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Risk Factors of Coronary Heart Disease among Bank Employees of Belgaum City - Cross-Sectional Study

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Abstract

Background: Bank employees, with their resources and infrastructure, are ideal for increasing awareness and initiating preventive activities for the control of coronary heart disease (CHD). However, there are no reliable estimates of CHD risk factor burden, or of its awareness and treatment status among bank employees. The study intends to evaluate the prevalence of risk factors of CHD among bank employees of Belgaum city. *Objectives:* To estimate the prevalence of risk factors of CHD and to assess the knowledge regarding risk factors of CHD among bank employees. *Methodology:* It was a cross-sectional study for a period of one month. The study population consisted of bank employees working in various banks in Belgaum city. *Results:* The prevalence of risk factors of CHD was as follows: hypertension 31%, diabetes 21%, high serum total cholesterol 29%, high triglycerides 39%, high LDL cholesterol 19.3%, low HDL cholesterol 17.7%, smoking 26%, sedentary habits 44%, positive family history 12%, overweight / obesity (BMI $\geq$25 kg/m^2) 33% and 26% of the study subjects had truncal obesity. Among these, 55% of the study subjects had at least two of these risk factors. *Conclusion:* The present study shows a disturbing burden of coronary risk factors in the study population. There is an urgent need to undertake population based measures to reverse the trend.

Keywords: Coronary heart disease; Risk factors; Employees, knowledge

Introduction

Coronary heart disease is the largest killer disease in developed countries and is rapidly assuming a similar role in developing countries. The WHO has drawn attention to the fact that coronary heart disease (CHD) is our modern epidemic, not an unavoidable attribute of aging. It is estimated that if incidence of CHD is brought to zero it would increase the life expectancy by 3 to 9%. [1] It has been estimated that during the period 1965 to 1996, CHD mortality fell by 50% in Australia, Canada, France, and the United States and by 60% in Japan due to total lifestyle modifications. Other parts of Western Europe reported more modest declines (20% to 25%) [2]. The burden of CHD is rising in India. The estimated prevalence of CHD is around 3-4% in rural areas and 8-11% in urban areas among adults older than 20 years, representing a two fold rise in rural areas and a six-fold rise in urban areas over the past four decades. About 29.8 million people were estimated to have CHD in India in 2003; 14.1 million in urban areas and 15.7 million in rural areas [3]. It is expected to double in the next two decades, making it the single largest cause of death by the year 2020 [4]. While the exact etiology of this predisposition to CHD in Indians is still debated, from a public health point of view it is clear that the rapid

transition in diet and lifestyles with urbanization has contributed to increasing levels of potentially reversible CHD risk factors [2]. Data from several cross-sectional studies confirm the high prevalence of risk factors such as smoking, type 2 diabetes, high blood pressure, dyslipidemia and obesity in urban Indians. Despite voluminous publications and undivided focus of scientific world on coronary heart disease, it remains the most important cause of morbidity and mortality world over. The past decades have seen the medical fraternity taking giant leap in understanding the pathophysiology as well as treatment aspects of this dreaded disease. In comparison the preventive and social aspects of the disease have not received much attention in preventing and treating the CHD. It largely remains paper bound and is not actually addressed at a clinical level. It is all the more a pity when we are aware that simple cost effective modifications in the lifestyle can substantially help and achieve this goal. So far, we have failed to curb this rapidly growing pandemic. The time has come for us to reevaluate our approach to fight this problem. The need of the hour is to reemphasize the pivotal role of total lifestyle modification of the people at large. Bankers with their sedentary lifestyles, relatively better socioeconomic condition and highly stressful job are subject to the risk of coronary heart disease. We decided to select a cohort of bank employees, because they represent the subset of population at risk to develop coronary heart disease. This study was designed to evaluate the risk factors predisposing bank employees of Belgaum city to coronary heart disease.

Objectives of the Study 1) To estimate the prevalence of risk factors of coronary heart disease among bank employees of Belgaum city. 2) To assess the knowledge regarding risk factors of coronary heart disease among bank employees.

Materials and Methods

1) Source of Data: The study population consists of bank employees working in various banks in Belgaum city. There were 1292 bank employees working in Belgaum. Since 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 10%, a sample size of 297 was arrived and it was rounded off to 300.

