

To Determine the Prevalence and Forms of Hyperlipidaemia in Hypertensive Individuals

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ABSTRACT

Background: The geriatric population is on the rise, and hypertension is particularly prevalent in this age group. Among addition, cardiovascular and cerebrovascular diseases related with high blood pressure are more prevalent in the elderly. The atherosclerosis-induced stiffness of the aorta and major arteries is a typical cause of isolated systolic hypertension in elderly individuals. Atherosclerosis is more broad and severe in hypertension individuals than in normotensive individuals, according to postmortem investigations conducted on human coronary arteries and aortas from throughout the world.

Aims & Objectives: To assess the prevalence and types of hyperlipidaemia in individuals with hypertension.

Methods & Materials: The proposed study would be undertaken at the Department of Medicine, Santosh Medical College, Santosh University, Ghaziabad, on Santosh Hospital OPD/IPD patients. From January 2014 to January 2015, the duration of the study will be one year. The following is a case-control study. There were 100 male and female participants between the ages of 31 and 60 who were of the same age and gender.

Results: This study reveals that 9% of cases are in their fifth decade of life, with 8% male and 1% female, 5% of cases are in their fourth decade, with 4% male and 4% female, and 8% of cases are in their third decade, with 3% male and 5% female.

Conclusion: It was found that serum lipid profile can serve as an important marker for cardiovascular disease screening in hypertensive individuals, and that early detection of cardiovascular disease can reduce cardiovascular morbidity and mortality. In addition, total cholesterol, HDL-C, LDL-C, and BMI were found to be abnormal in hypertensive people in my study, although triglycerides and VLDL-C did not substantially differ with hypertension.

Keywords: hyperlipidaemi, cerebrovascular disease, hypertensive, atheromatous plaques

1. INTRODUCTION

The proportion of elderly individual is on the rise and hypertension is extremely common in this age group. In addition cardiovascular and cerebrovascular disease associated with

elevated BP are greater in elderly people.[1] Isolated systolic hypertension commonly seen in elderly subjects can be attributed to atherosclerosis induced stiffening of aorta and major arteries.[2-5] Atherosclerosis is more extensive and severe in hypertensive persons than in normotensive, was the conclusion after the autopsy studies conducted on human coronary arteries and aortas collected from various parts of the world. There has been dramatic rise in the prevalence of coronary artery disease from 3.5% in 1960's to 11% in 1990s in urban individual and it is projected to rise substantially in future. Hypertension in adults is defined as systolic pressure to or greater than 140 mmHg and or/diastolic pressure equal to or greater than 90 mmHg.[6]

It is the most common risk factor of CVD which increases the risk of stroke, myocardial infarction, heart and renal failure.⁷ According to the world health report of 2003 cardiovascular diseases will be the largest cause of deaths and disability by 2020 in India.⁸ In 2020, 2.6 million Indians are predicted to die due to coronary heart disease which constitutes 54.1% of all cardiovascular disease deaths.⁹ The blood pressure however, is not the only determinant of cardiovascular damage and the propensity of hypertensive patients to develop target organ damage is markedly influenced by coexisting risk factors such as age, sex, smoking, obesity, diabetes, dyslipidemia and others. Among these factors lipoproteins are fundamental to the atherosclerotic process and greatly affect the impact of hypertension on development of target organ damage and therefore on cardiovascular morbidity and mortality.[8-10]

Dyslipidemia and hypertension are commonest risk factors for coronary artery disease.[11] Persons with combination of these risk factors are particularly at high risk of CAD. It is seen that lipid level increases as BP increases.[12] Early detection of risk factors before the catastrophic and life threatening effect of severe atherosclerosis is a major problem for the general public as well as for the practicing physician.

