IJLBPR

International Journal of

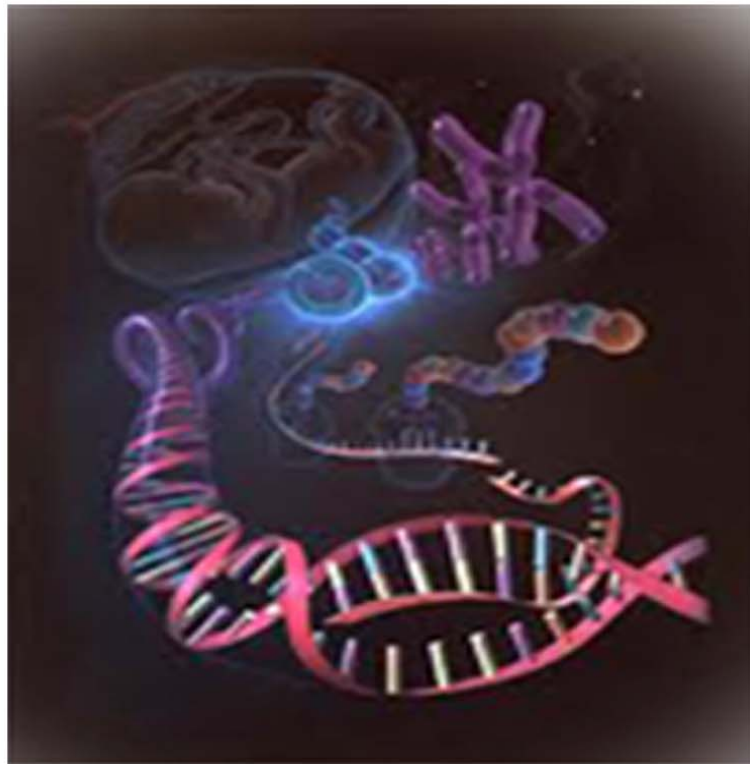## Life Sciences Biotechnology and Pharma Research

International Journal of Life Sciences Biotechnology and Pharma Research

Hyderabad, INDIA

Research Paper

STUDY ON HEALTHY LIFESTYLE BEHAVIOUR AND CARDIOVASCULAR MORTALITY AMONG URBAN AND RURAL POPULATIONS IN INDIA

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Aim of the study: To study the lifestyles and their behavioural determinants leading to cardiovascular disease among Urban and rural population groups in India. **Study Design and Data collection:** Cross-sectional observational study was conducted among men and women from January, 2010 to December, 2011. 2,500 men and women participants from three different states considering as urban and rural of India areas has been taken. A self administered questionnaire filled with combining questions related to non-controllable, controllable risk factors, personal health history and socioeconomic status, covering major aspects of lifestyle and behavior related to CVD. Ethically questionnaire was distributed to the people and information collected on risk behaviors within age group between 25-75 years. SPSS version-13 and EPI-Info software tools was applied to assess the data. **Conclusion:** Developing strategies at these risk behaviors and determining factors is necessary to promote healthy lifestyle among men and women. Smoking among male 15.9% is very common. The cigarette smoker and tobacco consumer is higher in urban male 14.7% compare to rural male 7.2%. Lower education level in rural and higher sedentary lifestyle because of jobs criteria or living style in urban is major cause of CVD. Especially urban populations are at increased risk for non-communicable disease, through exposure to unhealthy diets, smoking, alcohol abuse, and by leading a sedentary life.

Keywords: Lifestyle and behavior, Cardiovascular disease, Rural and urban pupulations, Chronic disease

INTRODUCTION

Cardiovascular diseases (CVD) are leading causes of death and disability among men and women in nearly all nations (Ambrose and Barua, 2004). CVD has emerged as the leading cause of death all over India, with coronary heart disease (CHD) affecting Indians at least 5-6 years earlier than their western counterparts (Xavier *et al.*, 2008; and Prabhakaran *et al.*, 2005).

