



## A STUDY ON CORRELATION OF LIPID PROFILE WITH GRADING HYPERTENSION IN A NEWLY DIAGNOSED HYPERTENSIVE PATIENTS

**Dr. Shashidhar P Khanapure**

Associate Professor, S Nijalingappa Medical College, Bagalkot-587102

**Dr. Sridhar G**

3st Year Pg Resident In Department Of General Medicine, S Nijalingappa Medical College, Bagalkote-587102

### ABSTRACT

**Introduction:** Earliest references about Hypertension are seen in Chinese books written about 2600 B.C. Until prior to twentieth century there were no clinical instrument for measuring blood pressure non invasively. Though the association of hypertension & dyslipidemia is common and been proved by various studies beyond doubt, the reason for this co-occurrence has not been probed out yet. This study is conducted to assess the abnormalities in plasma lipid profile of hypertensive patients and to determine the factors influencing it. **Material and methods:** The study consisted observational retrospective longitudinal study. 50 patients with newly diagnosed hypertension from hypertension clinic were included in the study group, and 50 non-hypertensive persons of same age group were included in the study as control. **Results:** On analysis of the lipid profile of 50 hypertensive patients and 50 normotensive persons the mean TC values in cases and controls are 197 mg/dl and 166 mg/dl respectively. The mean TG values are 197 mg/dl and 120 mg/dl, the mean LDL c values are 119 mg/dl and 98.4 mg/dl. All these differences are statistically significant with a 'p' value of < 0.0001 when analyzed with unpaired T test. The mean HDL (37.9 mg/dl) in hypertensive is significantly lower (p < 0.0001) than normotensive (42.3 mg/dl). **Conclusion:** Hypertensive patients have significantly higher levels of all forms of cholesterol and higher percentage of individuals in dyslipidemic state when compared with normotensive persons.

**KEYWORDS :** TC: Total cholesterol, TG: Triglyceride, LDL: Low density lipoprotein, HDL: High density lipoprotein, VLDL: Very low density lipoprotein.

### INTRODUCTION:

Earliest references about Hypertension are seen in Chinese books written about 2600 B.C. Until prior to twentieth century there were no clinical instrument for measuring blood pressure non invasively. However the presence of high blood pressure had long been recognized by the degree of "hardness of arteries". Even though the association of high blood pressure and major cardio-vascular events like stroke and cardiac failure were recognized by ancient physicians like Hippocrates and Galen, the real breakthrough came in the early twentieth century after the introduction of non-invasive BP monitoring with sphygmomanometer by Riva Roci<sup>1</sup> and Koratkoff. Further insights into variation of BP in humans under the effect of exercise, stress, emotion and the complication of longstanding hypertension were made possible. Today hypertension has been recognized as the most common cardiovascular disorder<sup>2</sup>. It is the leading cause of morbidity and mortality in both developing and developed countries<sup>3</sup>.

Hypertension is one of the ten leading reported causes of death with about 4% of such death due to hypertensive complications<sup>4</sup>. The risk features that have been associated with hypertension include increased salt intake, Diabetes mellitus, Cigarette smoking, elevated serum lipids, sedentary lifestyle, diet rich in saturated fats, genetic factors and stress<sup>5</sup>. Though the association of hypertension & dyslipidemia is common and been proved by various studies beyond doubt, the reason for this co-occurrence has not been probed out yet. Three possible mechanisms are proposed for this but none have been proven.

1. Dyslipidemia can increase the incidence of Hypertension.
2. Hypertension can increase the incidence of Dyslipidemia.
3. There may be a common factor which cause increased incidence of both.

This study is conducted to assess the abnormalities in plasma lipid profile of hypertensive patients and to determine the factors influencing it.

### Objectives Of The Study:

To study the prevalence and pattern of lipid profile

abnormalities in newly diagnosed hypertensive patients.

### METHODOLOGY:

**Study design:** observational retrospective cross sectional.

### Source of study population:

Patients admitted and treated SNMC and HSK Hospital Bagalkot.

### Study duration-

July 2021 to July 2022 at SNMC and HSK Hospital Bagalkot

### Sample size

**Sample size estimation** was done using open epi software version 2.3.1. At 95% confidence level,

**Sample size estimated is 50 newly diagnosed hypertensive patients and 50 normotensive control group.**

Formula used  $n = \frac{[DEFF * Np(1-p)]}{[(d^2/Z^2) * (N-1) + p*(1-p)]}$

### Inclusion Criteria:

- Newly detected hypertensive patients of age group between 31-75 yrs.
- Control group is non-hypertensive patients of same age group who attended medical OPD for minor illnesses.