The evaluation of different fractions of lipoprotein as risk factor for development of coronary artery disease and hypertension has been possible only recently, when methods to fractionate lipoprotein were made available. But cholesterol was incriminated as etiological factor for atherosclerosis in the beginning of this century, when cholesterol was found in atheromatous plaques. Various studies around the world have well established that LDL and VLDL are atherogenic and HDL is a protective factor against coronary artery disease and hypertension. Serum lipid and lipoprotein concentration are commonly used to identify individual who may have significant atherosclerotic disease.[13]

Lipoproteins transport hydrophobic lipids (primarily triglycerides, cholesterol, and fat-soluble vitamins) through body fluids (plasma, interstitial fluid, and lymph) to and from tissues. Lipoproteins play an essential role in the absorption of dietary cholesterol, long chain fatty acids, and fat-soluble vitamins; the transport of triglycerides, cholesterol, and fat-soluble vitamins from the liver to peripheral tissues; and the transport of cholesterol from peripheral tissues to the liver. Lipoproteins contain a core of hydrophobic lipids (triglycerides and cholesteryl esters) surrounded by hydrophilic lipids (phospholipids, unesterified cholesterol) and proteins that interact with body fluids.[22] Triglycerides and cholesteryl esters, the major neutral lipids transported through blood are insoluble in aqueous solution.[14-16] They must therefore be coated by amphipathic molecules to facilitate this process. The apoprotein directs the lipoprotein to its site of metabolism either by binding to specific enzyme or transport protein on cell membranes.[23]

2. METHODS & MATERIALS

The proposed research would be conducted at the Department of Medicine, Santosh Medical College, Santosh University, Ghaziabad, on patients attending the Santosh Hospital Medicine OPD/IPD. From January 2014 to January 2015, the study will be done over the course of one year. This is a case-control analysis. There were 100 age- and gender-matched male and female participants between 31 and 60 years old. 75 hypertension people will comprise the case group, whereas 25 healthy subjects will comprise the control group.

All parameters were examined using SPSS programme. To compare all of the parameters, analysis of variance (ANOVA) was employed. Cases and controls were compared using the Chi-square test and the t-test for independent samples, and the p value was computed. All data are shown as standard error of the mean (SEM).

3. RESULTS

A Case Control study was conducted with 75 patients as cases and 25 patients as control to see the prevalence of dyslipidemia in hypertensive patients, which took place at Santosh Medical College and Hospital, Ghaziabad, Uttar Pradesh.

Table1: Demographic, clinical and Biochemical profile of the hypertensive and normotensive patients

	Hypertensive	Normotensive	p-value
Age (Years)	49.5±7.7	46.8±9.0	P=.150
BMI (Kg/m ²)	26.0±1.73	22.3±1.73	P=.000
SBP (mmHg)	161.3±6.69	119.5±4.01	P=.001
DBP (mmHg)	93.09±7.83	78.08±4.48	P=.001
TC (mg/dl)	189.6±55.0	153.7±34.1	P=.003
HDL (mg/dl)	45.0±6.7	48.0±5.83	P=.000
LDL (mg/dl)	104.8±40.6	91.6±17.1	P=.000
TG (mg/dl)	102.8±43.1	85.9±34.9	P=.080
VLDL (mg/dl)	20.3±8.1	16.5±5.4	P=.029

Table 2: Age & Gender Distribution of the Normotensive Patients

This study shows that 9% of the cases are in their 5th decade of life that consists of 8% male and 1% female, 5% of cases are in their 4th decade which comprises of 4% male and 4% female and 8% of the cases are in the 3rd decade which has 3% male and 5% female.

Age	Female	Male	Total
31-40	5	3	8

41-50	4	4	5
51-60	1	8	9
Total	10 (40%)	15 (60%)	25 (100%)

Table 3: BMI and Lipid profile of Hypertensive and Normotensive Patients

Variables	Male (n)=44	Female (n)=31	p-value	Result
BMI (Kg/m ²)	26.03±1.8	25.8±1.6	0.63	Not significant
Total Cholesterol (mg/dl)	178.6±51.8	205.3±56.3	0.037	Significant
Triglyceride (mg/dl)	98.6±43.4	108.6±42.6	0.330	Not Significant
HDL- Cholesterol (mg/dl)	45.6±6.6	44.0±6.8	0.316	Not Significant
LDL- Cholesterol (mg/dl)	96.0±36.8	117.4±42.8	0.23	Not Significant
VLDL- Cholesterol(mg/dl)	19.18±7.3	22.0±8.9	0.127	Not Significant

