FREQUENCY OF CONVENTIONAL RISK FACTORS AMONG CORONORY ARTERY DISEASE PATIENTS IN TRIBAL AREA OF PAKISTAN

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Date Received: December 27, 2014
Date Revised: March 5, 2014
Date Accepted:March 20, 2014

Contribution
All the authors contributed significantly to the research that resulted in the submitted manuscript.

All authors declare no conflict of interest.

ABSTRACT

Objective: The objective of this study was to determine the frequency of conventional risk factors among patients with established coronary artery disease (CAD).

Methodology: This observational descriptive study was conducted at outpatient department(OPD) of Agency Head Quarter hospital(AHQ), Landikotal, FATA from 1st June 2012 to 31th October 2012. Patients of both genders who were above 18 years with established CAD were enrolled in study. Patients detail history regarding conventional risk factors such as hypertension, diabetes, smoking, history of daily activities, use of fat in diet during a week time, family history of premature CAD and past history of myocardial infarction, PCI or CABG were recorded. Detailed clinical examination was carried out, including blood pressure, weight and height measured and body mass index (BMI) was calculated. Relevant investigations such as fasting or random blood glucose and serum cholesterol were performed. All investigations were performed in hospital laboratory on Microlab-3 machine to control bias in the study. Data was entered and analyzed using SPSS version16. Qualitative variables were presented in percentages. Quantitative variables presented in mean ± standard variations.

Results: Total CAD patients were 926. Males were 559. Hypertension was the commonest risk factor and was present in 61.1%, followed by use of heavy fat diet in 45.4% and sedentary life style in 43%. Diabetes was present in 29.9%. Fifty percent patients were having more than three risk factors.

Conclusion: Population of Tribal area (FATA) of Pakistan has got high frequency of conventional risk factors among which hypertension is the leading risk factor.

Key Words: Coronary Artery Disease, Risk Factors, Tribal Area of Pakistan, Hypertension, Diabetes Mellitus

INTRODUCTION

According to World Health Organization report, cardiovascular diseases(CVD) is the most common disease and leading cause of death in the world. In the year 2005, about 17.5 million people died from CVD, representing 30% of all global deaths.[1] Deaths due to CVD, on one hand, have declined in several developed countries in recent time. On the other hand, mortality in low and middle-income countries are on the rise, with about 80% of the CVD now occurring in these countries.[2] Conventional risk factors such as hypertension, diabetes, hyperlipidemia and cigarette smoking act as independent risk factors for coronary artery disease (CAD) in more than 50% of patient. Control and treatment of these risk factors is the basic step to reduce future cardiac events.[3] However, a large number of CAD patients lack any of the conventional risk factors. This implies that other factors play a significant role in the development of this disease.[3]

Prevalence of CAD in general population is 7.3%, with a significant difference in coronary asymptomatic (3.8%) vs. symptomatic patients (17.1%).[4] According to a study conducted on Western population, hypertension was present in 47.7% of CAD patients, other risk factors were as follow; diabetes 12.9%, dyslipidemia 90.1% and smoking in 24.1%. Two-thirds (66.5%) patients had two or more risk factors.[5] Dodani et al, from Karachi observed that prevalence of hypertension, hypercholestrolemia and diabetes were 38.5%, 10.7% and 9.1%, respectively.[6] Obesity or overweight was present in 52.2% of the sample and 64.8% population never exercised; 11.9% had two or more major risk factors of CAD. However, this study was done on general adult population.

Up till now, most of the studies on risk factors among CAD patients have been done on population from European origin. To what extent these findings apply on the rest of population, is not sure. There are evidence that risk factors for CAD vary between populations, dyslipidemia may not be strongly associated with CAD in South Asians.[7] Similarly, hypertension as a risk factor for this disease might be more significant in Chinese people.[8] Even if the association of a risk factor with CAD is similar across populations, prevalence of this factor might vary e.g, serum cholesterol might be lower in Chinese population.[8]

There is not enough available data in our country about the prevalence of risk factors among patients with diagnosed CAD. Determining the frequency of various risk factors is important for scientific accuracy and to guide the practice of clinical medicine and public health policies. In addition, patients and physicians can better understand the impact of controlling these risk factors on reduction the of CAD. We therefore, sought to determine the prevalence of conventional risk factors in rural population of FATA. This study focused on the frequency of nine conventional risk factors in CAD patients (diabetes, hypertension, hypercholesterolemia, family history of CAD, smoking, ex-smoker, obesity, heavy fat intake and sedentary life style). This study was conducted to determine frequency of conventional risk factors and its relation to CAD. In addition, whether CAD risk factors in this population were equal to or differ from other parts of the world.

