

## A STUDY ON THE LIPID PROFILE OF HYPERTENSIVE PATIENTS IN UTTARA KANNADA DISTRICT

Vijay Naik<sup>1</sup>, Niteesh Shanbag<sup>2</sup>, Bharathraj M. Y<sup>3</sup>

<sup>1</sup>Assistant Professor, Department of General Medicine, Karwar Institute of Medical Sciences, Karwar.

<sup>2</sup>Assistant Professor, Department of General Medicine, Karwar Institute of Medical Sciences, Karwar.

<sup>3</sup>Assistant Professor, Department of General Medicine, Karwar Institute of Medical Sciences, Karwar.

### ABSTRACT

#### BACKGROUND

Abnormalities of lipid and hypertension usually coexist. Epidemiological studies have demonstrated that cholesterol levels are significantly higher in hypertensive patients with demographically matched normotensive patients. Hence, this study was undertaken to study the demographic profile of hypertensive patient.

#### MATERIALS AND METHODS

Present study was conducted at Karwar Institute of Medical Sciences, Karwar, in the Department of Medicine over a period of 6 months. Study included total 100 patients among, which 50 were hypertensives and 50 were normal subjects. All the subjects were aged between 30-80 yrs. All the subjects were estimated for lipid profile test, which included total cholesterol, HDL cholesterol, triglycerides, LDL-C and VLDL-cholesterol. Statistical analysis for our study used was Z-Mann-Whitney Test.

#### RESULTS

Among 50 hypertensive cases, 16 patients (32%) were females and 34 patients (68%) were males with age group between 30-80 years. Mean values of TC, TGL and LDL-C, VLDL and TC/HDL-C ratio were higher among hypertensive patients as compared with normal subjects. However, HDL levels were less in hypertensive patients compared to normal subjects.

#### CONCLUSION

Higher numbers of patients of hypertension were seen in the 5<sup>th</sup> to 6<sup>th</sup> decade. Larger studies are necessary to identify other co-factors like diet, obesity, diabetes, smoking, alcohol, etc. in addition to the lipid profile under study.

#### KEYWORDS

Hypertension, Lipid Profile, Uttara Kannada, Cholesterol.

**HOW TO CITE THIS ARTICLE:** Naik V, Shanbag N, Bharathraj MY. A study on the lipid profile of hypertensive patients in Uttara Kannada district. J. Evid. Based Med. Healthc. 2017; 4(27), 1577-1579. DOI: 10.18410/jebmh/2017/308

#### BACKGROUND

"Hypertension", i.e. increased blood pressure is the most common condition seen in primary care and leads to serious consequences if not detected early and treated appropriately. It is defined as having systolic blood pressure greater than or equal to 140 mmHg having diastolic blood pressure greater than or equal to 90 mmHg or currently taking medication to lower high blood pressure. The prevalence of low High-Density Lipoprotein (HDL) cholesterol was five times greater among non-Hispanic Asian men than women. Among non-Hispanic Asian adults, the prevalence of hypertension was higher among those who were older or had less education. Impaired endothelial function due to hypertension was associated with increased total-C/HDL-C values possibly as the result of increased

vascular oxidative stress and inflammation. In the early stages of atherosclerosis, the impact of both total-C/HDL-C and BP maybe similar in terms of endothelial damage. Research is ongoing and has enlarged the score of therapeutic options. Antihypertensive treatment with beta-blockers is associated with lower levels of HDL-related parameters, whereas treatment with ACE inhibitors appears to exert a small beneficial effect on total cholesterol and LDL-related parameters. Hypertension, although an independent risk factor for adverse clinical events, frequently exists as a part of a syndrome of cardiovascular, neuroendocrine and metabolic abnormality.<sup>1-4</sup>

Hypertension is classified into prehypertension, which does not require treatment and stage 1 and stage 2 hypertension, which requires treatment. Blood pressure and serum cholesterol are correlated with an r factor of 0.12 suggesting that those with higher blood pressure values tend to have higher serum cholesterol levels. Both systolic and diastolic blood pressures are also related to risk of coronary heart disease in a linear fashion- The higher the level of pressure, the greater the incidence of coronary heart disease. The blood pressure, however, is not the only determinant of cardiovascular damage and the propensity of hypertensive patients to develop target organ damage is

Financial or Other, Competing Interest: None.

Submission 16-03-2017, Peer Review 22-03-2017,

Acceptance 29-03-2017, Published 31-03-2017.

Corresponding Author:

Dr. Bharathraj M. Y,

Assistant Professor, Department of General Medicine,  
Karwar Institute of Medical Sciences, Karwar.

E-mail: mybharathraj@gmail.com

DOI: 10.18410/jebmh/2017/308



markedly influenced by coexisting demographic risk factors and others like smoking, obesity, diabetes, dyslipidaemia and others.<sup>1,3,4</sup>

**MATERIALS AND METHODS**

The present study was conducted in the Department of Medicine, Karwar Institute of Medical Sciences, Karwar, on 50 hypertensive and 50 normal subjects aged (30-80 yrs.) over a period of 3 months from June 2016 to August 2016. Patients with essential hypertension based on history and on antihypertensive medication were included. Patients with additional risk factors like concurrent diabetes mellitus, ischaemic heart disease, history of alcoholism and smoking were also included in the study. All subjects were on medication and without any complications. Exclusion criteria included patients with complication of hypertension, renal failure, familial dyslipidaemia, thyroid disorders and patients on lipid-lowering drugs.

