ORIGINAL ARTICLE

Prevalence of Dyslipidemia in Nonobese Young Individuals with a family History of Hypertension

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ABSTRACT

Background: Family history is an important risk factor for hypertension in both developed and developing countries. In South Asia the fast economic progress, industrialization and lifestyle changes results an increasing occurrence of hypertension.

Aims: To find the association of dyslipidemia with family history of hypertension in a group of young individuals.

Patients and Methods: This study included 48 normotensive medical students with age range 18-20 years. Student who have positive family history of hyertension were included in the study. A family history of hypertension involving first-degree relatives was recorded via the self-reported questionnaire in the survey. Level of serum total cholesterol, triglyceride, high-density lipoprotein (HDL) cholesterol were measured standard kits.

Results: Mean age of male and female subjects was 21.00 and 20.00 years respectively. BMI of male was 28 and of female were 24 kg/m^2 with inactive life style. Level of serum cholesterol, serum triglyceride and lipoproteins LDL-chole, VLDL chol was significantly increased in both male/female subjects with family history of hypertension. However the level of HDL was non significantly increased in male controls as compared to male subjects. Ratio of LDL/HDL was also more in male subjects as compared to female controls.

Conclusion: Finding of study highlights the significance of parental account of hypertension in the realization of community health strategies for preventing the hypertension and avoidance of complication including atherosclerotic dilemma.

Keywords: Hypertension, Family history, dyslipidimia

INTRODUCTION

Hypertension is a major contributor to the load of non-infectious disease worldwide. It is a major health challenge in both developed and developing countries[1]. In South Asia the fast economic progress, industrialization and lifestyle changes results an increasing occurrence of hypertension[2]. In Pakistan the prevalence of hypertension is 35%[3].

Family history is an important risk factor for hypertension. About 30 % of hypertension is associated with genetic factors[4,5]. The proposed mechanisms for the link between family history of hypertension and increase risk of developing hypertension, are the increased reaabsortion of sodium from proximal tubule of kidney, increase lithium-sodium counter transport, reduced urinary excretion of kallikrein, increase level of serum insulin, dyslipidemia and oxidative stress, along with environmental factors like increase exposure of heavy metals and increase sodium intake[6]. However the risk related with family history may be independent to other risk factors, including BMI, age and physical activity[7].

It is experimentally proved that among normotensive person with history of hypertension there is an early cardiac changes and impair capacity of peripheral vessels results an increased blood pressure[8]. There is also altered impaired uptake of glucose by insulin and dyslipidemia propose fundamental genetic reason of metabolic disorders[9].

Attention has been give to find the function of genetic factors in associated the primary hypertension with dyslipidimia. It is proposed that there is link of genetic faction with primary hypertension, but the phenotype of increased blood pressure with late penetrance. Hypertension and dyslipidemia are usually the disease of cardiovascular system[10]. It is suggested that hypertension may have a comparable pathophysiology with disease of cardiovascular system[11].

Dyslipidemia or altered level of lipids and their carriers increased the risk of complications associated with atherosclerosis. Damage of enodothelium and decrease vasomotor activity also results an increased blood pressure[12].

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Hypercholesterolemia and hypertension often coexist and the reason of dyslipidemic hypertension[13].
Aims and Objectives: Study was designed to find the association of dyslipidemia with family history of hypertension in a group of young individuals.

METHOD

This study included 48 normotensive medical student with age range 18-20 years. Student who have positive family history of hypertension were included in the study. A family history of hypertension involving first-degree relatives was recorded via the self-reported questionnaire in the survey. Overnight fasted blood samples were drawn from overnight fasting for at least 8 hours. Level of serum total cholesterol, triglyceride, high-density lipoprotein (HDL) cholesterol were measured standard kits using an autoanalyzer (Hitachi, Japan). The level of low-density lipoprotein (LDL) cholesterol was calculated using Friedewald's formula. LDL/ HDL ratio was calculated. Study was approved by ethical committee of Institute. Letter of consent was taken from each student.

Statistical Analysis: Data was analyzed by SPSS 20. Quantitative variables were presented as a mean ± SD. Statistical differences between data of the subject groups, and the control group, were calculated using student 't' test. P values were significant if <0.05.

RESULTS

Mean age of male and female subjects was 21.00 and 20.00 years respectively. BMI of male was 28 and of female was 24 kg/m^2. Socioeconomic status of most of the male/female subject was middle class. Both male and female subjects used health diet. Life style was inactive in most of the male/female subjects (Table 1).

Level of serum cholesterol, serum triglyceride and lipoproteins LDL-chole, VLDL chol was significantly increased in male subjects with family history of hypertension with a significant difference of P<0.05 and P< 0.001. However the level of HDL was non significantly increased in male controls as compared to male subjects. Ratio of LDL/HDL was also more in male subjects as compared to female controls (Table 2).

