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Community Medicine

A STUDY ON RISK FACTORS OF CORONARY ARTERY DISEASE IN YOUNG CORONARY ARTERY DISEASE PATIENTS OF TELANGANA

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ABSTRACT **Background:** There is an alarming rise in the incidence of coronary heart disease (CAD) among young Indians due to lifestyle changes. However, there is dearth of data available. Therefore, a systemic investigation is required to identify these risk factors. **Objectives:** Estimate the prevalence of risk factors in young patients diagnosed with CAD **Methodology:** A hospital based cross-study was conducted on 110 CAD patients under 45 years. A structured questionnaire developed based on WHO STEPS questionnaire was used. Analysis done using SPSS Package version 20. **Results**: In this study the order of prevalence of risk factors were abdominal obesity (76%), alcohol drinking (56%), physical inactivity and inadequate intake of fruits (55% each), diabetes (52%), BMI >25 kg/ m2 (51%), family history of risk factors (49%), smoking (48%), stress (46%), consumption of fast food (37%), hypertension (31%), hyperlipidemia (25%), inadequate intake of vegetables (18%) and hyperhomocysteinemia(4%). In this study urban males and urban smokers were at higher risk. **Conclusions:**It was noted that obesity, poor diet, diabetes, alcohol drinking and smoking were predominant risk factors. Abdominal obesity was the single most important risk factor in this population. This indicates that the young are gradually adopting a unhealthy lifestyle.

KEYWORDS : coronary artery disease, risk factors, young, Telangana.

Introduction:

At the threshold of the new millennium CAD is emerging as the new epidemic in Indians at a relatively younger age group. CAD is a devastating disease, what makes it more catastrophic is its occurrence in an otherwise healthy young individual who is in the prime of the life, might die or become disabled without any warning. [1] The entitling of "Coronary artery disease in young (CADY)" has been done due to increasing incidence of the disease amongst the young. [2]

Unfortunately, premature CAD is becoming increasingly evident in India owing to the destructive lifestyle factors, including exaggerated ambitions, competition, workaholism, poor diet, and lack of exercise. Despite this there are only few studies to evaluate the prevalence of risk factors and risk factor patterns in Indian populations. The objective of this study is to estimate the prevalence of risk factors in young patients diagnosed with coronary artery disease. This opportunity was also used to motivate patients to adopt risk reduction therapies. The importance of screening for identification and clinical management of modifiable risk factors is a paramount priority. [3]

Methodology:

After obtaining approval from Institution of Ethical Committee, a hospital based cross-sectional study was done 110 patients for six month period in a medical college and hospital located in Moinabad, Hyderabad. All subjects who participated in this study were less than or equal to 45 years and diagnosed with acute Myocardial Infarction and Fulfilled the acute myocardial Infarction criteria according to the WHO criteria [4] were taken . Patients who were unconscious and expired after admission were excluded. The participants signed a written informed consent.

A structured questionnaire developed based on WHO STEPS questionnaire [5] was used to collect required information.

The information was collected with the help of questionnaire by interview method.

Survey data entry and analysis was done using SPSS Package version 20. Simple proportions, mean, standard deviation and Chi-square test was used. Chi-square test was used to find out the association between two attributes.

Results:

The mean age (SD) of the subjects was 40 years (± 4.9 years). The demographic characteristics of the patients are shown in table 1.

Table 1: Demographic characteristics young coronary artery disease patients

Demographic characteristics	Number (%)	
Age	25-35Years 35-45 Years	21(19.1) 89(80.9)
Sex	Male Female	87(79.1) 23(20.9)
Area of residence:	Rural Urban	58(52.7) 52(47.3)
Occupation:	Sedentary work Moderate work Heavy work	50(45.5) 14(12.7) 46(41.8)
Income:	Upper Class Upper Middle Class Lower Middle Class Upper Lower Class Lower Class	2(1.8) 13(11.8) 35(31.8) 47(42.8) 13(11.8)
Education:	Primary Secondary Undergraduate Postgraduate None	22(20) 27(24.6) 12(10.9) 4(3.6) 45(40.9)
Religion:	Hindu Christian Muslim Others	99(90) 4(3.6) 6(5.5) 1(0.9)
Marital Status:	Married Unmarried	109(99.1) 1(0.9)

In this study the most common presenting cardiac symptoms were tightness in chest (83%) and acute chest pain (77%). It was also observed that most of the patients (80.9%) were having 3 or more symptoms during admission. Almost three-fourth of the population had acute myocardial infarction (76%) and a majority (70%) had single vessel disease.

