



LIPID PROFILE IN CASES OF HYPERTENSION PRESENTING AT TERTIARY CARE HOSPITAL

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ABSTRACT **Background:** Dyslipidaemia and hypertension are a major, common and modifiable risk factor for diseases like a stroke; coronary artery disease etc. which are common causes for mortality in India. Dyslipidaemia is closely associated with hypertension^{2,3}. **Aim & Objective:** To study lipid profile in cases of hypertension. **Methods:** A total of 100 patients admitted with hypertension were the participants of the study. The patients are in the range of 40-80 years. All were investigated for various clinical parameters on lipid profile abnormalities. Results were compared among cases and controls **Statistical Analysis:** The collected data were analyzed by SPSS software version 17. All values were expressed as mean and SD. Statistical significance of difference between cases and control groups were evaluated by student's "t" test and p-value. <0.05 was considered as significant. **Results:** Significant higher levels of total cholesterol, triglycerides, LDL-c and lower levels of HDL-c were observed in hypertensive patients with p-value significant <0.0001. **Conclusions:** Hypertensive patients have significantly elevated levels of all forms of cholesterol and a higher percentage of individuals in the dyslipidemia state when compared with normotensive patients.

KEYWORDS : Dyslipidaemia, Hypertension

INTRODUCTION

Hypertension is prevalent in about one-third of adult population in the south East Asia region. Most hypertensive are asymptomatic. Hypertension doubles the risk of ischemic and haemorrhagic stroke, cardiovascular diseases, peripheral arterial diseases, and renal failure^{7,8}. In children and adolescents, hypertension is generally defined as systolic and/or diastolic blood pressure consistently > 95th percentile for age, sex, and height.⁴

- As per this Table 1, 120/80 mm of hg is normal blood pressure. The elevated blood pressure is between SBP 120 – 129 but DBP should be less than 80. TARGET BLOOD PRESSURE in various age group <65yrs,<130/80 mmHg and >65yrs,<130/80 mmHg Hypertension: Blood pressure>130 mm Hg Systolic or >85mmHgdiastolic or on treatment^{5,6}.

Table 1: ACC/AHA Blood Pressure Classification

	Systolic, mmHg	Diastolic, mmHg
Normal	<120	And<80
Elevated	120-129	And <80
Stage 1 hypertension	130-139	Or80-89
Stage 2 hypertension	≥140	Or≥90
Target blood pressure in various subsets	<65years, <130/80 mmHg >65years, <130/80 mmHg	

Dyslipidemia is defined as a disorder of lipoprotein metabolism, including lipoprotein deficiency or overproduction or both.⁵ Dyslipidaemia may be manifested by increase of the total cholesterol (TC), the low-density lipoprotein cholesterol (LDL-c) and the triglyceride concentrations (TG), and a decrease in the high-density lipoprotein cholesterol (HDL-c) concentration in the blood.

- Dyslipidemia: Triglycerides ≥150 mg/dl or on medication
- Dyslipidemia (second separate criteria): HDL-C<40 mg/dl for males and < 50 mg/dl for female; or on medication.

MATERIALANDMETHODS

The study design is a prospective cross-sectional study. A total of 100 patients admitted with hypertension were the participants of the study. The patients are in the range of 40-80 years. All were investigated for various clinical parameters on lipid profile abnormalities

Inclusion Criteria

- Patients with essential hypertension with or without the complication of hypertension and medication were included.
- Systolic blood pressure > 140 mm Hg and diastolic >90 mmHg based on an average of two readings or one in case of known hypertensive and on antihypertensive medication.

Exclusion Criteria

- Secondary hypertensive subjects were excluded from the study.
- Patients with diabetes mellitus, hypothyroidism, and those receiving lipid-altering drugs were excluded.
- Control study: -Control group consisted of 50 subjects.
- After selecting cases for the study, each patient was subjected to the following as per format. A detailed history Careful physical examination Laboratory investigations Complete blood count Urine - albumin, sugar, microscopy Fasting blood sugar, post-prandial blood sugar ECG Lipid profile – total cholesterol, HDL cholesterol, LDL cholesterol, VLDL, Triglycerides ECHO / cardiac isoenzymes (CPK, SGOT, LDH)/ chest X-ray were done in relevant cases. The blood samplings were drawn from all the patients after a minimum of 12 hours of complete fasting. Blood Pressure measurement:
- Blood pressure was measured after the subject had reexamined for at least 5 minutes from right arm placed at the heart level by a physician. Two measurements were taken by a mercury sphygmomanometer with at least 5 minutes between successive measurements. The mean of two measurements of Korotkoff phase I was recorded for systolic blood pressure (SBP). The mean of two values of Korotkoff phase IV was recorded for diastolic pressure (DBP).

