

**Original Research Article****Study of lipid profile in hypertensive subjects**Anuradha K¹, Ranjana Mathur², Sadhna Sood³¹Department of Biochemistry, S.M.S. Medical College, Jaipur, Rajasthan, India²Senior Professor & Head, Department of Biochemistry, Dr. S. N. Medical College, Jodhpur, India³Senior Professor, Department of Biochemistry, S.M.S. Medical College, Jaipur, Rajasthan, India**ARTICLE INFO:****Article history:**

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ABSTRACT

Aim : The present study was designed to investigate lipid profile in hypertensive subjects. **Material and Method :** The present study was carried out on 25 healthy controls and 25 hypertensive subjects of either sex and of varying age groups attending the Out Patient Department of Medicine, Dr. S.N. Medical College and Associated group of hospitals, Jodhpur. **Results:** The results obtained in this study showed that the results of TG, Total cholesterol, HDL-c, VLDL-c, LDL-c were highly significant in patients compared with control subjects. **Conclusion:** The present study indicates an increased TG, Total cholesterol, VLDL-c, LDL-c & decreased HDL-c values in hypertensive subjects, which is due to many factors like obesity, age etc.

Introduction

Hypertension is the most common of the cardio-vascular 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 [1]. Hypertension is defined as SBP level higher than 140 mmHg and DBP higher than 90mmHg. Hypertension is characterized by abnormality of cardiac output systemic vascular resistance and arterial compliance. Approximately 25% of adult populations are affected.[2]. Hypertension is one of the ten leading reported causes of death and about 4% deaths were due to hypertensive complication.[3] Untreated hypertension is notorious for increasing the risk of immortality and is often described as a silent killer. Mild to moderate hypertension, if left untreated, is associated with a risk of atherosclerotic disease in 30% of people and organ damage in 50% of people after only 8-10 years of onset[4]. The most important risk factors for the development of hypertension are increased salt intake, obesity, cigarette smoking, lack of physical exercise, genetic factors and stress and strain[5]

Materials and methods

The present study was conducted on 50 subjects with either sex and of varying age group in the Department of Biochemistry, Dr.

S.N. Medical College and Associated group of Hospitals, Jodhpur.

The selected subjects were further grouped as:-

GROUP 1: Healthy control subjects (n=25). 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=25). 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 Weight (Kg) / height squared (m²) 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. Following biochemical parameters were analysed by commercially available reagents and kits on semi autoanalyzers and autoanalyzer in Clinical Biochemistry Laboratory, M.G. Hospital, Dr. S.N. Medical College, Jodhpur.
Lipid Profile:

(i) Serum Total Cholesterol (TC): Enzymatic, Cholesterol esterase, Cholesterol oxidase and Peroxidase, end point method.[6]

(ii) Serum Triglyceride: Enzymatic, Lipoprotein lipase, Glycerol kinase, Glycerol phosphate oxidase and Peroxidase, end point method[7]

(iii) HDL-c: Phosphotungstic acid, end point method[8]

(iv) VLDL-c and (v) LDL-c: By Friedwald's formula.

Result

Table 1: Characteristics of study population

S.No.	Characteristics	GROUP 1 (N:25)	GROUP 2 (N:25)
1.	Age	25.24±4.47	42.16±6.13
2.	Male	13	13
3.	Female	12	12
4.	BMI	22.20±1.27	25.11±4.19
5.	Systolic BP (mmHg)	116±5	139.64±9.01
6.	Diastolic BP (mmHg)	75.6±5.07	101.28±9.01
7.	Total Cholesterol (mg/dL)	161.96±12.69	230.2±34.55
8.	Triglyceride (mg/dL)	107.4±18.49	214.2±57.26
9.	HDL- cholesterol (mg/dL)	44.72±6.24	29.32±6.81
10.	LDL- cholesterol (mg/dL)	95.76±17.00	158.52±39.42
11.	VLDL- cholesterol (mg/dL)	21.48±3.70	42.84±11.45

