

Study of Lipid Profile in Accelerated Hypertension in Tertiary Care Hospital in Western Maharashtra

Amit Botre¹, Pavan D Patel², Shruti Nair³

ABSTRACT

Introduction: CVD is the leading cause of disability and death worldwide, and a great majority of CVDs are associated with dyslipidemia. Worldwide, there is broad variation in serum lipid profile levels among different population groups. Increased serum levels of TC, TG, LDL, and decreased HDL are known to be associated with major risk factors for CVD. The present study was conducted to assess the lipid levels among cases of accelerated hypertension presenting to a tertiary healthcare institute.

Material and methods: This study was done on 96 patients presented with hypertensive emergencies admitted under department of medicine, KIMS, Karad, from August 2018 to December 2018. On admission, detailed history was taken and complete clinical examination was done. It was a hospital based cross sectional study.

Results: Serum levels of TC, TG, HDL and LDL were 182 ± 3.4 , 143.62 ± 6.3 , 49.68 and 95.83 ± 7.8 mg/dL, respectively, in hypertensive subjects.

Conclusions: Our results suggest that elevated BP may predict certain disturbances in lipoprotein metabolism.

Keywords: Accelerated Hypertension, Hypertensive Crisis, Lipid Profile, Blood Pressure, Total Cholesterol, Triglycerides, HDL, LDL

INTRODUCTION

In the low middle-income countries, non communicable diseases like Hypertension, cardiovascular diseases and associated major risk factors like dyslipidemia, insulin resistance syndrome goes hand in hand and are responsible for more than 80% of deaths and disability due to non communicable diseases in those regions.^{1,2} The incidence and prevalence of hypertension and hence cardiovascular diseases and also other non communicable diseases is thus projected to rise globally, especially in the developing countries.²

In these years, industrialization, resulted in adoption of modern lifestyle which led to increased access to resources, updated healthcare and hence increased life expectancy. Consumption of unhealthy diet, and sedentary lifestyle led to an increased rate of CVD in Southeast Asia.³ It is already studies and proved facts that cardiovascular diseases are associated with hypertension and increased blood levels of triglycerides, low-density lipoprotein, and total cholesterol. Also reduced levels of high density lipoprotein is also considered as a risk factor for poorer prognosis and mortality from cardiovascular diseases.⁴ Several Epidemiological studies have already established a strong association between

altered lipid profiles, hypertension and development of coronary artery disease.⁵

Globally CVDs are the number 1 cause of death globally. An estimated 17.5 million people died from CVDs in 2012, representing 31% of all global deaths. In SEAR countries, Cardiovascular diseases including coronary heart disease and stroke cause an estimated 3.7 million deaths or a quarter of all deaths annually in the Region (2.0 million among males and 1.7 million among females) and 38% of all deaths due to cardiovascular diseases in the Region occur before the age of 70 years.

Raised serum levels of triglycerides, low-density lipoprotein, and total cholesterol and decreased high density lipoproteins are known to be associated with cardiovascular diseases. Altered lipid profile which is often labeled as Dyslipidemia, which comprising altered ratio of high total cholesterol level and isolated evaluation of the low-density lipoprotein or triglycerides, is observed to be associated with hypertension. Recent studies have proved a strong direct relationship between total low-density lipoprotein cholesterol levels and risk of developing cardiovascular diseases.

Though the trends of various lipid alterations among Asians and their relative impact on cardiovascular risk is not studied for sufficient evidence.¹⁰ Also, Low high density lipoproteins is increasingly recognized as an independent risk factor for adverse CVD outcomes, irrespective of levels of low density lipoproteins. Although sporadic reports suggest that the prevalence of low high density lipoproteins-cholesterol is substantial, we lack detailed data on the true prevalence of this condition among patients receiving treatment for dyslipidemia.¹¹

The present study was conducted to assess the lipid levels among cases of accelerated hypertension presenting to a tertiary healthcare institute.

MATERIAL AND METHODS

This study was done on 96 patients presented with hypertensive emergencies admitted under department of

¹Assistant Professor, Department of Medicine, KIMS, Karad,

²Resident, Department of Medicine, KIMS, Karad, ³Tutor, Department of Medicine, KIMS, Karad, Maharashtra, India

Corresponding author: Dr Pavan D Patel, Department of Medicine, Krishna Institute of Medical Sciences, Karad, Maharashtra, India

How to cite this article: Amit Botre, Pavan D Patel, Shruti Nair. Study of lipid profile in accelerated hypertension in tertiary care hospital in Western Maharashtra. International Journal of Contemporary Medical Research 2019;6(8):H14-H17.

