AGE AND GENDER WISE DISTRIBUTION OF RISK FACTORS AMONG PATIENTS WITH CORONARY ARTERY DISEASE.

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ABSTRACT

OBJECTIVE: To describe conventional risk factors by age and gender in coronary artery disease patients.

MATERIALS AND METHODS: This study was conducted in outdoor patient department of agency headquarter hospital (AHQ) Landikotal, Khyber agency, from June to October 2013. It was a hospital based descriptive observational study. Sample size was 926 patients with established coronary artery disease, recruited through purposive convenient sampling technique. Adult patients (above 18 years) of both genders with coronary artery disease were included in the study. Every patient was evaluated for the presence of conventional risk factors. Card vascular risk factors were assessed by a self-administered questionnaire and various laboratory tests.

RESULTS: Total patients were 926, male were 546(59%). Mean age was 58.28 ± 12.005 years (20-95 years). Study population was divided into younger (age ≤ 40 years) and older age groups (≥ 40 years). Younger patients were 66(7.1%) and older age 866(92.9%). Hypertension was present in 563 patients (61.1%) with 59.2% and 63.2% in male and female, respectively ($p=0.186$). Diabetes was present in 29.9% with 27.8% in male and 32.9% in female patients ($p=0.098$). Hypertension was significantly more common in older patients while smoking and heavy fat intake was significantly more common in younger patients. Other risk factors for CAD were similar across younger and older age groups.

CONCLUSION: Conventional risk factor in male and female differ widely with smoking, ex-smoker, heavy fat intake and obesity is significantly more common in male patients, while family history for CAD is common in female patients. Diabetes is higher in 40 years or above patients while smoking is higher in patients less than 40 years.

KEY WORDS: Conventional Risk Factor, Coronary Artery Disease, Age, Gender

INTRODUCTION

Cardiovascular diseases (CVD) are the most common cause of death in the world. According to a report of World Health Organization, about 7.6 million people died due to myocardial infarction in 2005¹. Cardiovascular mortality in developed countries is decreasing, while it is increasing in developing countries. About 80% of the CVD mortality is now occurring in these countries². Prevalence of coronary artery disease (CAD) varies according to the study population. Its prevalence is, 7.3% in general population, 3.8% in symptomatic population and 17.1% in asymptomatic patients³. In a study, among patients with CAD, hypertension was present in

47.7% of patients, diabetes in 12.9%, dyslipidemia in 90.1%, and smoking in 24.1% of patients. Two or more risk factors were present in 66.5% of patients⁴. Dodani et al in their study on general population, reported that prevalence of hypertension, hypercholesterolemia and diabetes were 38.5, 10.7 and 9.1 per cent, respectively. Obesity or overweight was present in 52%, 64% were leading sedentary life and 12% had two or more risk factors for CAD⁵.

Hypertension, diabetes, hyperlipidemia and cigarette smoking act as independent risk factors for CAD in more than 50% of patients. Risk factors for CAD varies between men and women

and this sex ratio varies between populations^{6,7,8,9}. CAD is 2 to 5 times more common in men than in women among middle-aged people. In both sexes, the risk of CAD increases markedly with age. Similarly, risk factors for CAD varies according to the age of presentation^{10,11}. The role of major cardiovascular risk factors in the development of CAD is well established among men. However, among women, the data is less extensive. Reasons for the sex difference in CAD risk are not fully understood¹². In the Framingham study, substantial differences were noted in the risk factors for CAD that occurred before the age of 65 years. Differences were noted between men and women and among different age groups. These patterns have biological, clinical and statistical significance¹³.

It is important to recognize sex differences in risk factors for CAD from public health and clinical point of view. However, very limited national data is available to assess the extent to which cardiovascular risk factors can explain the observed gender and age related differences in risk factors for CAD in our population.

This study was therefore, conducted to assess, whether conventional risk factors (hypertension, diabetes, hypercholesterolemia, history of premature CAD in the family, obesity, smoking, ex-smoker, heavy fat intake and sedentary life style) are similar in men and women; and to assess the difference in CAD risk between younger and older age groups in. This aim of the study was, to compare conventional risk factors for CAD between men and women and between young and older age groups in our population.

MATERIALS AND METHODS

Hospital ethical committee approved study protocol prior to start of the study. Written informed consent was taken from all study participants. This study was conducted in outpatient department of Agency Headquarter (AHQ) hospital Landikotal from June to October 2013. It was a hospital based descriptive observational study. Sample size was 926

patients. It was calculated on the basis of 7% prevalence of established CAD², total population of the area is 100,000 with 95% confidence interval and 3 margin of error. Sampling technique was purposive convenient. Sample selection was simple random. Patients who presented to outpatient department of AHQ hospital Landikotal with CAD were evaluated for enrolment in the study. Adult patients (above 18 years) of both genders who were diagnosed as CAD were included in the study. Patients with concomitant valvular heart disease and congenital heart disease were excluded from the study as these diseases make diagnosis doubtful. Patients with incomplete history or investigations were also excluded from the study.