Between 2008 and 2030, the global population is projected to grow by 20% from 6.7 billion to 8.1 billion people. The crude death rate is expected

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to remain more or less stable at around 8.4 deaths per thousand. However, a major shift is currently underway in the overall disease burden in the world. In 2008, five out of the top ten causes for mortality worldwide, other than injuries, were non-communicable diseases; this will go up to seven out of ten by the year 2030. By then, about 76% of the deaths in the world will be due to non communicable diseases (WHO, 2005).

Lifestyles of populations across the world have changed dramatically in the 20th century. These changes (collectively termed as epidemiological transition) have been brought about by a number of developments in science and technology that now affect every facet of human existence. Most human societies have moved from standard healthy diets and active lives to fast foods and sedentary habits. Combined with increasing tobacco and alcohol use, these changes have fuelled the epidemic of obesity, diabetes, hypertension, dyslipidaemia and CVD (Prabhakaran and Yusuf, 2010).

The average life expectancy at birth in India is 63.7 years, being 63.1 for male and 64.4 for female compared with the national average of 41.2 years in 1951-1961. There has been a decline in death rate from 1941 to 1971, followed by a sharp decline in birth rate from 1971 onwards (Gowarikar, 1995). Lifestyle risk factors, including dietary habits, physical inactivity, and smoking, strongly influence the established cardiovascular risk factors and also affect novel pathways of risk such as inflammation/oxidative stress, endothelial function, thrombosis/ coagulation and arrhythmia (Mozaffarian *et al.*, 2008).

There are a number of cardiovascular diseases that are associated with smoking. They include heart disease, stroke and peripheral vascular disease. It is estimated that around 13% of cardiovascular disease deaths are due to smoking and 31% of deaths due to cardiovascular disease. India is also the second largest consumer and second largest producer of tobacco in the world, second only to China. Surveys in India have revealed that 29.4% of male and 2.5% of female are current smokers. However, in those 30 years of age and above, the prevalence of smoking in India is 40.9% for male and 3.9% for female's (India, 1998-99).

The older age groups are typically more vulnerable as obesity, hypertension and diabetes are linked to the onset of CVD, health education programmes that promote exercise and weight reduction; screening for hypertension as another pathway to both influence exercise and dietary behaviour; early treatment; reduced smoking; selective taxation of foods, etc., need to be accorded high priority (Health, 2005).

Although research into cardiovascular risk factors has identified factors that are non-modifiable such as age, sex and family history of CVD, it is now recognized that most of the premature deaths and much of the morbidity caused by CVD are to a significant extent, preventable through behaviour change. Chronic non-communicable diseases are largely due to preventable and modifiable risk factors such as, high blood cholesterol, high blood pressure, obesity, physical inactivity, unhealthy diet, tobacco use and inappropriate use of alcohol. The positive relationship between sedentary lifestyle, high fat diet and cigarette smoking and CVD have been consistently supported by a research (Micallef *et al.*, 2005).

MATERIALS AND METHODS

A cross-sectional observational study was

conducted among men and women in 3 different states from January, 2010 to December, 2011. Through systematic random household sampling, 2500 samples were collected (625 number from each state) using a pre-tested, structured, anonymous, and self-administered questionnaire. Two cities were considered as urban population while another two were rural population. Within each state two districts, one with high Below Poverty Line (BPL) status and the other with low BPL status will be selected for the study of the rural sample. The Urban and rural sample will be drawn from houses of these states. The definitions of urban and rural areas were based on the guidelines of the Registrar General of the Census of India.

The ethically questionnaire was distributed to the people and information collected on risk behaviours within age group between 25-75 years. Only one individual in the household was considered as one participant per home. If the selected household did not have an eligible individual, the next household was contacted.

The Questionnaire was divided into 3 sections i.e. cardiovascular disease related non-modifiable risk factors, age, gender, family history of CHD and modifiable risk factors alcohol and tobacco consumption, personal health history and habits. The data collected with the closed ended questions. The questions were based on the information about e.g. age, gender, height (meter), weight (kilogram), tobacco chewing, smoking and alcohol consumption habits, personal history of the patients having cardiovascular diseases, hypertension & diabetes, family history of heart disease. SPSS version 13 and EPI-Info software was applied to assess the associations between risk behaviours and lifestyle.

