EVALUATION OF HAEMATOLOGICAL PARAMETERS OF HYPERTENSIVE PATIENTS BASED ON AGE GROUPS IN TERTIARY HOSPITAL IN OWO, ONDO STATE

ABSTRACT

Hypertension is a major health problem worldwide. It can lead to cardiovascular disease and also leads to functional disturbances including hematological parameters. Therefore, the aim of this study was to assess some hematological parameters of hypertensive individuals based on age groupsat Federal Medical Centre, Owo, Ondo State. The study was a hospital based cross-sectional in which subjects were selected randomly using a well-structured questionnaire who were age matched. 5 ml of blood was collected for haematological test analysis using ADVIA® 2120i Haematology system (SIEMENS). Data were presented in tables and shown as mean ± standard deviation and added using statistical packages for social sciences (SPSS, Version 20.0) with level of significance set at as $p \leq 0.05$. One hundred (100) hypertensive individuals were enrolled in this study. There was no significant differences in the haematological parameters of the study participants based on age groups.

Keywords*: hypertensive patients, haematological parameters, ages, hospital*

INTRODUCTION

Cardiovascular disease has become an important cause of premature death and disability in Sub-Saharan Africa (Jacob *et al.,* 2017). Hypertension is known to be the major contributor and is itself a consequence of increasing urbanization and an increasingly western lifestyle, exemplified by increasing obesity, higher salt intake, and a sedentary lifestyle**.** Another contributory factor to hypertension may be blood viscosity. Plasma and whole blood viscosity have been suggested as important determinants of arterial blood pressure (Jacob *et al.,* 2017) both in normotensive individuals and in those with untreated hypertension (Nwovu *et al.,* 2018; Obeagu *et al.,* 2016; Ozims *et al.,* 2017; Obeagu *et al.,* 2018).

Hypertension, also known as high blood pressure, is a global public health issue. It contributes to the burden of heart disease, stroke and kidney failure and premature mortality and disability (WHO, 2013). The adverse health consequences of hypertension are compounded because many

affected people also have other health risk factors who include tobacco use, obesity, high cholesterol and diabetes mellitus (WHO, 2013). Besides these traditional factors, there is a number of disputes in various studies with respect to variability of hematological parameters in patients with hypertension and normotensive subjects. Impaired haematological parameters may strongly indicate hypertensive end-organ damage, specifically kidney failure. Specifically increased Haemoglobin (Hb) level may cause left ventricular hypertrophy while low Haemoglobin (Hb) levels causes anemia and heart failure (Hamza, 2019). Arterial hypertension is a major cause of morbidity and mortality because of its association with coronary heart disease, cerebrovascular disease and renal disease.

The cellular components of blood contribute to the viscosity and volume of blood, thus playing a vital role in regulating blood pressure. It has been newly realized that many hematological parameters varies with hypertension in comparison with normotensives. This gives a vision into the connection between blood cell defects and blood pressure (Divya and Ashok, 2015). There are number of disputes in different studies with respect to variability of haematological parameters in hypertensive and normotensive subjects. Thus, this study is aimed at filling such gap differrence. The pathophysiology of hypertension is multifactorial which is affected by sympathetic over activity contributing to alterations in haematological parameters like hematocrit, viscosity and hypercoagulability of blood. These factors change the kinetics of blood flow acting as contributory risk factor for coronary artery diseases, stroke and thromboembolism (Badaruddoza and Basanti, 2010). Thus the haematological parameters gives an insight to prognosis of disease also. So the present study was therefore undertaken to estimates the haematological parameters as an indicator in hypertensive patient.

Aim

To evaluate haematological parameters of patients with hypertension based on age groups in Owo, Ondo State. Nigeria.

MATERIALS AND METHOD

Research Design

The study is a hospital based cross-sectional study among Hypertensive based on age groups. The subjects were selected using a well-structured questionnaire who were age and sex matched. Informed consent was obtained from subjects.

Study Area

This study was carried out at the Federal Medical Centre, Owo, Ondo State. **Target Population**

This study was conducted at Federal Medical Centre, Owo Ondo state, Nigeria**.** One hundred (100) hypertensive individuals gouped into two based on age groups were enrolled in this study.

Blood Collection

Ten (5 ml) blood sample was collected from prominent vein within the antecubital fossa and dispensed into dipotassium ethylenediaminetetra-acetic acid (K2EDTA) container, for haematological analyses.

Validation of Instruments

The subject's haematological parameters status was validated by thin film technique and Patients that are non-hypertensive were used as control samples.

