Original Research Article

Prevalence pattern of risk factors for coronary artery disease (CAD) among patients presenting for coronary artery bypass grafting (CABG) in rural Indian population

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Abstract

Objectives: Coronary artery disease (CAD) is the leading cause of death worldwide. The aim of study was to identify the pattern of prevalence of risk factors in CAD patients presenting for surgical revascularization by coronary artery bypass grafting (CABG) in rural setup in India.
Methods: Eleven risk factor in 206 patients coming for CABG in cardiothoracic departments of Jawaharlal Nehru medical college (JNMC), Sawangi (Meghe), Wardha, Maharashtra were analyzed in preanaesthetic checkup.
Results: Hypertension was most common modifiable risk factor for CAD coming for CABG. Prevalence of it was 62.62 % (129/206).while male sex (77.18%) was most common non modifiable risk factor for CAD coming for CABG. Prevalence of it was 77.18 % (159/206). Prevalence of other risk factors were as dyslipidaemia 40.29 % (83/206), diabetes 20.87% (43/206), advanced age 52.42 % (108 /206), smoking 20.38% (42/206), obesity 16.99% (36/206), family history 29.61%. (57/206), Sedentariness 19.90 % (41/206), alcohol 9.70 % (20/206) and diet 22.87 % (47/206).
Conclusions: In this study, Hypertension is most common risk factor for CAD coming for CABG. The most common combination of factors seen together was diabetes, hypertension, dyslipidaemia and male gender.
Keywords: Coronary artery disease (CAD), risk factor, diabetes mellitus, dyslipidaemia.

1. Introduction

Coronary Artery Disease (CAD) is the leading cause of death worldwide. [1][2]. Coronary artery disease is more prevalent in Indian urban populations and there is a clear declining gradient in its prevalence from semi-urban to rural populations. [3][4] Epidemiological studies show a sizeable burden of CAD in rural (3-5%) and urban (7-10%) populations. A conservative estimate indicates that there could be 30 million CAD patients in India of which 14 million are in urban and 16 million in rural area. If the current trend continues by the year 2020, the burden of atherothrombotic CAD in India will surpass other regions of the world. [5] The risk factor adjusted CAD rates are two times higher among Indians than whites.

Factors of risk for the premature CAD in Indian subjects could be multiple, ranging from social, economic, psychological, lifestyle (smoking, sedentary lifestyle, improper diet) and biological (abnormal lipids, hypertension, diabetes, and obesity). Genetic factors such as mutations at specific chromosomal locations and single nucleotide polymorphisms have also been implicated. [6][7]

Risk factors for coronary artery disease are classified into modifiable and non modifiable. Non modifiable are age, family history, gender. Modifiable risk factors are high blood pressure, dyslipidaemia, obesity, tobacco use, lack of physical activity diabetes psychosocial stress, low fruit and vegetables intake, heavy alcohol intake. Most of studies evaluate risk factors in urban population. So we are doing this study to evaluate risk factors in rural population in Vidhrabha. The aim of study was to identify the pattern of prevalence of risk factors in CAD patients presenting for surgical revascularization by coronary artery bypass grafting in rural setup in India.

2. Materials and Methods

2.1 Study design

This study was designed as a prospective observational study.

2.2 Study area

This study was carried in cardiothoracic departments Jawaharlal Nehru medical college (JNMC), Sawangi (Meghe), Wardha, Maharashtra which is NAAC A accredited a tertiary care level hospital and teaching institute.

2.3 Study period

The study was conducted during January 1014 – July 2015.

2.4 Study size

Eleven risk factors in 206 patients coming for CABG were analyzed in preanaesthetic check up. This included a history of cigarette smoking, dyslipidaemia, hypertension, and diabetes mellitus, advanced age, family history of CAD, obesity, male gender, sedentary life style excessive alcohol intake and diet.

2.5 Exclusion criteria

Patient with vulvular heart disease were excluded from study.

2.6 Statistical analysis

Data was recorded using a predesigned semi structured proforma and entered into Microsoft Excel worksheet. Appropriate tests were applied for analysis.

