Risk Factors of Cardiovascular Diseases in Elderly People
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Abstract

Introduction: Cardiovascular diseases are the major cause of mortality in women and men all over the world. This study aimed to evaluate the prevalence of cardiovascular diseases and associated risk factors in the elderly people.

Methods: This descriptive study has been done on 382 elderly people in 2009. Samples were chosen from different regions of Tehran city by random-cluster sampling method. Data was collected by researcher made questionnaire and also measurement of the height and weight (body-mass index), blood pressure, blood lipids and fasting blood sugar. The data analyzed using descriptive-analytical statistical method and SPSS 17 software.

Results: Risk factors of cardiac vascular diseases (and their prevalence) included obesity and overweight (48.1%), high triglyceride (37.2%), lack of exercise (36.4%), high cholesterol (32.2%), high systolic (31.4) and diastolic (28.0%) blood pressure, cardiovascular diseases (27.3%), tobacco consumption (19.7%), high fasting blood sugar (14.7%), and positive family history (13.4%). Prevalence of different risk factors of cardiac vascular diseases was significantly higher in men than women (P<0.05) except fasting blood sugar, physical inactivity and lack of exercise.

Conclusion: The results of the present study showed that the prevalence of risk factors for cardiac vascular diseases was high and higher in men than women. Therefore, educating individuals, control of risk factors and screening are suggested.

Keywords: Cardiovascular disease, Risk factors, Prevalence, Elderly people.

Introduction
Cardiovascular disease is the major cause of mortality in the United States and all over the world [1]. According to the reports of the World Health Organization, at least 15 million deaths happened in the world from which 30% is related to the cardiovascular diseases [2]. In addition, it causes the death of 500 thousand women in the United States annually which is more than deaths resulted from accidents, cancer and diabetes in this country [3]. The studies showed that prevalence of cardiovascular disease is in Santiago (32.2%), Montevideo (23.8%), São Paulo (19.8%), Buenos Aires (24.1%), Bridgestone (11.1%) and Mexico City (10.0%) [4]. Cardiovascular disease can cause increase in mortality, disability, low quality of life, high expenses and social problems [5]. Economically, the related costs with this disease was estimated about 400 billion dollars [1]. In the UK also, 1.6 billion pounds spent for coronary artery disease annually which cost of hospital care is about 55% of all the expenses [5]. The first and most common cause of death in Iran is also cardiovascular disease [7]. According to Tehran cemetery statistics, every month, 900-1200 people are dying due to heart disease [8]. Moreover, based on studies conducted in Iran, the prevalence of cardiovascular disease, diabetes, hypertension and smoking was reported 32.2%, 38%, 32% and 40% respectively [2]. Economically, the cost of treating these patients was so high so that in 2008, 500 million dollars had spent for their treatment [10]. The following factors had caused the increase of cardiovascular disease: age, sex and inheritance (which are not changeable), smoking, hypertension, abnormal blood
sugar, high blood lipid, stress, obesity and physical inactivity (which are changeable) [11]. Studies in Spain indicated that prevalence of risk factors are as the following respectively: hypercholesterolemia (46.7%), hypertension (37.6%), smoking (32.2%), obesity (28.8%) and diabetes (6.2%) [12]. Since, the more people exposed to more risk factors, the more they are susceptible for incidence of cardiovascular disease [13], and with increasing the knowledge and education, screening and control of these factors, the prevalence of this disease can be prevented or be delayed [14], therefore, this study with specific objectives aimed to evaluate risk factors for cardiovascular disease in elderly people and also comparing these factors in elderly men and women in Tehran.

