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Original article

Metabolic Equivalent Task Score and Risk Factors of Coronary Heart Disease in Bank Employees

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ABSTRACT

Background: Urban population is subjected to stressful and sedentary life style. There is evidence that job characteristics may be associated with CHD, independently of the social status. A logical beginning for investigation of occupational experience would be the macro epidemiological studies. **Aims:** To estimate the prevalence of risk factors for coronary heart disease and to assess the physical activity by Metabolic Equivalent Task score in bank employees. **Setting and Design:** A cross-sectional study design for a period of one year and a total of 400 bank employees across Hubli were included in the study. **Methods and Materials:** Total Banks in Hubli were 94, all the bank employees in the age group of 30 to 60 yrs were included in the study. Study was conducted for a period of 1 year from 1st August 2009 to 30th July 2010. A pretested and structured questionnaire was used to collect data socio-demographic profile and risk factors for CHD were taken by visiting the banks. The physical activity was assessed by Metabolic Equivalent Task Score (MET). **Statistical Analysis used:** Data was analyzed statistically using chi-square test with level of significance at $P < 0.05$ by using SPSS 13.0. **Results:** 76% of the subjects were male, 77% of subjects were in the age group of 30 to 60 yrs. 4% had already developed Coronary heart disease, 10% were smokers, 4% consume alcohol, 45% were non vegetarians, 44% consume oily foods more often, 10% were diabetic, 38% were hypertensive, 81% had stressful work, 56% had family history of CHD, 67% of the subjects had BMI > 25, and MET score for physical activity is less than 6 in 80% of population. **Conclusion:** Bank employees have High prevalence of Risk Factors for Coronary Heart Disease (85% of them having > 2 risk factors). Most of the Risk factors were modifiable risk factors above national average. MET Score can be used to assess the physical activity.

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1. Introduction

"The thousand mysteries around us would not trouble but interest us, if only we had cheerful, healthy hearts."

-Nietzsche

Coronary Heart Diseases (CHD) causes 25%-30% of deaths in developed countries. The WHO declared CHD as our modern 'epidemic' [1]. Recently even developing countries are catching up. The identification of measurable correlates of CHD constitutes one of the foremost advances in cardiovascular medicine. These

correlates are called as risk factors. The first step in the assessment of risk is to identify the major causal risk factors. This requires taking a smoking history, alcohol history, recording blood pressure, and measuring glucose in fasting plasma and detecting obesity by BMI and assessing stress. The patient's age represents a first approximation of plaque burden as a risk factor [2]. Several epidemiological studies suggested that most, i.e., 60%-85% of the CHD burden can be attributed to established risk factors like smoking, Hypertension (HTN), Diabetes Mellitus (DM), unfavourable cholesterol profile and physical inactivity. Remaining 15%-40% is prevalent among people with low socio-economic position. [3]

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Recent research indicates that psychological stress may be an independent risk factor for the development of CHD. There is evidence that job characteristics may be associated with CHD, independently of the social status measures. A logical beginning for investigation of occupational experience would be the macro epidemiological studies of CHD by occupational risk. [4] DM increases the risk to 2-3 times and high alcohol intake, defined as 75g or more per day is an independent risk factor for CHD, HTN & all Coronary Vascular Diseases. A family history of CHD is known to increase the risk of premature death. The pronounced difference in the mortality rates of CHD between male and female subjects suggests that the underlying factors may have a hormonal basis. Women using oral contraceptives have higher blood pressure. [12]

Bank employees have sedentary lifestyle; relatively better socioeconomic condition and stressful job are subject to the risk of coronary heart disease. They represent the subset of population at risk to develop coronary heart disease. This study was designed to evaluate the risk factors for coronary heart disease and to assess the physical activity by Metabolic Equivalent Task score in bank employees of Hubli City.

2. Materials and Methods

A Community Based Cross sectional study was undertaken among the Bank Employees of Hubli- Dharwad. The prevalence of various risk factors in bank employees is not known, so an estimated prevalence of 50% with 95% confidence interval and allowable error of 5%, a sample size of 384 was arrived and it was rounded off to 400. Total Banks in Hubli are 94; all the bank employees in the age group of 30 to 60 yrs were included in the study. Study was conducted for a period of 1 year from 1st August 2009 to 30th July 2010.

A pretested and structured questionnaire was used to collect data socio-demographic profile and risk factors for CHD were taken by visiting the banks. The physical activity was assessed by Metabolic Equivalent Task Score (MET). Weight was measured by Bathroom type weighing machine and Height was measured by standing method in centimeters. Informed consent was obtained from the subjects. Data was analyzed statistically using chi-square test and t-test at level of significance at $P < 0.05$ by using SPSS 13.0.

3. Results

In the study it was observed that majority 78% of the subjects were in the age group of 40 to 60 yrs, males constituted about 76% of the sample and 95% of subjects were married and majority 64% were degree holders and 85% belonged to upper middle socio-economic status.

Table 1: Shows the Socio-Demographic profile of subjects.

