

**COMPARISON OF LIPID PROFILE BETWEEN VEGETARIANS AND NON-VEGETARIANS IN HYDERABAD****<sup>1</sup>Rachel Sampreethi G, <sup>2</sup>Hannah Jessie Francis T and <sup>3</sup>Shiva Prakash M****<sup>1&2</sup>St. Ann's College for Women and <sup>3</sup>Former Scientist, ICMR- National Institute of Nutrition****<sup>1&2</sup>Mehdipatnam and <sup>3</sup>Jamai Osmania P.O., Tarnaka****Hyderabad, Telangana, India****INTRODUCTION**

Omnivores or non-vegetarians outnumber vegetarians 10 to 1 in western cultures. Vegetarians in western countries, but not in India, enjoy a remarkably good health, exemplified by low rates of dyslipidemia (cholesterol problems), obesity, hypertension, diabetes, coronary artery disease (CAD), and cancer, as well as a 3-to-6-year increase in life expectancy. Nearly half of Asian Indians are lifelong vegetarians. Unlike in other populations, Asian Indian vegetarians and non-vegetarians have a similar pattern of dyslipidemia and similar rates of CAD. This phenomenon appears to be due to “contaminated vegetarianism” wherein liberal amounts full-fat dairy products, sweets, curries, and fried food loaded with saturated fats, trans fats, and refined sugar are consumed. Based on this information, present project was planned to study the comparison of lipid profile status between Vegetarians and Non-Vegetarians randomly selected from Hyderabad City. Hyderabad is a cosmopolitical city in India as we can see people are migrated from all over India and settled here. The food culture is totally different from other regions of the country.

**METHODOLOGY****Selection of Subjects**

About 90 subjects were randomly selected from Hyderabad City with their age ranged from 26 to 70 years which include both 62 males and 28 females. Based on their dietary habits these were further divided into two groups i.e., Group (A) Vegetarians with 36 nos and (B) Non-Vegetarians with 54 nos.

**Laboratory investigations**

About three (3) ml blood sample was obtained from the subjects into sterile (EDTA) coated vacuettes and sent to laboratory for centrifugation and the plasma collected was stored at -20°C until analyzed. The plasma lipids were analyzed in a fully automated Siemen's centaur auto analyzer using commercially available kits (Biosystem). The lipid profile includes Total Cholesterol (TC), Total Triglycerides (TC) and High-density Lipid (HDL). The procedure is as follows. Lipid's analysis: Data obtained was compiled on to an excel sheet and subjected for statistical analysis using computer software SPSS version 20.0.

**RESULTS AND DISCUSSION**

The selected subjects were grouped as 'A' & 'B' based on their dietary status i.e., Group –A as vegetarians with number of 36 and Group – B with 54 belong to Non – Vegetarian. These were further sub - grouped into range of age, sex ratio (males & females) and also BMI index (**Table-1**). The data showed that there was marginally high i.e., above normal levels of 200mg/dl indicating with respect serum cholesterol in both the groups A & B i.e., in both vegetarian and non-vegetarian in the serum levels of the subjects selected in this study (**Table-2**). However, it was interesting to note that there was an increase in the non-vegetarians with respect to serum cholesterol i.e., recorded as 228.1 ±6.4 when compared to vegetarians who had 203.5 ±9.6 which was statistically significant at P< 0.001 indicating the major role of dietary factors involved in the physiology of cholesterol in humans.

Our study has confirmed with earlier reports that Vegetarian diets have been linked to reduced risk of chronic non-communicable diseases, since they positively modulate biochemical parameters, particularly those related with glycemic control and lipemia, and considered as potential strategy or weight control (1). Further reports when compared with omnivores, vegetarians had a better nutritional status, with lower BMI and waist circumference, significantly higher levels of plasma lipoprotein high-density, and healthier lifestyle.

Vegetarianism is the practice of abstaining mainly from the consumption of meat, poultry, seafood and flesh of any animal while depending mainly on foods of plant origin as reported by Cedell Naa Oblikai (2).

Similarly, there were high levels of circulating serum levels for triglycerides observed to be on the higher side i.e., 229.0 ±7.7 in the non-vegetarian group when compared to vegetarians the values were just in the borderline towards normal side with 197.5 ±5.6 (below 200 mg/dl). However, these levels were statistically significant in comparison with vegetarians which again indicated that there is an important role of nutrition in humans. It is interesting to note that HDL-Cholesterol levels were similar in the both groups Vegetarians and non-vegetarians as values were found to be closer i.e., 40.2 ±1.64 and 42.2 ±1.98.40 without any statistical significances.