CONCEPTUAL FRAMEWORK

Primary as well as secondary prevention strategies on CVD and CVD risk factors in able-bodied persons, regardless of whether additional measures (e.g. medication) are deemed to be indicated or not (Graham *et al.*, 2007) (Figure 1).

RESULTS AND DISCUSSION

A total 2500 persons were studied, there were 1798 male and 702 female response from them urban male were 39.1%, female 10.8% while rural were 32.8% , female 17.2% . The age considered for this study was 25 to 75 years. The overall mean (SD) age was 45.99 (12.09). Mean (SD) age for Male 47.43 (12.42%) and female 42.31(10.35%). The majority of respondents 30.8% from 31-40 years and 32.1% were from age group 41 -50 years. Only a few were from the age group 60 years and above (4.6%).

The height (meter) mean (SD) value was 5.4(0.3) in male and female 5.2 (0.3) while weight (kilo gram) mean (SD) value was in male 70.2(11.8) and female 69.1 (11.5). Majority of respondents 53.2% were doing service in private or government sector, 18.5% worked for their own business, only a small percent of the respondents were from farming 6.8%. The rest were housewife 16.2% and retired 5.2%.

BMI (Body Mass Index) was used to define overweight. BMI was calculated on kg/m^2. The BMI cut score (BMI $\leq$ 25) for overweight 48.0% from the total participants was too high as an alarming signal for CVD risk factor. Among the risk factors 29.5% males are more overweight and obese than18.4% (461/2500) females. BMI status among male and female was shown in (Table 1).

Modest alterations of lifestyle risk factors have powerful effects on cardiovascular risk. The

Table 1: BMI Status Among the Male and Female

	Range	Male	Female	Total
Sever Under weight	< 16.0	10 (0.4)	9(0.4)	19(0.8)
Under weight	16.0 to 18.49	100(4.0)	40(1.6)	140(5.6)
Normal	18.5 to 24.99	949(38.0)	192(7.7)	1141(45.6)
Over weight	25 to 29.99	432(17.3)	238(9.5)	670(26.8)
Obese 1	30 to 34.99	224(9.0)	153(6.1)	377(15.1)
Obese 2	35 to 39.99	53(2.1)	44(1.8)	97(3.9)
Obese 3	> 40	30(1.2)	26(1.0)	56(2.2)
		1798 (71.9)	702(28.1)	2500

Note: Figure in parentheses indicate percentages

harmful effects of smoking and the tremendous benefits of smoking prevention and cessation are well established (Ambrose and Barua, 2004). For many lifestyle habits, the impact on health of a single behavioral change—lifestyle monotherapy—are substantial.

Smoking among male is very common 15.9%.

The cigarette smoker and tobacco consumers is higher in urban male 14.7% compare to rural male 7.2%, while the chewing tobacco habit is common in rural 13.7% than in urban male 13.2%. Consumption of cigarettes, tobacco and alcohol is seen less in both urban and rural female (Table 2).

Table 2: Profile of Reported Behavioural, Anthropometric, Risk Factors Among Men and Women aged 15-75 Yr in Urban, Rural Population for Cardiovascular Disease

Characteristics	Male		Female	
	Urban (n=978)	Rural (n= 820)	Urban (n= 272)	Rural (n=430)
Daily tobacco consumers (%)	331(13.2)	342(13.7)	52(2.1)	19(0.8)
Daily cigarettes smokers (%)	368(14.7)	181(7.2)	31(1.2)	5(0.2)
Daily smoker & tobacco consumption both (%)	197 (7.9)	108(4.3)	13(0.5)	2(0.1)
Ever consumption of alcohol (%)	363(14.5)	253(10.1)	33(1.3)	10(0.4)
Family history of CHD	332(13.3)	230(9.2)	99(4.0)	120(4.8)
Suffer from disease*	488(19.5)	225(9.0)	121(4.8)	88(3.5)
Hypertension	240(9.6)	107(4.3)	66(2.6)	30(1.2)
High cholesterol	86(3.4)	43(1.7)	44(1.8)	13(0.5)
Obesity	106(4.2)	77(3.1)	63(2.5)	29(1.2)
Diabetes	207(8.3)	91(3.6)	33(1.3)	16(0.6)

Note: * Disease – HTN, Diabetes, high cholesterol, obesity, dis-lipidemia; Figure in parentheses indicate percentages.

