ORIGINAL RESEARCH

Lipid abnormalities in patients with newly diagnosed hypertension

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ABSTRACT
Background: The present study was conducted for assessing lipid abnormalities in patients with newly diagnosed hypertension.
Materials & methods: A total of 50 hypertensive subjects and 50 healthy controls were enrolled. Complete demographic details and clinical data of all the patients were obtained. Blood samples were obtained and sent to the laboratory where an auto-analyser was used for evaluation of serum lipid profile. High density lipoproteins (HDL-C), Low density Lipoproteins, Total cholesterol (TC) and triglycerides levels (TG) were evaluated. All the results were recorded and analysed by SPSS software. Student t test was used to evaluate the level of significance.
Results: Significant results were obtained while comparing the TG levels, LDL-C levels and TC levels among the patients of the two study groups. While assessing the lipid abnormalities, it was seen that 58 percent of the patients in the study group and 12 percent of the patients in the control group had a minimum of one lipid abnormality (p-value <0.05).
Conclusion: Lipid abnormalities are highly prevalent among newly diagnosed hypertensives.
Keywords: Hypertension, Lipid abnormality

INTRODUCTION
Hypertension affects approximately 1 of 3 adults in the United States, and about 2 million new cases are diagnosed each year. It is the leading cause of death and the second leading cause of lost disability-adjusted life-years worldwide. Randomized controlled clinical trials have shown that control of hypertension reduces the risk of stroke, coronary artery disease, congestive heart failure, end-stage renal disease, peripheral vascular disease, and mortality.[1-3] Self-screening allows patients to measure their own blood pressure outside of physician consultations, either in their own home or with public validated solid cuff automatic sphygmomanometers that require no training, just simple instructions for use.[4] Abnormalities in serum lipid and lipoprotein levels (dyslipidaemia) are recognized as major modifiable cardiovascular disease (CVD) risk factors and have been identified as independent risk factors for essential hypertension giving rise to the term dyslipidaemic hypertension.[5, 6] The consequences of dyslipidaemic patterns have been largely reported in previous studies. Elevated total cholesterol is known to play key roles in both initiation and progression of atherosclerosis with long term clinical consequences.[4- 6] Hence; the present study was conducted for assessing lipid abnormalities in patients with newly diagnosed hypertension.

MATERIALS & METHODS
The present study was conducted for assessing lipid abnormalities in patients with newly diagnosed hypertension. A total of 50 hypertensive subjects and 50 healthy controls were

enrolled. Complete demographic details and clinical data of all the patients were obtained. Blood samples were obtained and sent to the laboratory where an auto-analyser was used for evaluation of serum lipid profile. High density lipoproteins (HDL-C), Low density Lipoproteins, Total cholesterol (TC) and triglycerides levels (TG) were evaluated. All the results were recorded and analysed by SPSS software. Student t test was used to evaluate the level of significance.

RESULTS

The mean age of the patients in the study group and control group was 43.8 years and 41.7 years respectively. The majority proportion of the patients in both the study group were males. Mean TG levels among the patients of the study group and control group were 168.4 mg/dL and 113.9 mg/dL respectively. Mean HDL-C levels among the patients of the study group and control group were 38.1 mg/dL and 32.6 mg/dL respectively. Mean LDL-C levels among the patients of the study group and control group were 135.3 mg/dL and 111.8 mg/dL respectively. Mean TC levels among the patients of the study group and control group were 208.4 mg/dL and 171.6 mg/dL respectively. Significant results were obtained while comparing the TG levels, LDL-C levels and TC levels among the patients of the two study groups. While assessing the lipid abnormalities, it was seen that 58 percent of the patients in the study group and 12 percent of the patients in the control group had a minimum of one lipid abnormality (p-value <0.05).

