

A Cross Sectional Study on the Prevalence of Dyslipidemia and Diabetes among Young Adults with Hypertension

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ABSTRACT

In hypertensive patients, lipid disorders (LD) and diabetes mellitus (DM) are related with an amplified jeopardy of cardiovascular issues, which require aggressive treatment and close monitoring.

Therefore, this study was held to investigate the pervasiveness of dyslipidemia and diabetes in young patients with hypertension less than forty years of age.

Study Design: A cross-sectional study.

Place and Duration: In the Medicine department of Jinnah hospital Lahore and DHQ Hospital Mianwali for six-months duration from July 2021 to December 2021.

Methods: A total of 150 patients with hypertension under forty years of age, receiving antihypertensive treatment or newly diagnosed with hypertension were enrolled in the study. Blood pressure was measured twice with 30 minutes interval in sitting position on the right arm and average BP was recorded. The fasting blood glucose and lipid profile were evaluated after fasting for 12hrs, and the incidence of diabetes and dyslipidaemia was analyzed from the collected data. All statistical analyses and calculations are determined by SPSS 25.0.

Results: Of the 150 enrolled patients, 107 (71.3%) were aged 31-39 and 37 (24.7%) were aged 21-30 and 6(4%) were ≤ 20 of age group. 95 (63.3%) are men and 55 (36.7%) are women. The pervasiveness of pre-diabetes was 46 (30.7%) and diabetes mellitus was 17 (18%). The incidence of dyslipidaemia was 110 (73.3%) with the communal disorder being high triglycerides trailed by low HDL in 82(54.7%) patients. Of high cholesterol, high LDL cholesterol in 19 (12.7%) patients and very high LDL level in 13(8.7%) subjects. Among patients with regarding to HDL cholesterol; low level HDL cholesterol was seen in 82 (54.7%) subjects and 68 (45.3%) patients in acceptable level.

Conclusions: A high incidence of pre-diabetes, dyslipidemia and diabetes was noticed in patients with hypertension under 40 years of age.

Keywords: Dyslipidemia, Diabetes mellitus, Pre-diabetes and Hypertension

INTRODUCTION

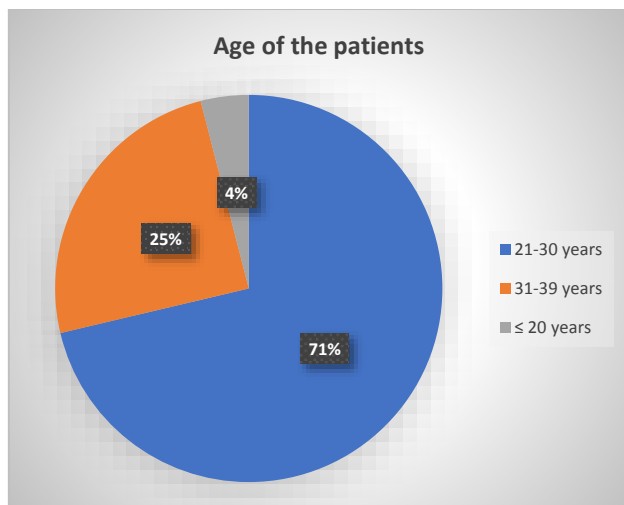
Cardiovascular disease (CVD) is the communal reason of morbidity and mortality worldwide and is growing on daily basis¹⁻². The augmented incidence of CVD has been accredited to many adjustable risk factors of cardiovascular diseases such as diabetes, hypertension, obesity and dyslipidemia. Most of these jeopardy factors are coexist and cluster in the same person and hypertension and hypercholesterolaemia are the most communal³⁻⁴. The risk of associated hypertension and dyslipidaemia is larger than the risks summation of dyslipidaemia or hypertension alone, and these subjects have high cardiovascular complications risk, which require monitoring and added aggressive treatments plans⁵⁻⁶. The collection of these danger factors is the metabolic disorder. In 2010, metabolic syndrome was noticed in about 40% of American adults, and supposed to increase to 45%. In huge cohort prospective study, type-II DM was nearly 2.6 folds more probable to develop in hypertensive patients as compared with normal blood pressure⁷. In Korea analysis found that dyslipidemia in hypertension and diabetes can also occur at an earlier age. In Kashyap Dahal et al study in Nepal; considered 40 acute myocardial infarction patients, 44.75% of whom had hypertension and diabetes in 47% of patients⁸⁻⁹. In other Chandra Mani Adhikari et al study in Nepal of ST segment elevation myocardial infarction (STEMI) in young people considered 133 patients (under 45) with STEMI, which accounted for 10.9% of all cases of STEMI. Amongst them, hypertension, diabetes and dyslipidemia occurred in 29.5%, 25.8% and 45.5% correspondingly¹⁰⁻¹¹. Such acute cardiac events burden can be condensed by optimum risk factor controller¹². Therefore, this analysis was held to investigate the pervasiveness of dyslipidemia and diabetes in young patients with hypertension less than forty years of age. The information will be beneficial in planning suitable therapeutic and prophylactic approaches for people at high risk.

