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An Observational Study to Determine the Abnormalities in Lipid Profiles in Newly Diagnosed Hypertensive Patients

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Abstract
Background: In both developed and developing nations, hypertension is a significant public health issue. Although anomalies in serum lipid and lipoprotein levels and changes in lipid metabolism are recognised to be related with hypertension, the cause and effect relationship is unknown. The study's primary objective was to determine whether primary hypertension patients visiting a tertiary care facility had aberrant lipid profiles. **Methods:** Diabetes and cardiology OPD of IMS & Sum Hospital, Bhubaneswar did this retrospective observational study with 400 patients whose health records were well-maintained or completely accessible at the hospital. **Results:** The mean average age of the study group was 48.4±6.9 years, whereas the control group's was 49.3±5.9 years. In comparison to other age groups, hypertension was more common in people aged 40 to 49. In comparison to the control group, the study groups' total cholesterol, triglycerides, HDL cholesterol, and LDL cholesterol were all considerably increased (p 0.05). The most frequent anomaly among hypertension participants was high TC (78%), followed by elevated LDL (66%). **Conclusion:** Combining dyslipidemia and hypertension raises the risk of stroke, cardiovascular disease, etc. Therefore, it is important to identify dyslipidemia in hypertension patients early and treat both disorders aggressively to avoid consequences.
Keywords: Lipid Profile Abnormalities, Hypertension, Cardiovascular Diseases.

Introduction

Dyslipidemia, which refers to abnormalities in blood lipid and lipoprotein levels, has been established as a major modifiable risk factor for cardiovascular disease (CVD)[1] and as an independent risk factor for essential hypertension, giving rise to the name dyslipidemic hypertension[2]. According to estimates, 7.1 million and 4.4 million deaths per year are caused by hypertension and dyslipidemia, respectively. The coexistence of these two risk factors has a detrimental effect on the vascular endothelium that is more than just additive, resulting in increased atherosclerosis and CVD[3]. According to the National Cholesterol Education Program (NCEP) Guidelines, they are crucial elements of the metabolic syndrome (MS) (Adult Treatment Panel III)[4].

More than 80% of the hypertensive population, according to data from the Framingham Heart Study, had at least one extra risk factor for cardiovascular disease, with atherogenic risk factors making up the majority of these risk factors. According to certain research, treating dyslipidemia has positive benefits on both coronary and cerebrovascular events, just as treating hypertension seems to[5].

The present study was conducted to evaluate the lipid profile abnormalities among hypertensive patients attending tertiary care hospital.

Methods

This study, which involved 400 patients whose clinical records were well-maintained or completely accessible at the hospital, was a retrospective observational study carried out at diabetes and cardiology clinic OPD of IMS & Sum Hospital, Bhubaneswar.

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After obtaining each patient's agreement, the information was gathered and analysed to get a study result. The study included all Type 2 diabetics who did not exhibit any clinical signs of cardiovascular involvement, had blood pressure <130/80mmHg, and had a normal ECG.Patients with Type 2 diabetes who also have cardiomyopathy, congestive heart failure, ischemic and hypertensive heart disease, or valvular heart disease. BMI (body mass index), SBP (systolic blood pressure), DBP (diastolic blood pressure), HbA1c (glycosylated haemoglobin level), FPG (fasting plasma glucose), Fasting Lipid profile, Urine routine and microscopy, ECG, Fundoscopy, Chest X-ray, and Echocardiography (E/A ratio; left atrial size was assessed) were outcome measures of the treatment of T2DM noted from the Evidence of left ventricular diastolic dysfunction were considered as the E/A <1 and increase in LA size.

All study patients were described using demographic, contextual, and additional variables, along with the appropriate statistics, such as frequency tables (count and percent) for categorical variables, or descriptive statistics (mean, SD, minimum, median, mode, and maximum) for continuous variables. Excel and SPSS version 20.0 were used to conduct the analysis. In the case of continuous data, t-test was used.