Table:2 Statistical analysis of serum lipid profile among the studied (hypertensive vs. healthy control subjects)

S.No.	Parameter	t value	p value
1.	Total Cholesterol (mg/dL)	9.27	p<0.001
2	Triglyceride (mg/dL)	8.87	p<0.001
3	HDL- cholesterol (mg/dL)	8.34	p<0.001
4	LDL- cholesterol (mg/dL)	7.31	p<0.001
5	VLDL- cholesterol (mg/dL)	8.88	p<0.001

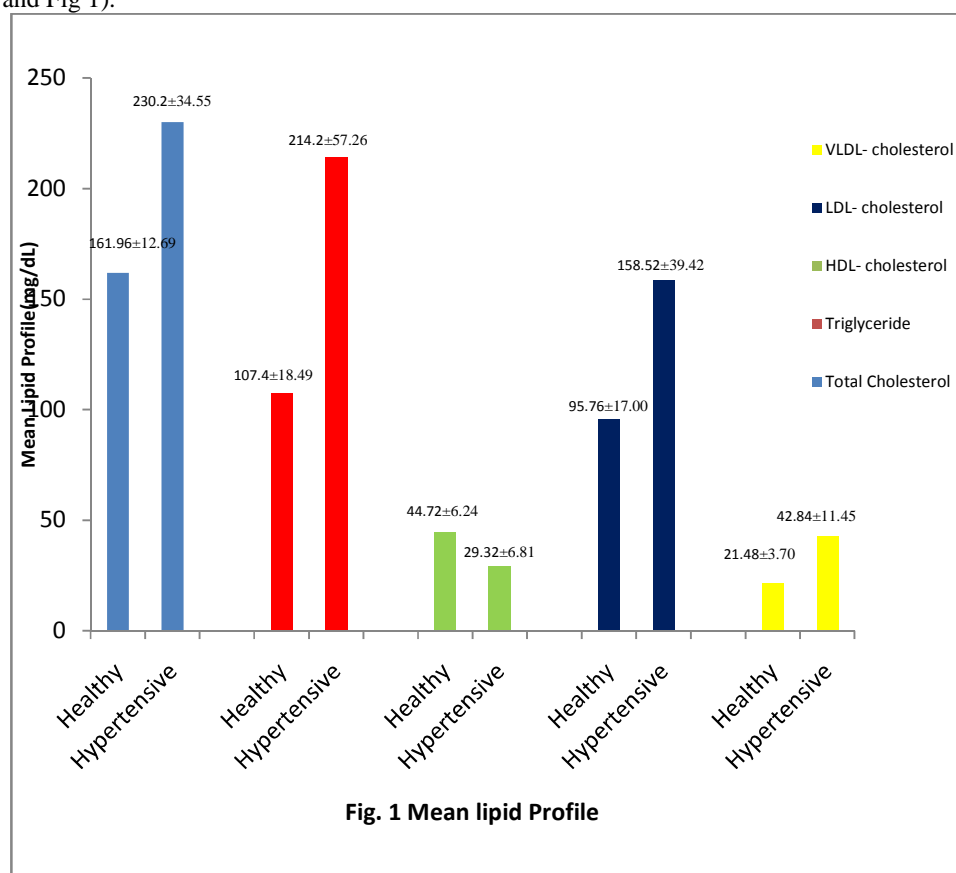
Table I shows the various baseline characteristics of study population. The mean age of patients with hypertension was 42.16 ± 6.13 years & 25.24 ± 4.47 years for healthy person, respectively. The mean systolic blood pressure of the healthy controls and hypertensive subjects in the present study was 116.00 ± 5.00 and 139.64 ± 9.01 mmHg. The mean diastolic blood pressure of the healthy controls and hypertensive subjects in the present study was 75.60 ± 5.07 and 101.28 ± 9.01 mmHg respectively.

The Mean serum total cholesterol values were highly significant ($t=9.27$, $p<0.001$) in hypertensive subjects (230.2 ± 34.55 mg/dL) as compared to the healthy control subjects (161.96 ± 12.69 mg/dL) (Table 1&2 and Fig 1).

