

### A Study on the Lipid Profile of Hypertensive Patients

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#### Abstract

**Background:** Dyslipidaemia and hypertension are the commonest risk factors for coronary artery disease (CAD). Recent reports show that borderline hypertension (systolic BP 130-139 and/or diastolic BP 85-89 mmHg) and Stage I hypertension carry a significant cardiovascular risk and there is a need to reduce this blood pressure.

**Methods:** The present study was carried out on a total of 100 hypertensive patients attending our Hospital and 100 age and sex matched healthy controls. Twelve hour fasting lipid analysis was done for Serum triglycerides (TG), total cholesterol(TC), High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL).

**Results:** The Mean serum total cholesterol values were highly significant in hypertensive subjects (231.2±34.5 mg/dL) as compared to the healthy control subjects (156.32±12.44 mg/dL). The mean serum TG level was 107.28±16.24 in healthy control subjects, and 214.54±38.41 in hypertensive patients. This difference was highly significant. The mean values for HDL 29.62 ±6.24 was mg/dL for hypertensive subjects whereas 43.56±4.21 mg/dl for healthy control subjects, respectively. The Mean serum LDLc values were highly significant in hypertensive subjects

(158.42±32.42 mg/dL) as compared to the healthy control subjects (94.23±15.60 mg/dL).

**Conclusion:** All the lipid profile like cholesterol, LDL, TG and HDL were derange in the hypertensive than those in the healthy controls.

**Keywords:** Hypertension ,Lipid profile, HDL ,TG , LDL.

#### Introduction

Hypertension which is defined as blood pressure of equal to or greater than 140/90mmHg has been recognized as the most common cardiovascular disorder and a leading cause of morbidity and mortality in both developed and developing countries. Hypertension has been recognized as one of ten (10) leading reported causes of death with about 4% of such deaths due to hypertensive complications<sup>1-2</sup>.

Approximately 25% of the adult populations are affected. Although historically defined as “an elevation of blood pressure” alone, hypertension is characterized by abnormalities of cardiac output, systemic vascular resistance, and arterial compliance. 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.<sup>3</sup>

Dyslipidaemia and hypertension are the commonest risk factors for coronary artery disease (CAD). Recent reports show that borderline hypertension (systolic BP 130-139 and/or diastolic BP 85-89 mmHg) and Stage I hypertension carry a significant cardiovascular risk and there is a need to reduce this blood pressure<sup>5</sup> The reported prevalence of hypertension varies around the world, with the lowest prevalence in rural India (3.4% in men and 6.8% in women) and highest in Poland (68.9% in men and 72.5% in women).<sup>6</sup> It has been found that men have a higher prevalence of hypertension than women although this changes later in life with substantial increase in the number of females with hypertension after the age of 50 years. Dyslipidaemia (hyperlipidaemia), which is associated with hypertension, has been recognised as independent risk factor for cardiovascular disease, a leading diagnosis for visits to physicians and cause of death.<sup>7,8</sup>

#### Materials and Methods

Patients who diagnosed as cases of essential hypertension based on history and on Antihypertensive Medication were included. The selected subjects were further grouped as:

**GROUP 1:** Healthy control subjects (n=100). It was ensured by routine examination that all the subjects were healthy and there were no signs and symptoms of hypertensive and other disease.

**GROUP 2:** Hypertensive subjects (n=100). It included the clinically established patients of hypertension. Their blood pressure is in range of systolic blood pressure (>140 mmHg) and diastolic blood pressure (>90mmHg) and have no symptoms of diabetes mellitus.

An informed consent was taken from all the healthy control subjects and patients, under study apprising them the nature and objective of the study. All subjects

were studied as outpatient. Participant's examination included interviews for medical and nutritional history. Present and past history of each case was recorded in detail regarding their general information i.e. name, age, sex, address, religion, occupation, economic status, nutritional and personal habits, education, medication and history suggestive of any systemic illness. Each subject was then examined for various anthropometric parameters: Weight (Kg), height (meters), BMI (Body Mass Index) was calculated by  $\text{Weight (Kg)} / \text{height squared (m}^2\text{)}$  and Blood pressure (BP).