Study population was divided into younger age (less than 40 years) and older age group (40 years and above). Every patient was evaluated for the presence of conventional risk factors. Cardiovascular risk factors were assessed by a self-administered questionnaire and various laboratory tests. Previous record of the patient was reviewed in detail for any previous procedure such as coronary angiography, percutaneous coronary intervention or previous bypass surgery. Detailed history was taken. History of daily activities, use of fats per week was sought. Similarly, history of hypertension, diabetes and past history of myocardial infarction, percutaneous coronary intervention (PCI) or coronary artery bypass graft (CABG) was determined. Previous record of the patient was reviewed in detail for any previous procedure such as coronary angiography, PCI or CABG. Present or past habit of smoking was asked. Family history of premature CAD in the family was determined. Detailed clinical examination was carried out. Blood pressure was measured with the subject in sitting position after at least five minutes' rest using mercury blood pressure apparatus. Newly diagnosed hypertension was confirmed by reevaluation after a week. Weight and height measured and Body Mass Index (BMI) calculated. BMI was calculated as weight (kg) divided by height

squared (m^2). Relevant investigations were performed. Fasting or random blood glucose and serum cholesterol measured, from hospital laboratory using microlab-III machine. All details were entered on a pre-determined proforma.

CAD was defined as documented CAD on coronary angiography or history of myocardial infarction or patients on anti-angina therapy. Myocardial infarction was defined as previous hospitalization for myocardial infarction as evident from previous record or new ST elevation in any two leads with ongoing chest pain on presentation. PCI: PCI was defined as previous procedure of angioplasty with placement of one or more stents as evident from record. CABG: any patient who has undergone CABG previously as evident from record. Angina: angina was defined as exertion chest pain that relieves with rest or sublingual nitroglycerin or patients already taking anti angina treatment.

Risk factors were defined as follow: Diabetes: self-reported history of diabetes or use of anti-diabetic medications or fasting blood sugar $126mg\%$ or random blood sugar more than $180mg\%$. Hypertension: self-reported history of hypertension or the use of anti-hypertensive drugs or documented blood pressure more than $140/80$ mm Hg on more than one occasion. Hypercholesterolemia: random blood cholesterol equal or more than 200 mg/dl. Family history of CAD: self-reported history of CAD in first degree relatives. Smoking: regular use of more than five cigarettes per day for more than one year. Ex-smoking: smokers who smoked for at least 2 years and quit smoking at least 6 months ago.

Obesity: BMI more than 29.9. Heavy fat intake: use of fatty meal more than 6 times a week as assessed on self-administered questionnaire.

Sedentary life style: No exertional activity and not more than 20 minutes walk daily as assessed on self-administered questionnaire.

Statistical Analysis: Data entered and analyzed using SPSS version 16. Qualitative variables were presented in percentages. Quantitative variables such as age were presented in mean $\pm$ standard variation.

RESULTS

Study population was 926 patients. Out of these male were 546 (59.0 %). Mean age of the study population was 58.2 ± 12.005 years and age ranged from 20 to 95 years. Study population was divided into younger (below 40 years) and older (40 years or above) age groups. Younger age group was 66(7.1%) and older age 866(92.9%).

CAD patients included patients with angina, previous myocardial infarction, post PCI or CABG. Angina was the predominant presentation and was present in 848 (91.9%) patients. Myocardial infarction was present in 379 (40.9%), PCI in 63 (6.8%) and CABG in 49 (5.3%) patients.

Hypertension was the most common risk factor, present in 563 (61.1%) patients. Hypertension in males and female was 59.2% and 63.2%, respectively ($p=0.186$). Diabetes was present in 29.9% with 27.8% (male) and 32.9% (female) frequency ($p=0.098$). Family history was present in 375(40.5%) patient with 36.45 in male and 46.3% in female ($p=0.005$). Hypertension, hypercholesterolemia and diabetes were similar in men and women. Smoking and sedentary life was significantly more common in female patients. With the exception of family history of CAD, men had more disadvantageous cardiovascular risk profile. Gender wise distribution of risk factor is given in Table-1.

Table 1: Comparison of risk factors among men and women

Variable	Men Frequency (%)	Women Frequency (%)	P-VALUE
Hypertension	323(59.2)	240(63.2)	0.186
Diabetes	152(27.8)	125(32.9)	0.098
Dyslipidemia	76(13.9)	45(11.8)	0.356
Family History	199(36.4)	176(46.3)	0.005
Smokers	77(14.1)	3(0.8)	0.000
Ex-smoker	268(49.1)	9(2.4)	0.000

obesity	156(28.6)	79(20.8)	0.007
Sedentary life	332(60.8)	66(17.4)	0.000
Heavy fat intake	328(60.1)	92(24.2)	0.000

Male were having more numbers of risk factor as compared to female patients. Among male, 50% patients had more than three risk factor while only 23% female patients had more than three risk factors ($p < 0.0001$).