Methods

This was a descriptive study conducted on 382 men and women over 65 years old. In this study, random-cluster sampling method was used i.e. elderly people in different regions of Tehran (North, East, West and Center) were selected by visiting them at their nursing homes. The subjects of the study were assured about the confidentiality of their information. Therefore, the following data collected using questionnaire after receiving informed consent: questions such as age, sex, marital status, educational level, current and previous occupation, history of cardiovascular disease, family history of cardiovascular disease, the duration of the disease and its treatment methods, smoking cigarette or tobacco consumption (the person who currently smoke or had quitted smoking during past 12 months), physical activity (the quantity and duration of these sport activities) and also measuring height and weight (BMI between 25-30 and more than 29.9 kg/m² were considered as overweight and obesity respectively), blood pressure (hypertension refers to systolic blood pressure over 140 mm Hg diastolic blood pressure over 90 mm Hg and/or taking lowering blood pressure medications), lipid (cholestrol 200 ml/dL and more, and triglycerides 150 and more and/or taking lipid lowering medications considered as high blood lipid) and FBS (fasting blood sugar above 126 or taking lowering blood sugar medications considered as high blood sugar). To determine the validity of the questionnaire (content validity) the comments of 10 professors and cardiologists were used and for its reliability, re-test method was used (r=0.95). Twelve hours after fasting, biochemical tests were measured on their blood. In addition, blood pressure was measured two times with different intervals in sitting position and its average was determined as person's blood pressure. Height and weight of the subjects measured without shoes and with minimal clothes and their body mass index calculated (dividing body weight by square of the height). Finally, collected data analyzed using software SPSS and chi-square, accurate Fisher and Pearson correlation coefficient tests (P<0.05).
Table 1. Frequency distribution of the risk factors in subjects in terms of age

<table>
<thead>
<tr>
<th>Factor</th>
<th>Sex status</th>
<th>Male</th>
<th>Female</th>
<th>Test results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dynamic</td>
<td>Rate</td>
<td>Rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inactive</td>
<td>Rate</td>
<td>Rate</td>
<td></td>
</tr>
<tr>
<td>Activity status</td>
<td></td>
<td>percentage</td>
<td>percentage</td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td>Always</td>
<td>104</td>
<td>27.2</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Sometimes</td>
<td>78</td>
<td>20.4</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Very low or never</td>
<td>23</td>
<td>6.0</td>
<td>27</td>
</tr>
<tr>
<td>BMI</td>
<td>Less than 20 (thin)</td>
<td>33</td>
<td>8.6</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>20-25(normal)</td>
<td>79</td>
<td>20.7</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>25-30 (overweight)</td>
<td>60</td>
<td>15.7</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>More than 30 (obesity)</td>
<td>33</td>
<td>8.6</td>
<td>33</td>
</tr>
</tbody>
</table>

Table 2. Frequency distribution in duration of risk factors in studied subjects

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Duration</th>
<th>Less than 5 years</th>
<th>5-10 years</th>
<th>More than 10 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Diabetes</td>
<td>23</td>
<td>34.8</td>
<td>15</td>
<td>22.8</td>
</tr>
<tr>
<td>Blood lipids</td>
<td>34</td>
<td>36.2</td>
<td>32</td>
<td>36.4</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>28</td>
<td>23.7</td>
<td>41</td>
<td>36.2</td>
</tr>
<tr>
<td>CVD</td>
<td>38</td>
<td>36.9</td>
<td>39</td>
<td>37.3</td>
</tr>
<tr>
<td>Smoking</td>
<td>2</td>
<td>3.1</td>
<td>7</td>
<td>10.2</td>
</tr>
</tbody>
</table>

Results

Personal information of the subjects included 205 males (53.7%) and 177 females (46.3%) with mean age of 74.1±7.87 years old. The subjects divided into three groups (in terms of age groups) of 65-74, 75-90 and over 90 years old. 4.2% of the subjects were single, 40.6% married, 9.4% divorced and 45.8% had lost their wives. 44.2% of the subjects were housewives, 9.2% workers, 18.6% employees, 8% jobless, and 27.2% self-employed. Besides, 72.3% of the subjects were illiterate and the rest (27.7%) were literate.

History of cardiovascular disease in men and women was 16.8% and 10.5% respectively. Positive cardiovascular family history was 7.9% and 5.5% in men and women respectively, that there was not any significant relationship between them statistically (P>0.05). In addition, 16.8% and 2.9% of the men and women had the history of smoking respectively that this difference was significant in both genders (P<0.001). Statistically there was not any significant relationship between the quantity of exercising, sport activity with sex and also various age groups in elderly people (P>0.05) (Table 1).

