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ASSOCIATION OF LIPID PROFILE AMONG THE HYPERTENSIVE IN COMPARISON TO NORMOTENSIVE PATIENTS IN OUR INSTITUTION

Biochemistry

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ABSTRACT

Introduction: Hypertension and dyslipidemia are associated with oxidative stress and are major causes of cardiovascular disease amounting to 30% of global death rate. It is widely accepted that cardiovascular disease is associated with hypertension and increased blood levels of low-density lipoprotein (LDL), total cholesterol (TC), and triglycerides. In contrast, a low level of high density lipoprotein (HDL) is a risk factor for mortality from cardiovascular disease. Hypertension is a major public health problem in developed and developing countries.

Methods: This study was a cross sectional study in which 159 diagnosed hypertensive patient and 75 with normal blood pressure (normotensive) were enrolled. These patients sought a through health cheek up including blood pressure assessment between May 2020 to April 2021

Results: The mean of Systolic blood pressure and Diastolic blood pressure of hypertensive were higher than normotensive ($p<0.001$). The serum levels of total cholesterol, triglyceride and LDL-C in hypertensive subject were higher than normotensive and statistically significant ($p<0.001$). Serum HDL-C was significantly lower ($p<0.001$) in hypertensive patients than in normotensive.

Conclusion: Hypertensive patients have been found to have close association with dyslipidemia. Hypertensive patients need measurement of blood pressure and lipid profile at regular interval to prevent heart diseases and stroke.

KEYWORDS

Hypertension, Lipid profile, Total cholesterol, Triglyceride, LDL-C, HDL-C.

INTRODUCTION:

Hypertension is a major public health problem in developed and developing countries. Hypertension and dyslipidemia are associated with oxidative stress and are major causes of cardiovascular disease amounting to 30% of global death rate.[1] It is widely accepted that cardiovascular disease is associated with hypertension and increased blood levels of low-density lipoprotein (LDL), total cholesterol (TC), and triglycerides. In contrast, a low level of high density lipoprotein (HDL) is a risk factor for mortality from cardiovascular disease. [2] Epidemiological studies have established a strong association between hypertension and coronary artery disease (CAD). Hypertension is a major independent risk factor for the development of CAD, stroke and renal failure. Non-communicable disease risk factor survey Bangladesh 2010 studies have estimated that among adults, the prevalence to range from 16% to 20%. [3] Nutrition, health and demographic survey of Bangladesh 2011 have estimated that among adults, the prevalence of hypertension was 34%. Urban subjects had a higher prevalence of hypertension 37% while for rural prevalence was significantly lower at 33% ($p<0.001$).[4]

The Seventh report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC-7) classifies BP as normal (Systolic BP<120mmHg and Diastolic BP<80mmHg). Pre hypertension (Systolic BP 120-139mmHg and Diastolic BP 80-89mmHg), Hypertension stage I (Systolic BP 124-159mmHg and Diastolic BP 90-99mmHg and hypertension stage 2 (Systolic BP 160mmHg and Diastolic BP 100mmHg) respectively.[5]

Atherosclerotic diseases are a leading cause of disability and death worldwide and two third of these are associated with dyslipidemia. Worldwide, there is a wide variation in mean population lipid profiles levels. Increased serum total cholesterol (TC), triglyceride (TG), low density lipoprotein (LDL-c) level and decreased high density lipoprotein (HDL-c) are associated major risk factors for cardiovascular disease (CVD). Dyslipidemia comprising altered ratio of high to total cholesterol level and isolated evaluation of the low density lipoprotein or triglycerides is usually associated with rising blood pressure levels. There are strong and relations between total LDL cholesterol concentrations and coronary heart disease risk. In Bangladesh consumption of saturated fat and red meat is injurious to health and a known risk factor for CVD especially hypertension.[6]

METHODS:

This study was a cross sectional study in which 159 diagnosed hypertensive patient and 75 with normal blood pressure (normotensive) were enrolled. These patients sought a through health cheek up including blood pressure assessment between May 2020 to April 2021. All the subjects were residents of the surrounding areas and aged 30-60 years. Patients with features of any cardiac or renal complication and major medical problem were excluded. For statistical analysis data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS 24.0. and GraphPad Prism version 5. A chi-squared test ($\chi 2$ test) was any statistical hypothesis test wherein the sampling distribution of the test statistic is a chi-squared distribution when the null hypothesis is true. Without other qualification, 'chi-squared test' often is used as short for Pearson's chi-squared test. Unpaired proportions were compared by Chi-square test or Fischer's exact test, as appropriate.p-value ≤ 0.05 was considered for statistically significant.

