DYSLIPIDEMIA IN NEWLY DIAGNOSED ELDERLY HYPERTENSIVE PATIENTS (>60 YEARS) IN A RURAL TEACHING INSTITUTE OF SUB-HIMALAYAN REGION

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ABSTRACT

Introduction: Elevated lipid levels are associated with the subsequent development of hypertension. However, the role of dyslipidemia in hypertension in the elderly has received little attention. **Aim:** We evaluated dyslipidemia in newly diagnosed elderly hypertensive patients at Dr RPGMC Kangra at Tanda. **Methods:** One hundred patients above 60 year of age newly diagnosed with hypertension and presenting to outpatient clinic of Department of Medicine, Dr RPGMC Kangra were included. Statistical analysis was performed using SPSS v21.0 (IBM, USA). **Results:** Mean age of the patients was 70.9 ± 6.8 years. 52% were males, 61% were taking vegetarian diet, 33% were smokers, 23% were abusing alcohol, and 19% were diabetic. Mean BMI was 23.6 ± 2.4 Kg/m². 25% had hypercholesterolemia (>230 mg/dl), 22% had triglyceridemia (>160 mg/dl), and 22% had LDL levels more than 120 mg/dl. In this study, non-vegetarian diet and diabetes were significantly associated with increased levels of cholesterol and triglycerides while only diabetes was a risk factors for increased LDL. Dyslipidemias were not associated with abnormal findings on ECG and Echo. **Conclusion:** Non-vegetarian diet and presence of diabetes are risk factors of dyslipidemia among the newly diagnosed elderly patients with hypertension.

KEYWORDS : Cholesterol, Triglycerides, LDL, Hypertension

INTRODUCTION

Hypertension and dyslipidemia are widely recognized risk factors for cardiovascular disease.^{1,2} And yet, the pathophysiology of the association between hypertension and dyslipidemias is still not completely understood.³ Several mechanisms have been postulated to explain this association. Atherosclerosis - caused in great part by dyslipidemias - leading to structural changes that result in the decreased elasticity of large arteries, is generally viewed as the principal pathophysiologic alteration contributing to the emergence of arterial hypertension in the elderly.⁴

By altering vasomotor mechanisms mediated by nitric oxide, dyslipidemias also alter endothelial function⁵, which in turn can cause increases in blood pressure. Renal microvascular injuries due to dyslipidemias are also postulated to contribute to arterial hypertension.⁶ Finally, coincident genetic factors, such as having chromosomal regions related to blood pressure and dyslipidemias in common^{7,8}, which predispose for the concomitant occurrence of hypertension and dyslipidemia⁹, and the fact that reductions in blood pressure in hypertensive individuals have been attributed to use of statins¹⁰, suggest shared pathophysiologic mechanisms that need to be better elucidated.

Several studies have examined prospectively whether elevated lipid levels are associated with the subsequent development of hypertension in middle age adults. Higher levels of triglycerides, higher total cholesterol (total-C), higher non-HDL cholesterol (non-HDL-C) have been found to be associated with an increased risk of hypertension.¹¹⁻¹⁴

Moreover, the role of dyslipidemia in hypertension in the elderly has received little attention. We evaluated dyslipidemia in newly diagnosed elderly hypertensive patients at Dr RPGMC Kangra at Tanda.

METHODS

This descriptive hospital-based study was conducted in Dr. Rajendra Prasad Government Medical College, hospital Kangra at Tanda over a period of 12 months. All patients above 60 year of age newly diagnosed with hypertension and

presenting to outpatient clinic were included. The patients aged below 60 years of age, failure to give consent, non-hypertensive patients, and those failed to complete the work-up, were excluded.

The classification of hypertension was based on the average of two or more properly measured seated BP readings. In JNC 7, the report JNC in contrast to the classification provided in the JNC 6 report, a new category designated pre-hypertension has been added, and stages 2 and 3 hypertension have been combined. The auscultatory method of BP measurement with a properly calibrated LED apparatus was used. Patients were seated quietly for at least 5 minutes in a chair (rather than on an exam table), with feet on the floor, and arm supported at heart level.

