

# The Purpose of This Study Is To Compare the Aberrant Lipid Profile (TC, TG, HDL, LDL, VLDL) Between Hypertension Patients and Healthy Individuals

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## ABSTRACT

**Background:** Considering that it is typically asymptomatic and undiscovered, essential hypertension has been properly dubbed the silent killer. Uncontrolled hypertension can harm every organ in the body. Dyslipidemia and hypertension are the most prevalent coronary artery disease risk factors (CAD). Those with a mix of risk factors are especially susceptible to coronary artery disease.

**Aims & objectives:** To compare the abnormal lipid profile (TC, TG, HDL, LDL, VLDL) of hypertension patients with healthy individuals.

**Methods & Materials:** The proposed research would be conducted at the Department of Medicine, Santosh Medical College, Santosh University, Ghaziabad, on patients attending the Santosh Hospital Medicine OPD/IPD. From January 2014 to January 2015, the study will be done over the course of one year. This is a case-control analysis. There were 100 age- and gender-matched male and female participants between 31 and 60 years old.

**Results:** This study shows that 38% of instances are in their fifth decade of life, with 19% male and 19% female, 23% are in their fourth decade, with 15% male and 8% female, and 14% are in their third decade, with 9% male and 5% female.

**Conclusion:** It was determined that serum lipid profile can serve as an important marker for cardiovascular disease screening in hypertensive individuals, and that early detection of cardiovascular illness can reduce cardiovascular morbidity and mortality. In addition, in my study, total cholesterol, HDL-C, LDL-C, and BMI were found to be abnormal in hypertensive individuals, although triglycerides and VLDL-C did not differ significantly with hypertension.

**Keywords:** Cardiovascular , Dyslipidemia, metabolic , abnormality , gastrointestinal mucosa

## 1. INTRODUCTION

Hypertension is a major health problem worldwide and it continues to be one of the most common diseases treated by physicians. Ongoing research has better defined the mechanisms and clinical characteristics for this condition and enlarged the score of therapeutic options. It is increasingly clear that high blood pressure although an independent risk factor for adverse clinical events frequently exists as a part of a syndrome of cardiovascular, neuroendocrine and metabolic abnormality.[1,2]

Essential hypertension has been appropriately called the silent killer because it is usually asymptomatic and undetected. Uncontrolled hypertension can cause damage to all organs of body.[3] Dyslipidemia and hypertension are the commonest risk factors for coronary artery disease (CAD). Persons with combination of risk factors are particularly at high risk of CAD. Hypertensive subjects frequently have higher cholesterol levels than normotensive subjects.[4] It is the most common of the cardiovascular diseases which is the leading cause of morbidity and mortality in the industrial world as well as becoming an increasing common disease in the developing countries.[5-7]

Though no specific pattern of dyslipidemia has been consistently reported among hypertensive individuals, many studies have shown that total cholesterol, triglycerides and virtually all fractions of lipoproteins tend to be more frequently abnormal among hypertensive patients than in the general population.[14,15] Recent investigation have clearly demonstrated that atherosclerosis and left ventricular hypertrophy are major factors linking hypertension and lead to myocardial infarction.[16,17]

Hypertension has emerged as a leading cause of the global burden of disease in both developed as well as developing countries.[18] There is a strong association between hypertension and dyslipidemia. They increase patients susceptibility to the development of coronary heart disease.[19]

The major foods on which the body lives (with the exception of small quantities of substances such as vitamins and minerals) can be classified as carbohydrates, fats and proteins. They generally cannot be absorbed in their natural forms through the gastrointestinal mucosa and for the reason are useless as nutrients without preliminary digestion.

Hypothyroidism should be ruled out by measuring serum TSH. Patients with hyperlipidemia, especially hypertriglyceridemia, who drink alcohol should be encouraged to decrease their intake. Sedentary lifestyle, obesity, and smoking are all associated with low HDL-C levels, and patients should be counseled about these issues.