Table 1: Lipid profile

Variable	Study group	Control group	p-value
TG (mg/dL)	168.4	113.9	0.001*
HDL-C (mg/dL)	38.1	32.6	0.112
LDL-C (mg/dL)	135.3	111.8	0.001*
TC (mg/dL)	208.4	171.6	0.001*

*: Significant

Table 2: Lipid abnormality

Atleast one Lipid abnormality	Study group	Control group	p-value
Number	29	6	0.000 (Significant)
Percentage	58	12	

*: Significant

DISCUSSION

High systolic blood pressure (BP) was one of the most frequent Level 3 risk factors for the global burden of disease according to the systematic analysis published in 2016. The estimated number of adults with elevated BP in 2015 increased to 1.13 billion, in comparison to 594 million in 1975 [2]. A 2015 systematic review and meta-analysis, which included data on almost 1.5 million adults from 45 countries, reported a 32.3% overall prevalence of arterial hypertension (AH). Similar, prevalence of 30–55% was also found in other recent studies.[5-8]

Hypertension is known to be associated with alterations in lipid metabolism which gives rise to abnormalities in serum lipid and lipoprotein levels. It has also been documented that the presence of hyperlipidaemia substantially worsens the prognosis in hypertensive patients. The frequent clustering of hypertension, lipid abnormalities, and other metabolic abnormalities, in an individual, has been demonstrated to be synergistic in accelerating atherosclerosis and the development of CVD.[7-9] Dyslipidaemia and hypertension are independent cardiovascular risk factors that are linked to insulin resistance and commonly coexist with other cardiovascular

risk factors such as dysglycaemia and truncal obesity in a cluster as seen in metabolic syndrome. Insulin resistance is related to lipoprotein lipase deficiency which affects lipid metabolism and consequent dyslipidemia.[8-10] Hence; the present study was conducted for assessing lipid abnormalities in patients with newly diagnosed hypertension.

In the present study, mean TG levels among the patients of the study group and control group were 168.4 mg/dL and 113.9 mg/dL respectively. Mean HDL-C levels among the patients of the study group and control group were 38.1 mg/dL and 32.6 mg/dL respectively. Mean LDL-C levels among the patients of the study group and control group were 135.3 mg/dL and 111.8 mg/dL respectively. Mean TC levels among the patients of the study group and control group were 208.4 mg/dL and 171.6 mg/dL respectively. Significant results were obtained while comparing the TG levels, LDL-C levels and TC levels among the patients of the two study groups. Our results were in concordance with the results obtained by Mahto SK et al, who also reported similar findings. In their study, the authors assessed the correlation between lipoprotein (a) [Lp(a)] and lipid abnormalities in patients with newly detected hypertension and its association with the severity of hypertension. 62% of cases as compared to 12% of controls had elevated serum Lp (a) levels. Apart from that, the levels of Lp (a) and lipid parameters increased significantly with a higher stage of disease (p < 0.0001). Approximately 8% of cases had left ventricular hypertrophy as compared to 1% of control. Similarly, 18% of cases had Non-alcoholic fatty liver disease as compared to 4% of controls. 5% of cases had retinopathy as compared to nil in controls. 4% of cases had microalbuminuria as compared to nil in controls. It was observed that newly detected hypertension is associated with major derangements of Lp (a) and lipid parameters.[10]

In the present study, while assessing the lipid abnormalities, it was seen that 58 percent of the patients in the study group and 12 percent of the patients in the control group had a minimum of one lipid abnormality (p-value <0.05). In a similar study conducted by Mahto SK et al, authors determined the pattern and frequencies of dyslipidaemic forms among hypertensive patients. The commonest dyslipidaemic type was reduced High density lipoprotein, HDL (96.1%), followed by elevated low-density lipoprotein, LDL (78.6%), then, elevated total cholesterol, (62.3%) TCHOL and elevated triglycerides, TG 43.5%. Dyslipidemic forms are very common among hypertensive patients, particularly with reduced HDL.[11] Amitesh Aggarwal, in another previous study, examined the serum lipid patterns and analysed the prevalence of dyslipidaemia in patients newly diagnosed with hypertension. Out of the 476 patients, 75 patients (15.7%) had a normal lipid profile. Low HDL was the most common abnormality followed by elevated TG, elevated LDL and elevated TC. Among isolated lipid abnormalities, isolated low HDL was most commonly seen in 45.4% of patients. Their study also found a high prevalence of dyslipidaemia in patients with hypertension with low HDL being dominant.[12]

CONCLUSION
Lipid abnormalities are highly prevalent among newly diagnosed hypertensives.

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