According to age groups analysis, hypertension was significant more common in older patients while smoking and use of heavy fat diet was significantly more common in younger patients. Other risk factors for CAD were similar across younger and older patients. (Table.2)

Table 2: Comparison of risk factors in younger and older age groups

Variable	Above 40 years (%)	Below 40 years (%)	P Value
Hypertension	61.5(533)	50.0(30)	0.175
Diabetes	30.9(268)	13.3(8)	0.001
Dyslipidemia	12.6(109)	20.0(12)	0.099
Family History	40.5(351)	40.0(24)	0.896
Smokers	8.2(71)	28.3(17)	0.001
Ex-smoker	30.9(268)	20.0(12)	0.075
obesity	24.7(214)	35.0(21)	0.077
Sedentary life	41.5(358)	33.0(20)	0.182
Heavy fat intake	44.7(387)	55.0(33)	0.121

DISCUSSION

In this study, significant differences were noted in the conventional risk factors among male and female. Smoking, heavy fat intake and sedentary life style were significantly more common in male patients, while family history of CAD was significantly more common in female patient. Our findings are consistent with international studies with few exceptions.

One study from India¹⁴ observed that hypertension (36.4% males, 37.5% females), diabetes (males 13.1, females 11.3%), obesity (male 57.4%, female 68.4%) and physical inactivity (male 28.5%, female 22.7%) were similar among men and women. However, significant difference was noted in smoking (36.5% male, 11.7% female ($p < 0.0001$)) and hypercholesterolemia (male 37.4%, female 4.1% ($p < 0.001$)). Overall, CAD frequency was 6.18% and 10.12% in male and female respectively.

They concluded that there is high prevalence of hypertension, truncal obesity, diabetes and dyslipidemia and increased significantly in both males and females. It is clear from this and our study that south Asian patients have similar characteristics with regard to risk factors for CAD.

Inherent study¹⁵ found that smoking, raised ApoB/ApoA1, history of hypertension, diabetes, abdominal obesity, psychological factors, daily consumptions of fruits and vegetables, regular alcohol consumption, and regular physical activity were all significantly related to myocardial infarction in both men and women, old and young, and in all regions of the world ($p < 0.0001$ for all risk factors). Collectively, these nine risk factors accounted for 90% of the Population Attributable Risk in men and 94% in women. In another study, males and females presented at similar ages and similar prevalence of smoking, diabetes, hypertension and family history of premature CAD, albeit women were less likely than men to have a prior history of myocardial infarction. The observed age difference between females and males with CAD was less than expected (3.3 ± 2.3 years, 95% confidence limits¹⁶).

In a study from Palestine¹⁷, smoking was present in 60.8% males while no single female was smoker (p -value < 0.001). However, hypertension and diabetes showed high prevalence in female than male with significant level for hypertension ($p = 0.041$). Dyslipidemia and family history of CAD showed no greater difference in both genders¹⁷. In our patients, hypertension, diabetes and dyslipidemia were equivalent in male and female. There was a trend towards high prevalence of hypertension in female patients that was statistically not significant. Hypertension was present in more than half patients and diabetes in more than one third patients. We have high frequency of hypertension, diabetes, sedentary life style and heavy fat intake. However, smoking is less prevalent in this area especially in female population. It is because, in our cultural and

custom values, smoking especially, in women is considered unacceptable.

In our study, diabetes was significantly more common in elderly patients while smoking was significantly higher in younger patients. Jameel¹⁷ found that difference in risk factors for young and older age group was significant. Older patients in both gender expressed higher prevalence of hypertension, diabetes and dyslipidemia. In both age groups, females expressed high prevalence of hypertension and diabetes compared to male, but did not reach statistical significant level. Dyslipidemia was higher among male regardless of age difference. In western study, among patient with CAD, 80.6% men and 84.6% of women were having at least 1 of the 4 conventional risk factors (cigarette smoking, diabetes, hyperlipidemia and hypertension) while, only 10% to 15% of patients, in younger patients (men ≤ 55 years and women ≤ 65 years) were lacking any of the 4 conventional risk factors. Premature CAD was related to cigarette smoking in men and cigarette smoking and diabetes in women. Smoking decreased the age at the time of CAD event nearly a decade in all risk factors combinations¹⁸. From these studies, it is clear that CAD risk factors vary significantly among men and women and at different ages. Its distribution varies in different parts of the world. In our population, Hypertension and diabetes is higher in older and smoking is high in male patients and in younger age. We need to improve the diagnosis, treatment and compliance for hypertension and diabetes. Similarly, smoking is easily controllable risk factor. Addressing these modifiable risk factors at clinical and public health level can effectively reduce the burden of CAD in our society.

CONCLUSION

Conventional risk factors in male and female differ widely with smoking, ex smoking, heavy fat intake and obesity is significantly more common in male patients while family history for CAD is common in female patients. Frequency of diabetes and hypertension increases as the age advances while smoking is

higher in younger age group and its frequency decreases as age advances.

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