

Original Article

Lipid Profile in non-obese and non-diabetic Hypertensive Patients

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ABSTRACT

Purpose of Study: To find out the frequency and pattern of lipid abnormalities in non-obese and non-patients suffering from essential hypertension.

Design of Study: This is the cross sectional descriptive study.

Place and Duration of Study: The study was conducted at the Department of Medicine and its OPD, Jinnah Hospital, Lahore from July 2009 to February 2010.

Materials and Methods: 100 patients were included in the study. Patients were taken randomly. Blood samples were checked in Pathology laboratory of the hospital.

Results: Increase in total serum cholesterol was seen in majority of patients. Increase in total cholesterol showed an increasing trend with the time duration of hypertension. Highly atherogenic LDL-cholesterol was increased in majority of patients. One patient of familial combined hyperlipidemia was also detected.

Conclusion: Physicians should be careful while treating hypertensive patients. Lipid profile should be advised not only in obese and diabetic but also in thin lean non-diabetic, hypertensive patients. If we treat dyslipidemia in hypertensive patients we can decrease the coronary artery disease risk to an appreciable level.

Key Words: Non-obese, Non-diabetic, hypertensive

INTRODUCTION

Hypertension is the leading cause of cardiovascular diseases worldwide ^[1]. In 2000 more than quarter population were hypertensive, a number totally one billion and suggests that by 2025 that number will climb up to 29% or i.56 billion people worldwide ^[2].

There is a myriad of factors playing their roles, directly or indirectly in the genesis of hypertension. Some of the worth mentioning include age, sex, occupation, amount of salt and alcohol intake, smoking, various hormone levels, amount of total cholesterol and pattern of lipid profile ^[3]. Obesity especially the central obesity and diabetes mellitus are among the key players and their role has been universally acknowledged ^[4].

Decreased HDL cholesterol is the most common variety of dyslipidemias in patient with essential hypertension and this frequently co-exist with essential hypertension^[5].

Hypercholesterolemia is associated with increased prevalence of cardiac events and is characterized by impaired coronary vascular function. This dysfunction is mediated partly through increased oxidative stress and partly through shift in oxidative stress ^[6].

It is the LDL-type of hypercholesterolemia which paves the way to hypertension. If LDL-particles are taken from patients with essential hypertension they exhibit enhanced susceptibility to oxidation in vitro. This is the abnormality which is thought to increase the cardiovascular risk. If Blood Pressure is controlled

effectively in non-obese non-diabetic hypertensive patients this abnormality can be reversed, though not fully but part of it ^[7].

Evidence suggests that hypertension may share similar pathophysiology with cardiovascular disease. Thus dyslipidemia is strong predictor of cardiovascular disease, may also predict incident hypertension ^[8]

Endothelial cell is no more considered just an architectural unit of blood vessel lining it is a large organ which secrete several growth factors and vasoactive substances include prostaglandins, thromboxane, nitric oxide and endothelins^[9]. Endothelial dysfunction is an important contributing factor in hypertension and is subject of extensive research which has proved that hypercholesterolemia is one of the predisposing factors in arterial dysfunction^[10].

The aim of my study was to see the lipid profile/lipid abnormality in selected hundred patients who are neither obese nor diabetic but are suffering from hypertension. Insulin resistance leading to dyslipidemia is also found in non-obese individuals. This insulin resistance dyslipidemia eventually leads to hypertension ^[11, 12]. Insulin resistance in non-obese individuals suffering from hypertension has been found in Africa ^[13]. It has also been mentioned in our part of world i.e. South East Asia ^[14]. The non-obese individuals can acquire this problem through inheritance ^[15].

At international level it was the Tromso study in which a cross-sectional relationship of total serum cholesterol, high density lipoprotein cholesterol, non HDL-cholesterol and triglyceride levels with blood pressure in a population of 8081 men, 20-50 years old, 7663 women of 20-49 years old were studied. In this study it was shown that total and non HDL cholesterol levels increased significantly with increasing systolic and diastolic blood pressure in both sexes ^[16].

At the national level a similar study was carried out in indigenous population of Multan in year 2003^[17]. As the indigenous population of Multan is different from the catchment population of Jinnah hospital Lahore it will be worthwhile and useful study to be carried out. It will help us in the understanding of abnormal lipid patterns, selection of drug for specific lipid abnormality and even in genetic counseling.

MATERIALS AND METHODS

This cross sectional descriptive study was carried out from July 2009 to February 2010 in Outpatient Department of Jinnah hospital Lahore. A total of 100 patients were included in the study. Patients were taken randomly. Blood samples were checked in Pathology laboratory.

RESULTS

Out of 100 patients, 51 (51%) were male and 49 (49%) were female (Table-1).

The maximum number of patients was in the age group 45-50 years and minimum number of patients was in the extreme range groups 35-40 years as shown in table-2.

Out of 100 patients, 18 (18%) were smokers and 82 (82%) were non-smoker (Table-3).

Majority of patients (55%) were having high blood pressure for more than 5 years duration (Table-4).

Forty six patients had cholesterol in the range of 151-200mg/100ml, 45 had cholesterol in range of 201-250mg/100ml. (Table-5).

