Archives of Hematology and Blood Diseases

Volume 1, Issue 1, 2018, PP: 23-26

Evaluation of Some Haematological Parameters among Different Tribes Residing in Nnewi, Anambra State, Nigeria

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Abstract

***Background:** Genetic and environmental factors have been shown to contribute to all blood cell measures, accounting for between 61%–96% of variance. This study was carried out to evaluate the values of some haematological parameters among different tribes (Igbo, Yoruba, Hausa, Ibibio, Ijaw, Urhobo and Efik) residing in Nnewi, Anambra state Nigeria.*

***Methodology:** Four hundred and twenty subjects of age range 18 to 84 years old were tested on some haematological parameters which includes; Haemoglobin concentration (Hb), Packed Cell Volume (PCV), Total Red Blood Cells count (RBC), Mean Corpuscular Volume (MCV), Mean Corpuscular Haemoglobin (MCH) and Mean Corpuscular Haemoglobin Concentration (MCHC), total White Blood Cells (WBC), Platelet count and erythrocyte sedimentation rate (ESR).*

***Result:** Hb, PCV, Platelets, MCH, MCHC, MCV and ESR were significantly ($p>0.05$) different among the seven different tribes residing in Nnewi. RBC and WBC were not significantly ($p<0.05$) different among the seven different tribes residing in Nnewi.*

***Conclusion:** Some haematological values differ among the different tribes in residing in Nnewi, Anambra state, Nigeria.*

Keywords: *Haematological values, Nnewi and Tribes*

Introduction

The oxford dictionary defined a tribe as a social division in a traditional society consisting of families or communities linked by social, economic, religious, or blood ties, with a common culture and dialect (1). Most of this tribe migrates to other cities, towns and villages for better opportunities and better livelihood. Traditional food systems play significant roles in maintaining the well-being and health of ethnic peoples (1). Nutritional status can be used as a measure to assess the nutritional status of the different tribes with whom we carried out the research. When it comes to native foods and cultural delicacies, their food mainly depends on the ingredients that are produced in a particular area (2).

Nnewi is a rural/semi urban community in Anambra State, one of the southeastern states of Nigeria. It is located east of river Niger and about 22km southeast of Onitsha. It lies on longitude 6.92 degrees East and latitude 6.03 degrees North and right in the middle heartland of the Igbo tribe (one of the three main tribes of Nigeria) (3). There are different tribes (Yoruba, Efik, Ibibio, Urhobo, Kanuri, Ijaw and Hausa), apart from the Igbo that are resident in Nnewi, and ethnicity is known to affect haematological parameters due to different dietary intake and genetic makeup (4).

Genetics and environment factors have been shown to contribute to all blood cell measures, accounting for between 61%–96% of variance (5).

Hematological parameters such as red (RBC) and white blood cell (WBC) counts and hemoglobin (Hb) concentration are tightly regulated traits with high clinical relevance. These traits are tightly regulated in healthy individuals and are under genetic control (6).

Recent human genome wide association studies have reported strong associations between specific loci and multiple hematological parameters (7), and in some cases the same loci are also associated with disease risk. For example, SNPs associated with hematocrit (8), are also associated with high blood pressure and hypertension. Likewise, SNPs associated with eosinophil number are associated with the risk of asthma (9). Haematological changes are commonly used to determine the body status and to assess the impact of environmental, nutritional and/or pathological stresses (10). Hematologic testing is very useful and is widely used in the clinical practice (11). Haematological parameters provide valuable information on the immune status of individual and these parameters may vary depending on age, gender, race, environmental and genetic background (12,13).

However, normal haematological information on different tribes is hardly available in the literature. This study was to evaluate baseline data on haematological parameters of seven different tribes residing in Nnewi, Anambra state, Nigeria.

Materials and Methods

One hundred and forty subjects, age range 18-84 years old was used for the study. They consist of 60 subjects each from the different tribes (Igbo, Yoruba, Hausa, Ibibio, Ijaw, Urhobo and Efik) and made up of males and females all residing in Nnewi.

Blood samples were collected from their cubital vein using 3 mL disposable syringe then transferred into a labeled test tube containing anticoagulant (K_2EDTA). It was immediately used for measuring the haematological values: Haemoglobin (Hb) in g/dl, Packed cell volume (PCV) in %, White blood cell count (WBC) in $x10^6$/l, Platelet count in $x10^6$/l, Red blood cells count (RBC) in $x10^{12}$/l, and red blood cells indices (MCV, MCH and MCHC) using haematology analyzer (Erma PCE 210 made in Japan). Erythrocyte sedimentation rate (ESR) in mm/hr was also measured using Westergren method**.** Mann Whitney test was used to compare two variables and Kruskal Wallis test used for multiple variables. Level of significant (P value ≤ 0.05) and confidence interval of 95% were considered as statistically significant at that level.