History of smoking or non smoking tobacco consumption was given by the patient or relatives. Hypertension was defined using WHO criteria-pressure exceeding a systolic value of 140 mmHg and/or a diastolic of 90 mmHg. Any patients whose pressure was controlled by medication were also included in this group. Patients on anti diabetic drugs or having a fasting blood glucose level ≥7.0 mmol/L were considered to be diabetic., Dyslipidaemia was defined when total blood cholesterol ≥200 mg/dl, decreased HDL cholesterol ≤40 mg/dl, adverse total cholesterol/HDL ratio ≥4.5.Obesity was defined as having a body mass index (BMI) of more than 30 kg/m2. Family history of coronary heart disease significantly increases risk of the disease in all first degree relatives. Advanced age was considered 60 years or more at presentation, based on the American Heart Association's first age cut-off limit for CAD. [8]

Time spend for moderate physical activity like brisk walking, cycling was calculated for each subject, and accordingly, they were classified as a physically inactive or sedentary lifestyle if physical activity was <30 minutes/day. Sedentariness affects heart by predisposing to obesity and diabetes and by decreasing HDL level in the blood [9]

Dietary factor responsible for CAD in India are inadequate consumption of fruits and vegetables, increased use of atherogenic diet including fried foods, processed foods, fast foods, that are high in calories, saturated fat, and trans fat, less consumption of omega 3 fatty acid. In this study dietary factors which are included are less consumption of fruits and vegetables, and high intake of fat. [10]

Moderate alcohol intake means 1-2 drinks per day for men and 1 drink for women. A drink is 12 OZ beer, 4 oz wine, 1.5 oz of 80-froof spirit, 1 oz of 100 proofs spirit. High alcohol intake of 75 mg or more per day is an independent risk factor.

3. Results

During 18 –month period, 206 patients underwent CABG. Of these patients, 198 cases of isolated CABG. 8 cases were associate with valve replacement.159 cases were male and 47 cases were female. The age varies from 35 to 70 years of age. Mean age for male 56. Mean age for female 63 years.
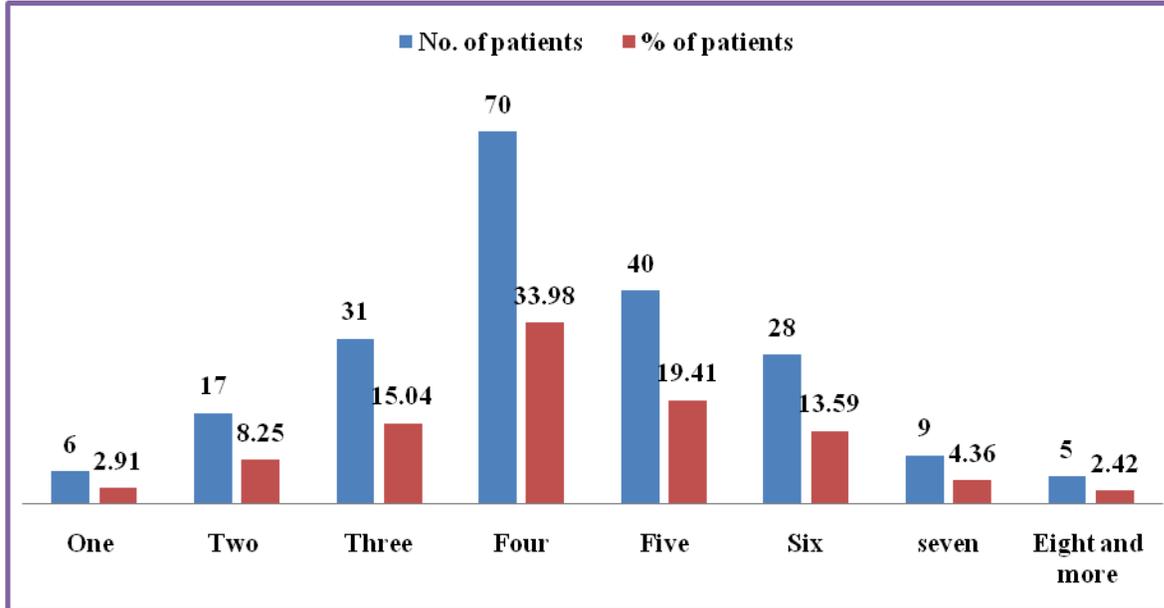
Figure 1: Prevalence of risk factors for coronary artery disease coming for CABG.
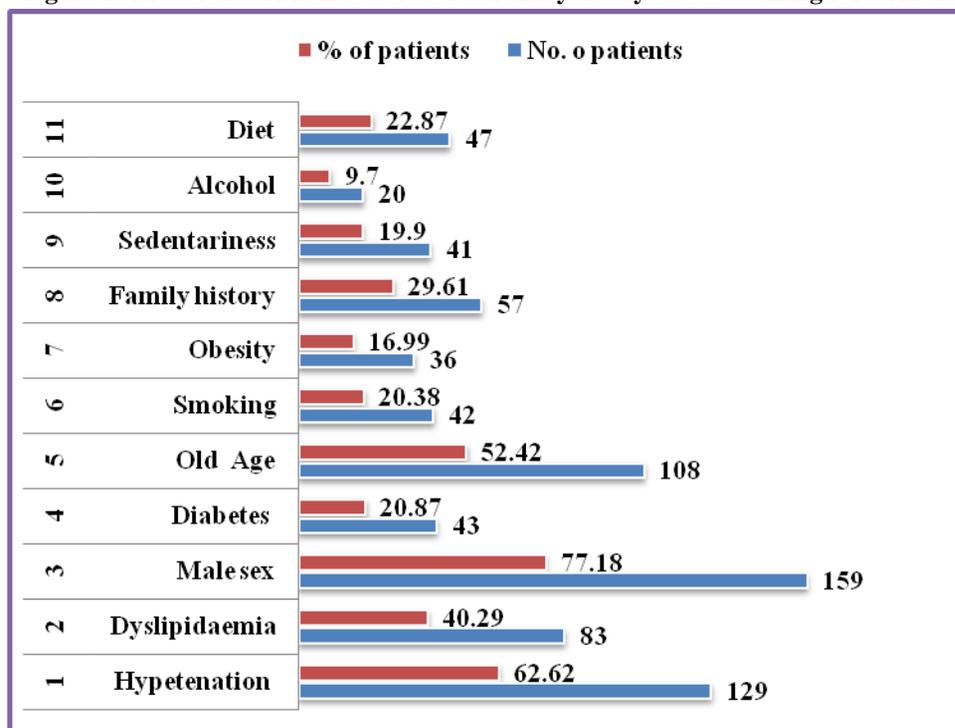
Hypertension was most common modifiable risk factor for CAD coming for CABG. Prevalence of it was 62.62 % (129/206), while male sex (77.18%) was most common non modifiable risk factor for CAD coming for CABG. Prevalence of it was 77.18% (159/206). Prevalence of other risk factors were as dyslipidaemia 40.29 % (83/206), diabetes 20.87% (43/206), old age 52.42 % (108 /206), smoking 20.38% (42/206), obesity 16.99% (36/206), family history 29.61%. (57/206),sedentariness 19.90% (41/206), alcohol 9.70 % (20/206) and diet 22.87 % (47/206).

