

Original Research Article

Comparative study of lipid profile and C-reactive protein in hypertensive and normotensive patients of Andhra Pradesh population

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ABSTRACT

Background: Parameters of lipid profile, C-reactive protein was studied in hypertensive and Normotensive adults aged between 25 to 60 years and compared to predict the cardio-vascular disease.

Methods: BP was recorded in both groups and compared. CRP lipid profile was studied in both groups and compared.

Results: Systolic BP, diastolic BP in HTN and Normotensive were compared statically and p value was highly significant ($p < 0.01$). C-reactive protein of both HTN and Normotensive was compared and statically highly significant ($p < 0.01$). The lipid profile parameters total cholesterol, triglyceride VLDL, HDL, LDL were also compared in both HTN and Normotensive and all values were statistically highly significant ($p < 0.01$).

Conclusion: This study highlighted the diagnostic and prognostic values of HTN and cardiovascular diseases, which have high rates of morbidity and mortality.

Keywords: C-reactive protein, Diastolic blood pressure, Hypertension, Systolic blood pressure

INTRODUCTION

Hypertension is known to double the risk of cardiovascular disease including coronary artery diseases. Excessive intake of saturated fats, cholesterol and other sources of calories and subsequent disturbance of lipid profile leading to hyper triglyceridemia and hyper cholestremia consequently hypertension. Under such scenario c-reactive protein serves as an important marker of atherosclerosis. Binding of CRP to lipid especially lecithin (phosphatidyl choline) and to plasma lipoprotein had been established. CRP is selectively bound to LDL, VLDL, as CRP could promote complement activation and thus inflammation in the plaques and there is atherogenesis. CRP has been known to stimulate tissue factor production by peripheral blood monocytes in vitro and could thereby have important pro-coagulant effect.¹

Hence functional integrity of CRP has been confirmed in lipid profile and hypertensive (HTN) because dyslipidemia and HTN are two major life threatening risk factors causing cardio vascular disease in India and abroad.² Moreover the cardiac disease like myocardial infarction, peripheral vascular disease, involve kidneys also.³ Hence, attempt was made to compare the CRP and lipid profile parameters in Hypertensive and Normotensive adults of both sexes.

METHODS

The adult patients who were regularly visiting Government Medical College Hospital, Ananthpuram. 85 Hypertensive and 85 control groups were included for study.

Inclusive criteria

Adults aged <25 years to >60 years were selected for study. 85 patients having HTN with angina pain, symptoms of IHD, atherosclerosis compared with 85 normal healthy adults of same age the detailed history of each patients was recorded in both HTN and Normotensive groups. B.P was recorded by Diamond mercury sphygmomanometer. Blood samples were collected after an overnight fasting of 10-12 hours. About 5 ml of blood was drawn in dry autoclaved disposable syringe and poured in sterilized plain vial after removing the needle and allowed to clot and then centrifuged to separate the serum. Then serum was analysed for the study of lipid profile and C-reactive protein

Exclusion criteria

The patients having any addiction of tobacco, alcohol, having personal and family history of Diabetics mellitus and tuberculosis, HIV positive were excluded from the study

Statistical analysis

The obtained results were compared statistically by using 2007 Microsoft computer. The duration of the study was about four years (2014 to 2018).

RESULTS

Table 1 Comparison between hypertensive and Normotensive patients- The systolic BP mean value in HTN was 148.0 (SD±0.08) and Normotensive was 111.1 (SD±0.37) t-test was 382.1 and p value was highly significant (p <0.01).

Table 1: Comparative study of blood pressure and C-reactive protein.

Parameters	Variables	Mean value	SD	T-test value	p-value
Systolic blood pressure	Hypertensive	148.0	±0.80	382.1	p<0.001
	Normotensive	111.14	±0.37		
Diastolic blood pressure	Hypertensive	100.23	±0.66	199.2	p<0.001
	Normotensive	82.72	±0.46		
C-reactive protein	Hypertensive	1.25	±0.01	71.2	p<0.001
	Normotensive	1.03	±0.03		

The systolic blood pressure, diastolic blood pressure, c-reactive protein have significant p value(p<0.001) in comparative study.

Table 2: Comparative lipid profile between hypertensive and normal patients.

Parameters	Variables	Mean	SD	T-test value	p- value
Total cholesterol	Hypertensive	228.60	±1.62	321.29	p <0.001
	Normotensive	163.81	±0.73		
Triglyceride	Hypertensive	179.60	±0.72	529.82	p <0.001
	Normotensive	120.53	±0.73		
VLDL	Hypertensive	33.05	±1.54	44.35	p <0.001
	Normotensive	24.08	±1.03		
HDL	Hypertensive	31.84	±6.43	142.85	p <0.001
	Normotensive	44.19	±0.67		
LDL	Hypertensive	167.58	±1.30	255.49	p <0.001
	Normotensive	118.56	±1.18		

Total cholesterol study, Triglyceride, VLDL, HDL, LDL study were highly significant (p<0.01) because hypertensive groups had more mean value in all parameters.