The mean serum TG level was 107.4 ± 18.49 in healthy control subjects, and 214.2 ± 57.26 in hypertensive patients. This difference was highly significant. ($t=8.87$, $p<0.001$). (Table 1&2 and Fig 1).

The mean values for HDL-c 29.32 ± 6.81 was mg/dL for hypertensive subjects whereas 44.72 ± 6.24 for healthy control subjects, respectively (Table 1 and Fig 1).

The Mean serum LDL-c & VLDL-c values were highly significant ($t=7.31$, $p<0.001$ & $t=8.88$; $p<0.001$) in hypertensive subjects (158.52 ± 39.42 & 42.84 ± 11.45) as compared to the healthy control subjects (95.76 ± 17.00 & 21.48 ± 3.70) (Table 1, 2 and Fig 1).



Discussion and Conclusion

Mean serum total cholesterol values were highly significant ($t=9.27$, $p<0.001$) in hypertensive subject as compared to the healthy control subject. Our findings show a relation with those of Saha MS *et al*[5] (2006), as they had reported a statistically highly significant relation ($p>0.001$) in serum total cholesterol level in hypertensive subjects (241.25 ± 6.57 mg/dL) as compared to the healthy controls (182.14 ± 4.4 mg/dL). Similarly, Kumar NL *et al*[9] (2010) also reported a statistically highly significant relation ($p<0.001$) in serum total cholesterol level in

hypertensive subjects (209 ± 31.63 mg/dL) as compared to the healthy controls (172.8 ± 13.43 mg/dL).

Mean serum TG values were highly significant ($t=8.87$, $p<0.001$) in hypertensive subjects as compared to the healthy control subjects. In accordance to our study, Saha MS *et al*[5] (2006) also reported a statistically highly significant relation ($p<0.001$) 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). Burattinmi R *et al* [10](2009) reported a statistically highly significant relation ($p<0.001$) in serum TG level in hypertensive subjects (135 ± 18 mg/dL) as compared to the healthy controls

(66.2±10.9 mg/dL). Kumar NL *et al*[9] (2010) reported a statistically highly significant relation ($p<0.001$) 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). Sarkar D *et al*[11] (2007) also reported mean serum TG values were highly significant ($p<0.001$) in the hypertensive subjects as compared to the healthy controls.

Mean serum HDL-c values were highly significant ($t=8.34$, $p<0.001$) in hypertensive subjects as compared to the healthy control subject. Our observation were in accordance with those of Saha MS *et al*[5] (2006) as they reported a highly significant relation ($p<0.001$) with serum HDL-c in hypertensive subjects (32.91±1.21 mg/dL) as compared to the healthy control subjects (42.88±0.93 mg/dL). Similarly, Sarkar D *et al*[11] (2007) reported a highly significant relation ($p<0.001$) in serum HDL-c level in hypertensive subjects as compared to the healthy controls.

Mean serum VLDL-c values were highly significant in hypertensive subjects ($t=8.88$; $p<0.001$) as compared to the

healthy control subject. Similarly, Kumar NL *et al*[9] (2010) reported a highly significant relation ($p<0.001$) in serum VLDL-c level in hypertensive subjects (35.77±13.43 mg/dL) as compared to the healthy controls (22.87±3.46mg/dL).

In our study, mean serum LDL-c values were statistically highly significant in hypertensive subjects ($t=7.31$; $p<0.001$) as compared to the healthy control subjects. In accordance to our study, Kumar NL *et al* (2010) reported a highly significant relation ($p<0.001$) in serum LDL-c in hypertensive subjects (134.31±29.24 mg/dL) as compared to the healthy controls (107.00±13.10 mg/dL). Saha MS *et al*[5] (2006) reported a highly significant relation ($p<0.001$) in serum LDL-c in hypertensive subjects (154.32±4.22 mg/dL) as compared to the healthy controls (105.73±3.53 mg/dL).

Conflict of interest: We declare that we have no conflict of interest.

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