Figure 2: Prevalence of number of risk factor in study group.

Patients with coronary artery disease coming for CABG may have one or multiple risk factors. Prevalence of four risk factors in CAD patients was 33.98 % (70/206). Prevalence of different number of risk factor in CAD patients coming for CABG were as fallows – one risk factor 2.91 % (6/206), two risk factor 8.25% (17/206), three risk factor 15.04 % (31/206), five risk factor 19.41 (40/2060), six risk factor 13.59% (28/206),seven risk factor 4.36 % (9/206), eight and more risk factor 2.42 % (5/206). Most common combination of risk factors is male sex, hypertension, dyslipidaemia and diabetes.

Figure 3: Prevalence of risk factor as distributed among male and female
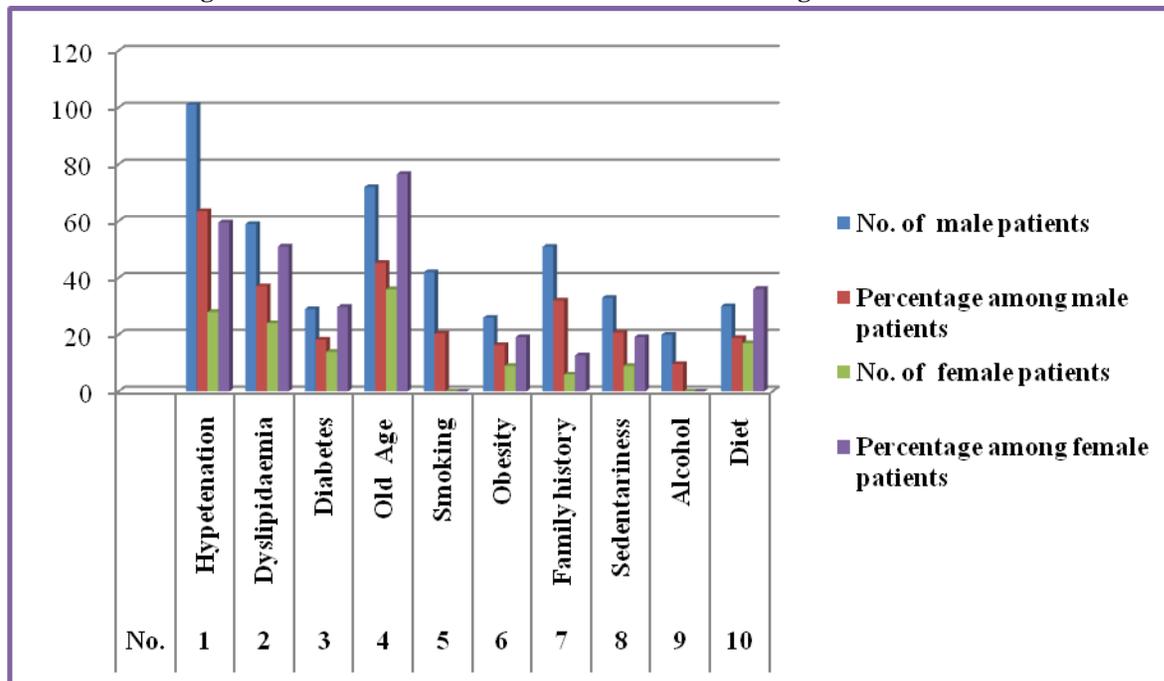
4. Discussion

This study shows that hypertension was most common risk factor for coronary artery disease coming for CABG. Prevalence of hypertension was 62.62 % (129/206). Our findings are similar with other studies. **P**rashanth Kulkarni *et al* (2014) found prevalence of hypertension in CAD in Indian patient is 53%. [7]

In this study, prevalence of dyslipidaemia in coronary artery disease patients coming for CABG is 40.29 (83/206). It could be associate with nutrition and dietary habits, obesity, diabetes, and genetic predisposition. Common dyslipidaemia associate with CAD coming for CABG are low HDL cholesterol, elevated LDL cholesterol, high triglycerides and high total cholesterol. Kalimuddin *et al* (2000) found that prevalence of hypercholesterolemia was 34% in Pakistan. [11]

Male gender is common risk factor for coronary artery disease coming for CABG and prevalence in male is 77.18 (159/206). In our study, male to female ratio for CAD coming for CABG is 3.38. This reflects male gender is an important risk factor for coronary artery disease .Most studied show that prevalence of CAD was common in male compared to female.

Prevalence of diabetes for CAD patients coming for CABG was 20.87 % (43/206). Kalra *et al* (2011) found prevalence of diabetes for CAD in eastern Nepal was 15.9%. [12] Changes in lifestyle of Indian population have increased the prevalence of diabetes as risk factor.

In several older people the date or year of birth was not known. We have always tried to correct the age stated in the records, if it was not consistent with the age of the first born child.

In this study, prevalence of smoking in CAD coming for CABG was 20.38.This risk factor is limited only in male in India. ZN Hatmi *et al* (2007) noted prevalence of smoking in CAD patients 21.6%.[13]

Many studies have found that obesity is an independent risk factor for CHD. Prevalence of obesity in CAD coming for CABG is 16.99 % (35/206). Okon *et al* (2014) found that 36.5% were obese who developed CAD in Nigeria. [14]

The risk of family history of ischemic heart disease independent of other well described risk factors has remained difficult to quantitate. .In our study, Family history is given by 29.61% (57/206)**.** Prashanth Kulkarni *et al* (2014**)** found that Positive family history of premature CAD was present in 32%. [7]

In this study, Sedentariness is observed in 19.90 % (41/206). Karla *et al* (2011) found sedentary life style in CAD patients was 47.1% in Nepal.[12]

These studies show that prevalence heavy alcohol intake associate with CAD and coming for CABG is 9.70%. Okon *et al* (2014) observed 14.6% had significant alcohol history in CAD patients in Nigeria.[14]

Dietary factor are responsible for 22.81 % of CAD patients coming for CABG. Reza Amani *et al* (2010) noted consumption of fruits and vegetables three or more servings per day versus less than once per day are associated with a 27 percent reduction in cardiovascular disease.[15]

5. Conclusion

In this study, Hypertension is most common risk factor for CAD coming for CABG. The most common combination of factors seen together was diabetes, hypertension, dyslipidaemia and male gender.. The incidence of CAD risk factors is likely to increase further because of rapid urbanization and its accompanying lifestyle changes.

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