

Original Research Article

Correlation between blood pressure and five food groups as a coronary heart disease risk factor in middle aged Indian male population

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ABSTRACT

Background: Social and lifestyle changes are responsible for the increasing prevalence of coronary heart disease risk factors. Objective of the study was to correlate blood pressure and five food group as a coronary heart disease risk factor in Indian population.

Methods: 31 male executives over the age of 30 years working in industry were included in the study. Systolic and diastolic blood pressures were measured with the help of a standard mercury sphygmomanometer.

Results: Statistical analysis was carried out and Pearson Correlation was applied. The study showed significant correlation between systolic blood pressure and food group I and food group IV consumption.

Conclusions: The present study highlights observation that the blood pressure as a risk factor for coronary heart disease is silently affecting the middle aged Indian male population due to unhealthy life style.

Keywords: Blood pressure, Coronary heart disease, Five food group

INTRODUCTION

Among the many health predictions for the new millennium, the most alarming is cardiovascular disease (CVD).^{1,2} Nearly 85% of CVD burden is borne by low and middle income countries.¹ In India approximately 53% of CVD deaths are in people younger than 70 years of age group.¹ Mortality rates are generally much higher for men than women. This distinction is present at all ages but is less obvious after the menopause. Coronary morbidity and mortality rates in women generally lag behind those of men by about 10 years but because females live longer there are more CHD deaths among women than men beyond the seventh decade in life.³

Urbanisation is on the increase and is responsible for many of these social and lifestyle changes leading to

increase in prevalence of coronary heart disease risk factors.⁴ The majority of the estimated 32 million hearth attacks and strokes that occur every year are caused by various cardiovascular risk factors among which hypertension is preventable and if meaningful action is taken against it.

Various investigators have studied the difference in the prevalence of coronary risk factors across different geographical territories of the country.⁵ Although there are reports of positive correlation with the risk factors with increasing CHD in India, not much work has been done specifically in middle aged executive male population. The focus of policy makers, the press, politicians and physicians is on novel genetic and biochemical factors and not on traditional risk factors. This gave us the stimulus to find out the correlation

among blood pressure as a coronary heart disease risk factor and five food groups in middle aged Indian male population and to highlight the primordial prevention strategy of CHD involving control of aberrant diet as a lifestyle related risk factor and the most cost effective method.

METHODS

This cross sectional study was conducted in a First-Aid clinic of a suburban industry in Mumbai, Maharashtra, India. Clearance from the Ethical Committee was obtained prior to the study. The study included 31 male executives over the age of 30 years working in the industry. The nature of work in the office hours was of sedentary type. Those with known respiratory or cardiovascular diseases, anaemia or those on chronic therapy for any other ailment were excluded from the study.

After taking informed written consent from each subject, a detailed history was recorded and a complete clinical examination was done to rule out the exclusion criteria. Prior to performing the intervention, the procedure was thoroughly explained as well as demonstrated to each subject, the queries and apprehensions of the subjects were satisfied.

The age, height (in cm) and weight (in kg) of the subject was noted on the day of assessment of the tests. Subjects were asked to lie down on a bed for 15 minutes. With the help of a standard mercury sphygmomanometer their systolic and diastolic blood pressures were measured to the nearest 2 mm Hg. For maintaining good health and physical efficiency the diet should provide adequate amount of all nutrients. The Nutrition Expert Group of Indian Council of Medical Research, India suggested a five food group plan.

The Five food groups are

- Food group I – Cereal grain products.
- Food group II – Pulses and legumes.
- Food group III – Milk, egg and flesh foods.
- Food group IV – Fruits and vegetables.
- Food group V – Fats and Sugar.

The Five food group plan allows a person to plan higher diet as per recommended dietary allowances and also converts qualitative nutrient data into food information to achieve nutritional adequacy.

Data of study parameters was compiled using Microsoft Office Excel software and the level of significance was tested by Pearson Correlation. The p-value less than 0.05 indicate that the results are significant statistically and p-value less than 0.01 indicate that the results are highly significant statistically.

RESULTS

Table 1 show that the mean values and standard deviation of age of the study sample was 40.03 ± 7.23 years while the mean values and standard deviation of systolic and diastolic blood pressure was 134.19 ± 14.69 mm Hg and 83.54 ± 5.62 mm Hg respectively.

Table 1: Mean and standard deviation of age, systolic and diastolic blood pressure in the study population.

Risk Factor	Mean	SD
Age (years)	40.03	7.23
Systolic blood pressure (mm Hg)	134.19	14.69
Diastolic blood pressure (mm Hg)	83.54	5.62

Table 2 show that the mean values and standard deviation values of the Food group I was 5.54 ± 2.83 , Group II showed the least mean value of 4.09 ± 3.45 , Group III had the highest mean of 50.90 ± 7.64 , Group IV and Group V showed the mean values of 17.90 ± 5.53 and 21.38 ± 6.19 respectively.

Table 2: Mean and standard deviation of five food groups.

Food group	Mean	Standard deviation
I	5.54	2.83
II	4.09	3.45
III	50.90	7.64
IV	17.90	5.53
V	21.38	6.19

Table 3: Correlation co-efficient among systolic and diastolic blood pressure and five food groups.

Food group	Blood pressure		't' value	'p' value
	Systolic	Diastolic		
I	0.454	0.161	2.71	< 0.01
II	0.0560	0.192	Not Significant	Not Significant
III	- 0.239	-0.190	Not Significant	Not Significant
IV	0.3449	0.287	2.09	< 0.05
V	- 0.147	0.258	2.76	< 0.01

In Table 3 the systolic blood pressure showed significant correlation with Food group I and Food group IV consumption. The 't' value were 2.71 and 2.09 respectively and 'p' value was <0.01 and <0.05 respectively.

DISCUSSION

In the present study the systolic blood pressure was positively correlated with Food group I (cereal, grain products) and Food group IV (fruits and vegetables) consumption. This observation indicates and can be explained on the basis of increased work related stress and strain at the executive level, irregularity in intake of proper diet, relatively sedentary lifestyle and lack of regular exercise in day to day working.

The epidemic of cardiovascular disease has taken deep roots in India and many other developing countries.⁶ The prevalence of coronary artery disease has been increasing in India over the past few decades.⁷ Social and lifestyle changes are responsible for the increasing prevalence of coronary risk factors. Affluence and other environmental factors including stress and strain of modern life seem to largely influence the increase prevalence of coronary risk factors. Many of risk factors of Coronary Heart Disease are modifiable, what is needed is self-consciousness about we being on boundary of unhealthy lifestyle. It was observed that whole grain foods reduced the risk of CHD as they contain phytochemicals including fibre and antioxidants.⁸ Previous studies has shown a correlation between Systolic blood pressure and degree of coronary and aortic atherosclerosis.⁹ Previous study done demonstrates significant increase in Blood pressure with age.¹⁰ A study done in Delhi and Bangalore observed a significant and dose-dependent inverse association between vegetable intake and IHD risk. Persons consuming a median of 3.5 servings/week of green leafy vegetables had a 67% lower relative risk than did those consuming 0.5 servings/wk. Cereal intake was also associated with a lower risk. Use of mustard oil, which is rich in linolenic acid, was associated with a lower risk than was use of sunflower oil.

CONCLUSION

This study suggest that the significant correlation which existed between diet and blood pressure for possible development of CHD in the executive middle aged male

could be prevented by diet that incorporates plenty of fruits, vegetables and whole grains that helps in reducing the risk of coronary heart disease and other complications associated with excess consumption of fatty or overly processed foods.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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