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SOME HAEMATOLOGICAL PARAMETERS AND LIPID PROFILE OF HYPERTENSIVE PATIENTS ATTENDING OUTPATIENT CLINIC OF FEDERAL MEDIAL CENTRE, OWERRI, NIGERIA

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ABSTRACT

The study was aimed at assessing platelet count, haemoglobin level and lipid profile of hypertensive subjects attending outpatient clinic in Federal Medical Center, Owerri. A total of 100 subjects were investigated, out of 50 were hypertensive subjects and 50 were normotensive. The platelet counts were analyzed using the colorimetric method. Total cholesterol of hypertensive subjects with 236.07± 67.06mmol/l while that of normotensive group 136.05±20.44 was significant. (P<0.05). Low density lipoprotein of hypertensive were significantly higher 169.33±67.26mmol/L when compared to that of the control group 86.20± 25.78mmol/L (P<0.05). High density lipoprotein of hypertensive subjects were significantly (P<0.05) lower 38.43± 11.47mmol/L compared with that of the normotensive control group 105.75±30.96mm/L. The triglyceride were also significantly increased (P<0.05) in hypertensive group 138.93±53.1mmol/l compared with control group 105.75±30.96mmol/L. The platelet count of hypertensive subjects were 205.23±35.85xl0^9/L lower than that of normotensive 214.65±46.49x10^9/L were not statistically significant. (P>0.05). The hemoglobin level of hypertensive subject were 11.67±1.77 lower than that of normotensive 12.88±1.13 but were (P>0.05). This work concluded that all the lipid profile studied statistically deviated from the control group. Again the hemoglobin and platelet were significantly below the reference value and recorded a change when compared with the control.

Keywords*: hypertension, haematological parameters, lipids, cardiovascular disease*

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INTRODUCTION

Hypertension, most commonly referred to as 'hypertension', is a long-term condition of persistently elevated blood pressure (Giles et al., 2009). Hypertension is present when a person has systolic blood pressure consistently above 140 mmHg and diastolic blood pressure consistently above 90 mmHg (Obeagu et al., 2016; Ozims et al., 2017; Obeagu et al., 2016; Ozims et al., 2017; et al., 2018; Nwovu et al., 2018).

However, long-term hypertension is a major risk factor for coronary heart disease, stroke, heart failure, peripheral vascular disease, blindness, and chronic kidney disease (Foëx and Sear, 2014). Screening programs have shown that 25% of individuals in the general population (m) have hypertension (Fernández-Arroyo et al., 2015). Prevalence and susceptibility to complications increase with age and are higher in blacks (Fernández-Arroyo et al., 2015). High blood pressure can be present without any symptoms, and if it is accompanied by symptoms, it can be discovered incidentally during a routine medical examination. These usually consist of headaches with symptoms. These usually consist of headache, ringing in the ears (ringing in the ears) and dizziness. Headaches tend to occur in the occiput, are worst in the morning, lessen during the day, and worsen in the evening (Kuan Huei et al., 2010). High blood pressure is on the rise due to unhealthy diet and lifestyle changes. A high-cholesterol diet is associated with elevated serum levels of total cholesterol, triglycerides, and low-density lipoprotein, which are known to be associated with hypertension and cardiovascular disease (Mora et al., 2013).

MATERIALS AND METHOD

Study Area

This study was carried out at the haematology and chemical pathology laboratory in the Federal Medical Centre (FMC) located in Owerri, Imo State in South East geopolitical Zone of Nigeria.

ETHICAL CONSIDERATION

Approval for the study was obtained from the department of medical laboratory science, Faculty of Health Sciences, Imo State University. Approval was also obtained from ethical/ medical advisory committee of the hospital (Federal Medical Centre, Owerri). Approval was also made on it agreement to seek the patient’s consent first.

SUBJECT SELECTION CRITERIA

The subject selection was carried out in Federal Medical Centre, Owerri Imo State. A total of 100 subjects were used for the study. 50 hypertensive subjects between the ages 18- 65 years were used as test. While 50 normotensive subjects, ages 18 -65 years were enrolled and participated as controls for the study.

