History of Fertility and Coronary Artery Disease in Iranian Women Older than 50 Years Old

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Coronary artery disease (CAD) is a leading cause of mortality, morbidity, and disability in Iranian population. In this study, the association between parity and the presence of CAD in women more than 50 years old age have been investigated in case (100 female patients with documented angiography-defined CAD) and control (320 female subjects with normal echocardiogram) group. Logistic regression analysis revealed that number of pregnancies and hysterectomy with ovariectomy was independent risk factors associated with CAD in this study.


Abstract

Keywords: Fertility ● Coronary artery disease ● Women

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Introduction

Coronary artery disease (CAD) is a common disease in Iran and is a major leading cause of morbidity and mortality in this country. The prevalence of CAD increases in women in the age of post-menopause in comparison with the men in this age range. Pregnancy is associated with structural and functional changes in the cardiovascular system. Pregnancy is a condition of relative insulin resistance and most authors proved stressed biological pathways for this association. Humphries et al (2001) demonstrated that high parity is associated with lower HDL cholesterol levels and higher glucose/insulin ratios long after childbearing has ceased. Total cholesterol, LDL cholesterol, and triglycerides increasingly elevated during pregnancy. Several investigations reported the possibility of association between gravity or parity and increased risk of cardiovascular disease in women. However there are some reports that did not show the constant relation. A higher number of children is associated with increased carotid atherosclerosis in both younger and older women indicated that child bearing might be a risk factor for atherosclerosis. Bertuccio (2007) reported that parity is associated to the increased AMI risk, mainly among pre-/perimenopausal women and among smokers. Hardy et al (2007) reported not constant relation between parity and CAD risk factors and they explained in this way that any association between number of children and CAD risk factors is a result of lifestyle and behaviours associated with family life rather than being as result of the biological impact of pregnancy in women. We investigated the association between parity and the presence of CAD in women more than 50 years old age.

Methods

This study was conducted in a case control descriptive analytic design. The case group was 100 female patients with documented angiography-defined CAD. The control group included 320 subjects who were selecte from general popoulation among those who have visited in a general clinic for non-cardiac causes. Both of groups were matched for age and other variables. All the subjects in case and control groups were > 50 years old and also have the positive history of pregnancy. For the case group demographic, numbers of pregnancy, cardiovascular risk factors and other required data were gathered by using their medical records and also interviewing them. The same data were gathered for the control group. The data were subjected to statistical evaluation, using SPSS II, with descriptive statistics (mean, median, standard deviation [SD] and interquartile range) being determined for all variables. In our comparisons t-tests and chi-square tests were used for quantitative and qualitative variables. A p <0.05 was considered significant. Logistic regression analysis was used to predict whether CAD is related to pregnancy and other analysed risk factors.

Results

In case group 42 patients (58.3%) were urban residents and in control group 203 subjects (63.4%) were urban residents. The mean age of the patients in case and control group were 61.11± 8.48 (Min: 50, Max: 85) and 60.01± 8.62 (Min: 50, Max: 85) respectively. There was no significant difference between the age of two groups (p=0.10). In case group 73 (73%) were married, 4 (4%) were divorced and 23 (23%) were widower. In control group the percentage of married, divorced and widower subjects were 283 (88.4%), 3 (0.9%) and 34 (10.6%) respectively. There was no significant difference between the marriage status of two groups (p=0.30). Logistic regression analysis was performed to assess the relative importance of selected parameters (mother age; number of pregnancies; menarche age; abortion; preterm labor; hyperlipidemia; hysterectomy with ovarectomy and age in the first pregnancy) in determining the presence of angiographically defined CAD. Logistic regression analysis revealed that mother age (OR, 1.04; CI,1.07 to 1.01; P=0.001), number of pregnancies (OR, 1.08; CI,1.16 to 1.00; P=0.0001) menarche age (OR, 0.77; CI,0.91 to 0.65; P=0.008),abortion (OR, 0.21; CI,0.41 to 0.10; P=0.001), preterm labor(OR, 1.94; CI,2.56 to 1.47;
P=0.003), hyperlipidemia (OR, 0.14; CI,0.25 to 0.008; P=0.001), hysterectomy with ovarectomy (OR, 3.10; CI,5.04 to 1.90; P=0.001) and age in the first pregnancy (OR, 0.87 CI,0.93 to 0.81; P=0.004), were independent risk factors associated with CAD in this study (Table 1).

Table 1 - The Relative Risk of CAD Associated with Individual Coronary Risk Factors

<table>
<thead>
<tr>
<th>Variables</th>
<th>Odds Ratio</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pregnancies</td>
<td>1.08</td>
<td>(1.16-1.00)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Preterm labor</td>
<td>1.94</td>
<td>(2.56-1.47)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Abortion</td>
<td>0.21</td>
<td>(0.41-0.10)</td>
<td>0.21</td>
</tr>
<tr>
<td>Menarche age</td>
<td>0.77</td>
<td>(0.91-0.65)</td>
<td>0.77</td>
</tr>
<tr>
<td>Age of the first pregnancy</td>
<td>0.87</td>
<td>(0.93-0.81)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hysterectomy and ovarectomy</td>
<td>3.10</td>
<td>(5.04-1.90)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>0.14</td>
<td>(0.25-0.08)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mother age</td>
<td>1.04</td>
<td>(1.07-1.01)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Number of Term labors</td>
<td>0.99</td>
<td>(0.91-1.07)</td>
<td>0.92</td>
</tr>
<tr>
<td>Number of live neonates</td>
<td>1.00</td>
<td>(0.91-1.11)</td>
<td>0.67</td>
</tr>
<tr>
<td>Number of still births</td>
<td>1.19</td>
<td>(1.05-1.35)</td>
<td>0.10</td>
</tr>
<tr>
<td>Age of the last delivery</td>
<td>0.96</td>
<td>(0.92-1.00)</td>
<td>0.13</td>
</tr>
<tr>
<td>Menopause age hypertension</td>
<td>1.32</td>
<td>(0.65-2.07)</td>
<td>0.43</td>
</tr>
<tr>
<td></td>
<td>0.47</td>
<td>(0.26-0.84)</td>
<td>0.01</td>
</tr>
</tbody>
</table>

CAD, coronary artery disease; CI, confidence interval; Adjusted odds ratios with 95% confidence intervals (95% CI) obtained by multiple logistic regression. Models were adjusted by logistic regression analysis for the association with CAD among our subjects.

Discussion

These data showed a significant association between the number of pregnancies and CAD which is consistent with the reports of other studies. Increase of different cardiovascular risk factors in the condition of pregnancy might be the etiology of the findings of this study. Augmented risk of insulin resistance during pregnancy might be one of the most important effective factors of increased CAD in the women with multigravity. Multigravid women fat distribution would be affected by the hazardous effect of insulin resistance. It is indicated in the results of this study that hysterectomy and ovarectomy is an independent risk factor of CAD which is the same as the findings of other studies which determine the effect of hysterectomy and ovarectomy on progression of CAD. The absence of estrogen might be the causative factor of higher CAD in these women. Pregnancy complications is associated with increased risk of cardiovascular disease. Our findings in this study clarified a strong association between high numbers of pregnancy and increase progression of CAD that should be considered imperatively in the society of Iran as a very effective risk factor. Recommendations and suggestions of physicians for the women who decide to have higher gravities especially in whom with the positive family history of CAD must be well thought out. Gravidity itself or some other unmeasured factor accounts for the increase in risk that we observed requires further investigation.

References