Mean value of Diastolic BP in hypertensive group was 100.23 (SD±0.66) and Normotensive group was 82.7(SD±0.46) t-test was 199.2 and p value was highly significant (p<0.01).

Mean value of C- reactive protein in Hypertensive group was 1.25 (SD±0.01) and Normotensive group was 1.03(SD±0.03) t-test was 71.2 and p value was highly significant (p<0.01).

Table 2 Comparison of lipid profile in Hypertensive and Normotensive patients. Mean value of total cholesterol in hypertensive group was 228.6 (SD±0.08) in Normotensive group 163.8 (SD±0.089), t-test 321.2 and p value was highly significant (p <0.01). Mean value of Triglycerides in Hypertensive group was 179.6 (SD±0.72) and in Normotensive group was 12.5 (SD±0.73) t-test was 529.8 and p value was highly significant (p <0.01).

Mean value of VLDL in Hypertensive group was 33.05 (SD \pm 1.54) and in Normotensive group 24.08 (SD \pm 0.1.03) t-test was 44.3 and p value was highly significant (p <0.01).

Mean value of HDL in hypertensive patients 31.8 (SD +6.43) and in Normotensive patients 44.1 (SD \pm 0.67) t-test was 142.8 and p value was highly significant (p <0.01).

Mean value of LDL in hypertensive patients was 167.5 (SD \pm 1.30) and Normotensive group was 118.5 (SD \pm 1.18) t-test was 255.4 and p value highly significant (p <0.01).

DISCUSSION

The present study was a comparative study of lipid profile and C-reactive protein in hypertensive and Normotensive patients of Andhra Pradesh. In the study of systolic Blood pressure-mean value in Hypertensive patients was 148.0 (SD \pm 0.08) and Normotensive patients was 111.1 (SD \pm 0.37) t-test was 382.1 and p value was highly significant (p <0.01) In diastolic BP study, Mean value of Hypertensive patients was 100.2 (SD \pm 0.66) and Normotensive patients was 82.7(SD \pm 0.46) t-test was 199.2 and p value was highly significant (p <0.01).

In the study of CRP mean value in hypertensive patients was 1.25 (SD \pm 0.01) and Normotensive patients was 1.03 (SD \pm 0.03) t-test was 71.2 and p value was highly significant (p <0.01) In the study of lipid profile mean value of total cholesterol in hypertensive patients was 228.6 (SD \pm 0.08) in Normotensive patients 163.8 (SD \pm 0.089), t-test 321.2 and p value was highly significant (p <0.01).

In the study of Triglycerides mean value of Hypertensive patients was 179.6 (SD \pm 0.72) and in Normotensive patients was 120.5 (SD \pm 0.73) t-test was 529.8 and p value was highly significant (p < 0.01) In VLDL study, mean value of hypertensive patients was 33.05 (SD \pm 1.54) and in Normotensive patients was 24.08 (SD \pm 1.03) t-test was 44.3 and p value was highly significant (p <0.01).

In HDL, mean value of hypertensive patients was 31.8 (SD +6.43) and in Normotensive patients 44.1 (SD \pm 0.67) t-test was 142.8 and p value was highly significant (p <0.01). In LDL study, mean value of hypertensive patients was 167.5 (SD \pm 1.30) and Normotensive patients was 118.5 (SD \pm 1.18) t-test was 255.4 and p value highly significant (p <0.01) (Table 2).

These findings were more or less in agreement with previous studies.⁴⁻⁶ The significant CRP values in hypertensive patients indicate that CRP is a biomarker to indicate or predict the elevated blood pressure and dyslipidemia. Hence CRP level could be significant clinical importance for cardiac diseases.⁷

The CRP binds with highest affinity to residues of phosphatidylcholine but it also binds to a variety of other autologous and extrinsic ligands. These ligands include native and modified plasma lipoproteins.⁸ And damaged cell membranes.⁹

Moreover CRP binding ligands have key properties of antibodies; hence CRP may contribute to the host defense against infection, pro inflammatory mediator and participate in physiological and pathophysiological handling of autologous constituents.

Hence, CRP production is an indication of coronary disease caused by HTN and dyslipidemia. CRP binding to lecithin and plasma lipoprotein was observed with activated complements within all acute myocardial infarction.¹⁰ Hence, it can be hypothesized that elevation of CRP level is a prediction of coronary disease aggravated by hypertension and dyslipidemic.

CONCLUSION

The present comparative study of C-reactive protein and lipid profile in hypertensive and Normotensive population will be useful to cardiologist, physician. One can predict the cardiovascular disease by knowing the parameter of C-reactive protein. But this study warrants further genetic, patho-physiological, nutritional, histological study because exact mechanism, action of C-reactive protein as biomarker is still unclear.

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Ethical approval: The study was approved by the Institutional Ethics Committee of Government Medical College Ananthapuram, Andhra Pradesh, India

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