DOI: <http://dx.doi.org/10.21276/ijcmr.2019.6.8.24>

medicine, KIMS, Karad, from August 2018 to December 2018. On admission, detailed history was taken and complete clinical examination was done. It was a hospital based cross sectional study.

Criteria

1. Systolic blood pressure of 180mmHg and above or diastolic blood pressure of 120mmHg and above.
2. Evidence of end organ damage, either clinically or laboratory findings.

Exclusion Criteria

1. Patients less than 18 yrs and above 40 yrs of age
2. Patients with valvular heart disease, pregnancy induced hypertension.

Diagnostic Criteria: The diagnosis of hypertensive emergency will be established by the following 1. Systolic blood pressure ≥ 180 mmHg or diastolic blood pressure ≥ 120 mmHg. 2. Acute target organ damage.

We obtained written informed consent in all cases to participate in the study.

Data collection procedure: All patients who fulfilled the inclusion and exclusion criteria were included in this study. The consent was taken from the patients or attendants who were included in the study, for performing the necessary investigations or procedures. A Proforma was prepared which included detailed history, clinical examination and requisite investigations available in our hospital. History includes all symptoms pertaining to hypertensive emergencies in young in detail with emphasis on all the risk factors attributable to the hypertensive emergencies in young. A detailed clinical examination was done and neurological deficits were identified. Relevant investigations like hemoglobin, total white cell count, erythrocyte sedimentation rate, routine urine analysis, blood glucose, blood urea, serum creatinine, serum electrolytes, serum lipid profile, Chest X-ray, CT scan head, electrocardiography, funduscopy, urine albumin were done for all patients, Bleeding time, Clotting time, echocardiogram, Color renal Doppler were done in the required patients. The results were analyzed to assess the etiology, risk factors, and the pattern of clinical and radiological profile.

A proper questionnaire was used to collect data from all the cases and which was recorded in the form of tables and graphs. The data were analyzed using SPSS program version 21 software. The data was summarized and tabulated accordingly.

RESULTS

In the present study, we observed that majority of the cases presented with accelerated hypertension were males (56.25%), followed by 43.75% female cases.

We observed that majority of the cases of accelerated hypertension belonged to 56-65 years of age group (29.16%), followed by 46-55 years (26.16%), and 66-75 years (16.66%). The mean age of the study subjects was 57.41 ± 14.12 years. We assessed their hypertensive status and diabetic status, we observed that majority of the cases were known cases of

Gender	Number of cases	Percentage
Males	54	56.25%
Females	42	43.75%
Total	96	100%

Table-1: Distribution of study subjects according to their gender

Age group	Number of cases	Percentage
<25 years	1	1.04%
26-35	7	7.29%
36-45	12	12.5%
46-55	25	26.04%
56-65	28	29.16%
66-75	16	16.66%
>76 years	7	7.29%
Total	96	100%

Table-2: Distribution of study subjects according to their age distribution

Blood pressure	Mean	Standard deviation
Mean SBP	183	24.7
Mean DBP	99.68	18.03

Table-3: Distribution of study subjects according to their blood pressure

Clinical presentation	Number of cases	Percentage
Headache	78	81.25%
Giddiness	36	37.5%
Chest pain	34	35.42%
Dyspnea	19	19.79%
Limb weakness	15	15.62%
Edema	10	10.41%
Pallor	11	11.45%

Tables-4: Distribution of study subjects according to their clinical presentation

Lipid parameter (in mg/dl)	Mean value
Mean Total cholesterol	182 ± 3.4
Mean triglyceride	143.62 ± 6.3
Mean LDL	49.68
Mean HDL	95.83 ± 7.8

Table-5: Distribution of study subjects according to their mean values of lipid profile parameters

hypertension (67.70%), and 12.5% cases were known cases of diabetes mellitus and 4.16% cases were known cases of ischaemic heart disease.

In the present study, we observed that majority of the study subjects presented with headache as a presenting complaint (81.25%), followed by giddiness among 37.5% cases, 35.42% cases presented with chest pain, 19.79% cases presented with dyspnea, weakness in limbs among 15.62% cases and edema among 10.41% cases.

We assessed the systolic and diastolic blood pressures of all the study subjects at presentation. We observed that the mean systolic blood pressure on admission was 183 ± 24.7 mmHg, while mean diastolic blood pressure on admission

was 99.68 ± 18.03 mmHg.