Result

Table 1 shows the haematological values of 7 different tribes residing in Nnewi. There were significant (p>0.05) difference in erythrocyte sedimentation rate, haemoglobin, packed cell volume and platelet count among the tribes. However, there was no significant (p>0.05) difference in white blood cell count and red blood cell count among the different tribes. The haemoglobin values of the Efik and the Ijaw subjects were higher than the other tribes. The packed cell volume values from Igbo tribe and Urhobo was significantly lower when compared with people from tribes studied. The MCHC values of the Ibibio and the Hausa subjects were lower when compared with the other tribes. the Igbo subjects, the Yoruba subjects, the Urhobo subjects, and the Efik subjects, were higher than the values obtained from the Ibibio subjects, the Ijaw subjects, and the Hausa subjects.

Table 1. *Some haematological parameters of the different tribes residing in nnewi, anambra state*

Haematological Parameters	IGBO (n=60)	YORUBA (n=60)	IBIBIO (n=60)	EFIK (n=60)	HAUSA (n=60)	URHOBO (n=60)	IJAW (n=60)	P VALUES
HB (g/l)	12.10±1.15	12.41±1.28	12.39±1.14	13.46±1.20	12.86±0.90	12.86±0.90	13.45±2.08	0.00*
PCV (%)	36.34±3.29	37.27±3.26	37.67±3.06	39.00±2.23	38.44±3.90	35.60±2.43	39.56±3.56	0.00*
WBC ($x10^9$/l)	4.38±0.95	4.33±0.87	4.57±0.79	4.18±0.90	4.24±0.45	4.60±0.43	4.56±0.56	0.86
PLATELET($x10^9$/l)	191.78±27.82	189.64±31.19	185.89±20.07	205.60±25.08	179.11±9.14	214.67±20.45	195.89±25.62	0.02*
RBC ($x10^{12}$/l)	5.69±0.61	5.74±0.57	5.66±0.65	5.92±0.58	5.87±0.29	5.67±0.45	5.89±0.62	0.79
MCH (pg)	21.80±2.27	20.18±1.92	21.59±2.61	22.36±0.54	21.41±1.32	20.35±1.48	22.51± 1.96	0.01*
MCHC (g/dl)	33.30±2.20	33.30±1.51	32.89±1.97	34.51±1.51	32.60±1.20	33.26±1.65	34.00±1.60	0.01*
MCV (fl)	64.48±3.56	65.63±2.24	64.84±2.10	61.27±4.05	64.99±2.23	63.23± 2.52	64.90±4.49	0.00*
ESR (mm/hr)	11.06±4.53	11.09±4.30	8.94±3.34	10.20±2.70	7.44±2.00	11.84±4.19	7.45± 1.08	0.02*

Data is expressed as mean ± SD; * Significant (P ≤ 0.05)

Discussion

There is no data are available on some haematological parameters among different tribes residing in Nnewi, Anambra state, Nigeria. Haematological parameters have been shown to be influenced by various factors such as age, sex, genetic, tribes and nutrition. Significant differences in haemoglobin and Packed cell volume values were also observed among the tribes studied, which can be attributed to diet, environment, socio-economic conditions and physique (14,15). Platelet count differ by ethnicity and has been reported (16,17, 18). Our findings, revealed significant differences in platelet count among the different tribes living in Nnewi and its environ, which agree with Biino *et al.*(19), that there is a micro-heterogeneity in platelet parameters even among apparently ethnically homogeneous subjects living in the same country and even in the same region. The different tribes in this study showed significant difference in their ESR values. These differences may be due to their genetic makeup even when these tribes might be staying in the same environment and also individual dieting may be different therefore implicating ethnicity as a factor affecting ESR reference value. Edwin and Robins in 2007 (20), discovered that ethnicity affects haemoglobin, white blood cells, platelets and pack cell volume but do not gives any information on ethnicity ESR, hence this information will serve as abased line on this. The different tribes studied did not show any significant differences in the values of RBC, this could be due to the fact that even though these people are from different tribes but having stayed together in the same location for a while might have their body system adjusted to this region by what they eat and the environmental factors. However, there was a significant difference in the values of RBC indices, this may be due to the fact that RBC indices is a factor of hemoglobin concentration rather than the red blood cells counts which may help in the classification of anaemia.

Conclusion

The results show remarkable diversity in parameters like haemoglobin, haematocrit, platelet and ESR values among the tribes living in Nnewi and environs. But the other parameters assayed in this study showed no variation among the tribes. The variation of the parameters among the tribes suggests that genetic, ethnicity and diet had more roles to play. The results are of importance to build up tribal information system and interpret result depending on the patient's ethnic background. The values developed form these tribes will be of immense benefit to most clinical trials requiring monitoring of haematological parameters and patient care in general. It may also reflect possible disease burden in relation to tribes, which will help define future health policies.

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Citation: **Onwurah O.W, Onyenekwe C. C, Ifeanyichukwu M, Ezeugwunne I. P, Igweze Z. G, Apakama A.I, Amilo G.I., Okosa M.C***. Evaluation of Some Haematological Parameters among Different Tribes Residing in Nnewi, Anambra State, Nigeria. Archives of Hematology and Blood Diseases. 2018; 1(1): 23-26.*