Table 3: Risk Factors of Cardiovascular Disease and Lifestyle Behaviors						
	Male	Female	Total	χ^2	df	P value
Smoker	181.80	1	0.001			
Yes	549 (22.0)	36 (1.4)	585 (23.4)			
No	1249 (50.0)	666 (26.6)	1915 (76.6)			
Smoking				187.83	4	0.001
Never smoker	1249 (50.0)	666 (26.6)	1915 (76.6)			
1-2 cigarettes	62 (2.5)	11 (0.4)	73 (2.9)			
2-5 cigarettes	219 (8.8)	10 (0.4)	229 (9.2)			
6-10 cigarettes	219 (8.8)	7 (0.3)	226 (9.0)			
10 or more	49 (2.0)	8 (0.3)	57 (2.3)			
Quit smoking d" 5 yrs	57 (2.3)	11 (0.4)	68 (2.7)			
Quit smoking e" 5 yrs	37 (1.5)	1 (0.0)	38 (1.5)			
Tobacco				195.53	3	0.001
Never	1125 (45.0)	631 (25.2)	1756 (70.2)			
Sometime	171 (6.8)	42 (1.7)	213 (8.5)			
Quite often	238 (9.5)	14 (0.6)	252 (10.1)			
Mostly	264 (10.6)	15 (0.6)	279 (11.2)			
Alcohol				205.88	1	0.001
Yes	616 (24.6)	43 (1.7)	659 (26.4)			
No	1182 (47.3)	659 (26.4)	1841 (73.6)			
Consume alcohol				214.38	4	0.001
Occasionally	381 (15.2)	22 (0.9)	403 (16.1)			
2 days / week	122 (4.9)	1 (0.0)	123 (4.9)			
3 days / week	79 (3.2)	11 (0.4)	90 (3.6)			
4 day/week	35 (1.4)	9 (0.4)	44 (1.8)			
No. of drinks				234.47	4	0.001
1-2	272 (10.9)	17 (0.7)	289 (11.6)			
3-4	259 (10.4)	15 (0.6)	274 (11.0)			
5	85 (3.4)	3 (0.1)	88 (3.5)			
≥ 6	2 (0.1)	8 (0.3)	10 (0.4)			
Type of alcohol				221.17	4	0.001
Whisky/Rum	479 (19.2)	27 (1.1)	506 (20.2)			
Wine	24 (1.0)	6 (0.2)	30 (1.2)			
Desi / Tari	17 (0.7)	9 (0.4)	98 (3.9)			
Any form	97 (3.9)	1 (0.0)	98 (3.9)			
Note: Figure in parentheses indicate percentages.						

Table 4: Comparison of Prevalence of CVD Risk Factors Among Male and Female						
Variable	Male	Female	Cases	Relative Risk -RR	OR (95% CI)	P value
Family History				1.002	0.997 (0.82-1.20)	0.001
Yes	562 (22.5)	219 (8.8)	781 (31.2)			
No	1236 (49.4)	483 (19.3)	1719 (68.8)			
Suffer from high cholesterol				0.884	1.143 (0.82-1.58)	0.001
Yes	129 (5.2)	57 (2.3)	186 (7.4)			
No	1669 (66.8)	645 (25.8)	2314 (92.6)			
High blood pressure				1.411	0.662 (0.51-0.84)	0.001
Yes	347 (13.9)	96 (3.8)	443 (17.7)			
No	1451 (58.0)	606 (24.2)	2057 (82.3)			
Diabetes				2.374	0.378 (0.27-0.51)	0.001
Yes	298 (11.9)	49 (2.0)	347 (13.9)			
No	1500 (60.0)	653 (26.1)	2153 (86.1)			
Obesity				0.745	1.358 (0.88-2.08)	0.001
Yes	63 (2.5)	33 (1.3)	96 (3.8)			
No	1735 (69.4)	669 (26.8)	2404 (96.2)			
Dyslipidemia				2.212	0.450(0.13 -1.53)	0.001
Yes	17 (0.7)	3 (0.1)	20 (0.8)			
No	1781 (71.2)	699 (28.0)	2480 (99.2)			
Cigarettes smoker				5.954	0.123(0.08- 0.17)	0.001
Yes	549 (22.0)	36 (1.4)	585 (23.4)			
No	1249 (50.0)	666 (26.6)	1915 (76.6)			
Alcohol drinker				5.593	0.125(0.09- 0.17)	0.001
Yes	616 (24.6)	43 (1.7)	659 (26.4)			
No	1182 (47.3)	659 (26.4)	1841 (76.6)			