Serum levels of TC, TG, HDL and LDL were 182 ± 3.4 , 143.62 ± 6.3 , 49.68 and 95.83 ± 7.8 mg/dL, respectively, in hypertensive subjects.

DISCUSSION

In the present study, we observed that majority of the cases presented with accelerated hypertension were males (56.25%), followed by 43.75% female cases.

In the present clinical study of hypertensive emergencies done at tertiary health care centre. The number of males presenting with hypertensive emergencies were more than the number of females. 66% of the patients were males. Martin et al In their study on hypertensive crises observed that 55% of patients were male among patients with hypertensive emergencies. The proportions of males in hypertensive emergencies were also higher in the study by Zampaglione et al.¹²

We observed that majority of the cases of accelerated hypertension belonged to 56-65 years of age group (29.16%), followed by 46-55 years (26.16%), and 66-75 years (16.66%). The mean age of the study subjects was 57.41 ± 14.12 years.

We assessed their hypertensive status and diabetic status, we observed that majority of the cases were known cases of hypertension (67.70%), and 12.5% cases were known cases of diabetes mellitus and 4.16% cases were known cases of ischaemic heart disease.

Garcia GM noticed a large number of patients, (65.9%), in their study to be previously diagnosed hypertensive. Zampaglione et al¹², Reports a larger number, with (92%) of known hypertensives among their patients. The number of patients with diabetes mellitus was 26% in the study done by Martin et al.

Martin et al, in their study found presenting symptoms of neurological deficits, dyspnoea and chest pain in 48%, 25%, and 18% of their patients. Zampaglione et al.¹² In their study had more patients presenting with chest pain (27%), followed by dyspnoea (22%) and neurological deficits (21%). Neurological deficits in the present study varied from hemiparesis (75%), convulsion (16.6%), and visual deficits (8.3%). Hemiparesis accounted for the largest group of patients with neurological deficit

We assessed the systolic and diastolic blood pressures of all the study subjects at presentation. We observed that the mean systolic blood pressure on admission was 183 ± 24.7 mmHg, while mean diastolic blood pressure on admission was 99.68 ± 18.03 mmHg.

Martin et al. In their study reports a mean systolic blood pressure of 193 ± 26 mmHg in their patients and a mean diastolic blood pressure of 129 ± 12 mmHg.

Serum levels of TC, TG, HDL and LDL were 182 ± 3.4 , 143.62 ± 6.3 , 49.68 and 95.83 ± 7.8 mg/dL, respectively, in hypertensive subjects.

In a study conducted by Kamrun Nahar Choudhary et al¹³, Serum levels of TC, TG, and low density lipoproteins were 238.3 ± 3.4 , 178.3 ± 6.3 , and 151.3 ± 7.8 mg/dL, respectively, in hypertensive subjects while in normotensive subjects, they were 187 ± 6.2 , 141.5 ± 11.2 , and 110.3 ± 6.3 mg/dL,

respectively, which were significantly higher in hypertensive patients ($P < 0.001$). The serum high density lipoprotein was significantly lower ($P < 0.001$) in hypertensive patients (41.2 ± 3.2 mg/dL) than in normotensive subjects (44.3 ± 5.6 mg/dL). The mean SBPs of hypertensives and normotensives were 146.8 ± 8.5 mmHg versus 119.2 ± 9.3 mmHg, respectively, and mean DBPs were 98.9 ± 7.3 mmHg versus 84.9 ± 5.3 mmHg, respectively.

In a study conducted in Mexico reported that the most prevalent abnormality in Mexican urban adults, aged 20–69 years, was high density lipoprotein cholesterol, 46.2% for men and 28.7% for women. Hypertriglyceridemia was the second most prevalent abnormality among 24.3% individuals. Increased low density lipoproteins was observed in 11.2% of the participants. About Half of the subjects presented with raised triglyceride levels had a mixed dyslipidemia or low high density lipoprotein cholesterol. More than 50% of the low high density lipoprotein cases were not related to hypertriglyceridemia.

The pan-European Survey of high density lipoprotein measured lipids and other cardiovascular risk factors in 3,866 patients with type 2 diabetes and 4,436 nondiabetic patients undergoing treatment for dyslipidemia in eleven European countries, and showed that diabetic patients had lower high density lipoprotein (1.22 ± 0.37 mmol/L versus 1.35 ± 0.44 mmol/L, $P < 0.001$) and higher TG (2.32 ± 2.10 mmol/L versus 1.85 ± 1.60 mmol/L, $P < 0.001$) than nondiabetic patients.²⁴ More diabetic compared to nondiabetic patients had low high density lipoprotein (45% versus 30%, respectively), high TG (≥ 1.7 mmol/L; 57% versus 42%, respectively), or both (32% versus 19%, respectively). high density lipoprotein < 0.9 mmol/L was found in 18% of diabetic and 12% of nondiabetic subjects.¹⁴

Previous studies showed the high rate of CVD mortality among South-East Asian compared to the rest of the world and that majority of CVD deaths occur below the age of 70.