A detailed history was taken from all subjects including age, sex, weight, food habits, lifestyle and history of hypertension and associated medical disorders based on a standardised questionnaire. The subjects were explained the purpose and nature of the study being carried out. Only subjects who gave their informed consent were selected.

Five mL venous blood sample was collected in a standardised procedure using Vacutainer from each patient who was fasting overnight. The samples were immediately dispatched to the biochemistry lab and the estimation was done for lipid profile (total cholesterol, triglycerides, LDL-cholesterol, HDL-cholesterol and VLDL-cholesterol and ratio of total cholesterol to HDL-cholesterol). Z-Mann-Whitney test was used for statistical analysis.

**RESULTS**

The study involved 50 patients of normotensive and 50 patients of hypertensive each. An inclusion criterion was strictly applied. The demographic data is as shown in table 1.

Criteria	Gender	Frequency	Percentage
Sex	Male	30	60.0
	Female	20	40.0
Diet	Non-veg	42	84.0
	Veg	8	16.0
Diabetes mellitus	Present	18	36.0
	Absent	32	64.0
Smoking	Present	21	42.0
	Absent	29	58.0
Alcohol	Present	25	50.0
	Absent	25	50.0
Obesity	Present	22	44.0
	Absent	28	56.0
Ischaemic disease	Present	2	4.0
	Absent	48	96.0

**Table 1. Frequency Distribution Table for Hypertensive Patients**

Males were more commonly hypertensive with non-vegetarian diet being seen in 84% of all the subjects. Concurrent diabetes, smoking or obesity was comparatively

lesser than the mean (Table 1). A statistically significant difference was seen in the mean levels of lipid profile except HDL of hypertensive subjects compared to non-hypertensive subjects.

**DISCUSSION**

The prevalence of hypertension is projected to increase globally, especially in the developing countries. In recent years, rapid urbanisation, increased life expectancy, unhealthy diet and lifestyle changes have led to an increased rate of Cardiovascular Disease (CVD). Black Africans have been reported to have lower serum total cholesterol and higher High-Density Lipoprotein Cholesterol (HDL-C) than whites and other blacks in industrialised countries. It is widely accepted that CVD is associated with hypertension and increased blood levels of Low-Density Lipoprotein (LDL), Total Cholesterol (TC) and Triglycerides (TG). In contrast, a low level of High-Density Lipoprotein (HDL) is a risk factor for mortality from CVD.

Hypertension remains one of the most important preventable contributors to disease and death. Several lifestyle interventions have been shown to reduce blood pressure. Apart from contributing to the treatment of hypertension, these strategies are beneficial in managing most of the other cardiovascular risk factors. It includes weight loss, salt reduction, exercise, alcohol consumption and avoiding cigarette smoking.<sup>3,4</sup>

All lipid fractions were elevated except HDL-C in the present study among hypertensive individuals compared to normotensive individuals. Previous studies have shown similar data. The increase in TC, LDL and TC/HDL ratio was statistically very highly significant in hypertensive subjects compared to healthy controls while the increased level of TG and LDL was highly significant in hypertensive subjects. Multiple studies have shown the similar data as in the present study.<sup>5-8</sup>

Hypertension is recognised globally as one of the major risk factor for CVD, stroke, diabetes, renal diseases, etc. Most of them have comorbidities like obesity, abnormal lipid metabolism, glucose intolerance, etc. Choudhury et al in their study have demonstrated the close relationship between dyslipidaemia and hypertension and the need to measure both at regular intervals to manage and reduce the risk of morbidity and mortality.<sup>5,9</sup>

Studies have shown the dyslipidaemic characteristic of metabolic syndrome to have a high implication in hypertension. HDL facilitates the uptake of cholesterol from peripheral tissue and helps in its transport to liver for degradation and excretion. Strong evidence shows importance of increasing HDL-cholesterol to yield clinically significant benefits. Experimental evidence has shown 1% reduction in HDL-C to increase 2-3% CHD risk. Increasing HDL-C has been recommended as a secondary target of therapy.<sup>6,9</sup> Analysis from the Interheart Study shows that among both cases and controls, mean LDL levels were about 10 mg/dL lower in Asians compared with non-Asians. A greater proportion of Asian cases and controls had LDL ≤100 mg/dL. HDL levels were slightly lower among Asians

compared with non-Asians, a population who require further study and targeted intervention.<sup>10</sup> Several studies have shown that most of the hypertensive patients undergo inconsistent treatment and there was significant instability of serum TC, TG, HDL and LDL in hypertensive patients.<sup>11-13</sup> Half of the hypertriglyceridaemic subjects had a mixed dyslipidaemia or low HDL cholesterol. More than 50% of the low HDL cases were not related to hypertriglyceridaemia.<sup>14</sup> Although, sporadic reports suggest that the prevalence of low HDL cholesterol is substantial. We lack detailed data on the true prevalence of this condition among patients receiving treatment for dyslipidaemia.<sup>15</sup> Hypertension and dyslipidaemia are well known to frequently coexist. The coexistence of hypertension and dyslipidaemia has multidimensional clinical implications. First, CVD risk is synergistically enhanced and for this reason, both conditions should be treated aggressively.<sup>16</sup>