### Exclusion Criteria

- Patients who are already known hypertensive and on drugs.
- Patients with secondary hypertension
- Hypertensive patients who are alcoholic.
- Hypertensive diabetic patients.

### RESULTS:

- 50 patients with newly diagnosed hypertension from hypertension clinic were included in the study group.
- 50 non-hypertensive persons of same age group were included in the study as control. With the available data two type of analysis were done.
- The mean values of Total cholesterol and other sub-groups of cholesterol are calculated for cases and controls and

their differences were analyzed for statistical significance. The statistical analysis is done using unpaired – T test, double tailed with unequal variance.

- The percentage of dyslipidemia prevalence for among cases and controls are calculated and compared. The percentage prevalence is analyzed for statistical significance using Chi-square test.

**Table-1: Mean Lipid Values: Cases Vs Controls**

LIPID	' N '		MEAN	SE	' P '
TC	CASES	50	197	2.67	< 0.0001
	CONTROL	50	166	2.77	SIGNIFICANT
TG	CASES	50	197	7.03	< 0.0001
	CONTROL	50	120	5.40	SIGNIFICANT
LDL	CASES	50	119	2.45	< 0.0001
	CONTROL	50	98.4	2.74	SIGNIFICANT
HDL	CASES	50	37.9	0.63	< 0.0001
	CONTROL	50	42.3	0.98	SIGNIFICANT

**Interpretation:**

In our study, dyslipidemia is defined as TC ≥ 200 mg/dl, TG ≥ 150 mg/dl, LDL ≥ 130 mg/dl and HDL < 40 mg/dl. Cases have significantly higher percentage of dyslipidemics when compared with control.

**Table-2: Percentage Of Dyslipidemia: Cases Vs Controls**

LIPID	' N '		PERCENT	' P '
TC	CASES	50	43.92	< 0.0001
	CONTROL	50	5	SIGNIFICANT
TG	CASES	50	84.11	< 0.0001
	CONTROL	50	20	SIGNIFICANT
LDL	CASES	50	28.03	0.0003
	CONTROL	50	5	SIGNIFICANT
HDL	CASES	50	53.27	0.005
	CONTROL	50	30	SIGNIFICANT

**Interpretation:**

In our study, dyslipidemia is defined as TC ≥ 200 mg/dl, TG ≥ 150 mg/dl, LDL ≥ 130 mg/dl and HDL < 40 mg/dl. Cases have significantly higher percentage of dyslipidemics when compared with control.

**Table-3: Mean Lipid Values In Different Age-groups**

LIPID	' N '		MEAN	SE	' P '
TC	YRS (31-45)	13	189	4.08	0.049
	YRS (61-75)	24	203	4.38	SIGNIFICANT
TG	YRS (31-45)	13	182	12.88	0.12
	YRS (46-60)	18	217	16.73	IN-SIGNIFICANT

**Interpretation**

Three age groups were formed among the hypertensive patients. Group- : 31-45yrs, group-II: 46-60yrs and group-: 61-75yrs. The total cholesterol is significantly high among hypertensive patients of group- when compared with group-.

**Table-4: Percentage Of Dyslipidemia In Age-groups**

LIPID	' N '		MEAN	SE	' P '
LDL	YRS ( 61-75 )	24	85.10		IN-SIGNIFICANT
	YRS ( 31-45 )	13	20.00		0.2459
HDL	YRS ( 61-75 )	24	36.17		IN-SIGNIFICANT
	YRS ( 31-45 )	13	52.00		0.9861
	YRS ( 46-60 )	18	54.28		IN-SIGNIFICANT

**Interpretation**

Significant percentage of dyslipidemics is present in group- with respect to total cholesterol and triglycerides when compared with groups with lowest lipid values.

**Table-5: Mean Lipid Values: Stages Of Hypertension Lipid' N' meanse' P'**

LIPID	' N '		MEAN	SE	' P '
TC	STAGE - 1	15	191	4.02	0.19 IN-
	STAGE - 2	35	199	3.37	SIGNIFICANT

TG	STAGE - 1	15	195	15.73	0.86 IN-
	STAGE - 2	35	198	7.54	SIGNIFICANT
LDL	STAGE - 1	15	114	4.22	0.153 IN-
	STAGE - 2	35	121	2.98	SIGNIFICANT
HDL	STAGE - 1	15	37.8	1.13	0.899 IN-
	STAGE - 2	35	38.0	0.76	SIGNIFICANT

**Interpretation**

There is no significant difference in mean lipid values between patients in stage-1 and stage-2 hypertension.

