

Epidemiologic Characteristics of Premature Coronary Artery Disease among Patients who Underwent Coronary Artery Bypass Grafting



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Abstract:

Back ground:

Introduction: Coronary artery disease (CAD) is commonly seen in patients older than 50 years old. The purpose of this study was to evaluate demographic variables and risk factors among patients with premature coronary artery disease (PCAD) who were candidate of coronary artery bypass grafting.

Methods: In this retrospective study which was conducted in Baqiyatallah hospital in Tehran, from March 2005 to March 2007, 83 patients with angiographically proved CAD were included; PCAD defined as CAD under the age of 45 in males and 55 in females.

Results: There were 48 (57.8%) males and 35 (42.2%) females. The mean age of patients was 45.6 years (range, 31 to 55). Hyperlipidemia (70 cases, 84.3%) and hypertension (67 cases, 80.7%) were the most common detected risk factors. Fifty-one patients (61.4%) had three-vessel disease. Significant difference was seen between two genders in term of smoking and diabetes ($P < 0.05$).

Conclusion: By earlier diagnosis of hyperlipidemia and hypertension in young population, premature coronary artery disease should be prevented.

Keywords: Coronary artery disease, premature, risk factor, prevention

Introduction:

Coronary artery disease (CAD) constitutes half of cardiovascular diseases, assumed as the leading cause of death in the world. Different risk factors cause increase in the incidence of CAD like hyperlipidemia, insulin resistance,

smoking, positive family history, and advancing age.(1)Epidemiologic studies have noted that CAD is an age-related disease, which commonly is seen among men over 40 years of age and in women over 50 years. Previous reports have shown that risk factors can be different in young patients with Premature Coronary Artery Disease (PCAD) compared to old ones. Hypercholesterolemia, familial history of coronary artery disease, and cigarette smoking all have been demonstrated as predominant risk factors in younger patients.(2-4) PCAD is of great importance due to young age of the affected patients who are in the productive years of their life. Most of these reports relate to developed countries; however regarding regional differences in genetic, environmental, and habitual factors, the prevalence of CAD and cardiovascular risk factors distribution can be different in developing countries.(5) By evaluating young patients with CAD in these societies, new concepts and experiences are gathered that can be useful in clinical practice. The purpose of the current study was to describe conventional risk factors in a young group of patients with CAD undergone coronary artery bypass grafting (CABG) surgery.

Methods and Materials:

This retrospective study was performed in cardiac surgery ward of Baqiyatallah hospital from March 2005 to March 2007. Inclusion criteria consisted of all patients, hospitalized from both genders for CABG surgery. PCAD defined as CAD under the age of 45 in males and 55 in females.

Their medical records were reviewed by medical research assistants and following variables were recorded: demographic data (age and gender), conventional risk factors, previous history of myocardial infarction (MI), and number of atherosclerotic coronary vessels in angiography. The conventional risk factors were defined as follow: (6)

- Hypertension: blood pressure greater than 140 mmHg systolic or greater than 90 mmHg diastolic or the patient was treated for hypertension on admission;
- Hyperlipidemia: total cholesterol more than 200 mg/dL or LDL more than 130 mg/dL;
- Diabetes mellitus: fasting blood glucose more than 126 mg/dL in two times or receiving antidiabetic medications;
- Obesity: body mass index (BMI) more than 25 kg/m²;
- Family history: report of acute coronary events in first degree relatives.

The major coronary arteries and their branches considered were left anterior descending artery, right coronary artery, and circumflex artery. Vessel disease was defined as greater than or equal to 70% obstruction. For statistical analysis, descriptive indices like frequency, percentage, mean and standard deviation (\pm SD) were used for expressing the data. The chi-square test was used for comparison of categorical variables. For numerical variables the student t-test was used. P values less than 0.05 were considered statistically significant. All analyses were performed using SPSS software for Windows (version 11.5) (Microsoft Inc., Chicago, IL).

Results:

Eighty-three patients were included, of whom, 48 (57.8%) were male and 35 (42.2%) were female. The mean age of patients was 45.6 years (range, 31 to 55). Hyperlipidemia was the most common conventional risk factor detected in 70 patients (84.3%), followed by hypertension (67 cases, 80.7%). The frequency of conventional risk factors is presented in Figure 1. The frequency of studied conventional risk factors in term of the gender of patients is presented in Table 1. As shown, statistically significant differences were seen regarding smoking (48% in males vs. 2.8% in females) and diabetes mellitus (71.5% in females vs. 33.3% in males) between two genders ($P \leq 0.001$). There were no significant difference in the other risk factors between males and females.

