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Original Research Article

Lipid Abnormalities in Hypertensive Patients: A Prospective Study

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Abstract

Background: It is generally recognised that dyslipidemia coexists with other risk factors, such as hypertension. Indians exhibit a different pattern of dyslipidemia than the people in the West. Data on dyslipidemia in patients with newly diagnosed hypertension are scarce from India.

Methods: A six-month case control study was conducted in the general medicine outpatient department (OPD) at the Kalinga Institute of Medical Sciences in Bhubaneswar. Based on inclusion and exclusion criteria, 200 study participants were included; 100 were primary hypertensive patients and 100 were controls with similar ages and genders.

Results: Out of 200 participants in the study, 88 (44%) were women and 112 (56%) were men. The majority of study participants were between the ages of 50 and 70. In hypertension patients compared to the control group, the mean values of total cholesterol, low-density lipoprotein (LDL) cholesterol, and triglycerides were all considerably higher. In comparison to controls, cases had decreased mean HDL cholesterol levels. It was determined that these differences were statistically significant.

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: Dyslipidemia, hypertension, Lipid

Introduction

The first mentions of hypertension can be found in Chinese texts from around 2600 B.C. There were no clinical tools for non-invasively measuring blood pressure before to the 20th century. However, the degree of "hardness of arteries" had long been used to detect the existence of high blood pressure. Even though ancient doctors like Hippocrates and Galen recognised the link between high blood pressure and serious cardiovascular events like stroke and cardiac failure, the real advancement occurred in the early 20th century with the development of non-invasive blood pressure monitoring with a sphygmomanometer by Riva Roci [1] and Koratkoff. It was made possible to gain more knowledge about how humans' blood pressure varies as a result of exercise, stress, emotion, and the complication of chronic hypertension. Today, it is acknowledged that hypertension is the most prevalent cardiovascular condition [2]. Both in developing and industrialised nations, it is the main factor in morbidity and mortality [3].

About 4% of deaths from hypertension-related causes are considered to be among the top ten causes of mortality [4]. Increased salt intake, diabetes, smoking, raised blood lipids, sedentary behaviour, a diet high in saturated fats, hereditary factors, and stress are risk factors that have been linked to hypertension [5].

This study is being undertaken to evaluate the anomalies in hypertensive patients' lipid profiles and to identify the contributing causes.

Methods

The current case control study was carried out over a period of six months in the Outpatient Department (OPD) of General Medicine at the Kalinga Institute of Medical Sciences in Bhubaneswar on cases who were primary hypertensive patients between the ages of 30-70. The control group consisted of non-hypertensive patients in the same age group and gender who visited the OPD for other illnesses.

Inclusion criteria

a) Cases: All male and female primary hypertensive patients and controls: all male and female non-hypertensive patients of same age group.
b) Age group 30 to 70 years.
c) Those who were willing to participate in the study

Exclusion criteria

a) Age below 30 years and above 70 years
b) Patients with secondary hypertension
c) Those who were not willing to participate in the study.

Sample size: Total 200. During this study period, 100 consecutive individuals with primary hypertension served as cases, and 100 consecutively healthy patients served as controls.

Method of data collection: Once receiving informed consent, data was collected after study participants had been informed of the goal of the investigation. The study respondents' sociodemographic data, including name, age, gender, address, socioeconomic status, occupation, etc., were collected. To rule out potential secondary causes of hypertension such as chronic renal failure, renal artery stenosis, hyperaldosteronism, pheochromocytoma, thyroid disease, cushing syndrome, coarctation of the aorta, and takayasu disease, a history of associated risk factors such as diabetes mellitus, smoking, alcohol, heart disease, and stroke was also obtained. An anthropometric assessment, including measurements of height, weight, blood pressure, and heart rate, was performed as part of the general physical examination. Studies like total cholesterol (TC), HDL (high density lipoprotein) and LDL (low density lipoprotein) levels, and

triglycerides (TG) levels were calculated. Dyslipidemic individuals were those with TC ≥200 mg/dl, TG ≥150 mg/dl, LDL ≥130 mg/dl, or HDL< 40 mg/dl for males and 50 mg/dl for women. 5 Systolic blood pressure (SBP) ≥140 mm Hg and/or diastolic blood pressure (DBP) ≥ 90 mm Hg are considered to be signs of hypertension.

Statistical Analysis

The SPSS software version 21 was used to evaluate the data that was entered into a Microsoft Excel spreadsheet. Proportions and percentages were used to represent qualitative data, and means and standard deviations were used to represent quantitative data. To determine the significance of the difference between the two means, an unpaired T test was utilised. Using the chi-square test, the significance of the difference in the proportion of dyslipidemia among each group was examined. Statistical significance was defined as a P value of 0.05 or lower.

