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Original Research

Assessment of alteration in lipid profile in hypertensive patients

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ABSTRACT:

Background: Dyslipidaemia refers to abnormalities in blood lipid and lipoprotein levels, has been established as a major modifiable risk factor for cardiovascular disease. The present study was conducted to assess abnormalities in lipid profiles amongst hypertensive patients. **Materials & Methods:** 82 hypertensive patients of both genders were recruited. Group I consisted of hypertensive patients and group II had healthy control. Systolic (SBP) and diastolic (DBP) blood pressures, body mass index, fasting blood glucose and fasting serum lipid profile was recorded. **Results:** Group I had 40 males and 42 females and group II had 38 males and 44 females. In group I and II, WC (cm) was 95.4 and 91.4, WHR was 0.99 and 0.95, FBS (mmol/L) was 5.2 and 4.7, TG was 1.27 and 1.12, HDL-c was 1.28 and 1.25, LDL- c was 3.04 and 2.44 and TC was 4.86 and 4.16, SBP (mm Hg) was 160.4 and 118.4, DBP (mm Hg) was 97.4 and 72.2, BMI (kg/m2) was 29.6 and 27.2 respectively. Elevated TC (\geq 5.2 mmol/L) was seen in 32%and 10%, elevated TG (\geq 1.7 mmol/L) in 8% and 2%, elevated LDL-C (\geq 3.4 mmol/L) in 24% and 5%, low HDL-C (<1.04 mmol/L) in 20% and 15%, no lipid abnormality in 52% and 70%, one lipid abnormality in 26% and 18% and >2 lipid abnormality in 24% and 12% in group I and II respectively. The difference was significant (P< 0.05). **Conclusion:** Lipid parameters were altered in hypertensive patients as compared to healthy subjects.

Key words: Hypertensive, serum lipid, lipid parameters

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INTRODUCTION

Dyslipidaemiarefers to abnormalities in blood lipid and lipoprotein levels, has been established as a major modifiable risk factor for cardiovascular disease (CVD) and as an independent risk factor for essential hypertension, giving rise to the name dyslipidaemic hypertension.¹ According to estimates, 7.1 million and 4.4 million deaths per year are caused by hypertension and dyslipidaemia, respectively.² The coexistence of these two risk factors has a detrimental effect on the vascular endothelium that is more than just additive, resulting in increased atherosclerosis and CVD. According to the National Cholesterol Education Program (NCEP) Guidelines, they are crucial elements of the metabolic syndrome (MS) (Adult Treatment Panel III).^{3,4}

Dyslipidaemia and hypertension are independent cardiovascular risk factors that are linked by insulin resistance and commonly coexist with other cardiovascular risk factors such as dysglycaemia and truncal obesity in a cluster as seen in metabolic syndrome.⁵ Studies had reported common patterns of dyslipidaemia in hypertension as include; increased total plasma cholesterol, triglyceride and low- density lipoprotein (LDL-C) cholesterol, decreased high-density lipoprotein (HDL-C) cholesterol, changes in the composition of LDL-cholesterol viz, small dense LDL-cholesterol, and increased electronegativity of LDL-cholesterol.^{6,7} These changes make LDL-cholesterol susceptible to oxidation and glycation, with foam cell formation, endothelial dysfunction and thus atherosclerosis.⁸The present study was conducted to assess abnormalities in lipid profilesamongst hypertensive patients.

MATERIALS & METHODS

The present study comprised of 82hypertensive patients of both genders. All were enrolled with their written consent.

Baseline characteristics such as name, age, gender etc. was recorded. Hypertensive patients were kept in group I and healthy control in group II. Assessment of blood pressure ie. systolic (SBP) and diastolic (DBP) blood pressures was done. Body mass index (BMI) was calculated as weight, divided by height squared (kg/m2). Hip and waist were measured to the nearest 1 cm and waist-to-hip ratio (WHR) was calculated as waist circumference divided by hip circumference. Fasting blood glucose and fasting serum lipid profile such as serum total cholesterol (TC), high density lipoprotein cholesterol (HDL-C), and triglycerides (TG) and low density lipoprotein cholesterol (LDL-C) was calculated. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Status	Hypertensive	Healthy subjects
M:F	40:42	38:44

Table I shows that group I had 40 males and 42 females and group II had 38 males and 44 females.