2) Sampling Procedure: All the bank employees in were arranged in alphabetic order and were numbered. The required numbers of bank employees were selected using 4 digit random number table. .

3) Study Period: This was a cross-sectional study conducted during a period of one month from May1st 2008to May 31st 2008.

4) Methods of Collection of Data: The study was conducted at the main branches of nationalized banks of Belgaum city. A list of bank staff was obtained from their respective banks with their age and address. The selected bank employees were interviewed, examined and investigated as per pre-designed and pre-tested proforma.

5) Data Analysis: 'Rates' were used to analyze the data. 'Chi-square test' and 'z-test' were used to find the statistical significance.

Results

Prevalence of Risk factors of coronary heart disease among bank employees

- **Smoking** was considered for only males because there were no female smokers in the present study. Among the study population 25.9% were current smokers, 3.5% were ex-smokers. Out of the Current smokers, 25.4% smoked ≥20 beedies / cigarettes per week and 74.6% smoked <20 beedies/ cigarettes per week. Majority 83% smoked for more than 10 years.
- **Smokeless tobacco;** 9.33% were currently using smokeless tobacco, 2.33% were ex-users. Out of the subjects using smokeless tobacco, 25% used ≥20 times per week and 75% used <20 times per week. Majority of subjects 85.7% were using for more than 10 years.
- **Alcohol** was considered for only males because no females in the study were drinking alcohol. 25.9% subjects were currently using alcohol, 2.2% were ex-users. Out of the alcohol users, 15.3% used ≥ 210 ml ethanol per week and 84.75% used less than 210 ml ethanol per week. Majority of subjects 67.8% were using for more than 10 years.
- **Physical activity**; 44% subjects were sedentary and 56% were physically active. Among physically active subjects 29.2% were involved in mild activity, 34.5% were involved in moderate activity and 36.3% were involved in vigorous activity.
- **Extra fat in diet** (≥30% of the daily calorie from fat) was consumed by 6.3% subjects. Majority of subjects 83.77% were consuming safflower oil followed by coconut oil 15.23%.
- **Family history of CHD** was present in 12.70% subjects. There was no much difference in the prevalence of family history of coronary heart disease among males and females.
- **Hypertension;** The prevalence of hypertension was 31.3%, the prevalence among males was 38.2% and among females was 9.7%. This difference was statistically significant. The prevalence of hypertension in the age group 25-29 years was nil, 30-34 years was 10%, 35-39 years was 16.1%, 40-44 yeas was 21.1%, 45-49 years was 30.2%, 50-54 years was 54.4% and 55-59 years was 56.7%. This showed increase in prevalence of hypertension with age which was statistically significant. In the present study, the prevalence of hypertension among sedentary subjects was 39.39%, among mild physical active subjects was 55.10%, among moderate active subjects was 20.69% and among vigorous active subjects was 4.92%. This difference was statistically significant.
- **Diabetes;** The prevalence of diabetes in this study was 21.3%, the prevalence among males was 23.7% and among females was 13.9%. This difference was statistically not significant. In the present study, the prevalence of diabetes in the age group 25-29 years and 30-34 years was nil. The prevalence in the age group 35-39 years was 4.83%, 40-44 years was 15.79%, 45-49 years was 31.74%, 50-54 years was 31.58% and 55-59 years was 36.67%. This showed increase in prevalence of diabetes with age which was statistically significant.

The prevalence of diabetes was 28.28% among sedentary subjects, 24.49% among mild active subjects, 17.24% among moderate active subjects and 6.53% among vigorous active subjects. This difference was statistically significant.

- The prevalence of **overweight (BMI 25-29.9 kg/m^2)** in the present study was 30% and that of **obesity (BMI ≥30 kg/m^2)** was found to be 2.7%. There was no much difference of overweight among males and females. The prevalence of BMI ≥25 was 31.81% among sedentary subjects, 57.14% among mild active subjects, 24.13% among moderate active subjects and 22.95% among vigorous active subjects. This difference was statistically significant.
- The prevalence of **truncal obesity** (males WHR ≥1.0 females WHR ≥085) was 26%. The prevalence was 22.37% among males and 37.5% among females. This difference was statistically significant. The prevalence of truncal obesity was 29.5% among sedentary subjects, 46.9% among mild active subjects, 17.24% among moderate active subjects and 9.84% among vigorous active subjects. This difference was statistically significant.
- **The prevalence of dyslipidemia was summarized in (Table 1).**
  The prevalence of high cholesterol in the age group 25-29 years was nil, 30-34years was 10%, 35-39 years was 20.97%, 40-44 years was 27.63%, 45-49 years was 34.92%, 50-54 years was 35.09% and 55-59 years was 36.67%. This showed increase in prevalence of high cholesterol with age which was statistically significant.

