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Evaluation of lipid status of hypertensive Nigerians in Ado-Ekiti, western Nigeria

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Abstract

Ninety hypertensive patients and thirty age and sex related controls in Ado-Ekiti, Nigeria were investigated for their serum lipid status: Total cholesterol (TC), Triacylglycerol (TG), Low Density Lipoprotein Cholesterol (LDLC), Very Low Density Lipoprotein Cholesterol (VLDLC) and High Density Lipoprotein Cholesterol (HDLC). Hypertension was found to be more prevalent among male (66.6%) than in female (33.3%) and majority of the patients belonged to 51-70years age group in both sexes. There was a significant increase ($P < 0.05$) in serum lipid contents of normotensive males compared with their female counterparts. However, no statistically significant alterations were observed in lipid profile of hypertensive males and females. There was significant increase in serum TC, TG, LDLC and VLDLC level as well as decrease in HDLC in hypertensive patients. The study shows that there is hyperlipidemia most importantly in TC, TG, VLDLC and LDLC in hypertensive patients in Ado-Ekiti, Western Nigeria.

Key words: Hyperlipidemia, patients, normotensive, hypertension, sexes, age.

INTRODUCTION

Hypertension otherwise known as High Blood Pressure (HBP) is one of the leading causes of death in developing countries [1]. The prevalence of hypertension has been found to vary with race, age, geographic pattern, gender and socioeconomic status. For instance, hypertension is more prevalent in blacks than in the whites and increases in elderly [2]. Socioeconomic status which is an indicator of lifestyle attributes and is inversely related to the prevalence, morbidity and mortality rates of hypertension [3]. Several risk factors such as obesity, cigarette smoking, increased salt intake, genetic factors and lack of physical exercise has been attributed to the development of hypertension in human [3]. An abnormal lipid profile has been strongly associated with atherosclerotic cardiovascular diseases and this has shown a direct effect on endothelial dysfunction that occurs in hypertension [4]. The alteration in serum lipid profile on

hypertension should be actively investigated. Therefore, in this study we intend to look at the serum lipids profiles of the hypertensive patients in Ado-Ekiti, Ekiti State, and western Nigeria.

MATERIALS AND METHODS

Subjects

The study was undertaken in the Department of Biochemistry, University of Ado-Ekiti Teaching Hospital, (UNADTH), Nigeria. A total number of ninety (90) newly diagnosed hypertensive patients who have not commenced medication were selected from outpatient's clinic of UNADTH. Another group of thirty (30) subjects served as age and sex related controls from the outpatient Department who were not hypertensive.

Venous fasting blood samples were drawn from all the subjects and analysed for TC, HDLC and TG by enzymatic colorimetric method [5]. LDLC and VLDLC were calculated by Friederickson-Friedewalds formular [6].

Statistical analysis of data was determined using student's t-test and $P < 0.05$ were regarded as significant.

RESULTS AND DISCUSSION

Table 1: Age and sex distribution in hypertensive subjects

Age Group (Years)	Males (%)	Females (%)
30 < 40	5 (5.5)	2 (2.2)
41-50	15 (16.7)	5 (5.6)
51-60	20 (22.2)	12 (13.3)
61-70	20 (22.2)	11 (12.2)
Total n = 120	60 (66.64)	30 (33.3)

Table 2: Serum lipid profile (mmol/l) of male and female hypertensive patients

Group	TC	HDLC	VLDLC	LDLC	TG
Males n = 60	6.59 ± 2.11	0.89 ± 0.55	0.69 ± 0.20	5.01 ± 2.65	3.45 ± 1.25
Females n = 30	6.44 ± 2.18	0.80 ± 0.15	0.67 ± 0.15	4.97 ± 0.34	3.35 ± 0.82
P - Value	P>0.05	P>0.05	P>0.05	P>0.05	P>0.05

Table 3: Serum lipid profile (mmol/l) of male and female normotensive patients

Group	TC	HDLC	VLDLC	LDLC	TG
Males n = 60	3.66 ± 2.11	2.50 ± 0.55	0.33 ± 0.20	0.83 ± 0.43	1.65 ± 1.25
Females n = 30	3.00 ± 2.18	2.12 ± 0.15	0.26 ± 0.15	0.62 ± 0.34	1. ± 0.82
P - Value	P<0.05	P<0.05	P<0.05	P<0.05	P<0.05

Table 4: Serum lipid profile (mmol/l) of hypertensive patients and normotensive controls

Group	TC	HDLC	VLDLC	LDLC	TG
Hypertensive n = 90	6.23 ± 2.32	0.93 ± 0.12	0.70 ± 0.08	4.62 ± 1.22	3.50 ± 1.65
Normotensive n = 30	3.82 ± 0.58	2.47 ± 0.65	0.32 ± 0.11	1.03 ± 0.34	1.58 ± 0.22
P - Value	P<0.05	P<0.05	P<0.05	P<0.05	P<0.05

The age and sex distribution presented in Table 1 revealed that most of the cases belonged to old age group. There was no significant difference ($P>0.05$) in the means of serum lipid levels in males and females hypertensive patients while there was a significant increase in the levels of serum lipid in males than in female normotensive subjects (Table 2 and 3). Most of the hypertensive patients have elevated serum lipids (Table 4). It shows that hyperlipidaemia is a common finding in hypertension.

DISCUSSION

Hyperlipidemia is a frequent finding in cardiovascular diseases most importantly in hypertension. In our study, we found significant increased ($P<0.05$) levels of TC, TG, LDLC and VLDLC in hypertensive patients when compared with their normotensive counterparts. However, there was a significant decrease in HDLC in hypertensive patients. Several studies have consistently shown correlation between serum level of cholesterol, TG, HDLC and VLDLC with hypertension [7, 8, 9]

In the present study, there was significant increase in TG in hypertensive patients. This hypertriglyceridemia might be probably due to hypercoagulability. The increased TG found in hypertension, is likely to be deposited in some predisposed vessels thereby contributing to the endothelial dysfunction resulting in the production of LDLC as evidenced in the present study where there is elevation in serum LDLC. This is in corroboration with the reports of other workers [2]. Serum TC concentration rose much more significantly in hypertensive patients in our study which corroborated with the findings of many workers [10,11,]. This hypercholestronemia seen in hypertension may be due to lack of physical exercise, increase intake of dietary animal fat and genetic factors [10]

HDLC level is found to be low in hypertensive patients than in the controls. HDLC level has been implicated in ischaemic heart disease [12]. Therefore, lower level of HDLC in hypertensive patients may play a significant role in hypertension.

The findings of raised VLDLC in hypertensive patients in comparison with normotensive controls observed in this study might be due to hypertriglyceridemia which leads to increased entry of VLDLC that carries endogenous triglyceride into circulation.

The results from the present study also show the peak incidence of hypertension in both sexes in age group of 51-70years. Higher incidence of hypertension has also been reported in the elderly age group [2]. We also found prevalence of hypertension in male population. Our results also show male value of serum TC, TG, LDLC and VLDLC to be significantly higher and HDLC was significantly lower in hypertensive patients.

From the results obtained from this study, it can be concluded that there is hyperlipidemia in hypertensive patients as TC, TG, LDLC and VLDLC correlates positively with hypertension. Increase age and sex may also be contributory factors to the development of hypertension in Nigerians. Thus, the assessment of serum lipids in the prevention and management of hypertension in Nigerians.

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