

Comparative Study of Lipid Profile Levels, Blood Pressure & Heart Rate in Vegetarian & Non-Vegetarian Persons

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Abstract:

Introduction: The lipid profile, blood pressure & heart rate is used to determine the risk of obesity, heart disease in myocardial infarction, atherosclerosis and help in deciding treatment for borderline or high risk persons. "Epidemiological data suggests that plant-based dietary patterns are associated with a significantly lower prevalence of hypertension."

Aim & Objective: To investigate comparative study of lipid profile levels, blood pressure & heart rate in vegetarian and non-vegetarian persons.

Materials And Methods: 30 Vegetarian persons and 30 non-vegetarian persons in age group of 20 to 60 years was taken from urban area of Rajkot city. A total of 60 samples i.e. blood (in sterile sample bottles) was collected. Biochemical analysis for Total Cholesterol, High density lipoprotein Cholesterol, Very low density lipoprotein cholesterol, Triglyceride, Low-density lipoproteins were done. Blood pressure & Heart rate were measured among all subjects

Results: There was significant increase blood pressure and heart rate in non-vegetarian persons than in vegetarian person. There was significant difference found in both the groups in values of all the parameters of lipid profile levels ($p < 0.05$) and 't' test is used to know the association between them.

Discussion: The purpose of our study is to determine if adults can improve their heart rate, systolic and diastolic blood pressure and lipid profile levels by choice of diet.

Conclusion: There is more dyslipidaemia indicated by higher values of total cholesterol, triglycerides, LDL, VLDL, and lower value of cardiac protective HDL in non-vegetarian person than in vegetarian person. In comparison to vegetarian, non-vegetarian had higher blood pressure and a higher heart rate.

Key Words: Vegetarian, Non-vegetarian, Blood pressure, Heart rate.

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Introduction

Cardiovascular diseases (CVD) are growing contributors to global disease burdens. Nutrition & dietary habits have been extensively investigated as risk factors for major CVD like coronary heart disease (CHD) and stroke and are also linked to other cardiovascular risk factors like diabetes, high blood pressure, and obesity. [1]

Vegetarian persons do not eat meat or meat products, but may consume milk, dairy products. This diet, when appropriately planned and balanced, it will provides health benefits, because it acts both in the prevention and in the treatment of diseases. "Plant-based dietary patterns are associated with a significantly lower prevalence of hypertension as suggested in epidemiological data." [2]

The lipid profile is used to determine the risk of obesity, heart diseases like myocardial infarction, atherosclerosis and help in deciding treatment for

who were in borderline or high risk groups. Cholesterol is transported in the blood by lipoproteins. Among them are: very low density lipoproteins (VLDL), low density lipoproteins (LDL), and high density lipoproteins (HDL). Differently from VLDL and LDL, HDL does not contain the apolipoprotein B100, which is recognized by the tissues. Therefore, HDL has total different behavior and function as compared to the others. [3]

It is responsible for reverse transportation, carrying basically the cholesterol from tissues to the liver, and therefore helps protect individuals against atherosclerosis. Therefore, the probability of developing atherosclerosis is significantly reduced in individuals with high HDL: LDL ratio.

Material and Methods

This Comparative study was conducted on 60 subjects with age group of 20 to 60 years and of both

sexes in which 30 vegetarian and 30 non vegetarian persons were selected from urban area of Rajkot city in which smokers, Alcoholics, Diabetics, Hypertensive, Familial hyperlipidemia & person with any chronic disease were excluded.

A total of 60 blood samples were collected by PI under strict aseptic precaution to do Biochemical analysis for lipid profile levels [HDL, LDL, VLDL, TG, TC] [7]

Systolic Blood pressure, Diastolic Blood pressure & Heart rate were measured among all subjects.

Result:

There was significant difference found in blood pressure & heart rate as seen in Table no. 1, and significant difference in lipid profile levels (p<0.05) in non-vegetarian persons than in vegetarian person in Table no. 2. Chart shows comparison in all parameters between both the groups.

Table 1: Difference between blood pressure and heart rate of vegetarian and non-vegetarian persons

Parameters		SBP	DBP	HR
Vegetarian	Mean	120.333	80.066	79.5
	SD	7.128	6.506	10.281
	P-Value	P<0.0001	P<0.0001	P<0.0001
Non-Vegetarian	Mean	140.966	90.2	91.7
	SD	9.216	8.193	7.764
	P-Value	P<0.0001	P<0.0001	P<0.0001

SBP: Systolic blood pressure; DBP: Diastolic Blood pressure; HR : Heart rate

Table 2: Difference between lipid profile levels of vegetarian and non-vegetarian persons

Parameters		TC (mg/dl)	TG (mg/dl)
Vegetarian	Mean	185.9	73.966
	SD	22.312	11.217
	P-Value	P<0.0001	P<0.0001
Non-Vegetarian	Mean	217.866	138.033
	SD	25.722	17.823
	P-Value	P<0.0001	P<0.0001