After an overnight fast of 10-12 hours, fasting blood samples were collected. Blood samples were drawn from antecubital vein of each subject by using aseptic technique. The blood was collected in plain tubes for lipid parameters respectively. Serum was separated after centrifugation and analysed.

Lipid profile measured following methods

- Serum total cholesterol: was measured by Enzymatic method Normal serum cholesterol: 150-250 mg/dl
- Serum HDL cholesterol: was measured by "Phosphotungstate method. Normal HDL – Cholesterol: 30 – 70 mg/dl.
- Serum LDL cholesterol: If the value of Triglycerides is known, LDL-cholesterol can be calculated based on Friedewald's equation.
- Serum Triglycerides: was measured by enzymatic colorimetric method Normal Serum Triglycerides: Male: 60-165 mg/dl Female: 40-140 mg/dl.

**Results**

Table 1. Socio-demographic variable

Socio-demographic variable	GROUP-1	GROUP-2	P-value
Age	46.23±6.24	45.68±8.09	>0.05
M:F	76:24	75:25	>0.05

Socio-demographic variable between both groups were comparable.

Table 2. Blood pressure

BP	GROUP-1	GROUP-2	P-value
SBP	118.21±4.02	142.2±4.23	<0.05
DBP	75.12±4.16	102.4±3.84	<0.05

The mean systolic blood pressure of the healthy controls and hypertensive subjects in the present study was 118.21±4.02 and 142.2±4.23 mmHg . The mean diastolic blood pressure of the healthy controls and hypertensive subjects in the present study was 75.12±4.16 and 102.4±3.84 mmHg respectively.

Table 3. Lipid profile

Lipid profile	GROUP-1	GROUP-2	P-value
TC (mg/dl)	156.32±12.42	231.2±34.5	<0.001
LDL (mg/dl)	94.23±15.60	158.42±32.42	<0.001
HDL (mg/dl)	43.56±4.21	29.62±6.24	<0.001
TG (mg/dl)	107.28±16.24	214.54±38.41	<0.001

The Mean serum total cholesterol values were highly significant in hypertensive subjects (231.2±34.5 mg/dL) as compared to the healthy control subjects (156.32±12.44 mg/dL). The mean serum TG level was 107.28±16.24 in healthy control subjects, and

214.54±38.41 in hypertensive patients. This difference was highly significant. The mean values for HDL 29.62 ±6.24 was mg/dL for hypertensive subjects whereas 43.56±4.21 mg/dl for healthy control subjects, respectively. The Mean serum LDLc values were highly significant in hypertensive subjects (158.42±32.42 mg/dL) as compared to the healthy control subjects (94.23±15.60 mg/dL).

**Discussion**

The Mean serum total cholesterol values were highly significant in hypertensive subjects (231.2±34.5 mg/dL) as compared to the healthy control subjects (156.32±12.44 mg/dL). The mean serum TG level was 107.28±16.24 in healthy control subjects, and 214.54±38.41 in hypertensive patients. This difference was highly significant. The mean values for HDL 29.62 ±6.24 was mg/dL for hypertensive subjects whereas 43.56±4.21 mg/dl for healthy control subjects, respectively. The Mean serum LDLc values were highly significant in hypertensive subjects (158.42±32.42 mg/dL) as compared to the healthy control subjects (94.23±15.60 mg/dL).

The significantly higher plasma total cholesterol, triglycerides and LDL-cholesterol in the hypertensive than in the normotensive patients in the present study is in corroboration with earlier studies.<sup>9-12</sup>

In accordance to our study, Saha MS et al (2006) also reported a statistically highly significant relation in serum TG level in hypertensive subjects (184.77±5.97 mg/dL) as compared to the healthy controls (142.73±6.68 mg/dL).<sup>13</sup>

Kumar NL et al (2010) reported a statistically highly significant relation in serum TG level in hypertensive subjects (180.88±68.5 mg/dL) as compared to the healthy controls (114.7±17.62 mg/dL).<sup>14</sup>

## **Conclusion**

All the lipid profile like cholesterol, LDL, TG and HDL were derange in the hypertensive than those in the healthy controls.

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