Once secondary causes for the elevated lipoprotein levels have been ruled out, attempts should be made to diagnose the primary lipid disorder since the underlying etiology has a significant effect on the risk of developing CHD, on the response to drug therapy, and on the management of other family members. [8-11] Often, determining the correct diagnosis requires a detailed family medical history and, in some cases, lipid analyses in family members.[12]

### **Hypertension and Hyperlipidemia**

Cardiovascular diseases are increasing worldwide.[16] This increase is causing a major concern in developing countries like India. Hypertension and dyslipidemia are the two major contributing risk factors for heart diseases. They co-exist in the range of 15 to 31%. Both the risk factors have an adverse impact on the vascular endothelium, which results in enhanced

atherosclerosis leading to CVD. Dyslipidemia is a major modifiable cardiovascular disease (CVD) risk factors.[17] It has also been identified as independent risk factors for essential hypertension.[18,19] Dyslipidemia is more common in hypertensive patients that have not been treated.[20,21] Studies have shown that total cholesterol (TC), triglycerides (TG), and all fractions of lipoproteins tend to be abnormal among hypertensive patients than in the general population.[22-25] Hypertension and lipid abnormalities act synergistically in accelerating atherosclerosis and development of CVD.

## 2. MATERIALS AND METHODS

The proposed study will be carried out in the Department of Medicine, Santosh Medical College, Santosh University, Ghaziabad, on patients who will be attending the Medicine OPD/IPD of Santosh Hospital. The study will be conducted in a time span of 1 year from January 2014 to January 2015. It is a case control study. There were 100 Male/Female age and sex matched subjects between 31-60 years will be taken. 75 subjects who are hypertensive will form the case group and another 25 healthy subjects will form the control group.

All the parameters were analyzed by using software SPSS. Analysis of variance (ANOVA) has been used for comparing all the parameters. Case and control were compared using Chi square test and independent sample t test and p value was calculated. All the results are presented as means  $\pm$  Standard Mean.

## 3. RESULTS

A Case Control study was conducted with 75 patients as cases and 25 patients as control to see the prevalence of dyslipidemia in hypertensive patients, which took place at Santosh Medical College and Hospital, Ghaziabad, Uttar Pradesh.

**Table 1: Demographic, clinical and Biochemical profile of the hypertensive and normotensive patients**

	Hypertensive	Normotensive	p-value
Age (Years)	49.5 $\pm$ 7.7	46.8 $\pm$ 9.0	P=.150
BMI (Kg/m <sup>2</sup> )	26.0 $\pm$ 1.73	22.3 $\pm$ 1.73	P=.000
SBP (mmHg)	161.3 $\pm$ 6.69	119.5 $\pm$ 4.01	P=.001
DBP (mmHg)	93.09 $\pm$ 7.83	78.08 $\pm$ 4.48	P=.001
TC (mg/dl)	189.6 $\pm$ 55.0	153.7 $\pm$ 34.1	P=.003
HDL (mg/dl)	45.0 $\pm$ 6.7	48.0 $\pm$ 5.83	P=.000
LDL (mg/dl)	104.8 $\pm$ 40.6	91.6 $\pm$ 17.1	P=.000
TG (mg/dl)	102.8 $\pm$ 43.1	85.9 $\pm$ 34.9	P=.080
VLDL (mg/dl)	20.3 $\pm$ 8.1	16.5 $\pm$ 5.4	P=.029

**Table 2: Age & Gender Distribution of the Hypertensive Patients**

This study shows that 38% of the cases are in their 5th decade of life that consists of 19% male and 19% female, 23% of cases are in their 4th decade which comprises of 15% male and 8% female and 14% of the cases are in the 3rd decade which has 9% male and 5% female.

