Prevalence of Abdominal Aortic Aneurysm in Patients with Coronary Artery Disease

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Abstract

Background: The prevalence of abdominal aortic aneurysm (AAA) increases with age and affects almost 5% of the population who are >50 years old. It has been demonstrated that ultrasound examination is accurate in identifying and following patients who have AAA and is favoured as a screening method in subjects who are at high risk. It has been previously demonstrated that, there may be a relation and coincidence between AAA and coronary artery disease (CAD), however the debate is ongoing. This study aims at evaluating the prevalence of AAA in patients with CAD.

Methods: In an analytic-descriptive cross-sectional study, 234 candidates for coronary artery angiography were studied in Tabriz Imam Khomeini and Madani Hospitals during an 18 month period. Abdominal duplex ultrasonography was employed for examining the cases for presence of AAA, which was considered as presence of abdominal aortic diameter ≥ 30 mm. Frequency of AAA was compared between the two groups.

Results: One hundred eighty four patients with CAD and 50 age and sex-matched controls without CAD were enrolled in the study. Frequency of AAA was 4.3% in those with CAD versus zero in those without it (p=0.208). According to ROC curve analysis, age of patients with CAD (≥ 67 years) predicted the presence of AAA with a sensitivity and specificity of 75% and 80%, respectively. In this age group, frequency of AAA was 14% and zero respectively in those with and without CAD. Frequency of AAA was 2.2%, 5% and 8.8% in patients with 1vessel, 2vessels and 3vessels CAD, respectively (p=0.269).

Conclusion: According to the current study, age is a significant risk factor for AAA in patients with CAD. So it is recommended that the screening program with duplex ultrasonography be considered in older patients with CAD. For determining an exact age-related cut-off point, further studies with larger sample sizes are recommended to be carried out. (J Cardiovasc Thorac Res 2009; Vol.1 (1): 1-4)

Keywords: Abdominal Aortic Aneurysm • Duplex Doppler Ultrasonography • Coronary Artery Disease.

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**Introduction**

Abdominal aortic aneurysm generally is a white men disease and affects 5% of men above 50 years. Aneurysm rupture probability is increasing after the age of 50 years. Its average rupture age is 76 years. The prevalence of abdominal aortic aneurysm (AAA) is increasing in developed countries, probably due to improvement of health care in these countries. The accurate prevalence of AAA in European and other Western countries is clear and well established but in Asian population, especially in Middle East, studies are so limited. In small studies which were conducted in Japan and Malaysia it has been shown that the prevalence of AAA is very low, but because of increasing the average age and changing the lifestyle during the late years, its prevalence is increasing.

**Methods**

In this descriptive study, 184 patients with coronary artery disease and 50 age and sex matched healthy people were studied for AAA using Doppler ultrasonography. This research was conducted in Tabriz Imam Khomeini and Madani Hospitals during an 18 month’s period, from August 2007 to February 2009. In this study 184 people with coronary artery disease, based on angiographic findings (coronary artery disease was defined as more than 50% constriction in epicardial segment), and 50 without coronary artery disease, were studied for AAA , using color Doppler ultrasonography; laboratory analysis were conducted in both groups. There was no sex and age difference between two groups. The maximum diameter of abdominal aorta and the maximum diameter of aorta at supra and infrarenal level were measured in both groups (groups with and without CAD).

**Results**

In 8 cases (4.3 %) of coronary artery disease group, aneurysm was seen but totally from this aspect there was no significant difference between two groups (p = 0.208), it is necessary to mention that all of the aneurysms were located in infrarenal portion of aorta and thrombosis was seen in 3 cases. The mean diameter of suprarenal aorta in the CAD positive group was 19.94±2.82 mm and in the control group, was 19.51±2.39 mm, from this aspect there was no meaningful difference between two groups (p= 0.329). The mean diameter of infrarenal portion of aorta in CAD positive group was 18.64±4.98 mm and in non CAD group was 18.02±2.97 mm, also this difference was not significant (p= 0.4). The average age of people who had coronary artery disease and AAA was 68.25 ± 7.09 years, the average age of the group without aneurysm was 59.28 ±8.73 years. All of aneurysms were detected in males (8 cases) (Fig. 1).

![Figure 1: The prevalence of coronary artery disease with and without abdominal aortic aneurysm (AAA) in different gender.](image)

In AAA positive cases, CAD was present in one vessel in 2 cases, in two vessel in 3 cases and in three vessel in 3 cases (Fig 2). In CAD positive patients with one vessel involvement the mean diameter of suprarenal and infrarenal aorta were 19.74 ±2.52 mm and 18.06±3.79 mm respectively and also19.93 ±3 mm, 18.68±3.79 mm and 20.59 ±3.15 mm, 20.24±6.53 in two and In AAA positive cases, CAD was present in one vessel in 2 cases, in two vessel in 3 cases and in three vessel in 3 cases. Three vessels groups, so there was no significant difference between groups (p= 0.321, 0.096 respectively). The mean diameter of aneurysm of aorta was 32.65±0.8 mm, 37.8 ±7.35 mm and 37.5 ± 5.17 mm in one, two and three vessel
Figure 2: The severity of coronary vessels constriction in patients with coronary artery disease, with and without abdominal aortic aneurysm (AAA) groups respectively, this difference was not significant (p = 0.269).

In CAD positive patients with one vessel involvement the mean diameter of suprarenal and infrarenal aorta were 19.74 ±2.52 mm and 18.06±3.79 mm respectively and also 19.93 ±3 mm, 18.68±3.79 mm and 20.59 ±3.15 mm, 20.24±6.53 in two and three vessels groups, so there was no significant difference between groups (p = 0.321, 0.096 respectively).

Discussion

In this study the prevalence of AAA in patients with coronary artery disease was compared with those without CAD (age and sex were matched). Prevalence of AAA in patients with coronary artery disease was 4.3%, and zero in control group but the difference between two groups was not meaningful (p = 0.208). At the study of Hertez et al. on 1000 patients, there was a coincidence between AAA and coronary artery disease. Based on study of Madaric et al. prevalence of AAA was 14% in CAD positive patients who were older than 60 years. Hanly et al. showed that in 9.9% of patients who needed bypass of coronary artery, AAA was present, this was 13% in the study of Bergersen et al. (10). Ito et al. in a study on 211 patients with established AAA, showed that 53% of them had coronary artery disease. Langanay et al. studied 172 patients with AAA that 31% of them had coronary artery disease too. Bayazit et al. studied 125 AAA patients and found that the incidence of coronary artery disease was 53% in them. In the study of Garofalo et al. on 126 AAA patients, coincidence of coronary artery disease was 35.7%. In another study conducted by Kioka et al. on 94 patients with infrarenal AAA, the prevalence of coronary artery disease was 45.7%. In our study all of AAA was detected in CAD positive group, this may be due to small number of aneurysms in our study group (just 8 cases in two groups).

It is obvious that increasing the age of patients is a main risk factor for AAA. Comparing the patients with and without AAA, it is clear that the mean age of AAA group was meaningfully higher than other group and the risk age point was 67 years (Fig. 3). According to ROC curve analysis, age of patients with CAD (≥ 67 years) predicted the presence of AAA with a sensitivity and specificity of 75% and 80%, respectively.

In our study the prevalence of AAA was higher in patients with two and three coronary vessels involvement than single vessel group, Frequency of AAA was 2.2%, 5% and 8.8% in patients with 1-vessel, 2-vessels and 3-vessels coronary artery disease, respectively (p = 0.269), but this difference was not statistically meaningful. Similar results were obtained by Ito et al. and also by Rigatoli and coworkers.
References