Method of the Test

This was carried out using an automated analyser; KX-2IN (Sysmex Corporation, Kobe, Japan) Haematology analyser.

Method of Data Analysis

The data were presented in tables and were presented as mean ± standard deviation and analyzed using statistical packages for social sciences (SPSS, Version 20.0) and level of significance set at as $p \leq 0.05$.

Ethical Clearance

Ethical approval was obtained from Achievers university ethical committee, after submitting a detailed project proposal, Introduction letter from the supervisor, questionnaires and informed consent. Confidentiality was assured to the subject, participation in the study was voluntary and a subject not willing to continue was free to withdraw at any stage.

RESULTS AND DISCUSSION

TABLE 1: Mean ± standard deviation of haematological parameters of Hypertensive patient based on age group

Parameters	**18-35years MEAN ± SD**	**➢ 35years MEAN ± SD**	**t- Value**	**p- Value**
PCV (%)	34.80±6.99	33.90 ± 9.87	1.74	0.79
HEMOGLOBIN (g/dl)	12.94±1.98	12.66 ± 2.79	1.65	0.89
RED BLOOD CELL COUNT ($\times 10^{12}$/L)	4.58± 1.79	4.38 ±1.94	0.36	0.45
TOTAL WBC($\times 10^{9}$/L)	11.17 ± 3.97	11.45 ± 4.24	-3.35	0.43
LYMPHOCYTE (%)	51.50 ± 7.87	52.70± 8.56	-3.64	0.89
NEUTROPHIL (%)	46.60±6.93	45.76 ± 9.17	-1.23	0.48
MONOCYTES (%)	2.30±0.56	2.70 ± 0.20	-2.12	0.97

EOSINOPHIL (%)	0.60± 0.01	0.30 ±0.01	1.23	0.68
MCV(FL)	91.51 ± 6.90	93.85 ± 7.70	-2.84	0.47
MCHC(g/dl)	32.78 ± 8.40	34.51 ± 7.90	3.39	0.86
MCH(pg/CELL)	31.98 ± 3.60	30.63 ± 9.40	1.27	0.92
PLATELET COUNT(× 10^9/L)	214 ± 34.78	224 ± 19.74	-2.38	0.56
PDW	16.43 ± 4.96	15.53 ± 2.98	-0.84	0.93
PLATELETCRIT (%)	0.194 ± 0.03	0.19 ± 0.01	0.38	0.83
MPV	9.30 ± 4.04	9.58 ± 2.54	0.78	0.96

The table above showed no significant differences in PCV(34.80±6.99%, 33.90 ± 9.87%, p=0.786) RBC(4.58± 1.79x1012/L, 4.38 ±1.94 x1012/L, p=0.453), HGB(12.94±1.98g/dL, 12.66 ± 2.79g/dL, p=0.897), PDW(16.43 ± 4.96fL, 15.53 ± 2.98fL, p=0.934) WBC (11.17 ± 3.97x109/L, 11.45 ± 4.24x109/L, p=0.432), LYM (51.5 ± 7.87%, 52.7± 8.56%, p=0.841),Neutrophil (46.6±6.93%, 45.76 ± 9.17%, p=0.476), Monocyte(2.3±0.56%, 2.7 ± 0.2%, p=0.967), Eosinophil(0.6± 0.01%, 0.3 ±0.01%p=0.675) MCV (91.51 ± 6.9fL, 93.85 ± 7.7fL, p=0.472), MCH (31.98 ± 3.6Pg, 30.63 ± 9.4Pg, p=0.923), MCHC (32.78 ± 8.4g/dL, 34.51 ± 7.9g/dL, p=0.856), PLT(214 ± 34.78x109/L, 224 ± 19.74x109/L, p=0.959), MPV (9.30 ± 4.04fL, 9.58 ± 2.54fL, p=0.964) and Plateletcrit (0.194 ± 0.03%, 0.195 ± 0.01%, p=0.826) when compared between the two age group

The findings of this report as shown in Table 1 revealed no statistical difference in the haematological parameters of the study participants based on sex. Thus, It is possible that the role of elevated WBC count (or mild chronic inflammation) in the development of hypertension may differ among the study participants (Ranjith *et al.*, 2015). Activated WBCs also reflect the inflammatory activity of atherosclerosis that perpetuates vascular injury and tissue ischemia. Some studies have reported that WBC count is also associated with several cardiovascular disease risk factors. These findings include positive associations with body weight, systolic blood pressure, fasting glucose level and negative associations with high density lipoprotein cholesterol level (Ranjith *et al.*, 2015).

CONCLUSION

The findings of this report observed no significant differences in the haematological parameters of the study participants based on age group.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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