Therefore, this information indicates the dietary role doesn't have major involvement or effect on of HDL-Cholesterol mechanisms however it was felt that estimation of serum LDL could have been given better insight on this matter which could not be carried out due to limitations. The similarity in lipid profiles between vegetarians and non-vegetarians may be partially explained by the relatively high fat intake (36.6%,  $\bar{x}$ ) in the vegetarian subpopulation, and by the careful matching of vegetarians to non-vegetarians T L Bazzarre (3). Vegetarian diets are typically low in fat, particularly saturated fat and high in dietary fibre, vegetables, whole grains and legumes. Plasma total cholesterol and low-density lipoproteins (LDL) cholesterol levels of vegetarians are consistently lower than non- vegetarians.

Although vegetarians do not eat meat there may be other sources of saturated fat in the form of unhealthy fat and oils in their diet which may affect their lipid profile. The study was not able to clearly establish whether vegetarian diet improves the lipid status of an individual. With the exception of protein, there were no significant differences in the macro nutrients intake between the vegetarians and non- vegetarians (p = 0.001).

Vegetarian diets have been linked to reduced risk of chronic non-communicable diseases, since they positively modulate biochemical parameters, particularly those related with glycemic control and lipemia, and considered as potential strategy for weight control. It is also reported that with diet, sex and age factor also influence parameters of lipid metabolism. Further the anthropometric indices, blood pressure levels and hematological analysis results vegetarian population in a study by Ji-Paraná, Rondônia, Brazil (4).According Patil, Seemadevi, et al. (5)have to have association between Lipid Profile in Vegetarians and Non-Vegetarians in the Local Population.

In our study the vegetarian study has a lower lipid profile status as compared to the non-vegetarian subjects. Therefore, consumption of a vegetarian diet has to be encouraged. There is increasing evidence that plant-based diets are associated with lower cardiovascular risk. Jocelyne R. Benatar (6) evaluated the effects of a vegan compared to an omnivorous diet on cardio-metabolic risk factors., High-density lipoprotein cholesterol (HDL-C) is important for improving risk estimates of atherosclerotic cardiovascular disease The investigation on the effect of omnivore and diverse vegetarian diets in connection with exercise on HDL-In summary, strict vegetarian diets in conjunction with regular exercise might not serve as healthful behaviors to be implemented in everyday life considering the negative impact on HDL-C (7). There is a need for estimation of LDL to obtain a better insight on this aspect.

There were also reports that there was no significant difference between both categories regarding blood pressure, body composition or resting heart rate, thus this study proves that non-vegetarian samples had a higher lipid profile compared to that of vegetarian as reported by Sunil Kumar Nanda (8). A study conducted on nutrition and lipid profile in general population and vegetarian individuals living in Bangladesh. To examine the association between consumption of vegetable-based diets and lipid profile of aged vegetarians in rural Bangladesh. This study suggest that compared to non-vegetarians, rural Bangladeshi vegetarians had better Comparison of effect of vegetarian and non-vegetarian diet on lipid profile and fasting blood glucose level. In most countries a vegan diet is associated with a more favorable cardio- metabolic profile compared to an omnivorous diet.

**CONCLUSION**

The health of vegetarians in this study was generally good and compares favorably with that of the non - vegetarian subjects. This study states that a diverse vegetarian diet can provide health benefits for human as their mean fasting plasma cholesterol, and triglycerides significantly low in vegetarians compared to non-vegetarians. Plant-based diets are associated with decreased total cholesterol, low-density lipoprotein cholesterol, and an increase in high density lipoprotein cholesterol. However, larger studies are needed to examine rates of specific metabolic and other diseases among vegetarians. However, consumption of a vegetarian diet needs to be encouraged.

**Table-1 Characteristics of the subjects studied\*\*\*\***

| S.NO | Particulars     | Veg | Non- veg | Total |
|------|-----------------|-----|----------|-------|
| Age  | a) 26– 47years  | 24  | 40       | 64    |
|      | b) 48 - 55years | 12  | 14       | 26    |
| Sex  | a) Female       | 12  | 16       | 28    |
|      | b) Male         | 24  | 38       | 62    |

\*\*\*\*A total of 90 subjects were randomly selected from Hyderabad city.They were classified based on the sex were Males 62 and females 28.Their age ranged from 26 to 70 years. Based on their dietary habit they were divided into A – vegetarian with 40 % and B – non vegetarian with 60%.

