Epidemiological Study of Risk Factors for Coronary Artery Disease in Young Asymptomatic Individuals

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Research Article

Abstract: A study was carried out to find the prevalence of different conventional risk factors for coronary artery disease in young asymptomatic population. Out of 100 randomly selected individuals maximum [40 %] were in age group of 26 to 30 years with mean age of 27.7 yrs, males outnumbering females [72 and 28]. Smoking was present in 40% of study population and all were males.28 % of people had sedentary life style. Generalised and central obesity were observed in 19% and 14 % of study group. 16 were hypertensive, while dyslipidemia and diabetes were present in 12 and 9 subjects of study population. Smoking was observed as the most common risk factor 40 in study group and a positive family history was the second most common risk factor with a prevalence of 31%. Fasting hyperglycemia was the least common observed in 9%. However there was no significant number of people in the study group who had all the risk factors.

Keywords: Coronary artery disease, Risk factors.

Introduction

Coronary artery disease (CAD) is the largest killer in developed countries. It is rapidly becoming one in developing countries and is forecast to be the most common cause of death globally, including India, by 2020.[1,2,3, 4]

The disease contributed to 15.3 million deaths in 1996, of which 5.5 million was from developed countries and 9.77 million from developing countries. A rise in the prevalence of coronary artery disease in the early half of twentieth century and a subsequent decline in the second half have been well documented in the industrialized countries. However, the scenario is reversed in developing countries especially India with a steady escalation in prevalence of coronary artery disease. [5] "Hritshoola", an equivalent of present day angina/coronary artery disease (CAD) was known to ancient physicians since 500 BC. It involves those individuals who have faulty life style including sedentary habits, increased consumption of fatty foods, smoking, hypertension, etc. Atherosclerosis starts at an early age in these individuals, these observations have been confirmed by Framingham studies.[6,7, 8] In a prospective autopsy study conducted on 100 cases dying of causes other than cardiovascular ailments, the earliest age of aortic and/or coronary atherosclerosis occurrence was 16 years in both sexes.[8] It is consistently observed that Indians have premature CAD and that their risk for CAD was two to four times higher than the white European population. The prevalence of CAD has increased to 10 times in the last 40 years. [5] India is at present experiencing an epidemiological transition with high rates of urbanization. One of the effects of this transition is a shift in the disease spectrum from communicable to noncommunicable diseases, particularly CAD and diabetes. [5] Previous data from different studies have indicated that smoking, hypertension and dyslipidemia if present in young individuals play an important role in the development of premature coronary artery disease.[6] smoking can increase the risk by 3-5 times and modest increase in central obesity (depicted by Waist Hip Ratio) increases the risk further.[6] There is need to identify and correct the conventional risk factors for coronary artery disease) The present study was carried out to assess conventional risk factors for Coronary Artery Disease in young asymptomatic adults and also to emphasise importance of measures to prevent occurrence of CAD in young subjects with risk factors. The purpose of this study was to see the prevalence of different conventional risk factors for coronary artery disease in young asymptomatic population.

Material and Methods

A study of risk factors for Coronary Artery Disease in young asymptomatic adults was carried out in the department of medicine from May 2007 to Dec 2009. A total of 100 individuals in age group of 18-40 years, fulfilling inclusion criteria were randomly selected. A detail history of all the subjects included in the study group was taken with special emphasis on dietary habits, occupational history, family history of major diseases ,addictions and socioeconomic history. A detailed physical examination with special emphasis on body mass index, waist-hip ratio and cardiovascular examination was carried out in all subjects. Routine haemogram, Fasting

blood sugar (FBS) , Serum lipids,Triglycerides,resting 12 lead ECG,X-ray chest (PA view) was done in all subjects.

Criteria for defining risk factor for CAD[9]	Criteria
Smoking	Present smoker or left less than 5years back
Generalized obesity	Body mass index (weight in kg/height2 in cm) = 27 in males and 25 in females
Central obesity	Waist/hip ratio =1.0 in males and 0.9 in females
Sedentary habits	Subject walking less than 14.5km/week
Hypertension	Blood pressure=140/90 mmHg (JNCVI criteria)
Diabetes mellitus	Plasma Sugar (fasting) level of =126 mg%
	Serum LDL=130 mg% Serum triglyceride =150 mg%

Result

Hundred randomly selected subjects fulfilling inclusion criteria were studied for risk factor of CAD , out of 100, 72 were male and 28 were females (Figure – 1) . The maximum number was in age group of 26 – 30 yrs with mean age 27.7 yrs.
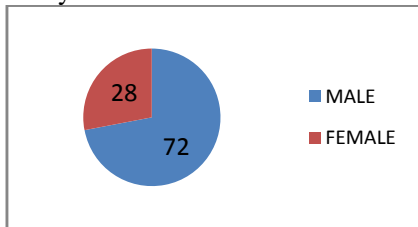

Figure 1: Sex distribution of the study group(n=100)

Risk factors - 40% had smoking as risk factor and all of them were males. None of the female had smoking habit (Figure 2). Most of these smokers were in age group of (26- 30) and had an average pack years of 6-10 pack/year (Figure - 3)
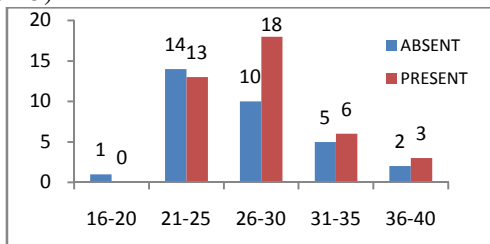

