effective^[5-7,9,10]. Considering the unchangeable characteristics of patients, such as age and gender, which will increase the risk of CVD a surveillance system to be included in health systems for the identification, monitoring, and planning of existing cardiovascular risk factors may provide useful information for achieving and maintaining ICH^[11].

It is reported that the ICH is very rare in different populations. In Turkey, there are no data related to ICH frequency. The aim of the study was to evaluate ICH and recurrence of myocardial infarctions by gender in cardiology outpatients.

Materials and Methods

This is a cross-sectional study among adults who applied to the Cardiology Policlinics of Eskişehir State Hospital for any reason.

The sample size has to be reached in the study and was calculated as at least 246 persons (CVD frequency 20%, confidence interval 95% and 5% margin of error)^[11]. 261 consecutive patients who applied to the cardiology polyclinic between study dates and accepted the study were included in the study.

To perform the study, permission of ethics committee was obtained from Eskişehir Osmangazi University Non-Interventional Clinical Research Ethics Committee and required written administrative leave was obtained from Eskişehir State Hospital administration.

The questionnaire form was applied by a face-to-face interview method by researchers after receiving the verbal confirmation from participants and informing the participants about the goals and subject of study. And the form was consisted of questions about socio-demographic char-

acteristics, cardiovascular risk factors and hypertension, diabetes, hyperlipidemia, and CVD history.

It is used AHA definitions to determine the cardiovascular risk factors and ICH. Having each risk factor was defined as 1 point. Accordingly, the total cardiovascular health score was calculated^[12]. Previously not having any CVD and not having any risk factors was defined as ideal whereas having any CVD history and/or having at least one risk factor was defined as poor cardiovascular health status. The patients were asked about their last measurement body weights and heights. According to this, those whose body mass index was over 30 were evaluated as obese. Participants were questioned about their eating habits related to salt, fat-free red meat, vegetables, fruits, and fat. More than 3 times fat-less red meat per week, <3 bowls vegetables per day, <3 fruits per day and consuming butter were taken as a nutritional criterion. Having three or more of these criteria were defined as unhealthy dietary pattern and were considered a cardiovascular risk factor^[6].

Patients whose blood pressure was above 140/90 mmHg at the last measurement evaluated as uncontrolled hypertension, those with a blood glucose level above 126 mg/dL accepted as uncontrolled diabetes, those with a total cholesterol level above 200 mg/dL were considered as uncontrolled hyperlipidemia^[6].

Socioeconomic status of the patients was evaluated as low, moderate, and high according to their statements.

The data were evaluated in computer with Statistical Package for the Social Sciences (SPSS) (version 15.0) statistical package program. Number, percentage, and mean and standard deviation (SD) values were used in the evaluation of the descriptive data. In the comparison of the groups, chi-square test was used for qualitative data and t-test was used for quantitative data. Spearman correlation analysis was used to define correlation between the total cardiovascular health score and the number of experienced myocardial infarctions. It is considered statistically significant if $p \leq 0.05$.

Results

The 261 participants of the study group had ages between 18 and 83, the mean age \pm SD was 50.68 \pm 15.39 years in the entire study group, 51.03 \pm 15.17 years in men and 50.44 \pm 15.58 years in women ($p > 0.05$). Of the study group, 107 (41.0%) were men, 185 (70.9%) were married, and 85 (32.6%) had high school and above education. Of the participants, 156 (59.8%) reported moderate income.

Differences in socio-demographic characteristics among

genders were observed only in education status of the study group. The education level of women was significantly lower than men. Distribution of socio-demographic characteristics by gender in the study group is shown in Table 1.

The most common cardiovascular risk factor in the study group was physical inactivity and it was significantly high in females (73.4%) than males (61.7%). Hypertension was the most common CVD in both gender (47.7% in males and 48.1% in females) ($p>0.05$). Percentage of smoking was higher in males ($p=0.031$). Similarly, hyperlipidemia was detected more commonly in men ($p=0.038$). It was detected that the 26.2% of men and 9.7% of women had myocardial infarction history and the rates were significantly higher in men ($p<0.001$).

The ICH status was found to be 4.6% in the study participants. The ICH frequency was 1.9% in males and 6.4% in females; no difference was found between ICH status of men and women of the study group ($p>0.05$).

The distribution of ICH parameters by gender in the study group is shown in Table 2.

In the study group, the percentage of hypertensive patients under control with hypertension was 62.7% in males and 44.6% in females; hypertension control in males was found to be more common ($p=0.046$). In the study group, achievement of goals among patients by gender is shown in Table 3.