METHODS

This observational and cross-sectional study conducted in Medicine department of Jinnah hospital Lahore and DHQ Hospital Mianwali for six-months duration from July 2021 to December 2021. Approval from hospitals review committee was obtained and written consent was gotten from registered participants. All 150 patients with primary or secondary hypertension under forty years of age, receiving antihypertensive treatment or newly diagnosed with hypertension were enrolled in the study. All subjects of age 40 years or above were not included in the study in addition to patients who were critically ill hospitalized in ICU. The standard technique was applied for measuring Blood pressure by means of mercury sphygmomanometer with an appropriately selected cuff. Blood pressure was measured twice with 30 minutes interval in sitting position on the right arm and average BP was recorded. Hypertension was definite as ≥ 140 mmHg of systolic blood pressure and / or ≥ 90 mmHg of diastolic blood pressure. The fasting blood glucose and lipid profile were evaluated after fasting for 12hrs, and the incidence of diabetes and dyslipidaemia was analyzed from the collected data. Diabetes was established when Impaired Fasting glucose as ≥100-125mg/dl and fasting blood glucose (FBS) ≥126 mg / dL; Grounded on 2018 guideline of American Diabetes Association. Statistics on demographic features of subjects, Lipid Profile including TC, Triglycerides, HDL, Fasting Blood Glucose and LDL cholesterol were gathered and the pervasiveness of Diabetes and Dyslipidemia were analyzed from the collected data. All statistical analyses and calculations are determined by SPSS 25.0.

RESULTS

Of the 150 enrolled patients, 107 (71.3%) were aged 31-39 and 37 (24.7%) were aged 21-30 and 6(4%) were ≤ 20 of age group. Overall, 95 (63.3%) are men and 55 (36.7%) are women.



The pervasiveness of pre-diabetes was 46 (30.7%) and diabetes mellitus was 17 (18%) (Table 1). Though, 46 (30.7%) of 150 patients without a previous diagnosis of diabetes had a FBS level of 100-125 mg / dL and 17 (18%) had FBS ≥126 mg / dL within the range of diabetes.

Table-1: Age distribution and incidence of diabetes and pre-diabetes

Males	95 (63.3%)
Females	55 (36.7%)
Prevalence of Diabetes Mellitus	46 (30.7%)
Prevalence of Pre-Diabetes	17 (18%)

Among the 150 studied people, 110 (73.3%) had raised TG levels, i.e., 62 (41.3%) patients had high levels at borderline and 43 (28.7%) had raised levels of TG and very high level of TGs were seen in 5(3.33%) patients (Table 2).

Table 2: Cross tabulation of Age Vs Lipid Triglycerides (TG)

Age	<150	150-199	200-499	≥500	Total
≤ 20	5	1	0	0	6
21-30	18	16	3	0	37
31-39	17	45	40	5	107
Total (%)	40	62	43	5	150

In our study, total cholesterol increased in 73 (48.7%) patients, i.e., over 200 mg / dl, and 44 (29.3%) patients had borderline raised total cholesterol levels, i.e., 200-239 mg / dl, and 29 (19.3%) patients with high levels of total cholesterol i.e, 240 mg / dL or more (Table 3).