Measurement of BP in the standing position was indicated periodically, especially in those at risk for postural hypotension. No liquor intake or smoking before recording blood pressure. An appropriate-sized cuff (cuff bladder encircling at least 80 percent of the arm) was used to ensure accuracy. At least two measurements were made. SBP was the point at which the first of two or more sounds is heard (phase 1), and DBP was the point before the disappearance of sounds (phase 4).

STATISTICAL ANALYSIS

Data were presented as frequency, percentages, mean, and standard deviation. Categorical variables were compared using Chi Square test with or without Yate's correction. P value < 0.05 was considered significant. Statistical analysis was performed using SPSS v21.0 (IBM, USA).

RESULTS

Mean age of the patients was 70.9 ± 6.8 years. 52% were males, 61% were taking vegetarian diet, 33% were smokers, 23% were abusing alcohol, and 19% were diabetic. Mean BMI was 23.6 ± 2.4 Kg/m².

Dyslipidemia

In this study, 25% had hypercholesterolemia (>230 mg/dl), 22% had triglyceridemia (>160 mg/dl), and 22% had LDL levels more than 120 mg/dl (Figure 1).

Risk Factors

In this study, non-vegetarian diet and diabetes were significantly associated with increased levels of cholesterol and triglycerides while only diabetes was a risk factors for increased LDL (Table 1).

Table 1: Risk Factors Of Dyslipidemia

	Cholesterol >230 mg/dl		Triglycerides >160 mg/dl		LDL (>120 mg/dl)	
	n	P value	n	P value	n	P value
Male sex	14	0.644	11	0.832	11	0.832
Non-veg diet	14	0.044	13	0.029	11	0.231
Smoking	10	0.390	8	0.902	7	0.894
Alcohol	8	0.337	6	0.590	6	0.590
Diabetes	14	<0.0001	13	<0.0001	14	<0.0001

ECG and Echo findings

In this study, dyslipidemias were not associated with abnormal findings on ECG and Echo (Table 2).

	Cholesterol >230 mg/dl		Triglycerides >160 mg/dl		LDL (>120 mg/dl)	
	n	P value	n	P value	n	P value
ECG		0.969		0.911		0.369
STEMI	2		1		0	
NSTEMI	1		1		0	
LVH	3		2		3	
Normal	19		18		19	
Echo		0.922		0.803		0.207
RWMA	3		2		0	
LVH	3		2		3	
Normal	19		18		19	

DISCUSSION

In this study, dyslipidemia was associated with non-vegetarian diet and presence of diabetes. Diet is an important factor that can be modified to prevent hypertension. Sufficient evidence supports the role of modifiable factors, including diet, body weight, physical activity, and alcohol intake in the development of hypertension. Dietary modifications have been shown to be particularly effective in preventing and managing hypertension.¹⁵ Epidemiological studies have shown that increased LDL-C and non-HDL-C levels and decreased HDL-C levels are associated with an increased risk of cardiovascular disease in patients with diabetes.¹⁶

Individuals with high blood cholesterol levels have a higher prevalence of hypertension and those with high blood pressure have a higher prevalence of hypercholesterolemia.¹⁶ A recent epidemiologic study revealed that 56.5% of patients with hypertension also had concomitant dyslipidemia and the percentage of patients with hypertension and dyslipidemia in the total population was estimated to be 15%.¹⁸ In our study, dyslipidemia were not associated with abnormal ECG and Echo findings.

Most of the studies have been conducted in younger hypertensive individuals, and data are lacking in elderly population. A study from Brazil showed that High HDL-cholesterol had an independent protective effect on subsequent development of hypertension in the elderly.¹⁹

CONCLUSION

Non-vegetarian diet and presence of diabetes are risk factors of dyslipidemia among the newly diagnosed elderly patients with hypertension.

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