METHODOLOGY

This observational descriptive study was conducted at outpatient department(OPD) of Agency Head Quarter hospital(AHQ), Landikotal, FATA from 1st June 2012 to 31th October 2012. Patients of both genders who were above 18 years with established CAD were enrolled in study. This study was approved from hospital ethical committee and written informed consent was taken from study participant. Patients with concomitant valvular heart disease and congenital heart disease were excluded as these diseases make diagnoses of CAD very difficult and investigations un interpretable. Patients with incomplete history or patients whose investigations could not be completed because of any reason were also excluded from the study. The sample size was 926 patients having established CAD. It was calculated on the basis of 7% prevalence of CAD, total population of the area as 100,000, confidence interval of 3 and margin of error 95%.[4] Sample technique was purposive convenient. Sampling method was simple random. Patients detail history regarding conventional risk factors such as hypertension, diabetes, smoking, history of daily activities, use of fat in diet during a week time, family history of premature CAD and past history of myocardial infarction, PCI or CABG were recorded. Detailed clinical examination was carried out, including blood pressure, weight, height measured and body mass index (BMI) was calculated. Relevant investigations such as fasting or random blood glucose and serum cholesterol were performed. All investigations were performed in hospital laboratory on Microlab-3 machine to control bias in the study. Details were entered on a pre-determined proforma.

Following operational definitions were used:

Coronary Artery Disease: Any patient with documented coronary artery disease on coronary angiography or history of PCI or history of myocardial infarction or patients taking anti-angina therapy.

Following conventional risk factors were assessed:

Diabetes, hypertension, hypercholesterolemia, family history of CAD, smoking, ex-smokers, obesity, heavy fat intake and sedentary life style.

Diabetes: Self-reported history of diabetes or use of anti-diabetic medications or fasting blood sugar of 126mg% or random blood sugar of more than 150mg%.

Hypertension: Self-reported history of hypertension or the use of anti-hypertensive drugs or documented blood

pressure more than 140/80 mm Hg.

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 or within six months of more than five cigarettes daily for at least a month.

Ex-smoker: Smokers who smoked for at least 2 years and quit smoking atleast 6 months ago.

Obesity: BMI of more than 29.9 kg/m^2.

Heavy fat intake: Use of fatty meal more than 6 times a week as assessed on history.

Sedentary life style: Related with a profession or living a life style in which there is daily less than 20 minutes' walk and/or no exertional activity, such as driving, shopkeeper, watch keeper as were assessed on history.

Data was entered and analyzed using SPSS version16. Qualitative variables were presented in percentages. Quantitative variables presented in mean ± standard variations.

RESULTS

The total study population was 926. All were having documented CAD. Out of them, male were 546 (59%). Mean age of the study population was 58.3 years and age ranged from 20 to 95 years. CAD patients included patients with angina, previous myocardial infarction, post Percutaneous Coronary Intervention (PCI) or patients with coronary artery bypass grafting(CABG). Angina was the predominant presentation and was present in 91.9%(848) patients. Myocardial infarction was present in 40.9%(379) and PCI in 6.8%(63) patients. Among study subjects 5.3% (49) had undergone CABG previously. Figure 1shows patterns of CAD patients.

Hypertension was the most common risk factor and was present in 61.1%(563) patients. Diabetes was present
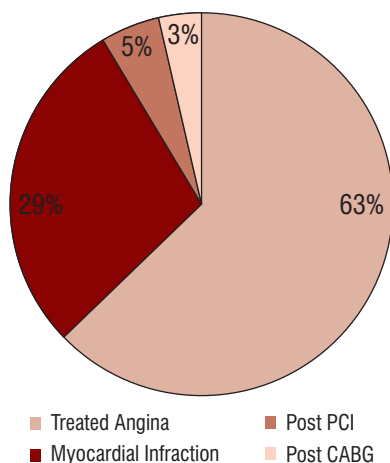
Table 1: Frequency of Various Risk Factors Among CAD Patients (n=926)

Variable	Frequency	Percentage
Hypertension	563	61.1
Diabetes	277	29.9
Family History	375	40.5
Ex-smoker	277	29.9
Obesity	235	25.4
Sedentary Life	398	43.0
Dyslipidemia	121	13.1
Smokers	83	9
Heavy Fat Diet	420	45.4

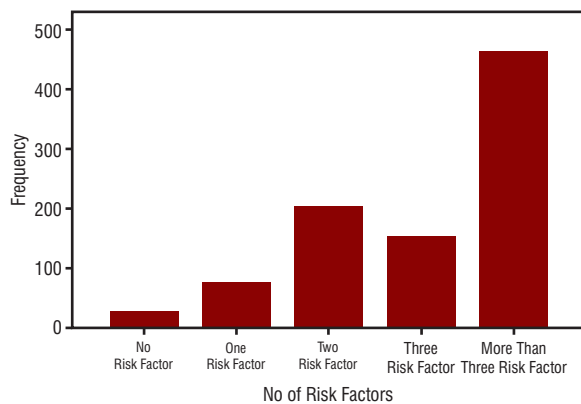in29.9%(277) patients. Family history of premature CAD in the family and hypercholestrolemia were present in 40.5%(375)and 13.1%(121) patients respectively. Among study subjects 29.9%(277) were previous smokers and 9%(83) current smokers. Table1shows frequency of nine conventional risk factors among CAD patients. Fifty percent of patients were having more than 3 risk factors and only 3.1% patients were having no risk factors. Detail of the number of risk factors in CAD patients is given in Figure 2.