Table 1*: Prevalence of Dyslipidemia*

Risk factors	Men (n=228)	Women (n=72)	Total (n=300)	z-value	p-value
Borderline high cholesterol (200-239 mg/dl)	23.25%	22.22%	23.00%		
High cholesterol (≥240 mg/dl)	5.70%	8.33%	6.33%		
Total (≥200 mg/dl)	28.95%	30.55%	29.33%	0.26	0.794
Borderline high LDL cholesterol (130-159 mg/dl)	16.25%	12.5%	15.33%		
High LDL cholesterol (≥160 mg/dl)	3.95%	4.2%	4%		
Total (≥130 mg/dl)	20.2%	16.7%	19.33%	0.66	0.509
Low HDL cholesterol (≤40 mg/dl)	19.3%	12.5%	17.7%	1.32	0.187
Borderline high triglycerides (150-199 mg/dl)	22.34%	16.67%	21%		
High triglycerides (200-499 mg/dl)	17.1%	16.67%	17%		
Very high triglyceride (≥500 mg/dl)	0.88%	-	0.67%		
Total (≥150 mg/dl)	40.4%	33.33%	38.67%	1.07	0.285

- **The prevalence of selected risk factors of coronary heart disease is summarized in Table2.**

Table 2: *-Prevalence of Risk Factors of Coronary Heart diseases among bank Employees*

Risk factor	Male%	Female%	Total%
Smoking Tobacco	25.90	--	19.70
Smokeless Tobacco	11.84	1.39	9.33
Alcohol	25.90		19.70
Extra fat Intake	7.90	1.40	6.30
Extra salt Intake	25.00	25.00	25.00
Physical Inactivity			44.00
Family History of CHD	12.71	12.50	12.70
Hypertension	38.20	9.70	31.30
Diabetes	23.7	13.90	21.30
Over weight	30.30	29.20	30.00
Central Obesity	3.50	--	2.70
Truncal Obesity	22.37	37.5	26.0
Dyslipidemia			
High cholesterol ($\geq$200 mg/dl)	28.95	30.55	29.33
Low HDL cholesterol ($\leq$40 mg/dl)	19.3	12.5	17.7
High LDL cholesterol ($\geq$130 mg/dl)	20.2	16.7	19.33
High triglycerides ($\geq$150 mg/dl)	40.4	33.33	38.67

- In this study, 21.3% of the subjects had no risk factor, 23.7% had one risk factor, 19.3% had two risk factors, 13.4% had three risk factors and 22.3% had more than three risk factors. The difference among males and females was statistically not significant **(Table 3).**

Table 3*: Presence of modifiable risk factors**

Risk factors	Males (n=228)		Females (n=72)		Total (n=300)	
	No.	%	No.	%	No.	%
None	44	19.20	20	27.80	64	21.30
One	48	21.10	23	31.90	71	23.70
Two	48	21.10	10	13.90	58	19.30
Three	31	13.60	9	12.50	40	13.40
>three	57	25.00	10	13.90	67	22.30

$\chi 2 = 9.114$ DF = 4 p=0.058

* Sedentary habits, high fat diet, smoking, overweight/ obesity, truncal obesity, hypertension, diabetes, dyslipidemia.

- Our study shows that the prevalence of dyslipidemia was strongly associated with decrease in the physical activity, as shown in (**Table 4).**

In this study, the prevalence of high cholesterol among safflower oil users was 26.29% and among coconut oil users was 45.7%. This difference was statistically significant.

The prevalence of high triglycerides among safflower oil users was 35.4% and among coconut oil users was 56.5%. This difference was statistically significant.

