

## To correlate the nutrient intake with socioeconomic characteristics among the male and female cardiac patients

Archana Singh<sup>1</sup> and Meenakshi Verma

<sup>1</sup>Department of Biochemistry, Institute of Home Science, Dr. B.R. Ambedkar University, Khandari, Agra – 282002 (U.P.) INDIA

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### Abstract

Cardiovascular disease today is one of the most leading cause of mortality in both developed and developing countries. The incidence of hypertension, heart attack and atherosclerosis has increased multi-fold. Today, life is a race in which each person tries to compete with other in terms of wealth, status, success, reputation and several such ideals through fair and unfair means. This accompanying tension and worries, the craving for the cigarette, this compelling peg, the leisurely or hectic made of travel and overweight, all drag the person towards a disease. The present study was conducted to know the prevalence of CVD between male and females and major risk factor contributing to high prevalence. Multistage stratified systematic sampling techniques were used for selecting 100 samples and an interview schedule was evolved to collect the information regarding socioeconomic profile, dietary pattern and specific information regarding this disease. In this study we found the consumption of high fat diet was revealed as the major contribution by cause of CHD. The mean BMI significant and positively correlated with Vitamin C among the male CHD patients whereas in significant and positively correlated with Vitamin C among female CHD patients. The dietary intake between male and female were highly significant.

### Key Words

CHD- Cardio-vascular Heart Disease, RDA- Recommended Dietary Allowance

### Introduction

Cardiovascular Heart Disease (CHD) is the leading cause of death worldwide. This disease is decreasing in many developed countries. However coronary disease is increasing in many developed or transitional countries like India. 80% of all deaths in the world due to heart disease, which covers most countries in Asia. A recent study predicted that 60% of all patients with heart disease in 2010 will be Indians<sup>5</sup> (WHO 2002).

World Health Organization (WHO) has drawn attention to the fact that CHD is our modern "EPIDEMIC". The prevalence of chronic disease is showing an upward trend in most countries and for several cause appears to be unhealthy life style and consumption pattern consisting of high fat diet with little whole grains , fruits and vegetables and smoking, mental stress and lack of physical exercise. The other major cause may be increased life expectancy resulting in a greater number of a people are living to older age and are at greater risk to chronic disease of various kinds. The WHO expert group examined data from 10 western populations, the percentage of body fat and risk factors of cardiovascular disease are higher among Asian

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Correspondance author's e-mail : [301archana@gmail.com](mailto:301archana@gmail.com)

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Population (Times of India 2002). The present study is an attempt to know the prevalence of cardiovascular disease between male and female cardiac patient and to correlate the nutrient intake with socio-economic characteristics among male and female cardiac patients.

### Materials and Methods

The study is carried out in 100 cardiac male and female patients from local hospitals from Agra city. Multistage stratified random sampling technique was

used in the selection of samples. An interview schedule was evolved to collect the information regarding socio-economic profile, dietary information and specific information regarding this disease. Nutrient intake was assessed by 24 hrs food recall method. The subjects were asked to report the food items consumed along with their raw ingredients. These were recorded in standard volumetric method and later it is converted in raw weight of foods i.e. groups and nutritive values was calculated using the food tables as per recommended by ICMR.

**Table 1 : Distribution of the patients according to age and sex.**

| Age in Years | Respondents |        |        |        |
|--------------|-------------|--------|--------|--------|
|              | Male        |        | Female |        |
|              | No.         | %      | No.    | %      |
| 30-40        | 4           | 6.89   | 4      | 9.52   |
| 40-50        | 10          | 17.24  | 9      | 21.43  |
| 50-60        | 12          | 20.69  | 12     | 28.57  |
| 60-70        | 20          | 34.48  | 9      | 21.43  |
| 70 and above | 12          | 20.69  | 8      | 19.05  |
| <b>Total</b> | 58          | 100.00 | 42     | 100.00 |
| <b>Mean</b>  | 58.14       |        | 55.00  |        |
| <b>SD</b>    | 12.00       |        | 13.03  |        |
| <b>T</b>     | 1.088       |        |        |        |
| <b>P</b>     | >0.05       |        |        |        |

Table-1 reveals the distribution of the patients according to age and sex. Out of 100 patients majority of them (58.00%) were males and remaining 42.00% were females. Among the male cardiac patients, majority of them (34.48%) were in the age group of 60-70 years, followed by 20.69% each in the age group of 50-60 years and 70 years and above respectively and minimum 6.89% were in the age group of 30-40 years. Among the female members majority of them (28.57%) were in the age group of 50-60 years, followed by 21.43% each in the age

group of 40-50 years and 60-70 years respectively. While the minimum (9.52%) were in the age group 30-40 years. Further table shows that mean age of male cardiac patients (58.14 years) was more as compared to female cardiac patients (55.00 years). Statistically, no significant difference regarding mean age was observed between male and female cardiac patients ( $t = 1.088, p = >0.05$ ).<sup>1,6</sup>

