Study of Lipid Profile in Newly Diagnosed Hypertensive Patients

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Abstrct

Key words:
*Hypertension,
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Back ground: Hypertension is one of the most important modifiable risk factors for cardiovascular disease (CVD) and stroke. Dyslipidemia is closely associated with hypertension. Dyslipidemia and hypertension are the commonest risk factors for CVD. The aim of the present study was to compare different lipid parameters among newly diagnosed hypertensive patients with normotensive subjects in Bangladesh and find out the relationship.

Methods: This study was a cross sectional study in which 42 newly diagnosed hypertensive patients who were on no antihypertensive medication and 42 subjects with normal blood pressure (normotensive) were enrolled for compare. Lipid parameters total cholesterol (TC), triglyceride (TG), low density lipoprotein (LDLc) and high density lipoprotein (HDLc) were estimated by Enzymatic colorimetric test.

Results: The mean systolic blood pressure of hypertensive and normotensive were 154.6±22.5 vs111.50±3.42 mmof.Hg and mean diastolic blood pressure were 93.2±5.20 vs 71.44± 3.21mm of Hg. The mean of SBP and DBP of hypertensive patients was found to be higher than normotensive (p< 0.05).

There was significant increase in different lipid levels namely TC 199.4±44.5 vs188.7±37.9 mg/dl, TG155.9±88.8 vs 121.9±73.2 mg/dl and LDLc 119.8±35.6 vs112.7±28.6 mg/dl in hypertensive patients as compared to normotensive (p<0.05). However there was no significant difference in HDLc level. BMI and waist circumference showed significant association in hypertensive patients (p<0.001).

Conclusion: Analytical results of the study revealed that hypertensive patients have been found to have close association with dyslipidemia, BMI and waist circumference. 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.

Introduction:

Epidemiological studies have established a strong association between hypertension and cardiovascular disease (CVD). Hypertension is a major independent risk factor for the development of CVD, stroke &renal failure. [1] Dyslipidemia and hypertension are the commonest risk factors for coronary artery disease (CAD). [2] Hypertensive persons have usually higher levels of serum lipids than normotensive persons. [3] The changes in serum lipid profile levels should be actively investigated but a few studies have established relation between hypertension and dyslipidemia.

Atherosclerotic diseases are a leading cause of disability and death worldwide and two third of these are associated with dyslipidemia. Worldwide, there is a wide variation in mean population lipid profiles levels. Increased serum total cholesterol (TC), triglyceride (TG), low density lipoprotein (LDL-c) level and decreased high density lipoprotein (HDL-c) are associated major risk factors for cardiovascular disease (CVD). [4]

The Seventh report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC-7) classifies BP as normal (Systolic BP<120mmHg and Diastolic BP<80mmHg). Pre hypertension (Systolic BP 120-139mmHg and Diastolic BP 80-89mmHg), hypertension stage I (Systolic BP 140-159mmHg and Diastolic BP 90-99mmHg and hypertension stage 2 (Systolic BP 160mmHg and Diastolic BP 100mmHg) respectively. [1]

Overweight and obesity with increasing body mass index and waist circumference leads to adverse metabolic effects on blood pressure,

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cholesterol and triglyceride level. Obesity and over weight is associated with increased risk of various disorders including dyslipidemia.

Various studies showed an association between BMI, dyslipidemia and hypertension. However, due to factors like socio-economic, geographic conditions, food habits, age sex, genetic and others influences these parameters. Therefore, this study was conceived with the aim of estimating serum lipid profile among newly diagnosed hypertensive patients with normotensive subjects and find out the relationship in Bangladesh.

Methods:

This study was a cross sectional study in which 42 newly diagnosed hypertensive patients who were on no antihypertensive medication and 42 subjects with normal blood pressure (normotensive) were enrolled for compare. These patients sought a through health cheek up including blood pressure assessment between January to December 2012 in National centre for control of Rheumatic fever and heart disease (NCCRF&HD). All the subjects were residents of the surrounding areas and aged 30-60 years. Patients with features of any cardiac or renal complication and major medical problem were excluded. After obtaining informed consent data collectors completed data sheet by interview, clinical examination, anthropometric measurement and investigation.

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). Hypertension was defined as an average SBP >140 mmHg and DBP >90 mmHg without antihypertensive medication. [1]

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 liprotein cholesterol) under 40mg/dl respectively, were considered to be undesirable.[5]

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 systolic 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± 3.21mmof Hg. The mean DBP of hypertensive cases was found to be higher than controls (p< 0.05). (The results are shown in Table I and Fig 1)

Table-I

Comparison of Mean SBP and DBP between hypertensive and normotensive study population.

