A Study of Evaluation Risk Factors for Coronary Artery Disease

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Abstract
Objective: *The objective of this study was to analyses the major risk factors for coronary artery disease (CAD) for patients with ischemia heart disease*
Design: *A study among patients with established CAD admitted in the Department of Cardiology during the month of June-Dec2012. Participants : A total of 496 patients who were admitted in the Cardiology department Govt. Hospital, Visakhapatnam between June 2012 and December 2012 with acute coronary syndrome or coronary angiographic or Electrocardiography evidence of ischemic heart disease. Risk factors studied were the conventional risk factors for coronary artery disease- hypertension, diabetes mellitus, dyslipidemia, body mass index (BMI), smoking, and family history of coronary artery disease Data are collected from the patients, old medical records, Clinical Examination and Laboratory results of the patients were analyzed for the study.*
Results: *From the study, diabetes or impaired glucose tolerance (79%) and dyslipidemia (71%) are the major risk factor for Coronary artery disease as only a minority of the study population had hypertension or gives a history of cigarette smoking. 57% of the study population had a family history of coronary artery disease. Among the studied population, 55% of females are with increased BMI, whereas only 16% of males with CAD were with BMI above 30.*
Conclusion: *Among diabetes mellitus and dyslipidemia are the major Risk factor for Coronary artery disease. So early detection of diabetes mellitus and dyslipidemia and proper treatment of both, before developing the end organ damage, play a vital role for the prevention of coronary artery disease.*
Keywords: *Bodymass index, coronary artery disease, diabetes mellitus. dyslipidemia. hypertension riskfactors*

I. Introduction

Coronary artery disease (CAD) is a condition that develops due to the accumulation of atherosclerotic plaque in the pericardia! coronary arteries leading to myocardial ischemia. It is a common multifarious public health crisis today and a leading cause of morbidity and mortality in both developing and developed countries. Cardiovascular disease is affecting millions of people in both developed and developing countries.

CAD includes a spectrum of disease manifestation ranging from asymptomatic atherosclerotic disease to acute coronary syndrome, which includes ST elevation myocardial infarction (STEMI), Non-ST elevation myocardial infarction (NSTEMI) and unstable angina.

The risk factors for CAD are broadly classified as modifiable and non-modifiable risk factors. Modifiable risk factors include hypertension, diabetes mellitus, dyslipidemia, obesity, and smoking. Non-modifiable risk factors Include age, sex, race, and family history for CAD. The Systematic Coronary Risk Evaluation system is recommended to assess an individual's total cardiovascular risk. CAD is closely related to life-style and modifiable physiological factors, and risk factors modification has been shown to reduse cardiovascular morbidity and mortality.

Risk factors for coronary artery disease

CAD is the most common cause of mortality in India. Hence, understanding the predominant risk factors among the Indian Population is important.

Aim

The aim of the study was to analyses the major risk factors for CAD among the patients with Ischemie heart disease.

The study was carried out on patients, admitted to the Department of Cardiology In the government hospital, Visakhapatnam during the study period from June 2012 to December 2012 and met the inclusion criteria/The inclusion criteria were:

Acute coronary syndrome - STEMI, NSTEMI or unstable angina;
Post-myocardial infarction state - with history of coronary bypass graft or percutaneous coronary intervention with or without stenting or with history of medical management either with fibrlnolytics or with heparins;

Chronic Ischemie heart disease-evidence from coronary angiogram or from a positive stress test. The data used for the study was the history taken from the patients and their previous medical records.

Physical examination of the patient included height,weightybdomfnaI circumference,and two blood pressure measurement: At the time of admission and on the following day. Hypertension was classified based on the Joint National Committee on Prevention,Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) classification for hypertension (reviewed). Laboratory investigations included random blood sugar, fasting blood sugar, 2-h post-prandial blood sugar, glycosylated hemoglobin - (HbAlc),fasting lipld profile (total cholesterol, LDL cholesterol, HDL cholesterol and trlglyceride level), and Troponin T and electrocardiography (ECG). Patients were defined as Diabetic or with impaired glucose tolerance based on their blood sugar levels and HbAlc value. Dyslipidemia was defined based in the Fasting Upid Profile. Classification of the patients according to the inclusion criteria were carried out based on ECG findings, Troponin T, and medical records.

Risk factors for coronary artery disease

A total of 282 (57%) patients in the study gave a positive family history for CAD.

Based on the blood 'pressure monitoring, the patients were classified according to JNC 7 (reviewed) classification for hypertension as normotensive 232 (47%), pre-hypertensive 17 (14%), stage 1 hypertension was found in 60 patients (12%) [Figure 4]. There was no gender difference noted in the occurrence of hypertension.

Diabetes mellitus was found tc be. a major rck factors in both males and females in the study population. Of the total 496 patients, 284 (58%) had diabetes mellitus, and 102 (21%) were with impaired glucose tolerance. Of the male patients, 166 (54%) were diabetics and 62 (20%) were found with impaired glucose tolerance. For the female group, the values were 118 (54%) and 40 (20%), respectively [Figure 5].