Previous history of MI was reported in 38 patients (45.8%). Mean (\pm SD) preoperative left ventricular

ejection fraction (LVEF) was 45.5 (± 6.8) percent. Mean (\pm SD) of LVEF at discharge was 50 (± 6.6) percent which showed a statistically significant increase compared to pre-operative values ($P < 0.001$).

Mean (\pm SD) number of involved vessels before surgery was 2.5 (± 0.7). Three-vessel disease was the most common form reported in 51 (61.4%) patients. Twenty-two patients (26.5%) had two-vessel disease, and 10 (12%) patients diagnosed as having one-vessel disease. Figure 2 shows the frequency of involved vessels in two genders. No significant difference was found regarding number of affected vessels in two genders.

Discussion:

CAD is an uncommon entity in young patients; however it constitutes an important problem for both the patient and physician because of the devastating effect of this disease on the active lifestyle of younger patients. The Framingham study reported a 10-year incidence rate per 1,000 of myocardial infarctions of 12.9 in men 30 to 34 years old and 5.2 in women of 35 to 44 years old. Generally, about 4% of patients with a myocardial infarction are younger than 40 years old. (7) Young patients may have different risk factor profiles, clinical presentations, and prognoses compared to older patients. All of these factors should be taken into consideration when treating young patients with CAD. The current study was conducted in a tertiary referral center in Tehran, and all groups with different socioeconomic situations had the chance to be included. All patients had angiographically proven atherosclerotic CAD, and were CABG candidates. According to our findings, hypertension and hyperlipidemia were the most common detected risk factors. This finding is contrary to former reports. Cigarette smoking and positive family history have been reported frequently as major risk factors in young patients admitted for myocardial infarction or underwent CABG. (8-11) About 29% of our patients were smokers which is much less prevalent than former reports of 95%. (9) Another considerable finding was low prevalence of positive family history, i.e. 18% in comparison to 42% in a study by Garioufalis et al. (9) One of the limitations was lack of enough information about the duration of hyperlipidemia and hypertension. Both Hyperlipidemia and hypertension are accepted risk factors for CAD. Early detection of these risk factors by periodic physical and laboratory examinations taken by primary health care providers can be of great help in prompt diagnosis and prevention of CAD.

The number of involved vessels was also different from former reports. Three-vessel disease was detected more common than one- or two-vessel disease; whereas less extensive or single vessel disease has been introduced commonly in patients less than 40 years of age.(12-14) This difference can be attributed to formerly stated difference of conventional risk factors between the current and previous studies.

Besides to traditional risk factors that were evaluated here, there are some other new risk factors (for example C-reactive protein, lipoprotein (a), etc) that were not studied. The current report provided some evidences about CAD in young patients. There is no doubt that through recognition of modifiable risk factors in younger population, earlier prevention of CAD and its adverse effects can be achieved.

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Table 1. Frequency of conventional risk factors according to the gender of patients.

	Male (n = 48)	Female(n = 35)	P value
Hypertension	38 (79.2%)	29 (82.8%)	0.6
Hyperlipidemia	39 (81.2%)	31 (88.6%)	0.3
Diabetes mellitus	16 (33.3%)	25 (71.5%)	0.001
Obesity	11 (23%)	10 (28.6%)	0.5
Positive familial history	9 (18.7%)	6 (17.1%)	0.8
Cigarette smoking	23 (48%)	1 (2.8%)	< 0.001

Fig. 1. The frequency of risk factors in 83 patients with premature coronary artery disease

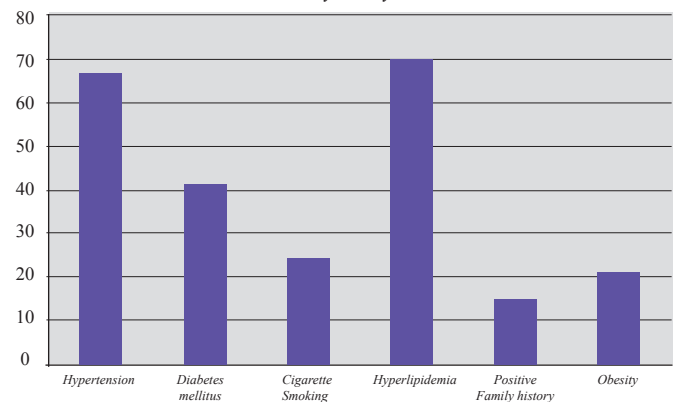


Fig. 2. The number of involved coronary vessels in term of gender