Note: Figure in parentheses indicate percentages.

Of the four established major CVD risk factors – high blood cholesterol levels, smoking, hypertension and rich diet – two factors – rich diet and cigarette smoking – are aspects of lifestyle that become mass phenomena in the twentieth century in western industrialized countries (Rose, 1991).

Light smoking was reported by 7.4% and 16.0% of rural and urban men and women, respectively. Overall, tobacco consumption is also low in male than female, but consumption of tobacco is more in rural than in Urban. The cigarette smoking and tobacco consumption is inversely proportion in urban and rural area was shown in Table 3.

Your increase of having a stroke is slightly increased if first-degree relatives have had heart disease or strokes. If they were young when they had their Heart disease or stroke, then the risk is slightly higher. Studies have shown that the risk

increases if you are a woman and your mother has suffered a heart disease or stroke. Studies have shown a genetic component for both hypertension and abnormal blood lipids, factors related to the development of cardiovascular disease (http://www.world-heart-federation.org/cardiovascular-health/cardiovascular-disease-risk-factors/family-history) (Table 4).

Analysis suggests that the participants are suffering more from hypertension 17.7% and diabetes 13.9% ; both are the major risk factor for CVD. Public health programs and expertise to promote healthy lifestyles need to be behind the cigarettes and food industry; even basic campaigns can have a significant impact. Major gaps remain, but strategies to lessen smoking have been effective and will reduce per capita tobacco use. Complex population behaviors, such as smoking, tobacco and alcohol consumption habits, can also be modified.
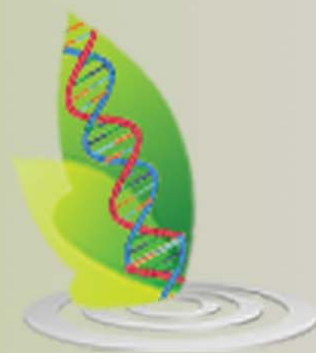
CONCLUSION

Our study showed that several modifiable lifestyle-related factors at midlife may affect the later development of CVDs. Male and female both are prone to CVD as the sedentary lifestyle is changing in urban areas. Male are more prone to high blood pressure, obesity, cigarette smoking having BMI of 71.9%. Urban (19.5%) are more suffer from disease those are directly related to CVD. Smoking among male is very common 15.9%. The cigarette smoker and tobacco consumer was higher in urban males 14.7% compare to rural males 7.2%. Alcohol intake was seen in 24.6% males and 1.7% females. Alcohol consumers had high prevalence of smoking and intake of non-vegetarian diet. Although this group had a high prevalence of cholesterol level (OR 1.14, CI 0.82-1.58) and obesity (OR 1.35, CI 0.88-

2.08). Regular CVDs screening and assessment according to guidelines is thus, clearly indicated. CVDs prevention including therapeutic lifestyle intervention needs to be developed, evaluated and then systematically implemented. Especially urban populations are at increased risk for non-communicable disease, through exposure to unhealthy diets, smoking, and alcohol abuse and by leading a sedentary life. More engaging in some high risk behaviors at high rates such as smoking, alcohol consuming is more likely to have CVD's. Promotion activities through television, social media is required to create awareness among population for heart disease.

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