Figure 2: Age wise distribution of smoking as a risk factor (n=72)
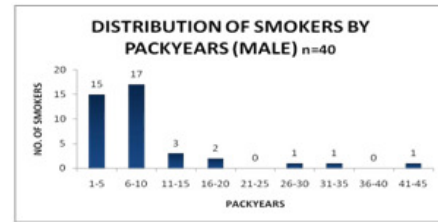

Figure 3: Distribution of smokers according to pack years (n=40)

A positive family history was the next common risk factor observed in 31% of study population (Figure 4) and almost similar number (28%) showed sedentary lifestyle as a risk factor(Figure 5)
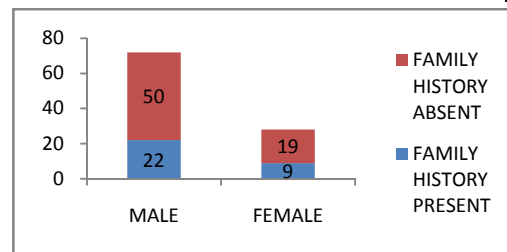

Figure 4: Distribution of family history as a risk factor (n=100)
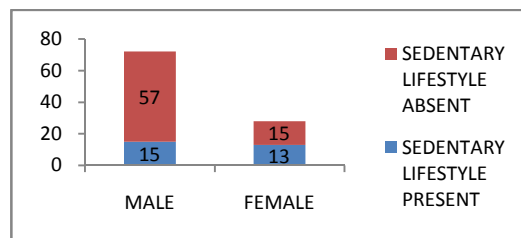

Figure 5: Distribution of sedentary lifestyle as a risk factor (n=100)

Generalized and central obesity were observed in 19% and 14% of study group (Table 1).

Table 1: Distribution of generalized and central obesity as a risk factor(n=100)

Obesity	Present	Absent	Percentage
Generalised	19	81	19%
Central	14	86	14%

Rest of the conventional risk factors i.e. hypertension, dyslipidemia, fasting hyperglycemia were not observed in significant number of study group (Hypertension – 16, Dyslipidemia – 12, Fasting hyperglycemia - 9) (Figure 6)
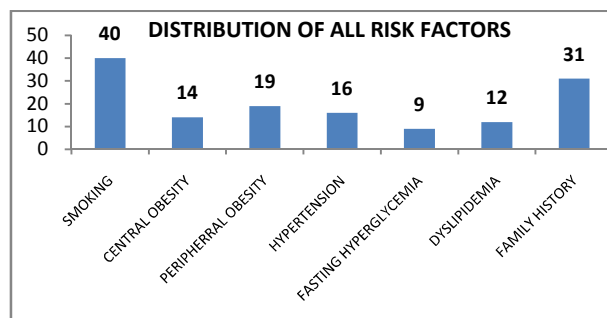

Figure 6

However there was no significant number of person in the study group who had all the risk factors. (Table 3)

Table 3: Distribution of all risk factors in study group

No. of risk factors	No. of patients
5	5
4	3
3	10
2	7
1	28

Discussion

Coronary artery disease is a major burden with increasing number of cases in developing countries. The problem is getting more severe as much younger population of productive age group is getting affected. The disease is also associated with morbidity and mortality. Many conventional and non-conventional risk factors have been recognized and studied over the years. The various Risk Factors for Atherosclerotic Coronary Artery Disease exert their deleterious effect through varied mechanisms. Relations between triglycerides and CAD have been proven in earlier studies. LDLs promote atherogenesis by affecting one or several of the processes of influx and efflux of the vessel wall. Elevated LDL levels also promote thrombosis formation. Endothelial dysfunction in hypertensive individuals can promote atherogenesis.In chronic hyperglycemia, glycated proteins and various local growth factors can stimulate the proliferation of the fibromuscular component of the mature atherosclerotic plaque. Smoking**,** the most important modifiable risk factor for CAD exerts its atherogenic effects by inducing catecholamine release, lowering HDL and oxidation of LDLApart from these conventional risk factors recently, a number of newer cardiovascular risk factors have been identified like higher C-reactive protein, plasminogen activator inhibitor (PAI 1) and homocysteine levels. These factors are of great interest in native Indians where more than 60% of the CAD remains unexplained by conventional risk factors[11]. In our study, the mean age of the subjects was 27.7 years. Smoking was present in 40 % of the subjects. All the smokers in the study were males. Fasting hyperglycemia was present in 9 % of the subjects. Smoking was the most common risk factor with a prevalence of 40% and fasting hyperglycemia was the least common with a prevalence of 9%. Most of our findings were consistent with the other studies conducted in the past. However few studies have reported much lower incidence of smoking as a risk factor.[10,11]Sedentary lifestyle as a risk factor was present in 28 % of the subjects. A much higher incidence of sedentary lifestyle as risk factor was also found in a previous study. [9]Family history of coronary artery disease was present in 31 % of the subjects. A lower incidence of family history of CAD as a risk factor has been reported in other study. [10]Generalized obesity was present in 19 % of our subjects and 14 % of the subjects were centrally obese. Some of the studies reported a higher prevalence rate of other conventional risk factors like hypertension, dyslipidemia unlike our study

Conclusion

The present study showed significant prevalence of various modifiable risk factors in young asymptomatic individuals early recognition of these risk factors in the young population is an important step towards prevention of CAD in young individuals. . Study of non conventional risk factors in large population needs to be studied in future.

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