Serum Assessments

Venous blood was collected in the morning after an overnight fast and serum was used for the biochemical tests. Lipid parameters (TC, TG, LDLc and HDLc) were estimated by Enzymatic colorimetric test. Dyslipidemia was defined according to ATPIII report. Hypercholesterolemia was defined as fasting total serum cholesterol and triglyceride of greater than or equal to 200mg/dl and 150 respectively. Blood concentration of LDL-C (low-density lipoprotein cholesterol) equal or above 150mg/dl and blood concentration of HDL-C (high-density lipoprotein cholesterol) under 40mg/dl respectively, were considered to be undesirable.

Statistical Analysis

The collected data were analyzed by SPSS software version 17. All values were expressed as mean and SD. Statistical significance of difference between cases and control groups were evaluated by student's "t" test and p-value. <0.05 was considered as significant.

RESULTS

The mean systolic3. blood pressure (SBP) of hypertensive patients was 154.6±22.5mmof Hg and that of normotensive subjects was111.5±3.42 mm of Hg. The mean systolic blood pressure was found to be higher in hypertensive than normotensive (p<0.05). Mean diastolic blood pressure of hypertensive cases was 95.2±5.20mm of

Hg and that of controls was 71.4 ± 3.21 mmHg. The mean DBP of hypertensive cases was found to be higher than controls ($p < 0.05$). Table 2

Table 2: Basic Biochemical, Demographic And Clinical Parameters.

Parameters	Mean
Age	55.9159 ± 5.230
SBP	162.710 ± 3.523
DBP	93.2897 ± 5.034
FBS	95.7196 ± 12.567
PPBS	126.121 ± 12.23
TC	196.804 ± 12.235
TG	197.312 ± 15.02
LDL	119.153 ± 17.04
HDL	37.935 ± 15.345
VLDL	40.0617 ± 2.348

As per Table 1, age of our study group was in the range of 30 to 75 years. SBP of the study range is 130 to 200 mmHg. DBP is 40 to 140 mmHg. TC was in the range of 150 to 283 mg/dl. TG was 58 to 350 mg/dl. LDL-c was 64 to 190 mg/dl. HDL-c was in the range of 24 to 53 mg/dl. VLDL-c was in the range of 12 to 68 mg/dl.

In this study group, cases showed the TC mean value higher than controls by 31. Cases showed the TG mean value higher than controls by 77, and LDL-c is higher in cases by 20.6, and HDL-c lower in cases by 4.4 compared to controls. The total cholesterol, LDL-c and triglycerides are significantly higher, and HDL-c is lower in hypertensive patients (cases) when compared with non-hypertensive patients (control) Table 3

Table 3: Mean Lipid Values: Cases Vs Controls.

Lipid	Number	Mean	SE	p'
	Cases	107	197	2.67
	Controls	60	166	2.77
TC	Cases	107	197	7.03
	Controls	60	120	5.40
TG	Cases	107	119	2.45
	Controls	60	98.4	2.74
LDL	Cases	107	37.9	0.63
	Controls	60	42.3	0.98

DISCUSSION

Hypertension is recognized globally as a major public health problem. In present study the results revealed that the mean value of serum total cholesterol, triglycerides and serum LDL-cholesterol was significantly higher and statistically significant. HDL-cholesterol levels were similar both the hypertensive and normotensive. About 43.92% hypertensive and 5% normotensive, has high TC (200 mg/dl). High TG (150 mg/dl) are found in 84.11% of the hypertensive and 20% normotensive group. The high LDL-c in the groups is 28.03% and 5% in controls. The low HDL-c (< 40 mg/dl) is seen in 53.27% of hypertensive patients and 30% in normotensive group. All these values, when analyses using the Chi-square test, are statistically significant.

The results are similar to the studies conducted by J. Idemudia E. Ugwuja in Nigeria, which showed a significantly elevated plasma TC, TG and LDL-c in hypertensive patients when compared with normotensive patients.¹⁰

Studies by Abdishakur Abdulla, Nico Negelkerke in UAE showed a significantly higher level of VLDL and TG among hypertensive patients but not TC and LDL levels. Studies conducted in Spain by D. Rueda and A. Maldonado showed a significantly high TC and TG than normotensive controls.

RESULT AND CONCLUSION

Hypertensive patients have significantly elevated levels of all forms of cholesterol and a higher percentage of individuals in the dyslipidemic state when compared with normotensive persons. Based on the results obtained from the present study, we concluded that serum lipid profile especially total cholesterol, triglycerides and LDL-cholesterol levels are positively associated with hypertension.

Hypertension and dyslipidemia can be modified either by proper life style changes or medical management or by the combination of the both. This study suggests that hypertensive patients need measurement

of blood pressure and lipid profile at regular interval to prevent heart diseases and stroke.

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