



COMPARISON OF LIPID PROFILE IN HYPERTENSIVE PATIENTS AND NON-HYPERTENSIVE SUBJECTS

Biochemistry

Ajay Kumar PhD Scholar, Department of Biochemistry, NIMS, Jaipur

Dr. R. C Gupta Professor & Head, Department of Biochemistry, NIMS, Jaipur

Dr. N. K Gupta* Associate professor, Department of Medicine, PIMS, Udaipur *Corresponding Author

ABSTRACT

Background: Hypertension and Dyslipidemia are the major modifiable risk factor for Cardiovascular Disease (CVD) which is more common in Urban Population than rural population. **Objectives:** The present study was undertaken to assess the status of Lipid Profile in hypertensive patients and to compare them with non-hypertensive subjects. **Methods:** 220 hypertensive patients and 220 age and sex-matched non-hypertensive subjects were taken. The following parameters were assessed: Serum Total Cholesterol, Triacylglycerol, HDL-C, and LDL-C. **Results:** Lipid Profile levels showed a significant variation in hypertensive patients as compared to non-hypertensive subjects. **Conclusion:** To conclude the present study indicates a strong relation with essential hypertension and dyslipidemia and that the hypertensives should undertake modifications in lifestyle to decrease the risk of CVD.

KEYWORDS

CVD, Dyslipidemia, Hypertension, Lipid Profile.

INTRODUCTION

Hypertension, as a common disease, poses a major public health challenge to the Indian population. It is one of the major risk factors for cardiovascular disease (CVD) mortality, accounting for 20-50% of all deaths. The incidence of CVD is more common in urban population than in the rural population due to certain risk factors like tobacco consumption, sedentary life style, hypertension and obesity. Developing countries also suffer from early death age due to CVD than the developed countries. Dyslipidemia is recognized as major modifiable cardiovascular disease (CVD) risk factor² and is an independent risk factors for essential hypertension.³ It is widely accepted that CVD is associated with hypertension and increased blood levels of low-density lipoprotein (LDL), total cholesterol (TC), and triglycerides (TG). In contrast, a low level of high density lipoprotein (HDL) is a risk factor for mortality from CVD.⁴

Hypertensive patients are advised to take regular treatment which not only controls blood pressure but can also favorably influence serum lipids. The present study was performed to compare the levels of Serum Total Cholesterol, Triacylglycerol, HDL-C, and LDL-C in hypertensive patients on regular medication and non-hypertensive control subjects.

MATERIAL AND METHODS

After obtaining prior IRB permission, the present study was conducted in National Institute of Medical Sciences and Research, Jaipur. The study was conducted on 220 hypertensive patients taking anti-hypertensive medication and 220 age- and sex-matched non-hypertensive subjects, all of whom were taken from Pacific Institute of Medical Sciences, Udaipur.

Duration of the study: one and half year.

The following were measured in their fasting blood samples:

- Serum Triglycerides (TGL)⁵
- Serum Total Cholesterol (TC)⁶
- Serum High Density Lipoprotein Cholesterol (HDL-C)⁷
- Serum Low Density Lipoprotein Cholesterol (LDL-C)⁸

The mean $\pm$ SD values of the two groups were compared using Student's unpaired t-test.

RESULTS:

Age and sex distribution of hypertensive patients and non hypertensive subjects is shown in Table 1.

Table 1: Age and sex distribution of Hypertensive Patients and Non-hypertensive Subjects

	Hypertensive Patients (n=220)	Non-hypertensive Subjects (n=220)
Mean $\pm$ SD Age (years)	46.9 $\pm$ 7.33	46.23 $\pm$ 8.63 ^{ns}
Gender	137 Males/ 83 Females	131 Males/ 89 Females