CONCLUSION

The present study concludes that the cases with hypertension are more likely to present with dyslipidemia as compared to normotensive patients. Commonest alterations in dyslipidaemia observed were: elevated total cholesterol, low density lipoproteins, triglycerides, and reduced high density lipoprotein cholesterol levels. This study puts the hypothesis that the elevated blood pressure may predict certain disturbances in lipoprotein metabolism. Investigating and proving this association may help to develop future strategies for preventing development and progression of non communicable diseases in a developing countries with limited resources. Also Hypertensive regular measurement of blood pressure and periodic assessment of lipid profile should be encouraged to prevent cardiovascular disease and stroke.

REFERENCES

1. Reddy KS. Cardiovascular disease in non-Western countries. *N Engl J Med.* 2004;350:2438–2440.

2. Murray CJ, Lopez AD. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study. *Lancet*. 1997;349:1436–1442
3. Joshi P, Islam S, Pais P, et al. Risk factors for early myocardial infarction in South Asians compared with individuals in other countries. *JAMA*. 2007;297:286–294.
4. Mora S, Glynn RJ, Ridker PM. High-density lipoprotein cholesterol, size, particle number, and residual vascular risk after potent statin therapy. *Circulation*. 2013;128:1189–1197.
5. Liu Y, Zhang B, Chen JY, Chen PY. The relationship between fasting triglyceride level and prevalence and severity of angiographic coronary artery disease in 16,650 patients from the TRUST study in the statins era. *Eur Heart J*. 2013;34:P1550.
6. Moniruzzamani AT, Rahmani S, Acharyyai A, Islami FA, Ahmed MSAM, Zamani MM. Regional Health Forum. 1. Vol. 17. Geneva: World Health Organization; 2013. Prevalence of hypertension among the Bangladeshi adult population: a meta-analysis.
7. Akhtaruzzaman M, Khan MNI, Islam SN. Nutrition, Health and Demographic Survey of Bangladesh-2011. Dhaka, Bangladesh: Institute of Nutrition and Food Science University of Dhaka; 2013. [Accessed May 12, 2014]. Available from:
8. World Health Organization . Non-Communicable Disease Risk Factor Survey Bangladesh 2010. Ministry of Health and Family Welfare; Bangladesh: 2010. [Accessed May 12, 2014].
9. Saquib N, Saquib J, Ahmed T, Khanam MA, Cullen MR. Cardiovascular diseases and type 2 diabetes in Bangladesh: a systematic review and meta-analysis of studies between 1995 and 2010. *BMC Public Health*. 2012;12:434.
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;53:244–253.
11. Bruckert E, Pamphile R, McCoy F, André P. Defining the prevalence of low HDL-C in a European cohort of dyslipidaemic patients. *Eur Heart J Supplements*. 2005;7:F23–F26.
12. Zampaglione et al. Hypertensive urgencies and emergencies. *Hypertension* 1996;27: 144-14.
13. Bruckert E, Baccara-Dinet M, Eschwege E. Low HDL-cholesterol is common in European type 2 diabetic patients receiving treatment for dyslipidaemia: data from a pan-European survey. *Diabet Med*. 2007;24:388–391.
14. Yusuf S, Hawken S, Ounpuu S, et al. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. *Lancet*. 2004;364:937–952.
15. Goyal A, Usuf S. The burden of cardiovascular disease in the Indian subcontinent. *Indian J Med Res*. 2006;124:235–244.
16. Yusuf S, Reddy S, Ôunpuu S, Anand S. Global burden of cardiovascular diseases part II: variations in cardiovascular disease by specific ethnic groups and geographic regions and prevention strategies. *Circulation*. 2001;104:2855–2864.
17. Ghaffar A, Reddy KS, Singhi M. Burden of non-communicable diseases in South Asia. *BMJ*. 2004;328:807–810.
18. Zaman MM, Choudhury SR, Ahmed J, et al. Plasma lipids in a rural population of Bangladesh. *Eur J Prev Cardiol*. 2006;13:444–448.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 12-04-2019; **Accepted:** 01-08-2019; **Published:** 17-08-2019