The behavioral risk factor profile of the study group is depicted in table 2. It was noticed that 49% of the population had positive family history, 48% were cigarette smokers and 56% were alcohol drinkers. Psychological stress was confessed by 46% of these adults. Dietary habits indicate inadequate fruits intake by 55% subjects and inadequate vegetables intake by 18% of population. 37% patients were consuming junk foods regularly. In this study 45 % patients were physically active.

Table 2: Profile of Behavioural Risk Factors among CAD patients.

Behavioral Risk Factor		No (%)
Family history	Yes	54(49)
	No	56(51)
Smoking	Yes	53(48)
	No	57(52)
Alcoholic	Yes	62(56)
	No	48(44)
Stress	Yes	51(46)
	No	59(54)
Fruit servings/week	Inadequate	61(55)
	Adequate	49(45)
Vegetable servings /week	Inadequate	20(18)
	Adequate	90(82)
Intake of fast foods /week	>3times	41(37)
	<3 times	69(63)
Physical activity	Sedentary	60(55)
	Active	50(45)

The physical risk factor profile of this young CAD group of patients is shown in table 3.

A large proportion of patients were found to be obese (51%) and overweight (25%). The remaining 24% had normal BMI. The mean BMI was found to be 25.3 kg/m2. Similarly, based on waist circumference, 76% of the population was found to be at risk. BP values showed that 31% of the subjects had hypertension. The biological risk factor profile of CAD patients is also represented in table 3. In this study 25% patients were hyperlipidemic (elevated total cholesterol). The mean total cholesterol was 163.5mg/dl. Among the study population 52% were diabetic. Homocysteine levels were elevated in 4% of the population and the mean value was found to be 21.9 µmol/L.

Table 3: Profile of Physical and Biological Risk Factors among CAD patients.

Risk Factor		No (%)
PHYSICAL:		
BMI	Obese	56(51)
	Overweight	28(25)
	Normal	26(24)
Abdominal Obesity	At risk	84(76)
	Not at risk	26(24)
Hypertension	Yes	34(31)
	No	76(69)
BIOLOGICAL:		
Hyperlipidemia	Yes	27(25)
	No	83(75)
Diabetes mellitus	Yes	57(52)
	No	53(48)
Hyperhomocyst einemia	Yes	4(4)
	No	106(96)

The comparative risk factor profile in rural and urban is demonstrated in table 4. It was observed that the chances of getting Coronary artery Disease in urban males (OR, 0.32; 95% confidence interval [CI], 0.11-0.87; P= 0.022) and urban smokers (OR, 0.4; 95%CI, 0.19-0.89; P=0.023) were high and statistically significant.

Table 4: Comparative Risk Factor Profile of Rural and Urban Coronary artery Disease patients.

Category	Rural %(n)	Urban %(n)	Odds ratio (95%ci)	P value
Sex(male)	47(41)	53(46)	0.32 (0.11-0.87)	p*
Smoking	42(22)	58(31)	0.41 (0.19-0.89)	p*

p*- p <0.005 is significant

Discussion:

The rapid urbanization is accompanied with sedentary lifestyle, consumptions of diet with excess calories, saturated fats, salt, growing influence tobacco use and alcohol drinking and lack of awareness among young supplement markedly to the risk of developing CAD. Now, premature CAD is not unusual in India and presents an enormous burden on our country.