Variation in the level of lipid profile in female subjects with family history of hypertension is tabulated as table 2. Level of serum cholesterol, serum triglyceride and lipoproteins LDL-chole, VLDL chol was significantly increased in female subjects with family history of hypertension with a significant difference of P<0.05 and P< 0.001. However the level of HDL was significantly increased in male controls as compared to male subjects. Ratio of LDL/HDL was also more in female subjects as compared to their female controls (Table 3).

Table 1: Demographic characterstics of male/female adolescent with family history of hypertenison.

Variables	Male (23)	Female (25)
Age (year)	21.00±0.08	20.00±0.06
BMI (Kg/m^2)	28.65±4.63	24.00±1.93
Socioeconomic status	11.0 (middle class)	10.0 (middle class)
	03 (upper class)	02 (upper class)
Family Background	19 educated	22 educated
	04 uneducated	03 uneducated
Diet	18 (healthy diet)	20 (healthy diet)
	05 (vegetarian)	05 (vegetarian)
Life style	07 Active	11 Active
	16 Sedentary	14 Sedentary
Blood pressure (mmHg)	120/75	110/70

Table 2: Variation in the level of fasting blood glucose and lipid profile in male subjects with family history of hypertension

Variables	Male subjects	Male controls
Serum cholesterol (mg/dl)	201.59±26.17**	183.5±17.09
Serum triglyceride (mg/dl)	193.47±33.68*	162.17±26.94
HDL-Chol (mg/dl)	39.47±3.18	48.47±21.07
LDL-Chol (mg/dl)	123.62±9.60**	105.86±16.75
LDL/HDL ratio	3.13	2.18

*P< 0.05= Significant difference
**P< 0.001= Highly Significant difference

Table 3: Variation in the level of fasting blood glucose and lipid profile in female subjects with family history of hypertension.

Variables	Female subjects	Female controls
Serum cholesterol (mg/dl)	203.88±25.47**	188.15±17.5
Serum triglyceride (mg/dl)	191.5±37.36**	166.2±28.52
HDL-Chol (mg/dl)	40.81±3.71	43.43±5.4
LDL-Chol (mg/dl)	124.81±27.92**	111.41±16.89
LDL/ HDL ratio	3.05	2.56

**P< 0.001= Highly Significant difference

DISCUSSION

Mean age of male and female subjects were 20-21 years. It is stated that family history of hypertension has an additive impact on the age-related increase in the risk of hypertension[14].

BMI of male was 28 and of female was 24 kg/m^2. According to a study increased BMI is directly related with hypertension in adolescent with positive family history of hypertension[15]. It is reported that subjects with positive family history of hypertension have a high BMI with increased lipid profile give an idea of metabolic syndrome in which insulin resistance is a common route for the development of obesity, hypertension and diabetes[16].

Socioeconomic status of most of the male/female subject was middle class. It is

suggested that hypertension is related with increased class of urbanization, educated background and socioeconomic status[17].

Our subjects are all students and their diet is usually consisting of snacks, intake of fried food and soft drink. The Life style was inactive in most of the male/female subjects. According to a study poor dietary habits and sedentary life results in hypertension[18]. It is suggested that hypertension is described by modification of biological systems, due to apo e genes that may increase the risk of hypertension[19]. Hypertension is an age-related disease with multiple factors. Both genetic and environmental factors (diet and life style) are responsible to increase the risk of hypertension[20].

We observed an increased dyslipidimia in both sexes of adolescent with positive family history of hypertension as compared to controls. According to a study about 15-18% of dyslipidemia is mainly due to genetic variants[21]. It is suggested that levels of serum lipid levels are altered by genetic[22] and several environmental factors[23] and their communications[24]. It is proposed that dyslipidemia and hypertension link to each other as these are the constituents of the metabolic syndrome, and it may be possible that hyperinsulinemia or insulin resistance may join disease associated with syndromes[25]. A study links the hypertension and lipid with increase expression of angiotensin I. Study also observed that insulin resistance and abnormalities of lipid are related with sympathetic hyperfunction which may increase the risk of hypertension[26].

A study found that increased lipid levels in adolescents have been related to genetic vulnerability and may contribute to the pathogenesis of disease of cardiovascular system[27]. Findings of a study suggest that metabolic disease like disease of cardiovascular system and dyslipidemia in fetal stage may occur in later life. Study reported that young people with a positive family history of hypertension in spite of their body weight, may have dyslipidemia due to high fat mass[28].

According to a study increased level of serum cholesterol is strongly linked with hypetension and important in developing Myocardial Infarction[27]. The results of a study revealed that the modification of *SLC13A* gene effect on the level of serum LDL-cholesterol, may increase the risk of hypertension[24]. Ratio of LDL/HDL-chol is a marker of cardiovascular diseases[29].

Conclusion:

Finding of study highlights the significance of parental account of hypertension in the realization of community health strategies for preventing the hypertension and avoidance of complication including atherosclerotic dilemma.

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