Significant at $p < 0.05$ level

4. DISCUSSION

Positive relation was seen for Total cholesterol between hypertensive and normotensive subjects. Total cholesterol was higher among hypertensive subjects (189.6±55) than normotensive subjects (153.7±34.1), it was significant at ($p=0.003$). The results of our study were in concordance with the study conducted by Srinivas Pai K, Sanjay Bhagoji et al⁸⁶ which showed positive relation of hypertension with total cholesterol. [17-19] They demonstrated that total cholesterol levels were higher in hypertensive patients than those in the healthy adults. Gulab Kanwar, Neelam Jain et al also concluded that there is a positive correlation of hypertension with total cholesterol.¹⁹ Arindam Sur, Trikey BN et al¹⁸, Umar G Adamu, George A Okku et al⁸⁵ also concluded the same in their study.

In this study, we also compared LDL-C levels with mean blood pressure. When LDL-C level of hypertensive (104.8±40.5) patients was compared with normotensive (91.6±17.1) patients, there was a positive relation between the LDL cholesterol and hypertension. The result was similar to study conducted by Golnoosh Ghooshchi, Mahdi Masoomian et al which showed increased levels of LDL-C in hypertensive subjects compared to normotensive subjects.⁸⁷ M S Saha, N K Sana et al also concluded that there is a positive correlation between hypertension and LDL cholesterol.⁸⁸ Arindam Sur, Trikey BN et al,¹⁸ N. Bixi Gormat, F. Benmaansour et al,⁸⁹ also concluded the same from their studies.

In the present study it was found that the frequency of hypertension increases with increasing of age in all groups which are in accordance with the former studies of M.S. Saha, N.K. Sana et al.⁸⁸ maximum number of patients of both sexes were between 50-60 years of age and the percentage had declined sharply below these ages [20-22]. N. Bixi Gormat, F. Benmaansour et al⁸⁹ also concluded the same from their study.

In this study total cholesterol was found to be higher in females (205.3±56.3) as compared to males (178.6±51.8) which was statistically significant ($p=0.037$). This was found to be in

accordance with the study conducted by AliAkbar Tavasoli, Masoumeh Sadeghi et al⁹² in which total cholesterol was found to be higher in females than in males and was statistically significant.

In this study no significant correlation was found between triglyceride levels of hypertensive patients and normotensive patients, which is in accordance with the study conducted by Umar G Adamu, George A Okku et al⁸⁵ but was unlike other studies conducted by Raksha Goyal, Nandini Sarwate et al⁸⁴ which concluded triglyceride level was found significantly higher in hypertensive patients as compared to normotensive patients.

In the present study no significant correlation was found between VLDL-C and mean blood pressure, contrary to the study conducted by Gulab Kanwar, Neelam Jain et al,¹⁹ which showed that VLDL-C level was significantly higher in hypertensive patients as compared to normotensive patients.[23-25]

Thus our study shows that dyslipidemia is more common among hypertensive patients, and among the parameters, total cholesterol, HDL-C, LDL-C were found to be abnormal compared to triglycerides and VLDL-C.

5. CONCLUSION

This study concludes that the prevalence of dyslipidemia is rising rapidly in both developing and industrialised nations. Together, hypertension and hyperlipidemia occur more frequently than expected by chance. Hyperlipidemia may predispose to hypertension, and lipid-lowering therapies may have a favourable effect on blood pressure and endothelial dysfunction. Hypertension and dyslipidemia are the two most important risk factors for cardiovascular disease, and as such, they can serve as essential markers for cardiovascular morbidity and death. The blood lipid profile of hypertension patients was considerably altered compared to normotensive patients.² There was no significant difference between hypertensive males and females in serum lipid profile.³ Only 20-31% of 75 hypertensive patients had an altered serum lipid profile.

Thus, it was determined that serum lipid profile can serve as an important marker for cardiovascular disease screening in hypertensive patients, and that early diagnosis of cardiovascular illness can reduce cardiovascular morbidity and mortality. In addition, in my study, total cholesterol, HDL-C, LDL-C, and BMI were found to be abnormal in hypertensive individuals, although triglycerides and VLDL-C did not differ significantly with hypertension.

6. REFERENCES

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