

Impact of Demographics and Diet on Blood Lipids

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Abstract

Dyslipidemia is considered as one of the major risk factor for development of cardiovascular diseases. In developing countries like India, there has been increased prevalence of overweight and obesity, in the last decades, which is associated with great abnormalities in the lipids. Factors such as diet, lifestyle, exercise, age, and sex all influence the lipid metabolism in the body. Hence, a study has been designed to assess the impact of demographics and diet consumed on the lipid profile of middle aged adults. A random sample of 100 subjects was selected. The information on their demographic profile and diet consumed was collected using an oral questionnaire. The recent lipid profile reports were taken. The results of the study revealed that age, income, occupation had an impact on blood lipids. Compared to non vegetarians, vegetarians had a better lipid profile. The study concludes that type of diet and demographics have a significant role in development of dyslipidemia.

Key words: Vegetarian, Non vegetarian, Dyslipidemia, Lipids, Demographics.

1. Introduction

The global disease burden is growing due to various lifestyle disorders like CVD. Alteration in the lipid levels is considered as a risk factor for the development of CVD and metabolic syndrome. Lipid metabolism in the body is influenced by several factors. Research has shown that as age increases the incidence of dyslipidemia also increases. It is also known that in women after post menopausal stage, due to various hormonal changes, the lipid metabolism is also affected. The variations in lipid profile with socio-economic status may be largely attributed to potentially modifiable factors such as obesity, physical activity

and dietary intake [Shamarina Shohaimi *et.al.*]. Diets rich in animal protein have higher amounts of fatty acids that are converted to various lipoproteins in the liver leading to deposition of adipose tissue facilitating formation of atheromatous plaques. [Sumon kumar das *et.al.*,2012]. Research shows that certain diets as Mediterranean diet contribute for a better cholestremic profile. Likewise, other studies have concluded that individuals under vegetarian diets and plant based diets have lower blood lipids levels, especially LDL as well as triglycerides, as compared to individuals who consumed meat [Simone *et.al.*,2005, Hope *et.al.*, 2009, Yokoyama *et.al.*, 2017]. Hence, type of diet being consumed and factors like age, genders etc also contribute in development of lipid related disorders.

2. Materials and Methods

A random sample of 100 individuals, both male and female between the age group 35-55years was selected.

All the subjects were the residents of Barkatpura, Bagh Lingampalli, Chikkadpalli and Kacheguda. Their lipids were tested from C.C.Shroff Hospital Located at Barkatpura. Information was collected after obtaining their informed consent. The purpose of the study was explained to the potential respondents. Participation in the study was voluntary.

Among the selected subjects, co-morbidities like Diabetes and Hypertension were also prevalent. Also, respondents had habits of alcoholism and smoking.

A self structured questionnaire was designed in order to obtain the information from the respondents. The questionnaire had close ended multiple choice questions related to demographics and diet.

The compiled data was subjected to statistical analysis and chi square test was used. The parameters age and lipid profile and diet they consumed and lipid profile was found to be statistically insignificant at $p < 0.05$.

3. Results and Discussion

3.1 Impact of Demographics on lipids:

Age has been found to be a factor that could affect the lipid metabolism in the body. In the present study, results revealed that, as there as an increase in age from 35years to 50years, the levels of total cholesterol also increased which is evident from figure 1. In age group of 35-40 years the percentage of respondents with high Total cholesterol values was 30% which increased to 54% in the age group of 46-50years and later the percentage in the age group 51-55years decreased to 35%. The highest percentage of respondents (54%) with high TC values was observed in the age group of 46-50years. Sumon *et.al.*, (2012) in their study said that, total cholesterol and LDL cholesterol are likely to increase with age till 70years, irrespective of sex, due to increase in LDL-C which was similar to the present study results. The Triglyceride values also increased up to the age of 50years. The highest percentage (45.45%) of respondents with high TG values was observed in the age group 46-50years with.

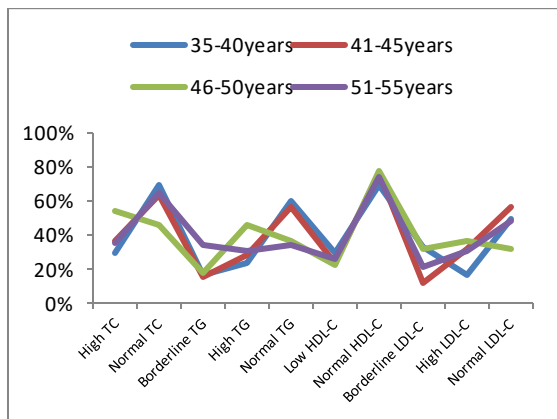


Figure 1: Age wise distribution of respondents and their lipids

The low HDL-C ($< 40\text{mg/dl}$) levels were highest between 35-40years with 30%, followed by 26% in 51-55years. In the present sample it was observed that, as the age increased, respondents with low HDL-C values decreased only till the age of 50years, again in the age group between 51-55 years a slight increase was noted. From the literature, it is suggested that as age increases HDL-C decreases (Gino Abraham, 2014). But in

the present sample it was observed that, as the age increased, the HDL-C values of the respondents were found to be normal which is vice versa to the above mentioned study.

In the sample, association was found between level of LDL-C and older age till the age of 50years. The number of respondents with borderline high LDL-C values gradually increased from 16.6% to 36.36% from age 35years-50years. Increased age was associated with higher plasma LDL cholesterol and apoB levels, especially in women. This was the observation made by Ernst J. Schaefer *et.al.*, in their study. Similarly, in the present study up to 50years of age the association was positive.