Dyslipidemia was also a major risk factor along with diabetes mellitus for Indian population. In the study group, the fasting lipid profile tests revealed evidence of dyslipidemla in (71%) of the patients: (66%) of the males and (78%) of the females were with dyslipidemia.

Of the study population. only 40 (8%) were current smoker. The number of females who smoked in the study population was 0 (0%).

Considering obesity as the risk factor for CAD, based on the body mass index (BMI), only 50 (16%) of the males had a BMI higher than 30, whereas 102 (55%) of the females had a BMI higher than 30. Only 62 (12%) of the studied population reported walking at least 30 min a day.

II.   Discussion

In this study, it was seen that in males CAD starts a decade prior to females - more incidence of CAD in males (20%) when compared to females (8.6%) between the age group 3565 and above 45 years male/female ratio for the occurrence of CAD was the same. The peak incidence of CAD was seen between 45 years and 64 years. Heart diseases rise in Asian Indians 5-10 years earlier than in other populations around the world- The mean age for first presentation of acute myocardial infarction in Indians Is 53 years. CAD that manifests at a younger age can have devastating consequences for aindividual, the family, and society.

A low incidence of hypertension (39%) was seen among the study population. Hence, hypertension was revealed as an insignificant risk factor among the studied population. The prevalence of hypertension in India is low compared to world figures. In India, 23.10% men and 22.6% women over 25 years old suffer from hypertension, says the World Health Organization's "global health statistics 2012". Sofia study and Eurospire 111 have shown that among the Europeans with advancing age, all forms of CAD increase. In Sofia Study and Europspire study, hypertension has been seen as a major risk factor for CAD.

A high incidence of Diabetes and impaired glucose were seen among the studied population. Of the total 496 patients, 284 (58%) had diabetes mellitus, and 102 (21%) were with impaired glucose tolerance. Of the male patients, 166 (54%) were diabetics, and 62 (20%) were found with impaired glucose tolerance. For the female group, the values were 118 (54%) and 40 (20%), respectively.

Hyperinsulinemia, insulin resistance, and the higher rate of prevalence of metabolic syndrome in people with type 2 diabetes were attributed to high coronary risk in south Asians. In Chennai (formerly Madras), India in an urban population study the prevalence rates for CAD were 9.1% in normal subjects and 21.4% in those with type 2 diabetes. Attributable risk due to diabetes for myocardial infarction was 9.9% in the Inter-heart study. In the study group, the fasting lipid profile rests revealed evidence of dyslipidemia in 352 (71%) of the patients: 206(66%) of the males and 146 (78%) of the females were with dyslipidemia. The importance of dyslipidemia in the pathogenesis of CAD is well-known. In a study conducted between 1998 and 2002 in a North Indian population, Mohan et al. Showed that CAD occurred at much lower levels of total cholesterol and LDL-C than other population, and high triglyceride and low HDL level were of a universal phenomenon in this population. Our study revealed a high prevalence of dyslipidemia (71%}-elevated levels of total cholesterol, LDL-C and high triglycerides with concurrent low HDL-C values.

Nearly, 57% patients in the study gave a positive family history for CAD. Family history reflects not only enetic susceptibility, but also interactions between genetic, environmental, cultural and behavioral factors. Enas et al. Have shown that Indian emigrants to western states have a high prevalence of dyslipidemia and insulin resistance, thereby increasing the risk for CAD. A modest increase in body fat with central distribution has been shown to increase the risk of CAD. Jain et al. Have shown that a family history of premature CAD in first-degree relatives is associated with development of CAD. Gambhlr et al. Have further demonstrated that low-molecular-weight isoforms of lipoprotein (a) were prevalent in Indian subjects with a positive family history of premature CAD. lnterleukin-6 gene polymorphisms have also been described to be important genetic factors in premature CAD, and in the regulation of key atherogenic markers in Asian Indian families. The family history not only indicates the genetic predisposition to disease, but may also represent the sum total of the interaction of the individual with environment, expressed in the several ways, including diabetes and thrombotic disorder.

Considering obesity as the risk factor for CAD, based on the BMI, only 50 (16%) of the males had a BMI higher than 30, whereas 102 (55%) of the females had a BMI higher than 30. Although most of the co morbidities relating obesity to CAD increase as BMI increase, they also relate to body fat distribution. Long-term longitudinal studies; however, indicate that obesity as such not only relates to but independently predicts coronary atherosclerosis. Prevalence of an increaseing number of risk factors in patients with CAD is also crucial since it has been shown that as the number of cardiovascular risk factors increases, so does the severity of asymptomatic coronary aortic atherosclerosis.

III.   Conclusion

The importance of this study lies in the fact that it revealed a district association of diabetes mellitus and dyslipidemia among those suffering from CAD. The study highlighted diabetes mellitus, obesity, and dyslipidemia as potential targets. A large multicenter study can help further substantiate the hypothesis and help devise a scoring system specific for Indian patients at higher risk for CAD. Most of the patients had more than two risk factors. Patient's need to be managed intensively for the control of multiple risk factors. Early detection of the risk factors and proper management by life-style modification, and by drugs if needed may play a key role in preventing the progress of the atherosclerotic process.

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