SAMPLE COLLECTION

Five milliters (5ml) of blood was collected aseptically from each subject into an anticoagulated sample bottle and plain sample bottles which was allowed to clot. The blood was centrifuged for five minutes (5 minutes) at 3000 revolutions per minutes (RPM) and the serum was separated into plain sample bottles and was stored frozen for subsequent analysis.

METHODOLOGY

PLATELET COUNT (I1AEMOCYTOMETRIC METHOD)

PROCEDURES

0.38ml of filtered ammonium oxalate was pipette into clean khan tubes. 20ul of well mixed anticoagulated venous blood was also added to each khan tubes and mixed properly. The counting chamber was assembled, and then the grids of the counting chamber were filled with the sample. The chamber was left undisturbed for 20 minutes in a petri dish wet swap after which the underside of the chamber was cleaned and mounted on the microscope stage. The cells were then counted using X40 objective lens.

HAEMOGLOBIN ESTIMATION (CYANMETHAEMOGLOBIN METHOD)

PROCEDURE

0.02ml (20ul) of blood was added to 5ml (milliliters) of drabkin's solution in a test tube (1: 250 dilution). It was well mixed and allowed to stand for 10 minutes. The absorbance was read colorimetrically at 540 Nanometers (green filter) wavelength with d rabid ns solution as blank. The absorbance of the standard was read in the same way.

ESTIMATION OF TOTAL CHOLESTEROL

PROCEDURE

All reagents were brought to room temperature before use. Four (4) different test tubes labeled Test, Control, Standard and Blank were used and arranged on a test tube rack. 1ml (millitres) of the cholesterol reagent was pipette into all the different test tubes (Test, Control, Standard

and Blank). 10ul (microlitre) of the sample was added into the tube labeled Test, 10ul (microlitre) of the control sample was added to the tube labeled Control and 10ul (microlitre) of the standard reagent was added to the tube labeled Standard. The tubes were mixed properly and allowed to stay at room temperature for 1Ominutes. The absorbance of the test was read at a wavelength of 546nm (nanometer) wavelength.

ESTIMATION OF TRIGLYCERIDES

PROCEDURE

All reagents were brought to room temperature before use. 1ml (millilitre) of the triglyceride regent was pipetted into four (4) different test tubes labeled Test, Control, Standard and Blank. 10ul of sample was added to the tube labeled Test, 10ul (microlitre) of control sample was pipetted into the tube labeled control and 10ul of standard reagent was added to the tube labeled standard. The tube were mixed properly and allowed to stay at home temperature for 10 minutes. The absorbance of the test was read at a wavelength of 546nm wavelength.

ESTIMATION OF HIGH DENSITY LIPOPROTEIN (HDL)

PROCEDURE

300ul (microlilers) of sample was pipetted into a centrifuge tube. The lube was well mixed after the addition of 300µl of HDL reagent and allowed to stand for l0minutes at room temperature. The mixture was then mixed again and centrifuge for l0minutes at 4000 rpm (revolution per minute).

1 ml (milliliter) of the cholesterol reagent was added to three different tubes labeled Test, Control, Standard and Blank. 50µl (microliter) of the supernatant was transferred into the tube labeled Test, 50µl of the control sample was transferred into the tube labeled Control, 50µl of HDL standard was added to the tube labeled Standard. The tubes were well mixed and were incubated at.37°C for 5minutes. The absorbance was read at a wavelength of 546nm (nanometer).

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These parameter were obtained by computation as shown below using the friedeWald's equation (Warnicker al 1990).