P value interpretation ns : not significant

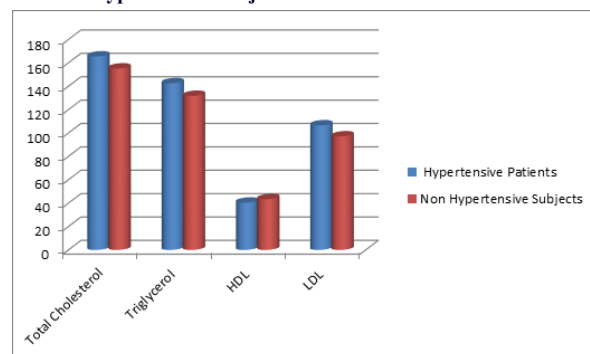
Figure 1 and Table 2 show the lipid profile of hypertensive patients and non-hypertensive subjects. The mean $\pm$ SD serum levels of Total Cholesterol (mg/dL), Triacylglycerol (mg/dL), HDL-C (mg/dL) and LDL-C (mg/dL) in hypertensive patients were 165.5 $\pm$ 22.28, 142.6 $\pm$ 24.3, 40.46 $\pm$ 3.71 and 106.6 $\pm$ 11.01 respectively. The same in non-hypertensive subjects were 155.2 $\pm$ 16.63, 131.8 $\pm$ 17.46, 43.47 $\pm$ 3.5 and 97.17 $\pm$ 8.33 respectively. These results show that the levels of Total cholesterol, Triacylglycerol and LDL-C in hypertensive patients were significantly higher as compared to non-hypertensive subjects while HDL-C level was significantly lower in hypertensive patients as compared to non-hypertensive subjects.

Table 2: Comparison of Lipid profile of Hypertensive Patients and Non-hypertensive Subjects (the values are mean $\pm$ SD)

Parameters	Hypertensive Patients (n=220)	Non-hypertensive Subjects (n=220)
Serum Total Cholesterol (mg/dL)	165.5 $\pm$ 22.28	155.2 $\pm$ 16.63 [*]
Serum Triacylglycerol (mg/dL)	142.6 $\pm$ 24.3	131.8 $\pm$ 17.46 [*]
Serum HDL-C (mg/dL)	40.46 $\pm$ 3.71	43.47 $\pm$ 3.5 [*]
Serum LDL-C (mg/dL)	106.6 $\pm$ 11.01	97.17 $\pm$ 8.33 [*]

^{*}p < 0.001

Figure 1: Comparison of Lipid profile of Hypertensive Patients and Non-hypertensive Subjects



DISCUSSION:

Impaired endothelium-dependent vascular relaxation in patients with essential hypertension may be associated with hypercholesterolemia.⁹ It has been suggested that low density lipoprotein (LDL) cholesterol in itself may be a modifiable risk factor for hypertension.¹⁰ Lowering of LDL cholesterol level is associated with lowered incidence of hypertension and that LDL cholesterol may blunt endothelium-dependent vascular relaxation.¹¹ Sesso et al. have shown that baseline levels of lipids, particularly HDL-C and non-HDL-C and the TC/HDL-C ratio, are associated with an increased risk of incident

hypertension, even among those with low initial SBP and DBP.¹² Gaziano et al. concluded that there were no significant interactions found between hypertension and any lipoprotein parameter. Hence the risk of Myocardial Infarction associated with treated hypertension may have a lipid mechanism involving high-density lipoprotein cholesterol and/or triglycerides.¹³ The effects of antihypertensive drugs on lipid profile vary with both the pharmacological class and the individual drugs. Many studies have examined the effects of different antihypertensive agents on lipid levels. Although there is a general consensus that thiazide diuretics and nonselective β blockers adversely affect lipid levels, many areas of disagreement still exist about the effects of other antihypertensive agents on lipids.¹⁴ Alpha blockers reduce triglyceride levels¹⁵ and many authors have concluded that ACE inhibitors do not affect lipids.¹⁶ Ahmed et al concluded that calcium antagonists as a group have no significant effect on lipids.¹⁴ Our results show that dyslipidemia persisted in hypertensive patients despite regular use of antihypertensive medication.

CONCLUSION:

The present study shows significantly increased levels of Total cholesterol, Triglycerides and Low Density Lipoprotein Cholesterol levels, and significantly decreased level of High Density Lipoprotein Cholesterol in hypertensive patients under treatment as compared to non-hypertensive controls.

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