As pointed out in most of the studies [6, 7] this study also shows that almost three fourth patients with PCAD are males (79%). This could be due to the cardio protective role of estrogen that prevents atherosclerosis. Further, greater prevalence of smoking, alcohol drinking and poor dietary habits among young Indian men add to this. There are very few studies that establish the correlation between socio-demographic data and CAD. Previously, the correlation between acute myocardial infarction and low education status was noted.[8,9]

Family history is an important risk factor present in many CAD patients. 49% participants had a positive family history of risk factors in the present study. A study from Oman [10] shows high occurrence of family history of CAD (72%). Patients with a family history for premature CAD tend to have more prevalence of lipid abnormalities, insulin resistance, and obesity strengthening the belief of a common genetic linkage and also tend to have more arterial abnormalities than the rest. [11]

Smoking was one of the important risks for ACS in this study, present in 48% of patients.

Smoking was established as the single most important modifiable risk factor in some studies.[12, 13] There is evidence highlighting the elevated rates of tobacco use among very young patients who present with AMI, with percentages ranging from 47% to 93%. [6,14,8,15] According to few researches smoking is more common in young adults than the older CAD patients.[14] Smoking increases the risk of CAD by 3-5 times. In the first world countries, smoking has significantly decreased and is socially looked down-upon. In contrast, in India smoking is increasing particularly in the younger generation. Kannel *et al.* found in patients included in the Framingham Heart Study that the relative risk for CAD was about three times higher in smokers of age 35 to 44, compared to non-smokers.[1] According to a study by Ashish Kakaria *et al*.[16], more than half of young Indian males with IHD are smokers.

There is paucity of data on the roles of emotional distress, anger, and sudden or extreme physical exertion and their association with CAD. Like this study, Mulay Pramod Pz *et al.*[2] and Ashish Kakaria *et al*.[16], reported stress as a common risk factor in 35% to 40% of the study population.

Fast food and deep-fried food intake were reported considerably high by some articles.[6,15] The same holds true for the current study (55%) also. Here, it was obtained that 18% take inadequate vegetables and 55% take less than the required fruits. Inadequate vegetable intake has been emphasized in other studies [6,12] also. These results shed light on the significance of healthy and balanced diet towards individual's health.

A Meta-analysis of studies showed the relative risk of IHD death was 1.9% in sedentary as compared to active subjects. [16] 55% population in this study are inactive physically. This is a highly significant proportion keeping in view the age group that was considered.

Obesity (BMI >25kg/m2) is yet another risk factor for CAD in both men and women. In comparison to study in Poland [17], in this study 51% of patients are obese and 25% of patients are overweight. Earlier studies show varied proportion obese CAD patients ranging between 10% to 48.9%.[6,12,13]

Central obesity (determined by waist circumference) is an independent risk factor for CAD. Even modest increase in body fat with central distribution enhances the risk of development of IHD.[18] In the present study 76% (84) subjects were at risk, reflecting the sedentary lifestyle of the population. These results correspond with another study by Amitesh Agarwal *et al.*[19]

This study showed that 31% are hypertensive corresponding to some previous studies. [4,10,13] as well. In a study by Adhikari CM *et al*. [14] hypertensions was found in 70% patients. In contrast to this hypertension was found less prevalent in other researches. [20]

High total cholesterol is prevalent in 25% of the population. Similar outcomes were obtained in few studies [20] but there are other studies [6,14,12,16] that show a prevalence up to 85%. In Delhi, the mean serum

cholesterol level has risen from 160 mg/dl in 1982 to 199 mg/dl in 1994.[18]

During the past decade, the number of people with diabetes in India has increased. 52% of the patients had a history of diabetes in the current study. The results correspond to previous studies [13,16] in which diabetes has significantly contributed towards PCAD. However, diabetes is a major risk factor for IHD but is less common in young as highlighted by some previous studies.

Conclusion:

The significant findings in this study are that the population of young adults with CAD are predominantly male, residing in rural areas and characterized by a low socio-economic status. Abdominal obesity, alcohol drinking, sedentary lifestyle, unhealthy dietary habits, diabetes and smoking were the common risk factors.

There is still a need for more research to be done on this topic especially in India due to the diversity of the population and different environmental and nutritional variations that exist.

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