### LIMITATIONS

Our study has several limitations particularly with the small sample under study. Age and sex matched along with other risk factors matched study would have yielded better representation. This is the first study of its kind from this region. Larger studies with risk matched factors can yield better results for application in the field.

### CONCLUSION

Lipid abnormalities are highly prevalent among hypertensive cases. All the lipid fractions were high in the hypertensive patients than those in the healthy controls. There is need for measurement of blood pressure and lipid profile at regular intervals in patients with hypertension and to start early with control of hypertension and also early treatment of dyslipidaemia with lipid-lowering agents to prevent other devastating cardiovascular diseases, stroke and other comorbidities.

### ACKNOWLEDGEMENT

Authors would like to thank all the participants of the study. Authors also acknowledge the great help received from the scholars whose articles cited and included in references of this manuscript. The authors are also grateful to authors/editors/publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed.

### REFERENCES

- [1] Aoki Y, Yoon SS, Chong Y, et al. Hypertension, abnormal cholesterol, and high body mass index among non-hispanic Asian adults: United States, 2011-2012. *NCHS Data Brief* 2014;140:1-8.
- [2] Kandzari DE, Bhatt DL, Brar S, et al. Predictors of blood pressure response in the SYMPPLICITY HTN-3 trial. *European Heart Journal* 2015;36(4):219-227.
- [3] Weber MA, Schiffrin EL, White WB, et al. Clinical practice guidelines for the management of hypertension in the community. *The Journal of Clinical Hypertension* 2014;16(1):14-26.
- [4] James PA, Oparil S, Carter BL, et al. 2014 evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA* 2014;311(5):507-520.
- [5] Choudhury KN, Mainuddin AKM, Wahiduzzaman M, et al. Serum lipid profile and its association with hypertension in Bangladesh. *Vascular Health and Risk Management* 2014;10:327-332.
- [6] Osuji CU, Omejua EG, Onwubuya EI, et al. Serum lipid profile of newly diagnosed hypertensive patients in Nnewi, south-east Nigeria. *International Journal Of Hypertension* 2012;2012:1-7.
- [7] Ghooshchi G, Masoomian M, Yazdi MS, et al. Evaluation of the lipid profile of hypertensive patients compared to non-hypertensive individuals. *Patient Saf Qual Improv* 2014;2(3):120-122.
- [8] Biswas UK, Kumar A. Study on lipid profile, oxidation stress and carbonic anhydrase activity in patients with essential hypertension. *Journal of Clinical and Diagnostic Research* 2010;4(6):3414-3420.
- [9] Kim MA. Triglyceride and cardiovascular disease. *Journal of Lipid and Atherosclerosis* 2013;2(1):1-8.
- [10] Karthikeyan G, Teo KK, Islam S, et al. Lipid profile, plasma apolipoproteins, and risk of a first myocardial infarction among Asians: an analysis from the interheart study. *J Am Coll Cardiol* 2009;53(3):244-253.
- [11] Bambara R, Mittal Y, Mathur A. Evaluation of lipid profile of north Indian hypertensive subjects. *Asian Journal of Biomedical and Pharmaceutical Sciences* 2013;3:38-41.
- [12] Ijeh I, Ejike CE, Okorie U. Serum lipid profile and lipid pro-atherogenic indices of a cohort of Nigerian adults with varying glycemic and blood pressure phenotypes. *International Journal of Biological and Chemical Sciences* 2010;4(6):2102-2112.
- [13] Isezuo S, Badung S, Omotoso A. Comparative analysis of lipid profiles among patients with type 2 diabetes mellitus, hypertension and concurrent type 2 diabetes, and hypertension: a view of metabolic syndrome. *J Natl Med Assoc* 2003;95(5):328-334.
- [14] Aguilar-Salinas CA, Olaiz G, Valles V, et al. High prevalence of low HDL cholesterol concentrations and mixed hyperlipidemia in a Mexican nationwide survey. *J Lipid Res* 2001;42(8):1298-1307.
- [15] Bruckert E, Pampile R, McCoy F, et al. Defining the prevalence of low HDL-C in a European cohort of dyslipidaemic patients. *Eur Heart J Supplements* 2005;7(Suppl F):F23-F26.
- [16] Williams RR, Hunt SC, Hopkins PN, et al. Familial dyslipidemic hypertension. Evidence from 58 Utah families for a syndrome present in approximately 12% of patients with essential hypertension. *Journal of the American Medical Association* 1988;259(24):3579-3586.