**Table-6: Percentage Of Dyslipidemia: Stages Of Hypertension**

LIPID	' N '		PERCENTAGE	' P '
TC	STAGE -1	15	43.75	1.00 IN-
	STAGE -2	35	44.00	SIGNIFICANT
TG	STAGE -1	15	84.37	0.9748 IN-
	STAGE -2	35	84.00	SIGNIFICANT
LDL	STAGE -1	15	28.12	1.00 IN-
	STAGE -2	35	28.00	SIGNIFICANT
HDL	STAGE -1	15	50.00	0.6596 IN-
	STAGE -2	35	54.66	SIGNIFICANT

**Interpretation**

There is no significant difference in percentage prevalence of dyslipidemia among stage-1 and stage-2 hypertensives

**DISCUSSION:**

On analysis of the lipid profile of 50 hypertensive patients and 50 normotensive persons the mean TC values in cases and controls are 197 mg/dl and 166 mg/dl respectively. The mean TG values are 197 mg/dl and 120 mg/dl, the mean LDL c values are 119 mg/dl and 98.4 mg/dl. All these differences are statistically significant with a ' p' value of < 0.0001 when analyzed with unpaired T test. The mean HDL (37.9 mg/dl) in hypertensive is significantly lower (p < 0.0001) than normotensive (42.3 mg/dl).

About 43.92 % of hypertensive has high TC (i.e. ≥200 mg/dl) when compared with the normotensives (i.e. 5%). High TG (≥150 mg/dl) is found in 84.11 % of the hypertensive population, whereas it is seen only in 20% of normotensives.

The high LDL in the groups is 28.03% and 5%. The low HDL (<40 mg/dl) is seen in 53.27 %of hypertensive and 30% of normotensive. All these values are statistically significant when analyzed using Chi-square test.

The results are similar to the studies conducted in Nigeria by J.Idemudia E.Ugwuja<sup>63</sup> which showed a significantly elevated plasma TC, TG, LDL-c and HDL-c in hypertensive patients when compared with normotensive patients. Studies conducted by M.S. Saha, N.K. Sana and Ranajith kumar Shaha<sup>64</sup> in northern Bangladesh also showed a significantly high TC, TG and LDL values (TC-291.25 mg/dl vs.

182.14 mg/dl, TG-184.77 mg/dl vs. 142.73 mg/dl and LDL-154.32 mg/dl vs. 105.73 mg/dl) and significantly lower HDL-c values (32.91 mg/dl vs .42.88 mg/dl ) in hypertensive patients when compared with normotensive patients. Studies by Abdishakur Abdulla, Nico Negelkerke<sup>65</sup> in UAE showed a significantly higher level of VLDL and TG among hypertensive patients but not TC and LDL levels. Studies conducted in Spain by D.Rueda and A.Maldonado<sup>66</sup> showed a significantly high TC and TG than normotensive controls.

**CONCLUSION:**

Hypertensive patients have significantly higher levels of all forms of cholesterol and higher percentage of individuals in dyslipidemic state when compared with normotensive persons.

Elderly hypertensives have significantly high total cholesterol values when compared with young and middle aged hypertensives.

The stage of hypertension does not alter the lipid profile in hypertensives.

#### Limitations

1. The sample size is small.
2. The design of the study is cross sectional.
3. The impact of treatment of dyslipidemia on hypertension and vice versa could not be studied longitudinally.
4. Chances of confounding biases are more.
5. The emerging risk factors like Lipoprotein (α) and LDL c sub- fractions are not included in the study.

#### REFERENCES

1. Riva Rocci s.un nuovo sfigomanometro.Gazetta mediche de torino 50: 981-996,1896
2. The sixth report on JNC on detection evalvation and treatment of high blood pressure, Arch Int Med 1997;157 ; 2413 -2446.
3. WHO Classification of hypertension.Report of WHO group,technical report series,1978 :657 ;87 - 95.
4. Bangladesh health survays report.cause of death and morbidity profieal . Directorate ,General health services.Govt of Bangladesh 1998.
5. William GH and Braunwald.E.Hypertensive vascular disease.Hariosons principle of int medicine 16 th edition
6. Chobanion AV , Bakris GL,Black HR et, all, JNC 7 report. JAMA 289 : 2560-2572,2003
7. The WHO Monica project Risk factors.Int.J.epidemiol 18 :S46-S 55, 1989
8. Vasan RS , Beisel A , seshadai S, et al. residual lifetime risk for developing HT in middle aged women and men . The Framingham Heart study JAMA287:1003-1010, 2002.
9. Keys A seven countries. A muli variate analysis of death and CHD, Cambridge MA ,Hardward university press 1980. Stamler J R , Neaton J.D BP systolic and Diastolic and CV risks : Int med 153 : 598 -615, 1993