Table II Assessment of biochemical parameters

Parameters	Group I	Group II	P value
WC (cm)	95.4	91.4	0.05
WHR	0.99	0.95	0.25
FBS (mmol/L)	5.2	4.7	0.04
TG	1.27	1.12	0.19
HDL- c	1.28	1.25	0.94
LDL- c	3.04	2.44	0.04
TC	4.86	4.16	0.19
SBP (mm Hg)	160.4	118.4	0.03
DBP (mm Hg)	97.4	72.2	0.05
BMI (kg/m2)	29.6	27.2	0.90

Table II, graph I shows that in group I and II, WC (cm) was 95.4 and 91.4, WHR was 0.99 and 0.95, FBS (mmol/L)was 5.2 and 4.7, TG was 1.27 and 1.12, HDL-c was 1.28 and 1.25, LDL- c was 3.04 and 2.44

and TC was 4.86 and 4.16, SBP (mm Hg) was 160.4 and 118.4, DBP (mm Hg) was 97.4 and 72.2, BMI (kg/m2) was 29.6 and 27.2 respectively. The difference was significant (P< 0.05).

Graph I Assessment of biochemical parameters



Lipid abnormality	Group I	Group II	P value
Elevated TC (≥5.2 mmol/L)	32%	10%	0.01
Elevated TG ($\geq 1.7 \text{ mmol/L}$)	8%	2%	0.05
Elevated LDL-C (≥3.4 mmol/L)	24%	5%	0.02
Low HDL-C (<1.04 mmol/L)	20%	15%	0.09
No lipid abnormality	52%	70%	0.05
One lipid abnormality	26%	18%	0.11
>2 lipid abnormality	24%	12%	0.04

Table III Prevalence of serum lipid abnormalities

Table III shows that elevated TC (\geq 5.2 mmol/L) was seen in 32% and 10%, elevated TG (\geq 1.7 mmol/L) in 8% and 2%, elevated LDL-C (\geq 3.4 mmol/L)in 24% and 5%, low HDL-C (<1.04 mmol/L) in 20% and 15%, no lipid abnormality in 52% and 70%, one lipid abnormality in 26% and 18% and >2 lipid abnormality in 24% and 12% in group I and II respectively. The difference was significant (P< 0.05).

DISCUSSION

Abnormalities in serum lipid and lipoprotein levels (dyslipidaemia) are recognized as major modifiable cardiovascular disease (CVD) risk factors and have been identified as independent risk factors for essential hypertension giving rise to the term dyslipidemic hypertension.^{9,10}Dyslipidaemia is more common in untreated hypertensives than normotensives, and lipid levels increase as BP increases.^{11,12}The present study was conducted to assess abnormalities in lipid profiles amongst hypertensive patients.

We found that group I had 40 males and 42 females and group II had 38 males and 44 females.Maria Cristina Eliaset al¹³determined whether primary hypertension patients visiting a tertiary care facility had aberrant lipid profiles. The mean average age of the study group was 48.4±6.9 years, whereas the control group's was 49.3±5.9 years. In comparison to other age groups, hypertension was more common in people aged 40 to 49. In comparison to the control group, the study groups' total cholesterol. triglycerides, HDL cholesterol, and LDL cholesterol were all considerably increased. The most frequent anomaly among hypertension participants was high TC (78%), followed by elevated LDL (66%).

We found that in group I and II, WC (cm) was 95.4 and 91.4, WHR was 0.99 and 0.95, FBS (mmol/L) was 5.2 and 4.7, TG was 1.27 and 1.12, HDL-c was 1.28 and 1.25, LDL- c was 3.04 and 2.44 and TC was 4.86 and 4.16, SBP (mm Hg) was 160.4 and 118.4, DBP (mm Hg) was 97.4 and 72.2, BMI (kg/m2) was 29.6 and 27.2 respectively. Osuji et al¹⁴ examined the serum lipid patterns of two hundred and fifty newly diagnosed adult hypertensive patients and an equal number of age- and sex-matched controls. 126 males and 124 females were in each of the two groups. Mean age was comparable in both groups. Hypertensives had significantly higher mean systolic blood pressure, diastolic blood pressure, body mass index, waist circumference, waist-hip ratio, and fasting blood sugar than the controls. The mean TC, TG, and LDL-C were significantly higher among the hypertensives. The mean HDL-C was comparable; P = 0.8. Among the hypertensive subjects, there was statistically significant positive correlation between BMI and TC; LDL-C and TG; WC and TG; FBS and TC; LDL-C and TG. HDL-C showed a statistically significant inverse correlation with WHR in hypertensives

We found that elevated TC (\geq 5.2 mmol/L) was seen in 32%and 10%, elevated TG (\geq 1.7 mmol/L) in 8% and 2%, elevated LDL-C (\geq 3.4 mmol/L) in 24% and 5%, low HDL-C (<1.04 mmol/L) in 20% and 15%, no lipid abnormality in 52% and 70%, one lipid abnormality in 26% and 18% and >2 lipid abnormality in 24% and 12% in group I and II respectively. Kavindra et al¹⁵ studied lipid profile in hypertensive patients. High Triglyceride level, high Low Density Lipoproteins level were observed in Hypertensive patients and high HDL level found in Normotensive individuals.

The limitation the study is small sample size.

CONCLUSION

Authors found that lipid parameters were altered in hypertensive patients as compared to healthy subjects.

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