Table 4*: Prevalence of dyslipidemia in relation to physical activity*

Dyslipidemia	Sedentary (n=132)	Physically active (n=168)			Chi-square	DF	p-value
		Mild (n=49)	Moderate (n=58)	Vigorous (n=61)			
High cholesterol (≥200mg/dl)	62 (46.97%)	14 (28.57%)	8 (13.79%)	4 (6.5%)	41.843	3	0.000
High LDL cholesterol (≥130mg/dl)	38 (28.79%)	11 (22.44%)	8 (13.79%)	1 (1.63%)	21.257	3	0.000
High triglycerides (≥150mg/dl)	71 (53.79%)	23 (46.9%)	12 (20.69%)	10 (16.4%)	34.805	3	0.000
Low HDL cholesterol (≤40mg/dl)	32 (24.2%)	12 (24.48%)	8 (13.79%)	1 (1.63%)	16.863	3	0.001

- **Out of the 300 bank employees, 11 (3.67%) employees were under the treatment for coronary heart disease.**

Knowledge Regarding Risk Factors of Coronary Heart Disease among Bank Employees

The mean of scores for all subjects was 14.36 ($\bar{x}$) with standard deviation 2.95 (SD). The level of knowledge was classified as:

a) Poor knowledge – refers to score less than 12 (< $\bar{x}$ – 1SD)
b) Average knowledge – refers to score 12 to 17 ($\bar{x}$ - 1SD to $\bar{x}$ + 1SD)
c) Good knowledge – refers to score more than 18 (> $\bar{x}$ + 1SD)

- In the present study, 48(16%) of the study subjects were having poor knowledge, 214 (71.33%) of the subjects were having average knowledge and 38 (12.67%) of the subjects were having good knowledge regarding risk factors of coronary heart disease.

Discussion

The findings of our study comparable with other studies conducted among urban population of Thiruvanthapuram and Jaipur cities. It was also comparable with industrial employees of North India **(Table 5).**

Table 5: *-Prevalence of risk factors of coronary heart disease in different studies*

Risk factor	Present study	D. Prabakaran et al.(2005)[5]	Gupta et al. (2002)[6]	Kutty et al. (2000)[7]
Male	76%	100%	49%	37%
Smoking	25.9%	36%	23.9%	57%
Alcohol consumption	25.9%	--	--	34%
Sedentary habits	44%	--	27%	51.4%
BMI ($\geq$25 kg/m^2)	32.7%	35%	27.4% (BMI $\geq$27 kg/m^2)	--
BMI ($\geq$30 kg/m^2)	2.7%	3.3%	--	6.3%
Truncal obesity	26% (WHR $\geq$1.0 men, $\geq$0.85 women)	66% (WHR $\geq$0.95)	63.8% (WHR $\geq$0.9 men, $\geq$0.8 women)	--
Hypertension ($\geq$140/90 mmHg)	31.3%	30%	36.9%	27%
Diabetes	21.3%	15%	12.2%	16.3%
High cholesterol ($\geq$200mg/dl)	29.33%	30.1%	39.1%	32% (serum cholesterol $\geq$240mg/dl)
Presence of two or more than two risk factors	55%	47%	-	-

Conclusion

Our study revealed that one fourth of the male subjects smoked and consumed alcohol. Nearly half of the subjects were found to have sedentary habits. Extra salt consumption was reported by one fourth of the subjects and few of them were found to consume extra fat. Nearly one third of the subjects were found to be hypertensive and one fifth of them were diabetes. An increasing trend was observed for both these conditions with advancing age. Nearly one fourth of the subjects were found to have truncal obesity, one fourth were overweight and only few subjects being obese. With regards to lipid profile one third of the subjects were found to have high cholesterol which was significantly associated with increasing age, sedentary habits and use of saturated oil. Finally to conclude our study revealed the presence of one or more risk factors in majority of the bank employees with only one fifth have no risk factors for CHD. Majority of the subjects were having average knowledge regarding risk factors of CHD. It was sad to note that nearly one fifth of the subjects had poor knowledge. It was also observed that the level of knowledge was significantly associated with employment status and educational status. So awareness regarding risk factors of CHD should be given to the bank employees who lead sedentary life style.

Recommendations

Based on the findings of the present study, the following recommendations are being suggested for the control of risk factors of CHD:1)Findings of the study should be shared with the bank employees and the risk factors highlighted.2)Imparting of health education regarding risk factors and to adopt healthy life style practices.3)Periodic screening for the risk factors of CHD among bank employees should be arranged.4)Regular follow-up of the subjects is recommended.

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