Table - Distribution Of Age: Hypertensive And Normotensive Patients.

		Hypertensive =159		Normotensive = 75	
		Male (n=88)	Female (n =71)	Male (n=40)	Female (n=35)
Age groups (years)	<=30	12 (80)	3 (20)	16 (59)	11 (41)
	31 – 40	18 (51)	17 (49)	9 (43)	12 (57)
	41 – 50	24 (53)	21 (47)	7 (54)	6 (46)
	51 – 60	21 (49)	22 (51)	6 (75)	2 (25)
	61 – 70	9 (75)	3 (25)	2 (33)	4 (67)
	>=71	4 (44)	5 (56)	0(0)	0(0)

Table 2: Serum Lipid Profile Of Hypertensive And Normotensive Patients.

		Hypertensive =159		Normotensive = 75		
		Mean (SE)	CI	Mean (SE)	CI	P-Value
Indicators (mg/dl)	Total Cholesterol	248.31 (2.16)	211.01 - 242.5	177.01 (4.26)	183.62 - 191.51	0.001
	Triglyceride	179.34 (1.84)	169.51 - 181.1	151.47 (2.83)	136.72 - 143.13	0.001
	HDL-cholesterol	42.23 (1.09)	39.23 - 46.36	43.38 (1.82)	45.65 - 48.91	0.001
	LDL – cholesterol	139.22 (1.65)	137.13 - 165.3	120.32 (2.33)	106.63 - 113.97	0.001

RESULT AND DISCUSSION:

Hypertension is recognized globally as a major public health problem.[7] It is known as the well known risk factor for coronary heart disease, type 2 diabetes mellitus and renal diseases.[8] About 80% of hypertensive persons have co morbidities such as obesity, glucose intolerance, low HDL-Cho, high LDL-Cho and increased triglycerides etc. Two or more co morbidities are found in about more than 50%hypertensive patients. Present study was focused on to study the lipid profile pattern of hypertensive patients with normotensive patients. In present study the results revealed that the mean value of serum total cholesterol, triglycerides and serum LDL-cholesterol was significantly higher and statistically significant. The mean of HDL of cases were lower than that of controls and was statistically significant. A prospective study which was based in the northern region of Bangladesh, to investigate the lipid profile status in hypertensive patients as compared to healthy normotensive controls. Their study revealed similar findings of high serum total cholesterol, triglycerides and LDL-cholesterol as observed in our study.[9] Our findings of increased level of total cholesterol in hypertensive patients are similar to the findings of some other studies.[10] A prospective study conducted in Bangladesh on type 2 diabetes mellitus patients with and without hypertension revealed significantly high total cholesterol, triglycerides and LDL-cholesterol in hypertensive patients with type 2 diabetes mellitus as compared to the normotensive type 2 diabetes mellitus subjects.[11] Few studies showed strong association of hypertension and dyslipidimia with major risk factors of coronary heart disease.[12]

Based on the results obtained from the present study, we concluded that serum lipid profile especially total cholesterol, triglycerides, LDL-cholesterol levels and HDL-cholesterol are significantley associated with hypertension.

CONCLUSION:

Analytical results of the study revealed that hypertensive patients have been found to have close association with dyslipidemia. Hypertension and dyslipidemia can be modified either by proper life style changes or medical management or by the combination of the both. This study suggests that hypertensive patients need measurement of blood pressure and lipid profile at regular interval to prevent heart diseases and stroke.

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