Most of the patients with hypertension less than 5 years had mean TLC level 198.4 ± 20.8 (Table-6)

Twenty one patients had LDL cholesterol in range of 150-159mg/100ml. seven patients had LDL cholesterol in range of >159 (table-7).

Table 1: Distribution of cases by sex

N=100

Sex	Number	Percentage
Male	51	51.0
female	49	49.0
p-value	P>0.05	

Table 2: Distribution of cases by age

N=100

Age (year)	Number	Percentage
35-40	07	7.0
41-45	25	25.0
46-50	28	28.0
51-55	18	18.0
56-60	14	14.0
>60	08	08.0
Mean SD	46.4±13.3	

Table 3: Distribution of cases by smoking

N=100

Smoking	Number	Percentage
Yes	18	62.0
No	82	38.0
P value	P<0.001	

Table 4: Distribution of cases by duration of hypertension

N=100

Duration (year)	Number	Percentage
1-5	45	45.0
>5	55	55.0
Mean plus minus SD	6.2±4.2	
p-value	p>0.05	

Table 5: Duration of cases by total cholesterol

N=100

Total cholesterol Mg/100ml	Number	Percentage
<150	04	04.0
151-200	46	46.0
201-250	45	45.0
>251	05	05.0
Mean±SD	205.2±38.3	

Table 6: Effect of hypertension on TC, HDL, LDL

Duration (year)	No	T.C (mg/dl)	HDL (mg/dl)	LDL mg/dl
<5	55	198.4±20.8	43.8±6.8	141.5±9.5
6-10	27	204.9±20.9	45.9±7.2	142.0±13.2
>10	18	217.7±78.6	48.0±15.4	144.2±17.2

Table 7: Distribution of cases by total low density lipoprotein (LDL) Cholesterol

N=100

Low density lipoprotein	Number	Percentage
119-129	08	08.0
130-139	21	21.0
140-149	43	43.0
150-159	21	21.0
>159	07	07.0
Mean±SD	142.7±12.2	

DISCUSSION

The study in hand consisted of a limited population of men and women. Total number of patients included was one hundred. Out of these 51% were male and 49 % were female. Almost all groups were given representation. This study had allowed a detail analysis of the association between hypertension and lipid abnormalities which included three variables total cholesterol, low density cholesterol and high density cholesterol.

Majority of patients had mean total cholesterol 198.4 plus minus 20.8. Highest mean level of total cholesterol was found in the age group of 46-50 years with mean TC level 208.9 plus minus 30 and in the age group of 51-55 years with mean TC level 208.6 plus minus 12.6

Male and female had almost the same levels of total cholesterol. Smokers had relatively higher levels of total cholesterol. Patients with rural background had been found to have more total cholesterol than urban dwellers. LDL-cholesterol showed an increasing trend with increase in the duration of hypertension.

Highest level of LDL cholesterol was found in the age group of 41-45. Sex had no statistically significant effect on LDL cholesterol. Smokers had relatively high level of LDL cholesterol than non-smokers. Place to which patients belonged did not effect LDL cholesterol levels significantly. HDL increased with increase in duration of hypertension. Sex, smoking, place of living had no significant effect on HDL cholesterol.

Coronary artery disease has been emerged as one of the biggest concern of morbidity and mortality not only globally but also in our motherland. Diabetes mellitus, hypertension, smoking, gender, life style, dietary patterns, levels of certain hormones are the major contributors which have been universally acknowledged. Still some new ones are coming up like elevated levels of lipoprotein and cholesterol ester transfer protein.

This study had helped us to consider the timely evaluation of lipid profile in hypertensive patients so that we can counter the multiplicative effects of these risk factors as had been done in Australia where a decline of 83% from the 1968 peak by the year 2000 has been seen.

The study had allowed us a detailed analysis of the association between hypertension and total cholesterol. The consistent positive relation between blood pressure and cholesterol level within the population strata suggested that there is a biological interrelation between the two major coronary heart disease risk factors.

It is not a simple way of explaining that all hypertensive patients had high levels of total cholesterol. It is a continuous and graded relationship throughout the usual course of hypertension. Longer is the duration of

hypertension more is the level of total cholesterol. In this study the same had been observed. Total cholesterol has been shown to have increasing trend. The same has been proved in tromso study conducted by Bonna and Thelle¹⁶.

Age and total serum total cholesterol levels are interlinked in a different way as the clustering of cholesterol level with blood pressure is more pronounced in men 20-39 years age group than in women of similar age group and the clustering decreases with age in men increases with age in women. In our study a total cholesterol is seen to be 200.8 plus minus 17.8 in the age group of less than 35 years. This finding is consistent with Tromso study¹⁶ and also with Tassadaque et al¹⁷.

In our study the age adjusted levels of HDL cholesterol showed a slight increase with duration of hypertension. If BMI remain sonstant this relationship is more strengthened and is consistent with Bonna and Thelle¹⁶. Sex had no significant effect on HDL cholesterol and the same has been observed by Tassadaque et al¹⁷.

CONCLUSION

In non-obese, non-diabetic hypertensive patients, treating hypertension alone is one side of the coin. The other side is dyslipidemia which should neither be ignored nor underestimated because it's a potentially reversible risk factor for coronary artery and cerebrovascular diseases.

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