Parameters		HDL (mg/dl)	LDL (mg/dl)	VLDL (mg/dl)
Vegetarian	Mean	72.666	71.966	16.2758
	SD	9.102	11.003	4.398
	P-Value	P<0.0001	P<0.0001	P<0.0001
Non-Vegetarian	Mean	54.866	125.6	23.1
	SD	16.046	26.913	6.172
	P-Value	P<0.0001	P<0.0001	P<0.0001

HDL : High density lipoproteins; LDL : Low density lipoproteins; VLDL : Very low density lipoproteins; TC : total cholesterol; TG : triglyceride

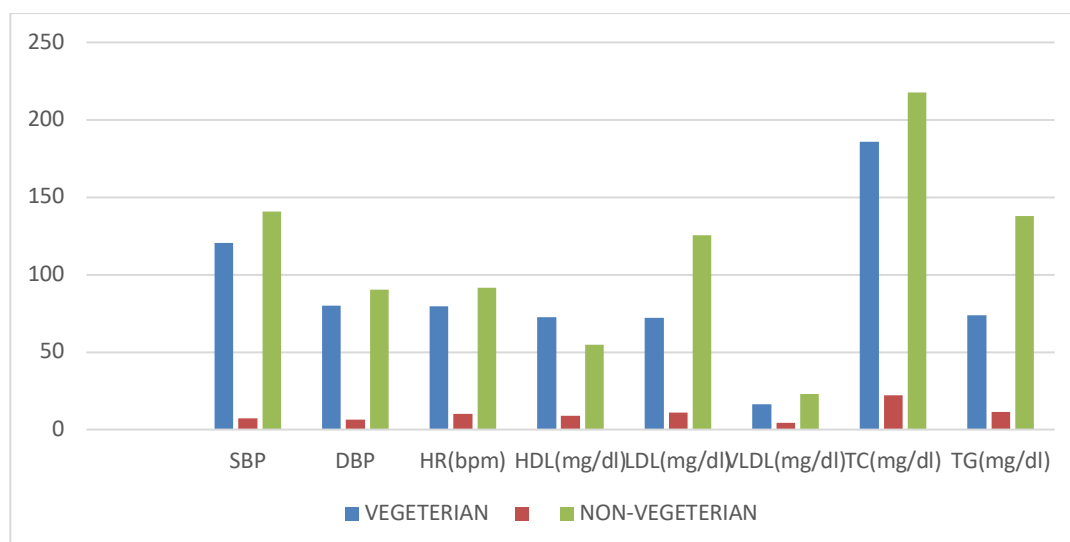


Chart 1: Comparison between blood pressure, heart rate and lipid profile levels of vegetarian and non-vegetarian persons

Discussion

The main objective of our study was to determine if a vegetarian diet led to lower blood pressure and a lower heart rate. This study found significant difference in systolic and diastolic blood pressure between the vegetarians and non-vegetarians.

The blood pressure readings are almost similar to past studies that have found that plant-based diets are associated with a significantly lower prevalence of hypertension. [8]

Present study showed significant differences in lipid profile levels between vegetarian and non-vegetarian person.

A previous study suggests that predicting the risk of cardiovascular disease can be simplified by measuring the lipid profile levels. [9]

We found vegetarian group had lower mean total cholesterol & lower mean triglyceride level than non-vegetarian group.

The hypocholesterolemic effect of fibers is probably due to an increase in bile-acid binding, fecal sterol excretion, and fermentation of soluble fibers which produce short chain fatty acids that inhibit hepatic cholesterol synthesis.

Limitations

No preliminary study was done that is the limitation of this study. With a preliminary study, we could have had a general picture of the difference in mean and standard deviation (SD) of lipid profiles in vegetarian and non-vegetarians person who are at risk for overweight or obesity. In addition, this study did not involve a strictly-controlled diet analysis (Food record). A well conducted diet analysis would have provided a representation of the amount, type, and composition of nutrients (pro-

teins, fats, and carbohydrates) consumed by the subjects. [4]

Further research could be conducted looking each sex individually, a smaller age range, larger number of subjects, different types of diets, or the effects of a diet on cardiovascular disease. [5,6]

Conclusion

We have been able to prove that there is increased Lipid Profile levels and dyslipidemia in Non-vegetarian person which have increased risk for heart Failure, myocardial infarction, Atherosclerosis.

Looking at our result, there is significance difference present in blood pressure and heart rate. Systolic blood pressure, diastolic blood pressure & heart rate is higher in non-vegetarian persons than in vegetarian persons.

Also, there is significant difference present in lipid profile levels in both the groups in which HDL is higher in vegetarian persons while LDL, VLDL, TG & TC is higher in non-vegetarian persons.

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