**Table 2 : Distribution of the patients according to body mass index and sex.**

| Body Mass Index | Respondents |        |        |        |
|-----------------|-------------|--------|--------|--------|
|                 | Male        |        | Female |        |
|                 | No.         | %      | No.    | %      |
| 10-15           | 4           | 6.89   | 1      | 2.38   |
| 15-20           | 17          | 29.31  | 9      | 21.43  |
| 20-25           | 24          | 41.38  | 20     | 47.62  |
| 25-30           | 9           | 15.52  | 10     | 23.80  |
| 30-35           | 4           | 6.90   | 2      | 4.76   |
| <b>Total</b>    | 58          | 100.00 | 42     | 100.00 |
| <b>Mean</b>     | 21.88       |        | 22.76  |        |
| <b>SD</b>       | 4.69        |        | 4.28   |        |
| <b>T</b>        | 0.960       |        |        |        |
| <b>P</b>        | >0.05       |        |        |        |

Table-2 shows the distribution of the cardiac patients according to BMI and sex. Out of 58 male patients, majority of them (41.38%) were having BMI 20-25, followed by 29.31% having 15-20 BMI and the minimum 6.90% each having the BMI of 10-15 and 30-35 respectively. On the other hand, female cardiac patients (47.62%) were having 20-25 BMI; followed

23.80% having 25-30 BMI and the minimum 2.38% were having 10-15 BMI. Further table depicts that mean BMI of males (21.88) was slightly less than BMI of females (22.76). Statistically, no significant difference regarding mean BMI was observed between male and female cardiac patients ( $t = 0.960$ ,  $p > 0.05$ )<sup>3,4</sup>.

**Table 3 : Distribution of the respondents according to lipid profile and sex.**

| Investigations in mg/dL | Sex of Patients |       |               |       | Statistical Values |       |
|-------------------------|-----------------|-------|---------------|-------|--------------------|-------|
|                         | Male (n=58)     |       | Female (n=42) |       |                    |       |
|                         | Mean            | SD    | Mean          | SD    | t                  | p     |
| Serum Cholesterol       | 212.55          | 39.33 | 211.05        | 21.38 | 0.224              | >0.05 |
| HDL                     | 32.91           | 5.66  | 32.48         | 7.42  | 0.329              | >0.05 |
| LDL                     | 202.03          | 45.98 | 198.71        | 26.77 | 0.419              | >0.05 |

Table-3 shows the distribution of the respondents according to lipid profile and sex. Mean serum cholesterol of male cardiac respondents (212.55 mg/dL) was slightly more as compared to female cardiac patients (211.05 mg/dL). Statistically, no significant difference regarding mean serum cholesterol was observed between male and female cardiac patients, ( $t = 0.224$ ,  $p > 0.05$ ). It may be due to lack of exercise, hormonal changes etc. Further table also

depicts mean HDL level of male cardiac patients (32.91 mg/dL) was very slightly more as compared to female cardiac respondents (32.48 mg/dL). Statistically no significant difference regarding mean HDL level was observed between male and female cardiac respondents ( $t = 0.329$ ,  $p > 0.05$ ). It may be due to increased level of serum creatinine, faulty food habits, family history etc. Further table also reveals that mean LDL-level of male cardiac respondents

(202.03 mg/dL) was more than female cardiac patients (198.71 mg/dL). Statistically, no significant difference regarding mean LDL level was observed

between male and female cardiac patients.<sup>2,7</sup> It may be due to high consumption of saturated fatty acids etc.

**Table 4 : Mean intake of various nutrients among male and female respondents.**

| Nutrient               | Unit | Respondents    |        |                  |        | Statistical Values |       |
|------------------------|------|----------------|--------|------------------|--------|--------------------|-------|
|                        |      | Male ( n = 52) |        | Female ( n = 48) |        | t                  | p     |
|                        |      | Mean           | SD     | Mean             | SD     |                    |       |
| Calories               | Kcal | 2919.41        | 213.97 | 2146.72          | 135.00 | 20.619             | <0.05 |
| Protein                | Gm   | 53.17          | 3.61   | 48.32            | 3.53   | 7.438              | <0.05 |
| Calcium                | mg   | 453.35         | 84.56  | 374.17           | 58.16  | 5.237              | <0.05 |
| Vitamin A              | µg   | 2441.42        | 206.62 | 2765.31          | 216.79 | 7.578              | <0.05 |
| Vitamin B <sub>1</sub> | mg   | 1.49           | 0.32   | 1.19             | 0.13   | 5.742              | <0.05 |
| Vitamin C              | mg   | 39.29          | 2.91   | 42.93            | 3.38   | 5.765              | <0.05 |
| Iron                   | mg   | 26.57          | 4.73   | 31.09            | 4.81   | 4.683              | <0.05 |
| Fat                    | gm   | 21.97          | 3.03   | 27.00            | 2.81   | 8.445              | <0.05 |
| Riboflavin             | mg   | 1.37           | 0.08   | 1.32             | 0.04   | 3.727              | <0.05 |
| Niacin                 | mg   | 18.11          | 2.20   | 16.62            | 2.69   | 3.041              | <0.05 |

Table-4 reveals the mean intake of various nutrients according to sex of respondents. Mean intake of calories, proteins, calcium, vitamin B<sub>1</sub>, riboflavin and niacin were found to be more among male respondents as compared to female respondents, while the mean intake of Vitamin A, Vitamin C, iron

and fat were found to be more among females as compared to male respondents. Statistically significant differences regarding mean intake of all nutrients were observed between male and female respondents (p<0.05).