| Variables (mm of Hg)	Hypertensive		Normotensive		P-Value
	Mean	SD	Mean	SD	
Systolic Blood Pressure	154.6	22.5	111.5	3.42	0.05
Diastolic Blood Pressure	95.2	5.2	71.4	3.21	0.05
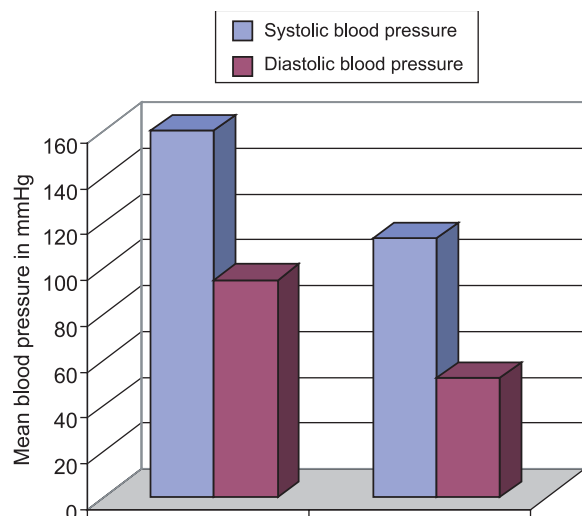
Fig.-1: *Comparison and mean values of SBP and DBP between hypertensive and normotensive study population.*

The mean age of hypertensive and normotensive were 57.1±13.4 vs 48.1±12.8 years respectively. The mean total cholesterol (TC) in hypertensive was 199.4±44.5mg/dl whereas that of normotensive was 188.7±37.9 mg/dl. The mean of hypertensive was higher than normotensive (p< 0.05). The mean HDL of hypertensive was 35.43±4.21 mg/dl and normotensive was 36.21±5.51 mg/dl and it was not statistically significant. Mean LDL of hypertensive was 119.8±35.6 mg/dl and that of normotensive was 112.7±28.6 mg/dl. The mean LDL of hypertensive cases was higher than that of normotensive (p<0.05). The mean triglycerides of hypertensive and normotensive was 155.9±88.8 vs 121.9±73.2 mg/dl respectively and statistically significant (p<0.05). BMI and waist circumference showed significant association in hypertensive patients (p<0.001). (The results are shown in Table II and Fig 2).

Table-II

Comparison of Mean lipid profile between hypertensive and normotensive study population.

Indicators	Hypertensive		Normotensive		P-Value
	Mean	SD	Mean	SD	
Age (in years)	57.1	13.4	48.12.8	12.8	<0.001
Total cholesterol	199.4	44.5	188.73	7.9	<0.001
HDLc	35.43	4.21	36.21	5.51	0.195
LDLc	119.8	35.6	112.7	28.6	<0.001
Triglyceride	155.9	88.8	121.9	73.2	<0.001
BMI	26.3	2.3	25.8	4.3	<0.001
Waist Circumference	86.1	8.9	78.27	5.3	<0.001
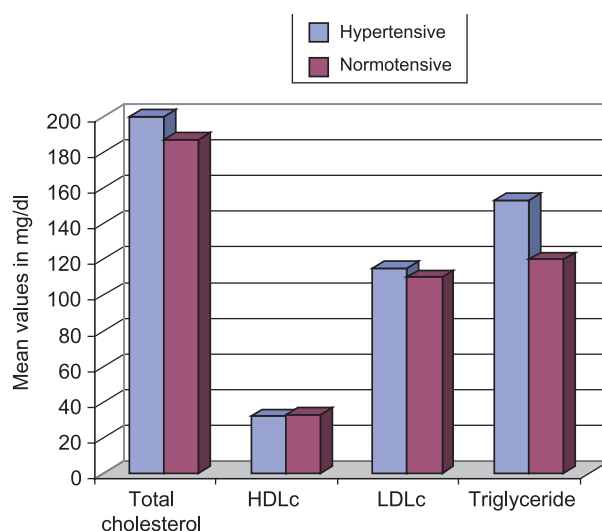
Fig.-2: *Comparison of mean levels for TC, HDLc, LDLc and TG between hypertensive and normotensive study population.*

Discussion:

Hypertension is recognized globally as a major public health problem. [6] It is known as the well known risk factor for coronary heart disease, type 2 diabetes mellitus and renal diseases.[7] About 80% of hypertensive persons have co morbidities such as obesity, glucose intolerance, low HDL-Cho, high LDL-Cho and increased triglycerides etc. Two or more co morbidities are found in about more than 50% hypertensive patients. Present study was focused on to study the lipid profile pattern of hypertensive patients to normotensive. 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. A prospective study which is based in the northern region of Bangladesh, to investigate the lipid profile status in hypertensive patients as compared to healthy normotensive controls. Their study revealed similar findings of high serum total cholesterol, triglycerides and LDL-cholesterol as observed in our study. [8] Our findings of increased level of total cholesterol in hypertensive patients are similar to the findings of some other studies. [9] A prospective study conducted in Bangladesh on type 2 diabetes mellitus patients with and without hypertension revealed significantly high

total cholesterol, triglycerides and LDL-cholesterol in hypertensive patients with type 2 diabetes mellitus as compared to the normotensive type 2 diabetes mellitus subjects. [10] Few studies showed strong association of hypertension and dyslipidimia with major risk factors of coronary heart disease. [11] BMI and waist circumference showed significant association in hypertensive patients in our study. Similar findings showed in association of lipid profile and body mass index in hypertensive patients of Eastern Nepal. [12]

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.

Conclusion:

Analytical results of the study revealed that hypertensive patients have been found to have close association with dyslipidemia. 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.

Acknowledgment:

Conflict of Interest - None.

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