**Table – 2 Socio demographic Characteristics of study sample (n=90) \*\*\***

| Characteristics | Category         | f (%)     |
|-----------------|------------------|-----------|
| Age             | 1) (26-46 years) | 64 (71.1) |
|                 | 2) (47-67 years) | 26 (28.9) |
| Gender          | Male             | 62 (68.8) |
|                 | Female           | 28 (31.2) |
| Diet            | Vegetarian       | 36 (40)   |
|                 | Non-vegetarian   | 54 (60)   |

\*\*\*All about 90 subjects include age ranged from above 26 to 67 years in which higher percentage were between 26-46 i.e., is with 71.1% and age percentage from 47-67 were 28.9%. As regard to gender males were predominant with 68.8% and females were 31.2%. As for diet is concern non-vegetarians were high with 60% and vegetarians were 40% in this

**Table 3 Association between Diet and Total Cholesterol in the study population (n=90)\*\*\***

| Characteristics | Category       | Total Cholesterol (Mean ± SD) | p-value |
|-----------------|----------------|-------------------------------|---------|
| Diet            | Vegetarian     | 203±9.6                       | <0.001* |
|                 | Non-Vegetarian | 228.1±6.4                     |         |

\*\*\*Indicates statistically significant difference between vegetarians and non-vegetarians with respect to cholesterol levels indicating both the groups need to monitor their lipid profile.

**Table 4: Association between Diet and Triglyceride in the study population (n=90)**

| Characteristics | Category       | Triglyceride (Mean ± SD) | p-value |
|-----------------|----------------|--------------------------|---------|
| Diet            | Vegetarian     | 197.5±5.6                | <0.001* |
|                 | Non-Vegetarian | 229±7.7                  |         |

\*\*\*Indicates statistically significant difference between vegetarians and non-vegetarians with respect to Triglycerides levels indicating both the groups need to monitor their lipid profile status.

**Table -5 Association between Diet and HDL in the study population (n=90)**

\*Both the groups have normal levels of HDL however they are required to maintain these levels based on monitoring of lipid profile status

| Characteristics | Category       | HDL (Mean ± SD) | p-value   |
|-----------------|----------------|-----------------|-----------|
| Diet            | Vegetarian     | 40.2±1.64       | P > 0.05* |
|                 | Non-Vegetarian | 42.2±1.98       |           |

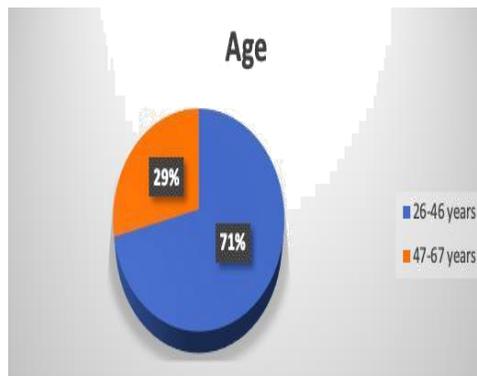


Figure -1 show most of the subjects selected were higher in percentage (71%) with their age ranged between 47-67years followed by 29% with age ranged between 26-46 years



Figure -2 shows the percentage highest percentage (60%) belong to non-Vegetarians while the remaining 40% were vegetarians in this study

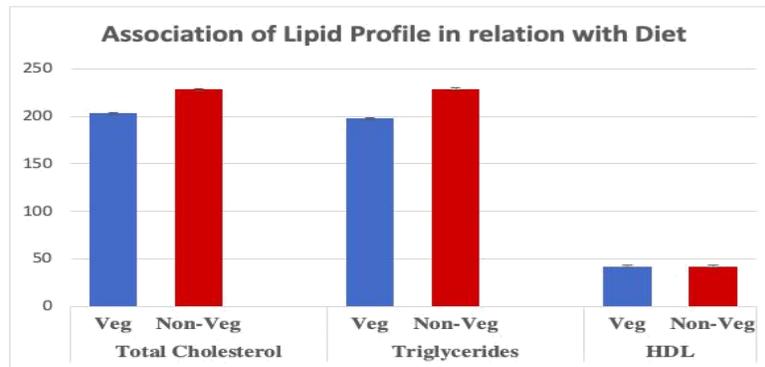


Figure -3 shows higher levels of serum Cholesterol and Triglycerides can be observed in the non-vegetarians when compared to vegetarians however there was no difference with respect to serum HDL levels between these groups.

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