DISCUSSION

This study was conducted in Landikotal, tehsil subdivision of Khyber Agency FATA-Pakistan. It is a rural area and located about 40 km away towards Pak Afghan border. Its population is about one lakh. Average age for CAD patients at presentation was 58 years. CAD present at a younger age in this part of the world as was observed in this study. This was also evident from the INHERENT study in which median age for South Asian population was 53 years, and 63 years for Western Europe, China and Hong Kong.[9] There is high frequency of various risk factors in this locality as was observed in this study. These risk factors lead to early development of CAD in this population.

Hypertension was the commonest risk factor in our study. Similarly, more than one third of patients had diabetes. Other risk factors were also present in high frequency. Findings in this study were comparable to studies done in South Asian or Western countries. A study from Bangladesh reported that 57% patients with Myocardial Infarction had hypertension and 46% had diabetes.[10] Interheart study observed that smoking, hypertension, diabetes, abdominal obesity, psychosocial factors, daily consumption of fruits and vegetables, regular alcohol consumption, and regular physical activity, were all significantly related to acute myocardial infarction (p<0.0001 for all risk factors).[9]

Figure 1: Shows Patterns of CAD Patients

63%
29%
5%
3%

■ Treated Angina   ■ Post PCI
■ Myocardial Infraction   Post CABG

Figure 2: Percentage of Number of Various Risk Factors in CAD Patients

Collectively, these risk factors accounted for 90% of the population Attributabe Risk. From these studies it is clear that frequency of various CAD risk factors among CAD patients in our locality is similar to that observed in other regions of the world.

Risk factors for CAD are less prevalent in general population as compared to patients with established CAD. In Peshawar Heart Study, it was reported that among Journalists 20% were hypertensive, 36% were current smoker, family history of CAD was present in 30% and 26% were having regular exercise.[11,12] Among school teachers 36% were hypertensive, 4% were known diabetic and 6 % had RBS of ~ 140(newly diagnosed diabetics) , 20% had dyslipidemia, family history of CAD was positive in18%, 58% were having regular exercise, 35% were overweight and 47% obese. Dodani et al, observed that prevalence of hypertension, hypercholesterolemia and diabetes was 38.5, 10.7 and 9.1 percent, respectively.[6] One study from India reported that hypertension (> or =140 and/or 90 mmHg) was present in 36.4% and diabetes (diagnosed by history or fasting glucose > or =126 mg/dl) in13.1% patients.[13] Smoking was present in 36.5%, sedentary life in 28.5%, obesity(body mass index > or =27 kg/m^2) in 24%,hypercholesterolemia (total cholesterol levels of > or =200 mg/dl) in 37.4%. Another population based study from Iran found that diabetes was present in 6.3%,21.6% were smokers and 15% had positive family history for CAD, 61% had total cholesterol more than 200 mg%,13.7% were hypertensive and 87% were physically inactive.[14] Our findings are higher from these studies because we studied patients with CAD while this study was conducted on general healthy population.

Multiple risk factors were present in half of patients. CAD risk factors are interrelated. Heavy fat diet and sedentary life lead to obesity and dyslipidemia. Similarly hypertension and diabetes are present in families as is CAD. Conventional risk factors among CAD patients are mostly modifiable. Control and modification of these risk factors will help prevent most

CAD cases, especially at younger age. Smoking was less frequently observed in our study. However, when ex- smoker were added, it matched the prevalence observed in other studies. It implies that majority of smokers quit smoking when they had an event of CAD. Ex-smoking was considered for the first time as risk factor for CAD and its frequency was higher than current smokers. It is, therefore, suggested that ex smoker or recent smoker should be included in risk stratification for CAD.

LIMITATION

This study has some limitations. It was a hospital based study and therefore, not a true representative of the population. Study subjects were patients already having CAD. Many risk factors were considered on self-reported history of the patients. So there may be recall bias. Despite this, it was the first study of its kind in the country to determine the frequency of risk factors among CAD patients in our rural population.

CONCLUSION

Pakistan rural population of FATA has got high frequency of conventional risk factors among which hypertension is the leading risk factor.

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