31.4% of the subjects (17.5% men and 13.9% women) had systolic blood pressure above 140 mm Hg and 28% (16.8% men and 11.3% women) had diastolic blood pressure above 90 mm Hg, that there was not any significant relationship between two genders.
statistically (P>0.05). FBS in 14.7% of the subjects (6.3% men and 8.45 women) was 126 and more which was not significant statistically (P>0.05). Moreover, 17.3% of the men and 14.9% of the women had cholesterol levels above 200 which there was a significant difference between two genders statistically (P<0.05). While, 18.15 of women and 19.15 of men had triglyceride levels of 150 and more which there was not any significant relationship between two genders statistically (P>0.05). The duration of the risk factors in subjects is given in table 2. In addition, the means of the variables have reported as following: BMI 24.9±4.68, systolic blood pressure 132.0±17.5, diastolic blood pressure 79.63±11.6, cholesterol 188 ± 52.19, triglyceride 136.1±50.4 and FBS 102.3±39.1.

Discussion
Several risk factors has made cause and exacerbation of cardiovascular diseases such as diabetes, high blood lipids, inactivity, lack of regular physical activity, positive family history of heart diseases, obesity and smoking [15]. The mean of the obtained risk factors in the present study was in accordance with its Western sample so that in study of Carols [16], the average systolic and diastolic blood pressure was 134 ± 15.0 and 80 ± 10.0 respectively. In study of Karalis also [17], the average FBS and cholesterol was 98.5 ± 43.6 and 197.2 ± 39.1 respectively. In the present study, the prevalence of heart diseases was higher in men than in women. In addition, in several similar Western studies, similar results were obtained [16, 18, 19]. Positive family history of cardiovascular disease in this study was higher in men than in women as well as study of Najafi et al [20]. Smoking (smoking here refers to tobacco consumption) is one of the greatest controllable mortality factors all over the world [20] and is one of the three major factors in creating coronary artery disease [21]. In this study, smoking rate was higher in men than in women. The study of Carols also indicated that smoking significantly (P<0.001) was higher in men (13.6%) than in women (5.2%) which this was observed in similar studies too [16, 22, 23]. Hypertension is considered as one of the important risk factors in cardiovascular diseases [24]. In the present study, the prevalence of both systolic (above140) and diastolic (above 90) blood pressure was higher in men than in women which this was similar to local research (prevalence of systolic and diastolic blood pressure in men was 250% and 21.1% respectively and in women was 16% and 20% respectively) and Western research [23, 25]. While, blood sugar level above 126, was higher in women in comparing with men. Gabriel also showed that prevalence of FBS above 126 in ages over 65 years old was more in women (13.3%) than in men (12.9%) [26]. On the other hand, cardiovascular system is affected by inactivity, so that sport activities in men were higher than in women. In addition, with increasing age, the rate of physical activity and sport activity significantly decreased in both genders. That is because, with increasing age, functional abilities of the individual decrease and subsequently the activity and mobility would also be reduced [28]. This was in accordance with local [29] and foreign studies [13, 23]. Moreover, Sharifi rad in his study showed that 26.6% of the elderly people were continuously exercised and 46.2% of them never had any exercise [9]. The association of increase in blood cholesterol levels and heart disease has been well accepted [13]. In this study, prevalence of
cholesterol over 200 and also triglycerides over 150 was higher in men than in women. This was similar to local and foreign studies [2, 24]. The obesity is another factor causing cardiovascular diseases [7]. The American Heart Association declared obesity as the biggest changeable factor in cardiovascular diseases [30]. Body mass index of over 30 (obesity) in this study was equal in both men and women, while in elderly people, with increasing age in both genders, the obesity reduces [31]. This finding was in accordance with the study results of Hennis et al [21].

**Conclusion**
Finally, the results of the present study showed that risk factors of cardiovascular diseases in elderly people in Tehran had a significant outbreak. In addition, the prevalence of all the risk factors except FBS and inactivity, in men was higher than in women, so that totally prevalence of risk factors of cardiovascular diseases was higher in men than in women. Therefore, application of education for changing lifestyle such as quit smoking, implementing regular exercise programs, diet modification and appropriate BMI can prevent from cardiovascular diseases and decrease disability and mortality resulted from this disease. At the end, it is recommended that for more comprehensive and accurate research, similar studies with similar objectives be done in different age groups and other cities of Iran and compare those results with the results of the present study.

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