The mean cardiovascular health score in the study group was 2.69 ± 1.47 in males and 2.49 ± 1.54 in females, with no significant difference between them ($p=0.275$). In the

Table 1. Distribution of socio-demographic characteristics by gender in the study group

Variables	Males, n (%)	Females, n (%)	X ² ; P
Age (year)			
18–29	10 (9.3)	15 (9.7)	0.733; 0.865
30–44	26 (24.3)	43 (27.9)	
45–59	39 (36.4)	49 (31.8)	
60 and above	32 (29.9)	47 (30.5)	
Marital status			
Single	26 (24.3)	50 (32.5)	2.041; 0.153
Married	81 (75.7)	104 (67.5)	
Education status			
Illiterate	7 (6.5)	21 (13.6)	7.647; 0.022
Primary and Secondary school	56 (52.3)	92 (59.7)	
High school and above	44(41.1)	41(26.6)	
Income status			
Low	26 (24.3)	44 (28.6)	1.260; 0.533
Middle	64 (59.8)	92 (59.7)	
High	17 (15.9)	18 (11.7)	

Table 2. Distribution of ideal cardiovascular health parameters by gender in the study group

Variables	Males, n (%)	Females, n (%)	X ² ; P
Hypertension	51 (47.7)	74 (48.1)	0.004; 0.951
Diabetes	21 (19.6)	34 (22.1)	0.228; 0.633
Hyperlipidemia	27 (25.2)	23 (14.9)	4.324; 0.038
Smoking	42 (39.3)	41 (26.6)	4.643; 0.031
Physical inactivity	66 (61.7)	113 (73.4)	4.007; 0.045
Obesity	26 (24.3)	48 (31.2)	1.743; 0.187
Unhealthy dietary pattern	27 (25.2)	35 (22.7)	0.219; 0.640
History of myocardial infarction	28 (26.2)	15 (9.7)	12.382; <0.001
Ideal cardiovascular health	2(1.9)	10(6.4)	P=0.130*

*Fisher's exact test.

Table 3. In the study group achievement of goals among patients by gender

Variables	Males, n (%)	Females, n (%)	χ^2 ; P
Controlled hypertension	32 (62.7)	33 (44.6)	3.985; 0.046
Controlled diabetes	13 (61.9)	12 (35.3)	3.708; 0.054
Controlled hyperlipidemia	4 (14.8)	6 (26.1)	0.986; 0.321

study, there was a moderate positive correlation between the total cardiovascular health score and the number of experienced myocardial infarctions ($r=0.541$, $p<0.001$ for men, $r=0.422$, $p<0.001$ for women).

Discussion

Low ICH frequencies reported in studies conducted in different communities indicates that the prevalence of cardiovascular risk factors globally and that these risk factors cluster in individuals. The aim of the study was to evaluate the ICH parameters by gender in those who applied to a cardiology polyclinic. The ICH frequency in participants of the study group was found 4.6%, and there was no difference between male (1.9%) and female (6.4%). In some studies, it has been reported that the ICH frequency ranges from 0 to 6.9%^[6,13-17]. In a study by Folsom et al.^[12], the ICH frequency is reported as 0.2% in men and 0.1% in women, and also in an study by Wu et al.^[18] it is reported 0.6% for males and 2.6% for females.

There was no significant difference between genders in terms of age, marital status, and income level; whereas the proportion was higher in males and those who studied high school and higher education. In a study done by Zeng et al.^[19], there was no difference between men and women among the average of age; whereas it has been reported more frequent in males who had studied high school and higher education.

In the study group, approximately half of men and women had a history of hypertension; hypertension was the most common CVD. While there was no difference in the frequency of diabetes between men and women of the study group; nearly one in five patients had diabetes (19.6% in males and 22.1% in females). Hyperlipidemia was seen in one of the four males in the study group (25.2%); this frequency was found to be reduced to one out of six or seven females (14.9%) in females in the study group. The prevalence of hypertension in adult population in Turkey is reported as, 15% of men and about 20% of women. Diabetes prevalence is reported to be 7–12.4% in men and 12–14.6% in women in our country. The history of hyperlipidemia is reported in Turkey chronic diseases and risk factors stud-

ies as 9% in men and 16% in women^[1,2,20]. Unal et al.^[21] in a large sample research, reported that diabetes in men, hypertension, and hypercholesterolemia in women were more frequent. Kılıçkap et al.^[22] indicated that in the meta-analysis, the prevalence of hypertension in Turkey is higher in women. The study was conducted among patients who applied to a cardiology polyclinic is considered as the main reason for the detection of these diseases in the research group about twice the frequency of the normal population groups.

Our findings show that the frequency of hypertension and diabetes control in males was close to each other and better than females. In hypertension patients, the percentage of under controlled was found in six of ten (62.7%) of the males and in four of the ten (44.6%) of the females. Controlled diabetes was observed in three out of ten patients (35.3%) in women, this frequency was seen in almost half of men (61.9%). Hyperlipidemia is under control in approximately one of the five patients. Turkey chronic diseases and risk factors study reports that the control frequency of hypertension, diabetes, and hyperlipidemia as 25.4%, 25.6%, and 38.1% in men and 33.2%, 32.6%, and 39.9% in women, respectively^[1]. In a study done by Tokgozoglu et al.^[23] reported that six men in ten and eight women in ten with hypertension were not under control. The high frequency of controls identified in the study group may be related to health care purchases.