Age	Female	Male	Total
31-40	5	9	14
41-50	8	15	23
51-60	19	19	38
Total	32 (42.6%)	43 (57.4%)	75 (100%)

#### 4. DISCUSSION

The burden of cardiovascular disease (CVD) is increasing worldwide and it continues to be the most common disease treated by the physician. The increase in the burden is a major concern and problem in developing countries like India. It is well-established that hypertension and dyslipidemia are the two major contributing risk factors for CVD.[20-21] Various epidemiological studies have shown the prevalence of the co-existence of hypertension and dyslipidemia, in the range of 15 to 31%. The co-existence of the two risk factors has more than an additive adverse impact on the vascular endothelium, which results in enhanced atherosclerosis, leading to CVD, and is associated with adverse outcomes.[22]

The present study was conducted to determine the abnormality of lipid profile (TC, TG, HDL, LDL, VLDL) in hypertensive patients and healthy subjects and to know the incidence and types of hyperlipidemia in hypertensive subjects. It is a case control study with number of cases 75 and controls [23-24].

Patients were evaluated with detailed history, meticulous examination (Blood pressure measurement) and laboratory investigations. Laboratory investigations included lipid profile (TC, TG, HDL, LDL, VLDL) fasting blood glucose, post prandial glucose levels, Serum TSH level, blood urea, Serum creatinine, ECG and chest x-ray to rule out secondary hypertension.

The finding of our study revealed a significant increase in BMI in cases ( $26.0 \pm 1.73$ ) as compared to controls ( $22.3 \pm 1.73$ ), it was significant at ( $p=0.000$ ). Our finding corroborates with a study conducted by Charles U. Osuji, Emeka G. Omejua et al, who analysed cross sectional data and concluded that hypertensive subjects were significantly heavier than the normotensive subjects, with significantly higher lipid profile.[23] Raksha Goyal, Nandini Sarwate, also analysed a cross sectional data and concluded that hypertensive patients had BMI higher than normotensive patients with significantly deranged lipid profile.

Therefore, this study has shown a significant relationship between the mean blood pressure and total cholesterol, HDL-C, LDL-C, but no significant relationship was seen between triglycerides and VLDL-C. As per the study conducted by Gulab Kanwar, Neelam Jain et al, 19 Arindam Sur, Trikey BN et al, 18 N. Bixi Gormat, F. Benmaansour et al 19 total cholesterol, LDL-C were raised in patients with hypertension in comparison to normotensive patients.[25-27] HDL-C levels were decreased in hypertensive patients as compared to normotensive patients.

In this study no significant correlation was found between triglyceride levels of hypertensive patients and normotensive patients, which is in accordance with the study conducted by Umar G Adamu, George A Okku et al [28] but was unlike other studies conducted by Raksha Goyal, Nandini Sarwate et al [84] which concluded triglyceride level was found significantly higher in hypertensive patients as compared to normotensive patients.

## 5. CONCLUSION

This study concludes that, the incidence of dyslipidemia is increasing at a rapid rate in developing and developed countries. Hypertension and hyperlipidemia occur together more often than it is expected by chance. There is some evidence that hyperlipidemia itself may predispose to hypertension and that lipid lowering interventions may have a beneficial effect on blood pressure and on endothelial dysfunction. Hypertension and dyslipidemia are the two major contributing risk factors for heart diseases and therefore they can serve as important markers for cardiovascular diseases as well as morbidity and mortality related to them. Our study and several other studies have shown that:-1. The serum lipid profile of hypertensive patients were deranged significantly compared to normotensive patients.,2. No significant difference was seen in serum lipid profile between hypertensive males and females.,3. Of 75 hypertensive patients only 20-31% patients had altered serum lipid profile.

Thus, it was concluded that serum lipid profile can serve as an important marker for screening hypertensive patients for cardiovascular diseases, and their early detection can reduce cardiovascular morbidity and mortality. More so, in my study, total cholesterol, HDL-C, LDL-C and BMI were found to be abnormal in hypertensive patients, but triglycerides and VLDL-C did not show any significant variation with hypertension.

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