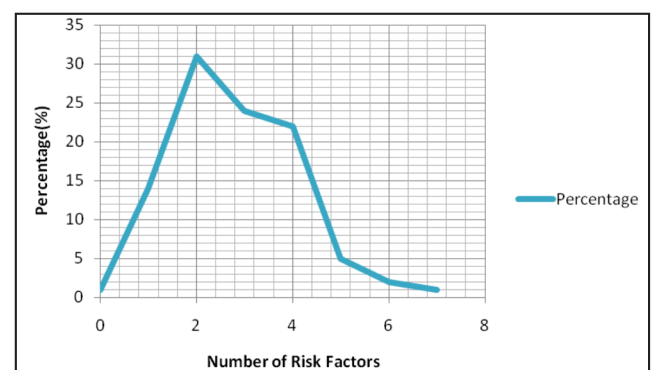
It was observed that 31% had 2 risk factors for CHD, followed by 24%, 22%, 14% and 5% had 3, 4, 5 and 6 risk factors respectively. Only 1% of them did not have any risk factor for CHD

Table 1: Showing Socio-Demographic profile of the study subjects

Socio-Demographic profile		Frequency (n=400)
Age	30 to 40 yrs	88(22%)
	40 to 50 yrs	160(40%)
	50 to 60 yrs	152(38%)
Sex	Male	304 (76%)
	Female	96 (24%)
Marital Status	Married	380(95%)
	Unmarried	20(5%)
Education	Masters	60(15%)
	Degree	256(64%)
	PUC	36(9%)
	Secondary	36(9%)
	Primary	8(2%)
	Illiterate	4(1%)
Socio-Economic Status (Modified B G Prasad of 2010 Classification)	Upper	20(5%)
	Upper Middle	340(85%)
	Lower Middle	28(7%)
	Upper Lower	12(3%)

Fig 1: Diagram showing Distribution of study sample according to number of Risk factors present.

Fig 1: Shows the Number of Risk Factors among subjects



Age was a risk factor in 78% of subjects, smoking in 10%, Alcohol in 4%, Diabetes in 10%, Hypertension in 38%, Stress in 81%, Previous History of CHD in 4%, BMI > 25 in 56% and MET score < 6 in 80%

Table 2: Showing the Risk Factors among subjects

80% of subjects had a MET score of < 6 (Moderate Physical activity) which in turn is a risk factor for CHD. There was a significant association between BMI < 25 and MET score < 6 BMI was increasing with decrease in physical activity

Table 2: Showing Prevalence of risk factors for CHD among Bank Employees

Risk factors	Frequency N=400(%)
Age(>40yrs)	312(78%)
Smoking	40(10%)
Alcohol Consumption	16(04%)
Diabetes	40(10%)
Hypertension(>140/90mmHg)	152(38%)
Stress	324(81%)
Previous H/O CHD	16(04%)
BMI(>25)	224(56%)
MET score <6	320(80%)

Table 3: Showing Association between MET Score and BMI

BMI	MET Score>6	MET Score>6	Total
<25	64(16%)	112(28%)	176(44%)
>25	16(4%)	208(52%)	224(56%)
Total	0(20%)	320(80%)	400(100%)

$\chi^2 = 52.6, p=0.00001, df=1$

In the present study Majority 40% of the Bank employees were in the age group of 40 to 50 yrs, followed by 38% in 50 to 60yrs age group. In the study by Mandal S et al [10] in 250 urban population of Siliguri, Westbengal, the mean age of the study population was 52.8 years old (+ 12.6). The mean age of males was 54 years old and the mean age of females was 51.5 years old.

The findings of our study comparable with other studies conducted among urban population of Belgaum, Thiruvanthapuram and Jaipur cities. [5, 8, 9] It was also comparable with industrial employees of North India and in American population (Harvard alumni). [6]

Table 4: Showing the prevalence of the risk factors among various studies

Risk factors	Present Study	H.R.Shivaramakrishna et al. (2010) ⁵	Howard D et al (2000) ⁶	D.Prabakaran et al.(2005) ⁷	Gupta et al. (2002) ⁸	Kutty et al. (2000) ⁹
Male	76%	76%	-	100%	49%	37%
Smoking	10%	25.9%	81	36%	23.9%	57%
Alcohol consumption	4%	25.9%	58	-	-	34%
Sedentary	80%	44%	236	-	27%	51.4%
Habits BMI (>25kg/m ²)	56%	35.4%	101	38.3%	27.4%	-
Hypertension (>140/90 mmHg)	38%	31.3%	63	30%	36.9%	27%
Diabetes	10%					
Presence of two or more than two risk factors	85%	21.3%	1075	15%	12.2%	16.3%
		55%	1075	47%	-	

In the study it was observed that majority of the Bank employees (80%) had MET score < 6 (Moderate Physical activity) which is a known risk factor for CHD among adults. There is strong association between BMI (> 25) and MET score <6. Hence suggesting that with decrease in physical activity (MET score <3) increases the BMI.

Howard D Sesso et al. in their study on "Physical Activity and Coronary Heart Disease in Men: The Harvard Alumni Health Study" on 12516 subjects of Harvard alumni found that most of the energy was expended on moderate (4 to 6 METs) and vigorous (>6 METs) activities, which contributed 37.4% and 56.1%, respectively, to the total energy expended from sports or recreational activities. [6]

5. Conclusions

1. Bank employees have High prevalence of Risk Factors for Coronary Heart Disease (85% of them having >2 risk factors) hence they form a vulnerable population for Coronary Heart Disease.

2. Most of the Risk factors were modifiable risk factors. These risk factors can be prevented through aggressive Behavioural change and communication (BCC) activities to modify their life

3. MET Score can be used to assess the physical activity. Health education should be given to bank employees about the risk factors of CHD. They should be encouraged to involve themselves in physical activities like yoga, jogging etc. Regular screening should be done for the non-communicable disease like HTN, DM, and Obesity

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