**Table 5 : Correlation between ages with various nutrient intakes among male cardiac patients.**

| Parameters             | Unit | Statistical Values |        |         |       |       |
|------------------------|------|--------------------|--------|---------|-------|-------|
|                        |      | Mean               | SD     | r       | t     | p     |
| Age                    | Year | 58.14              | 12.00  |         |       |       |
| Calories               | Kcal | 2919.41            | 213.97 | - 0.010 | 0.075 | >0.05 |
| Protein                | gm   | 53.17              | 3.61   | - 0.283 | 2.208 | <0.05 |
| Calcium                | mg   | 453.35             | 84.56  | - 0.032 | 0.240 | >0.05 |
| Vitamin A              | µg   | 2441.42            | 206.62 | + 0.056 | 0.420 | >0.05 |
| Vitamin B <sub>1</sub> | mg   | 1.49               | 0.32   | + 0.027 | 0.202 | >0.05 |
| Vitamin C              | mg   | 39.29              | 2.91   | + 0.030 | 0.225 | >0.05 |
| Iron                   | mg   | 26.57              | 4.73   | - 0.030 | 0.225 | >0.05 |
| Fat                    | gm   | 21.97              | 3.03   | - 0.152 | 1.151 | >0.05 |
| Riboflavin             | mg   | 1.37               | 0.08   | - 0.045 | 0.337 | >0.05 |
| Niacin                 | mg   | 18.11              | 2.02   | - 0.500 | 4.320 | <0.05 |

Table-5 reveals the correlation between ages with various nutrient intakes among male cardiovascular patients. Significant and negative correlations were observed between the age with protein and niacin among the male cardiovascular patients ( $p < 0.05$ ). While positive and insignificant correlations were

observed between age with Vitamin A, Vitamin B<sub>1</sub> and Vitamin C among the male cardiovascular respondents ( $p > 0.05$ ). However negative and insignificant correlations were observed between age with calories, calcium, iron, fat and riboflavin among the male cardiovascular respondents ( $p > 0.05$ ).

**Table 6 : Correlation between ages with various nutrient intakes among female cardiac patients.**

| Parameters             | Unit | Statistical Values |        |         |       |       |
|------------------------|------|--------------------|--------|---------|-------|-------|
|                        |      | Mean               | SD     | r       | t     | p     |
| Age                    | Year | 55.60              | 13.03  |         |       |       |
| Calories               | Kcal | 2146.72            | 135.00 | - 0.157 | 1.005 | >0.05 |
| Protein                | gm   | 48.32              | 3.53   | + 0.296 | 1.960 | <0.05 |
| Calcium                | mg   | 374.17             | 58.16  | + 0.082 | 0.520 | >0.05 |
| Vitamin A              | µg   | 2765.31            | 216.79 | - 0.328 | 2.196 | <0.05 |
| Vitamin B <sub>1</sub> | mg   | 1.19               | 0.13   | - 0.164 | 1.051 | >0.05 |
| Vitamin C              | mg   | 42.93              | 3.38   | - 0.079 | 0.501 | >0.05 |
| Iron                   | mg   | 31.09              | 4.81   | + 0.012 | 0.076 | >0.05 |
| Fat                    | gm   | 27.00              | 2.81   | + 0.207 | 1.338 | >0.05 |
| Riboflavin             | mg   | 1.32               | 0.04   | + 0.139 | 0.888 | >0.05 |
| Niacin                 | mg   | 16.62              | 2.69   | - 0.051 | 0.323 | >0.05 |

Table-6 depicts the correlation between ages with various nutrient intakes among female cardiovascular patients. Significant and negative correlation was observed between age with Vitamin A among female cardiovascular patients ( $p < 0.05$ ). While positive and insignificant correlations were observed between age with calcium, iron, fat and riboflavin among female cardiovascular respondents ( $p > 0.05$ ). However, negative and insignificant correlations were observed between age with calories, vitamin B<sub>1</sub>, vitamin C and niacin among female cardiovascular patients even at 5% level of significance.

### Conclusion

From the study it was concluded that dietary intake by both males and females were highly significant but contrary the results like age, BMI, lipid profile etc. in both cardiac patient showed insignificant. Obesity, diabetes, high blood pressure etc. were revealed as among the major risk factor contributing to CHD in both sexes. Therefore males and females should take food, high in complex carbohydrates, diet rich in fruits, vegetables and grain products that contain some types of dietary fibre, particularly soluble fibre that may reduce the risk of heart disease.

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