Results

This study involved 400 patients; 200 patients were in the study group and 200 patients were in the control group. The mean average age of the study group was 48.4±6.9 years, whereas the control group's was 49.3±5.9 years. Additionally, it was noted that the study group was heavier than the control group.

In comparison to other age groups, hypertension was more common in people aged 40 to 49. The distribution of the mean serum lipoprotein level was shown in Table 1. In comparison to the control group, the study groups' total cholesterol, triglycerides, HDL cholesterol, and LDL cholesterol were all considerably increased (p<0.05). (table 1). According to the above table, the study group's mean total cholesterol was higher (211.2±17.6 mg/dl) than the controls' (161.3±16.3 mg/dl) (p<0.05). The mean triglycerides were higher among control groups (176.86 ± 22.5 mg/dl) than controls

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(121.68 ± 22.8 mg/dl). The mean HDL was low among study group (42.64 ± 4.81 mg/dl) than controls (48.9 ± 3.9 mg/dl) (p<0.05). The mean LDL was higher among study group (141.43 ± 21.8 mg/dl) than

controls (102.87 ± 17.4 mg/dl) (p<0.05). Statistically significant difference was found in between the two groups (p<0.05).

Table 1: Mean level of serum lipoproteins

Parameters	Studygroup(n=200)	Controlgroup(n=200)	P Value
Total Cholesterol (mg/dl)	211.2±17.6	161.3±16.3	<0.05
Triglyceride(mg/dl)	176.86±22.5	121.68±22.8	<0.05
HDL-Cholesterol (mg/dl)	42.64±4.81	48.9±3.9	<0.05
LDL-Cholesterol(mg/dl)	141.43±21.8	102.87±17.4	<0.05

Among the hypertensive subjects most frequently occurring abnormality was elevated TC (78%), followed by elevated LDL (66%).

Table 2: Prevalence of serum lipid abnormality

Lipid abnormality	Study group (n=200)	Control group (n=200)
Elevated TC (> 200 mg/dl)	156(78%)	2 (1%)
Elevated LDL(>130 mg/dl)	132(66%)	6 (3%)
Elevated TG(>150 mg/dl)	82(41%)	8 (4%)
Low HDL-C (<40 mg/dl)	78(39%)	4 (2%)

Discussion

The aim of the present study examination of primary, newly diagnosed hypertension patients was dyslipidemia. In this study, it was shown that there were significantly more male participants in both groups. Anil Kumar Mahapatro et al. and Jugal Kishore et al. reported similar findings, reporting a higher proportion of male participants in the study group and the control group[6, 7]. In a similar investigation, Vasan et al. among 1298 participants discovered substantial correlation of age with blood pressure[8]. Our study showed a strong association between age and hypertension. This study also found that, compared to other age groups, the incidence of hypertension was highest in people aged 40 to 49.These results are also consistent with those of other earlier research[9–11]. Additionally, it was shown that the study groups' total cholesterol, triglycerides, HDL cholesterol, and LDL cholesterol were considerably greater than those of the control group in this study (p<0.05). These results concur with those presented in a few earlier experiments[12, 13].

Total and non-HDL-C levels significantly increased with rising systolic or diastolic blood pressure in both sexes, as shown in our study and earlier by a few other researchers[14,15].

Reducing blood pressure lowers the risk of stroke and coronary heart disease, according to a meta-analysis of all clinical studies conducted to date [16]. Even in CVD outcomes studies for diabetes and dyslipidemia, this lack of lower BP goal accomplishment is seen.

The methodologies used by the authors to dichotomize the risk factors are just one of the many limitations of their data that they admit. A very complex and challenging paper would have resulted from further dividing these components due to variation in huge populations.

Conclusion

According to this study, lipid abnormalities are extremely common among newly diagnosed hypertensives. One of the main risk factors for coronary artery disease is hypertension, which is made worse by the biological link between serum lipids and blood pressure. Therefore, early detection and vigorous treatment of dyslipidemia in hypertension patients are necessary to avoid problems.

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