Table 3: Cross tabulation of Age Vs Total cholesterol

Age	<200	200-239	≥240	Total
≤ 20	4	2	0	6
21-30	22	13	2	37
31-39	51	29	27	107
Total (%)	77	44	29	150

119 (79.3%) subjects had LDL levels of cholesterol above 100 mg / dL, borderline high LDL levels of cholesterol (100-129 mg / dL) noticed in 62 (41.3%) patients, and high cholesterol levels over 130-159 mg / dl noticed in 28 (18.7%) subjects.

Table 4: Cross tabulation of Age Vs LDL cholesterol

Age	<100	100-129	130-159	160-189	≥190	Total
≤ 20	3	2	1	0	0	6
21-30	12	20	2	2	1	37
31-39	14	40	24	17	12	107
Total (%)	31	62	28	19	13	150

Of high cholesterol, high LDL cholesterol in 19 (12.7%) patients and very high LDL level in 13(8.7%) subjects (Table 4).

Among patients with regarding to HDL cholesterol; low level HDL cholesterol was seen in 82 (54.7%) subjects and 68 (45.3%) patients in acceptable level (Table 5)

Table 5: Cross tabulation of Age Vs HDL cholesterol

Age	40-60	<40	Total
≤ 20	4	2	6
21-30	26	11	37
31-39	52	55	107
Total (%)	82	68	150

DISCUSSION

The purpose of this research was to collect vital information on the pervasiveness of 2 major risk factors for cardiovascular diseases, diabetes and dyslipidemia, in young people with hypertension. Of the 150 enrolled patients, 107 (71.3%) were aged 31-39 and 37 (24.7%) were aged 21-30 and 6(4%) were ≤ 20 of age group. In our analysis, the pervasiveness of pre-diabetes was 46 (30.7%) and diabetes mellitus was 17 (18%). During the 8-year follow-up of Nkatha Meme in Kenya, approximately 15.1% of the patients had diabetes, 18% had pre-diabetes, and in Germany Luders et al study; 39% of the patients with hypertension had glucose intolerance and diabetes in 12%¹⁰⁻¹¹. In contrast, Bachir Cherif et al study of Algeria exhibited high incidence of DM with 22.1% and only 11.2% had glucose intolerance¹²⁻¹³. This analysis displays that the incidence of DM rises with time of life, possibly because of the collective effect of age and BMI, as recommended in preceding trainings¹⁴. The dyslipidemia incidence in our study was 110(73.3%) which is comparable to Thiombiano et al study, which comprised 710 patients and 62.1% of cases with hypercholesterolaemia¹⁵. In Akintunde et al study in Nigeria institute that 59.1% of recently identified patients with hypertension had minimum one altered lipid constraint. In contrast, a lower incidence was seen in Bachir Cherif et al a study of 3,268 hypertensive patients in Algeria and 16.1% of them had dyslipidaemia¹⁶⁻¹⁷. In China; Zhang et al and in Italy; Pedrinelli et al, the incidence of dyslipidaemia in hypertensive patients was found to be 16.9% and 19.1%, respectively¹⁸. The occurrence of dyslipidaemias is a cause for concern. Its prevalence has been found to increase with age¹⁹. Therefore, mandatory early screening tests can be useful to ease prompt recognition and rapid treatment. In this setting, the AHA commends that dyslipidaemia screening to be commenced when people are in their 20s and concludes that continuous monitoring is necessary. Cardiovascular disease is increasing in developing countries such as Pakistan. This comes with several manageable risk factors and dyslipidemia is a modifiable risk factor usually associated with changes in behaviour and eating habits²⁰⁻²¹. Particular attention should be paid to the predisposition to accelerated diabetes and dyslipidaemia²². Effective treatment and early detection of dyslipidemia and diabetes in young hypertensive subjects is necessary and must be the priority for public health in Pakistan.

CONCLUSION

The results of this study propose that there is disturbing incidence of pre-diabetes, diabetes and dyslipidaemia amongst young hypertensive patients, which may assist as a guide to health organisers in developing and implementing strategies to raise public alertness of the growing incidence of diabetes and dyslipidaemia in young people with hypertension. It also emphasizes the necessity for consistent monitoring of lipid profile and blood glucose in young people with hypertension.

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