

RELATIONSHIP BETWEEN HAEMATOLOGICAL VALUES WHITE BLOOD CELL (WBC), CD4 AND HIV INFECTION IN INDIVIDUALS NOT YET ON ANTI-RETROVIRAL IN ONITSHA METROPOLIS, ANAMBRA STATE, NIGERIA.

ABSTRACT

Four hundred and seventy eight (478) individuals, who exhibited some manifestations of chronic and debilitating illnesses including persistent cough, skin cancer and dermatitis, multiple lymph adenitis, diarrhoea and enteritis, genital sore, urethritis, vaginitis and weight loss were examined to establish relationship between human immuno deficiency (HIV) infection and some haematological parameters of WBC and CD4 counts. Haematological values such as white blood cell (WBC) and CD4 counts were evaluated to know the characteristics of the values in HIV positive and negative individuals. Both male and female among HIV negatives (282) recorded higher WBC count of 5149 per mm³ range of 3000-7000 and standard deviation of 5742 while those with HIV positive numbered one hundred and sixty nine (169) with mean WBC count of 2460 per mm³ ranged 1,500-3,500 standard deviation of 662. Mean CD4 counts for both gender in HIV negative was 799.56 lymphocytes/ml whereas HIV positive had 255.2 lymphocytes /ml. Generally, HIV positive individuals showed decreased WBC and CD4 cell counts when compared with the HIV negative individuals.

Keywords: Haematological values, Lymphocytes, CD4, WBC, HIV Positive and negative.

INTRODUCTION

Some haematological indices may act as indicators or predictive markers of HIV infections (Adewuyi and Chitalka 1994, Erhabor *et al.*, 2005, Donald *et al.*, 2008, Zon and Groop man, 1988, Domniquez at al, 1994). Two of these parameters viz white blood cell (WBC) and CD4 Counts were studied in HIV infected individuals. The study was designed to establish the existence or otherwise of this pattern in the area studied as a prelude to identifying patients that could be subjected to HIV screening.

MATERIALS AND METHOD

SAMPLE POPULATION

A total of four hundred and seventy eight (478) individuals were involved in the study. Some of them were direct patients who were referred to fezimedical laboratory for HIV screening. Many were patients from various private Hospitals and clinics in Onitsha and others were General Hospital Onitsha. Patients record of ages and symptoms were obtained through questionnaire.

COLLECTION OF BLOOD SAMPLES

The EDTA samples collected by vene-punctures were used for the WBC count estimations as follows:

TOTAL WHITE BLOOD CELL COUNT

0.02ml of mixed EDTA blood samples were pipetted into 0.38ml of glacial acetic acid in a clean glass tubes, mixed and allowed to stand for about 20 minutes for complete lysis of the red cells. Improved Neuber counting chamber was filled using Pasteur pipette and the content stood for 5 minutes to settle. Using X40 objective lens, the (WBC) white blood cells were counted in four corner squares of the chamber (Baker and silvertan 1997). The WBC count per ml was calculated as described by Dacie and Lewis (1975).

CD4 COUNT METHOD

CD4 cell count was by the method of (Chacha, 2009).

RESULT**TABLE 1: DIFFERENCE IN CD4 COUNT (LYMPHOCYTE/ μ L BETWEEN HIV POSITIVE AND NEGATIVE INDIVIDUALS WITH RESPECT TO GENDER**

HIV POSITIVE					HIV NEGATIVE						
Gender	Number Tested	Range	Mean	Standard deviation	Number tested	Range	Mean	Standard deviation	Normal values in Lymphocyte unit/ μ l	T. test value	Significance at $P \leq 0.05$
Male	71	150-350	243	58	58	600-1600	822	570.68	>350 units/ μ l	15.77	Significant
Female	84	150-380	265	99	149	600-1100	775	631	>350 units/ μ l		
Both	155	150-380	255	83.21	307	600-1600	800	426			

TABLE 2: DIFFERENCE IN TOTAL WHITE BLOOD CELLS COUNT (per mm^3) BETWEEN HIV POSITIVE AND NEGATIVE INDIVIDUALS WITH RESPECT TO GENDER

HIV POSITIVE					HIV NEGATIVE						
Gender	Number Tested	Range	Mean	Standard deviation	Number tested	Range	Mean	Standard deviation	Normal values in mm^3	Student T. test value	Significance at $P \leq 0.05$
Male	78	1500-1900	2473-86	501	145	3000-7000	5061-04	5173	4000-1100/ mm^3	5.93	Significant
Female	91	1600-3500	2448.90	776	137	3800-7000	5241	6306	4000-11000/ mm^3		
Both	169	1500-3500	2460	662	282	3000-7000	5149	5741.53	4000-11000/ mm^3		

DISCUSSION

There was a significant different difference between HIV positive and negative individuals in respect of CD4 count ($t(462) 15.77P=0.031$) with HIV negatives recording higher counts than HIV positives. Mean CD4 count for both gender in HIV negatives was 799.56 lymphocytes/ml whereas HIV positives had 255.2 lymphocytes/ml. Total number for HIV positives was one hundred and fifty five (155) and HIV negatives, three hundred and seven (307).

In males, HIV negatives tested were one hundred and fifty eight (158) CD4 range was 600-1600 units/ml, mean 822.26 lymphocytes /ml and standard deviation 370.68. HIV positives tested were seventy one (71), range 150-350 units/ml, mean, 242.96 lymphocytes/ml and standard deviation 58.24. HIV negatives females tested were one hundred and forty nine, range 600-1100 lymphocytes/ml mean 775

unit/ml and standard deviation of 6306 while HIV positives tested were eighty four (84), range 150-380 units/ml, mean 255 and standard deviation of 83.

There was a significant difference in white blood cell count (WBC) between HIV positive and negatives. (T(442)= 5.93, $P \leq 0.05$) with HIV negatives recording higher mean WBC count 5061 per mm^3 of blood while HIV positives recorded 2474 mm^3 as shown in table 2 below. For males, number tested, for HIV negatives were one hundred and forty five (145), range 3000-7000 and standard deviation 5173 and for HIV positives were 78, range was 1,500 – 1,900, mean, 2474 and standard deviation 501.

Females numbered one hundred and thirty seven (137) for HIV negatives with mean WBC count of 5242.24 per mm^3 , range 3,800 – 7000 and standard deviation 6306 while female HIV positive individuals had lower mean WBC of 2449 per mm^3 of blood lower range of 1,600 – 3,500 and lower standard deviation 776.

Both male and female among HIV negatives (282) recorded higher WBC count of 5149 per mm^3 range of 3000-7000 and standard deviation of 5742 while those with HIV positive numbered one hundred and sixty nine (169) with mean WBC count of 2460 per mm^3 , range 1,500-3,500 standard deviation of 662.

Generally, an individual whose WBC and CD4 counts were low with symptoms of loss of weight and one or more signs of immuno deficiency may be considered worthy of HIV testing and regarded as a high suspect individual (zon and Groopman 1988, maury and lah-clerita 1990, Nannuki *et al* 1997). If individual tests HIV negative in cases of aggamaglobulinamia, a polymerase chain reaction test can be done.

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