The frequency of smokers among the participants was 39.3% in males and 26.6% in females, and smoking was more common among males. The frequency of smoking in our country is reported to be around 40% in males and 15% in females^[2,21,24]. Among Turkey's data of European Action on Secondary and Primary Prevention through Intervention to Reduce Events IV (EUROASPIRE IV) smoking prevalence is 35.8% in men and is about twice as often as women^[23]. In European countries, the percentage of smoking is reported to be 18% for males and 11% for females^[25]. According to the country's general data, the frequency of smoking in women is higher in the study group. When compared with similar patient groups, in both sexes, although the prevalence of smoking was similar to the re-

sults of studies reported in Turkey, it is much higher than Europe.

The frequency of physical inactivity among the participants was 61.7% in males and 73.4% in females; physical inactivity was more common in women. The least common ICH parameter in the study group was physical activity. Similar results have been reported in studies conducted by Zeng et al.^[19] Turkey Nutrition Health Survey reports similar results to our study that 67.6% of men and 76.5% of women never exercise at all. In a study “Let’s eat healthy and protect our heart” conducted in our country and consist of 12.879 people, it is reported that there are very few people doing regular exercise in both genders and its below 5% in both men and women^[26,27]. Regular exercise is less common in our country than in European countries, and it makes difficult to control other risk factors as obesity and hypertension^[28].

Our findings indicate that obesity was found in one of four males (24.3%) and one of three females (31.2%). In studies conducted in Turkey, obesity prevalence is reported in between 15.3–21.7% for men and 24.5–41.5% for women^[2,24,26]. In a study conducted by Zeng et al.^[19] it was reported that there was no difference between the genders in terms of obesity frequency and this frequency was found to be 25.7% for men and 23.5% for women.

Unhealthy dietary pattern was observed in one of the four individuals (25.2% in males and 22.7% in females) and there was no difference in the frequency of unhealthy eating between genders. A study by Tokgözoğlu et al.^[23] also supports our study. Talegawkar et al.^[29] reported that about half of the participants in their study were healthy eating habits, while in the study conducted by Kanauchi and Kanauchi^[30] was only one in ten. Lifestyle behaviors such as smoking, unhealthy diet, and physical inactivity are determinant for CVD and many chronic conditions. But reducing the mortality from CVD in some developed countries indicate that these lifestyle factors are modifiable^[19].

In the study group, the mean±SD of the total cardiovascular health parameters was 2.69±1.47 in males and 2.49±1.54 in females, but no difference was found between them ($p>0.05$). In a study by Ommerborn et al.^[15] a similar result is reported. In some studies, it has been reported that the ICH parameter frequency is lower in men^[14,16,31]. The average number cardiovascular health parameters reported by Fang et al.^[32] in their study is 4.55 in females and 4.20 in males. In the study, there was a moderate positive correlation between the total cardiovascular health score and the number of passed myocardial infarcts. In a meta-analysis

by NaFang and friends, it is reported that as the number of ICH parameters increases in individuals, the risk of cardiovascular events and strokes decreases, and total and cardiovascular mortality decreases^[16,17,33]. The study by Miao et al.^[14] reported that if the total ICH score increases, the risk of myocardial infarction decreases by approximately 20%. A modeling in study conducted by Wilsgaard et al.^[17] those who have 3 or fewer ICH parameters, it is reported that almost six myocardial infarcts can be prevented by a few increases in one of this numbers (with four and above). The present study had both advantages and limitations. The number of participants and cross sectional design is the limitations. However, it is valuable because of being one of the rare studies which evaluate the ICH in Turkey.

Conclusion

Ideal cardiovascular health frequency was found to be very rare. In both sexes, ICH score was associated with myocardial infarction recurrence. Protection from CVDs through lifestyle modifications rather than through increased medications is a more effective and reliable method^[34].

Ethics Committee Approval: Eskisehir Osmangazi University Non-Interventional Clinical Research ethics committee (date and number of the approval 19.06.2017, 80558721/G-200-03).

Peer-review: Externally peer-reviewed.

Authorship Contributions: Concept: E.D., G.D., S.M.; Design: E.D., G.D., S.M.; Data Collection or Processing: E.D., G.D.; Analysis or Interpretation: G.D., S.M.; Literature Search: E.D., G.D.; Writing: E.D., G.D., S.M.

Conflict of Interest: None declared.

Financial Disclosure: The authors declared that this study received no financial support.

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