Results

There were 200 study participants in total. 100 study participants were controls, while 100 study participants were cases. Out of 200 participants in the study, 88 (44%) were women and 112 (56%) were men. 44 of the cases and 56 of the controls were female (table 1). The bulk of the participants in the current study were between the ages of 60 and 70 (male: 40, female: 35), with 50 to 59 years coming in second (male-30, female-25).

Table 1: Gender distribution between cases and controls

Gender	Controls	Cases	Total	P value
Male	56	56	112	1.00
Female	44	44	88	
Total	100	100	200	

According to the above table, patients had a mean systolic pressure that was greater than controls (156.70±8.12) (114.87±5.21). It was discovered that there was a statistically significant difference between them. In comparison to controls, cases had a higher mean diastolic pressure (92.72±5.42 vs. 74.67±6.62), and this difference was shown to be statistically significant (table 2).

Table 2: Comparison of mean SBP, DBP between cases & controls

Parameter	Cases Mean ±SD	Controls Mean ±SD	P value
DBP	92.71 ± 5.41	74.66 ± 6.61	0.001
SBP	156.69 ± 8.11	114.86 ± 5.20	0.001

According to the above table, hypertension patients' mean total cholesterol was higher (202.46±40.12) than that of controls (186.41±32.12). In comparison to controls (186.41±32.12), hypertension patients' mean triglycerides were higher (161.51±40.61). In comparison to controls (49.16±3.84), cases had lower mean HDL levels (42.86±5.23). Compared to controls (114.12±31.48), cases had a mean LDL that was higher (124.18±36.85). It was determined that there was a statistically significant difference between them (table 3).

Table 3: Comparison of mean lipid values between cases and controls

Parameter	Cases Mean ± SD	Controls Mean ±SD	P value
LDL	124.17 ± 36.84	114.11 ± 31.47	0.03
Triglycerides	161.50 ± 40.60	142.30 ± 36.11	0.005
Total Cholesterol	202.45 ± 40.10	186.40 ± 32.11	0.002
HDL	42.85 ± 5.22	49.15 ± 3.83	0.001

Discussion

The primary focus of the current study was to evaluate dyslipidemia in patients with primary hypertension. Male participants made up 56% of the study's participants. Similar results were found in a research by Jugal Kishore et al., who reported that the majority of both the hypertensive group and the control group were men [6]. As people become older, their blood pressure rises. Vasan et al. observed a strong correlation between age and hypertension in their study of 1298 participants. [7]

The bulk of the participants in the current study were between the ages of 50 and 70. Researchers Pyadala N et al. [8] and T.V. Murali Krishna et al. [9] found similar results in their studies. These results were at odds with a study by J. Idemudia et al. [10], which discovered that the majority (63%) of study participants were in the 30- to 39-year age range. Cases had a higher mean systolic pressure (156.70±8.12) than controls (114.87±5.21) did. In comparison to controls (74.67±6.62), cases (92.72±5.42) had a higher mean diastolic pressure. Pyadala N. et al. [8] and Charles U. Osuji et al. [11] reported similar findings. Hypertensive patients had greater levels of total cholesterol, triglycerides, and LDL than controls, and this difference was determined to be statistically significant. Charles U. Osuji et al. revealed similar results. [11]

According to the results of the current study, hypertension patients' mean SD levels of total cholesterol, LDL, and triglycerides were considerably higher than those in the control group. In comparison to controls, cases had lower mean HDL levels. In the research of Pyadala N. et al. [8], T.V. Murali Krishna et al. [9], and Kavindra Borgaonkar et al., similar results were found. [12] Clinical ramifications of the coexistence of dyslipidemia and hypertension are multifaceted. Due to the synergistic increase in CVD risk, both illnesses should be aggressively managed. [13]

Conclusion

In this study, a statistically significant difference between normotensive and hypertensive patients was discovered in the mean values of total cholesterol, LDL cholesterol, triglycerides, and HDL cholesterol. This study comes to the conclusion that 57–62% of hypertensive persons have dyslipidemia. Although the exact cause-and-effect relationship between high blood pressure and lipid metabolism is unknown, early preventive measures such as lifestyle changes (such as a healthy diet, regular exercise, maintaining an ideal body weight, and completely abstaining from smoking and alcohol) and the right medications (keeping in mind that antihypertensive medications are known to cause dyslipidemia) are very important. Cardiovascular illnesses, strokes, and other comorbidities can be avoided by regular lipid profile evaluations, early statin therapy among hypertensive patients, and antihypertensive medication.

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