When lipids of males and females were considered irrespective of occupation, 56% of females had abnormal lipid profile, 20% had borderline and 24% had normal profile. Among males, 48% had abnormal lipid profile, 24% had borderline and 28% had normal profile.

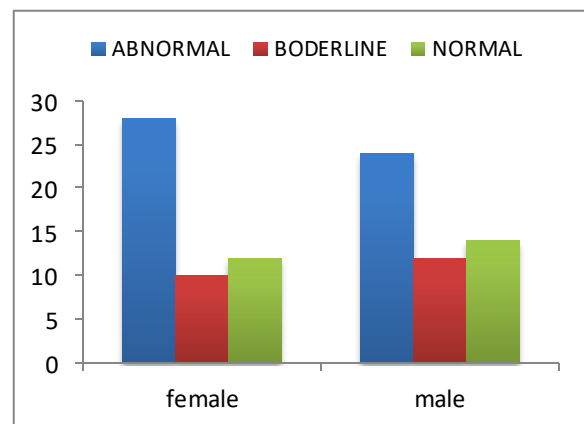


Figure 2: Gender wise distribution of respondents and their lipids

Among non-working and working females, more number of non working females had an abnormal lipid profile (62.8%) when compared to working females of which only 40% had an abnormal profile. No correlation was observed between household works and lipid profile values among women.

The sample collected had respondents from various economic groups. The highest percentage (63%) of respondents with abnormal lipid profile was observed earning income of $> 10\text{lakh/annum}$, followed by 57% among the ones who earned 3lakh/annum . Shamarina *et.al.*, in their study reported that, in developing countries the association is often positive with those in higher socio-economic status having higher levels of

serum lipids. This proves to be true in the present study too, that more people had abnormal lipids in the higher income group.

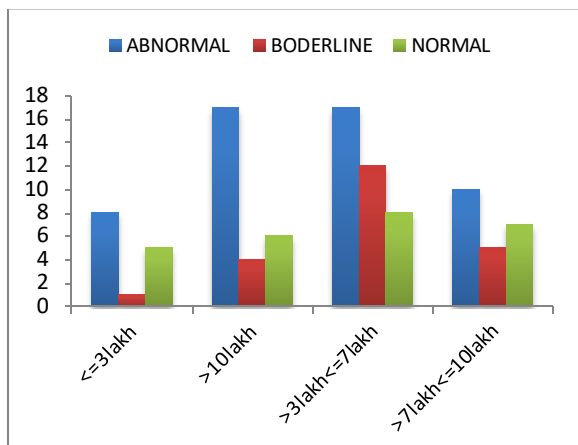


Figure 3: Income wise distribution of respondents and their lipids

3.2 Impact of type of diet on lipids :

The percentage of respondents with normal Total cholesterol values was slightly lower among the non vegetarian group with 61.2% when compared to vegetarians, where there were found to be 63.15% of respondents with normal levels.

The number of respondents with high values of Triglycerides (>200mg/dl) was found to be more in vegetarian group with 36.84%, when compared to non vegetarians where it was only 27.41%. But, the number of respondents with borderline TG values (>150mg/dl) was more among the non vegetarian group (22.5%) than that of the vegetarians (18.42%). Similar results were made by Manish Verma *et.al.*, in their study.

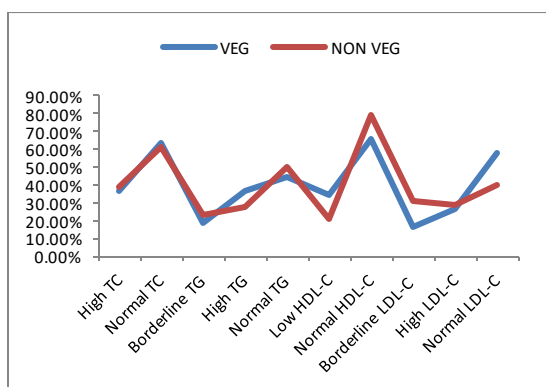


Figure 4: Type of diet and its effect on lipids

The percentage of respondents with low levels of HDL-C (<40mg/dl) was high among the vegetarians. 34.21% of vegetarians had low HDL

levels. Whereas, only 20.96% of non- vegetarians had lower HDL levels.

In the present sample, the percentage of respondents with high LDL values (>130mg/dl) was more among the non-vegetarians with 29.03% when compared to vegetarians who were only 26.31%. Almost 58% of vegetarians have normal LDL values and only 40% of non-vegetarians were found to have normal values. Simone *et.al.*, and Yokoyama *et.al.*, also in their respective studies indicated that consumption of vegetarian diet tends to lower serum LDL-C levels and also observed the same in their studies.

Association was found between age and lipids, type of diet and lipids but was statistically insignificant at $p < 0.05$. It was also noted that, more than half of the population did not even know that they had lipid abnormalities.

4. Conclusions

From the above results we can conclude that, the type of diet and demographics influenced the lipid profiles of the subjects. It was noted and proved that, as the age was increasing, the TC, TG and LDL-C values were also increased and there was a decrease in the levels of HDL-C from the age 35years till 50years. Later, from 51years till 55years, there was no specific trend in the lipid levels. The highest percentage of respondents with abnormal lipid profile was observed in high income group.

From the study it is proved that, compared to non vegetarians, vegetarians had a better lipid profile, except for the cardio protective HDL-C levels which were more among the non vegetarians which can be attributed to their physical activity status.

Further research could emphasize on frequency of consumption of non vegetarian foods among non vegetarians to that of their lipid levels.

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