LDL (mmol/L) = TC - (HDL + VLDL)

VLDL (mmol/L) = TG/ 2.2

RESULT

TABLE 1: COMPARISM OF MEAN AND STANDARD DEVIATION OF LIPID PROFILE OF HYPERTENSIVE (TEST) SUBJECTS AND NON HYPERTENSIVE (CONTROL) SUBJECT

PARAMETERS	TEST	CONTROL	P-VALUE
TC (mg/dl)	236.07±67.06	156.05± 20.44	P<0.05
TG (mg/dl)	138.93±53.91	105.75±30.96	P<0.05
HDL (mg/dl)	38.43±11.47	44.35±5.71	P<0.05
LDL (mg/dl)	169.33±67.26	86.20±25.78	P<0.05

TC of test (236.07±67.06mg/dl) statistically significantly (P<0.05) higher than that of the control (156.05±20.44 mg/dl). Triglyceride level of the test group (138.93±53.91mgldl) was significantly higher than the control (105.75±30.96mg/dl). Comparism of HDL between the test (38.43±11.47mgldl) and control group (44.35±5.71mgldl) shows a significantly lower level in the test group. LDL of the test group (169.33±67.26mgldl) was significantly higher than the control group (86.20±25.78mgldl).

TABLE 2: COMPARISM OF MEAN AND STANDARD DEVIATION OF PLATELET AND HEAMOGLOBIN OF TEST AND CONTROL SUBJECTS

Parameters	Test	Control	P-value
Platelet ($x10^9$)	205.35±32.85	214.65±46.49	P>0.05
Hemoglobin (g/dl)	11.67±1.77	12.88±1.13	p>0.05

Reg: Significantly significant when compared with the control.

The platelet count of the test group (205.35±32.85 x 10^9) was not significantly (P>0.05) lower when compared with the control group (214.65±46.49 $xl0^9$).The Haemoglobin (11.67±1.77) of the test group was significantly (P<0.05) lower than the control group (12.88±1.13).

DISCUSSION

The lipid profile in hypertensive subjects showed statistical significant differences in most of the lipid parameters such a triglyceride, low density lipoprotein and very low density lipoprotein compared to the control group. The total cholesterol of hypertensive subjects was higher but not. This may be due to the fact that most of the hypertensive subjects were not on antihypertensive drugs and most of them again were not on diet restriction which could have reduced the total cholesterol (Gregg *et al.,* 2003). A study conducted on hypertensive patients who were not restricted to a traditional American diet enriched with fruits and vegetables alter eight weeks follow up period showed higher total cholesterol level. High Density Lipoprotein of hypertensive patients were also lower 38.43T1 1,47mmol/L as compared to the control group which was 44.35±5.71 mmol/L and was statistically significant (<0.05). High density lipoproteins are known as good cholesterol because it helps remove other forms of cholesterol from the bloodstream. A normal healthy individual should have elevated density lipoprotein in order to maintain normal state of other cholesterol that may cause complications.

Significantly raised lipoprotein was observed among hypertensive subject in this study and also twice the control group. The finding may be so because of the significantly higher level of triglyceride observed in this study 05.75±30.96minol/L. The reason for this is because VLDL is the major transporter of lipids in the body and caries more of triglycerides (50-60%) than cholesterol (10-1 5%).

The low density lipoprotein (LDL) of the studied subject was significant (P<0.05) higher than that of the control though the normal upper reference range. The LDL produced from VLDL due to interaction of enzymes in the blood stream with the triglyceride within the lipoprotein s change its configuration from VLDL to LDL which has more cholesterol (40%) than the triglyceride (10%). The higher LDL observed when compared, with the control group may be due to raised level (Karthikeyan *et al.,* 2009).

The platelet of hypertensive subjects are within the normal reference range and also similar to that of the control group. This implies that the risk of formation of platelet clot within arteries is reduced. May be because of the drugs or because of the normal cholesterol level in the study group has prevented the formation of plaque to trigger the platelet action in the blood vessels(Obeagu *et al.,* 2016; Obeagu *et al.,* 2018). However, the hypertensive subjects showed

elevated systolic and diastolic blood pressure when compared with the control group. This is understandably so because of the much pressure required by the heart to pump blood for circulation (Azuonwu *et al.,* 2018; Obeagu *et al.,* 2022; Ifeanyi Obeagu *et al.,* 2022)

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CONCLUSION

This work has shown that the platelet count and lipid profile of hypertensive subject when on anti-hypertensive medication and diet restriction is within the normal reference value. When on medication and diet restriction the total cholesterol, high density lipoprotein and low density lipoprotein show good progress as all these parameters are within the recommended references values of the general population.

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